



REPORT

June 2015

Norwegian National Advisory Unit on Arthroplasty and Hip Fractures

Norwegian Arthroplasty Register
Norwegian Cruciate Ligament Register
Norwegian Hip Fracture Register
Norwegian Paediatric Hip Register

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NORWEGIAN NATIONAL ADVISORY UNIT ON ARTHROPLASTY AND HIP FRACTURES 2015 ANNUAL REPORT

This annual report presents results and descriptive statistics from our five registers. The Paediatric Hip Register has recently received pre-national status and its finances are ensured through funding from Helse Vest.

National medical quality registers must have a general manager employed by the hospital where the register is located; in the case of our registers, this is Helse Bergen. Knut Fjeldsgaard is now the general manager of the Cruciate Ligament Register.

As required by the Interregional Steering Committee for the National Service Centre for Medical Quality Registers, the results at hospital level from the Hip Fracture Register were published in autumn 2014 (<http://www.kvalitetsregistre.no/resultater/>). In the present annual report, we publish for the first time, at hospital level, the ten-year survival rate of hip and knee replacements, the ten-year survival rate of ACL graft surgery and the two-year implant survival rate after hip fracture surgery. The results are presented with an explanation of the limitations of our data, together with results of coverage analyses showing the proportion of the operations notified to the Norwegian Patient Register (NPR) which were also reported to our registers, and vice versa.

The completeness analyses were performed in collaboration with the National Service Centre for Medical Quality Registers of the Centre for Clinical Documentation and Evaluation (SKDE) and the NPR. The results of the completeness analyses for total hip and knee arthroplasties, as well as for operations for hip fractures and knee ligament injuries, were also published in last year's report.

All orthopaedic surgeons should help to check the completeness in their own hospital. In hospitals with poor completeness, the surgeons should review their procedures for collection and submission of forms to the registers, and their present coding practice on operations on the relevant joints in the administrative system of the hospital (to the NPR). In our reports, we provide advice on the use of codes. The Directorate of Health and the Centre for Clinical Documentation and Evaluation (SKDE) have made separate reports based on the completeness analyses from our registers. These reports are available at <http://www.kvalitetsregistre.no> and www.helsedirektoratet.no. We are now working on completeness analyses for prostheses in other joints than the hip and knee and for the Paediatric Hip Register. We plan to repeat the analyses every second year.

Norwegian orthopaedic surgeons have long been requesting a system of electronic reporting to the registers. The National Service Environment for Medical Quality Registers is dealing with this, but it has proved difficult to develop a system that is legal and as easy for surgeons to use as the paper forms, and which enables reporting of implant data at a catalogue number level. There is also ongoing work on a system of electronic recording and transmission of patient-reported outcome measures (PROM) for the joint replacement registers and the Cruciate Ligament Register. The systems should be compatible with the various electronic recordkeeping and administrative systems used in hospitals, and should comply with Norwegian regulations for electronic transmission of personally identifiable health information. It remains uncertain when these tools will be ready for use.

The annual report is sent electronically to all Norwegian orthopaedic surgeons. Paper copies can be obtained by contacting us. The Norwegian Arthroplasty Register website <http://nrlweb.ihelse.net/> contains all our annual reports and references to all our scientific papers and presentations. Most of the papers are also available electronically from our website.

We mainly publish our findings on implants and surgical methods in scientific journals, where we can explain materials and methods and discuss strengths and weaknesses and the significance of the findings. We refer to the reference list at the end of the present report.

Hospital-based annual reports, with data from each hospital, will as before be sent to our contact persons at the hospitals. We encourage our contacts to check the coverage analysis and that the figures recorded from the hospital are correct, and to use the reports for local quality control work.

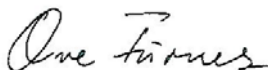
Please remember that the Norwegian Data Protection Authority requires consent forms to be signed by patients before operations are reported to the registers, and the declarations of consent must be stored in the patient record in the hospital.

We would like to thank all orthopaedic surgeons in Norway for good reporting. We are also grateful for good cooperation with Helse Bergen, Helse Vest, SKDE, the equipment suppliers, the University of Bergen, NPR, the Norwegian Knowledge Centre for the Health Services, the Norwegian Institute of Public Health, the Office of the Auditor General, the Norwegian Board of Health Supervision, the Directorate of Health and the Ministry of Health and Care Services.

Bergen, 03.06.2015



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THE HIP ARTHROPLASTY REGISTER 2015 ANNUAL REPORT

This year's annual report contains data from 190 962 total hip replacement operations. In 2014, there were 8099 primary operations and 1284 revisions. The figures are similar to those from 2013.

TRENDS AND RISK OF REVISION

Overall, there has been a positive development with improved results over time, but the risk of early reoperation has increased in recent years, when there have also been changes in surgeons' choice of prostheses and operation techniques.

In recent years, uncemented prostheses have been more frequently used for elderly patients than previously. This change in practice is not supported by the literature (Dale et al. 2012; Mäkelä et al. 2014; Jämsen et al. 2014), and we see in this year's report that the increased use of uncemented femoral prostheses in elderly patients has now ended.

In Table 26 and Figure 13 in this year's report, we now see a clear reduction in the use of 22 and 28 mm head diameters, and increased use of 32 mm. This is probably beneficial, since 32 mm heads give a lower risk of dislocation. For articulation with highly crosslinked polyethylene there is no evidence that 32 mm leads to increased wear. Larger heads than 32 mm would probably further reduce the dislocation risk, but heads of 36 mm or larger could increase the risk of fretting (corrosion) on the taper joint between head and neck.

There have also been changes in the choice of surgical approach. The use of minimally invasive anterior and anterolateral approaches has been increasing for several years, but this has now levelled off. The use of posterior approaches has increased over the last seven years and is still on the increase, at the expense of the direct lateral approach. This may be beneficial, since Amlie et al. (2014) showed that with a direct lateral approach about 25% of patients experienced limping after surgery. This was about twice as many as for patients who underwent other surgical approaches.

We are not certain as to whether limping after a direct lateral approach has always been a problem or whether this is due to changes in surgical technique or earlier postoperative weight bearing than before. To gain a better overview of the problem, we ask all surgeons to report to the Hip Register all reoperations involving muscle transposition or re-fixation of the gluteus medius

Although early revisions have increased somewhat, hip replacement surgery shows good results.

METAL ON METAL (MoM) PROSTHESIS

Please remember that hospitals have a duty to regularly monitor all patients with MoM prostheses with a diameter of >32 mm for the rest of their lives, as recommended by the Norwegian National Advisory Unit on Arthroplasty and Hip Fractures (<http://nrlweb.ihelse.net/> or <http://www.haukeland.no/nrl/>) and in line with similar recommendations in other countries.

PUBLICATIONS:

From 1 January 2014 to date, the Register has published 17 papers dealing with total hip arthroplasty. See the publication list later in the annual report and on the website of the Register (<http://www.haukeland.no/nrl/> or <http://nrlweb.ihelse.net/>).

SUMMARY OF SIGNIFICANT SCIENTIFIC FINDINGS LAST YEAR

Mäkelä et al. (BMJ) found in the NARA database that in patients over 65 years the results of cemented hip prostheses were better than those of uncemented hip prostheses.

Pedersen et al. (Osteoarthritis Cartilage), in a study of NARA data on patients under 55 years, found no overall difference between cemented and uncemented prostheses. Young patients with uncemented prostheses had fewer revisions due to loosening, and more early revisions due to dislocation, fracture and infection, than young patients with cemented prostheses.

Amlie E et al. (Acta Orthop) found that with a direct lateral surgical approach about twice as many (roughly 25%) of patients reported limping after hip replacement surgery, compared to those who had been operated on with a posterior or one of the anterior approaches.

Dybvik E. et al. (Acta Orthop) found that radiotherapy of patients with gynaecological cancer did not increase the risk of hip arthroplasty surgery.

Thien TM et al. (J Bone Joint Surg Am), using NARA data, found a greater risk of periprosthetic fracture with uncemented than with cemented prosthesis. With a cemented prosthesis, the risk was greater with a short prosthesis with a smooth surface than with a longer prosthesis with a non-smooth surface.

Stea S et al. (J Bone Joint Surg Am), in a study of the ICOR database (data from 6 registers), concluded that the use of uncemented hip prostheses in patients older than 75 years should be avoided.

Furnes O et al. (J Bone Joint Surg Am), in another ICOR study, found that total prostheses with metal-on-metal articulation with large heads (>36 mm) had a greater risk of revision after two years than prostheses with metal-on-cross-linked polyethylene articulation. ASR prostheses were not included in this study.

Allepuz A et al. (J Bone Joint Surg Am), also using ICOR data, found no benefits in using heads with a diameter greater than 32 mm, compared with heads of 32 mm diameter.

Paxton E et al. (J Bone Joint Surg Am), in an ICOR study with five-year follow-up, found no difference in results between prostheses with cross-linked and conventional polyethylene.

Lutro O et al. (Adv Orthop) examined bacteria from operations for infected hip arthroplasty from three five-year periods and found that the incidence of methicillin-resistant coagulase-negative staphylococci increased from 54% in the first period to 84% in the final period.

Hailer NP et al. (Acta Orthop) analysed data on 116 069 uncemented hip prostheses in NARA, and found that uncemented femoral prostheses without hydroxyapatite coating might have as good results as uncemented femoral prostheses with hydroxyapatite coating.

Varnum C et al. (Acta Orthop), using NARA data, found an increased risk of revision for uncemented femoral prostheses with metal-on-metal articulation compared with prostheses with other articulations. ASR prostheses had the highest risk of revision.

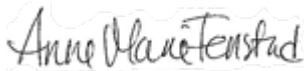
Schrama JC et al. (Acta Orthop), also studying NARA data, found that prosthetic patients with rheumatoid arthritis had a slightly greater risk of revision due to infection than prosthetic

patients with osteoarthritis.

Bergen, 18.06.2015



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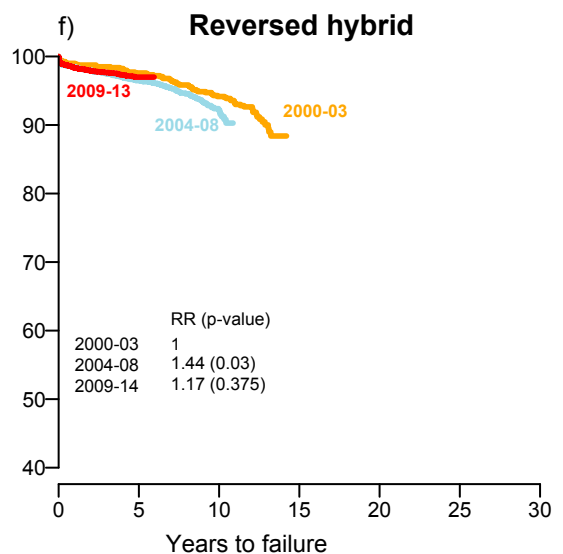
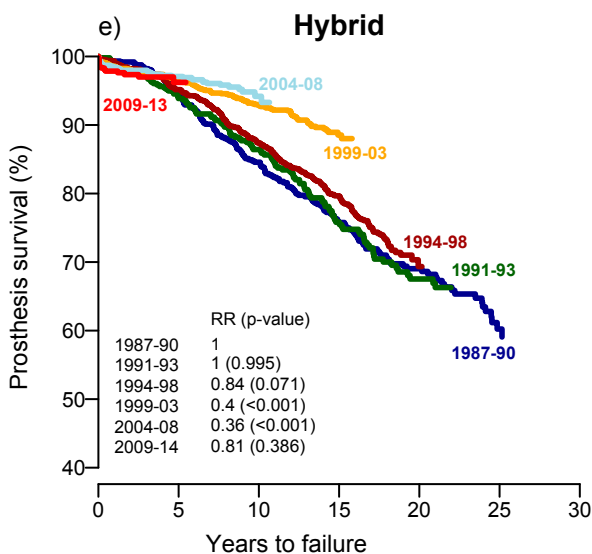
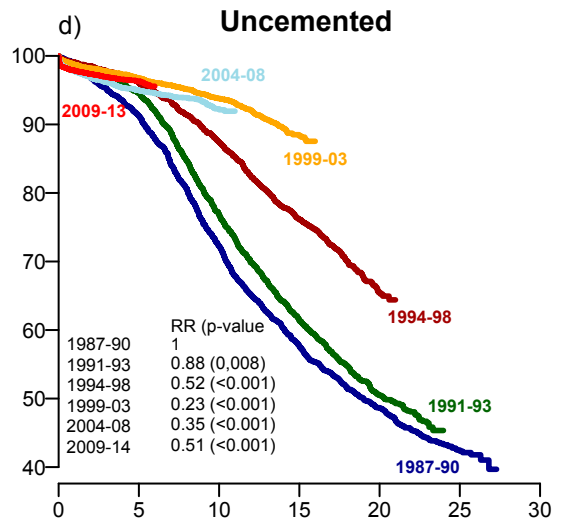
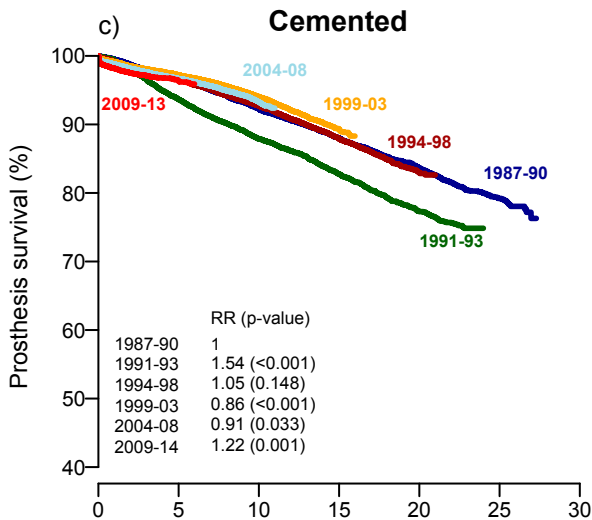
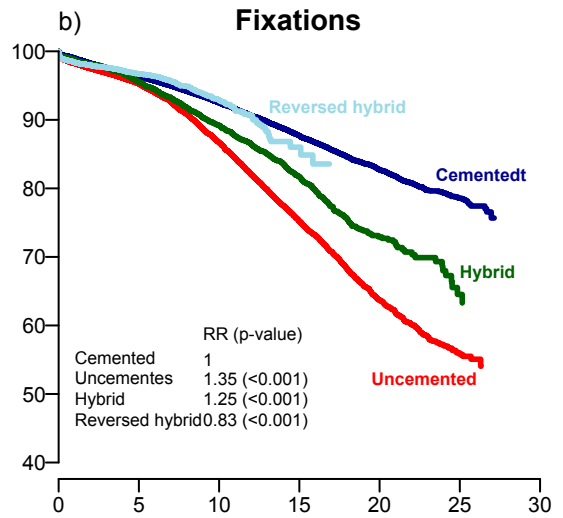
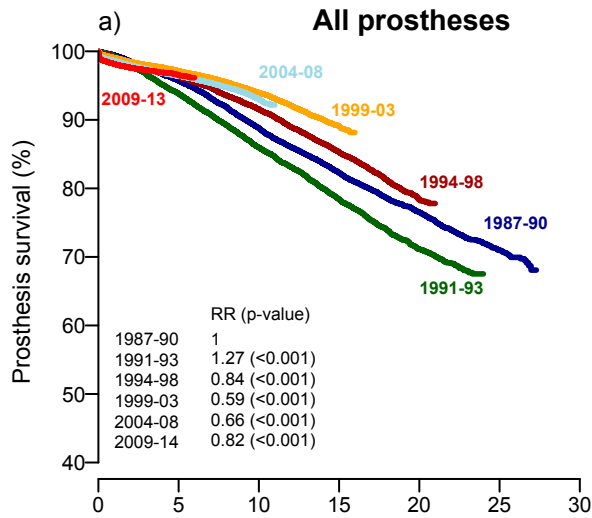


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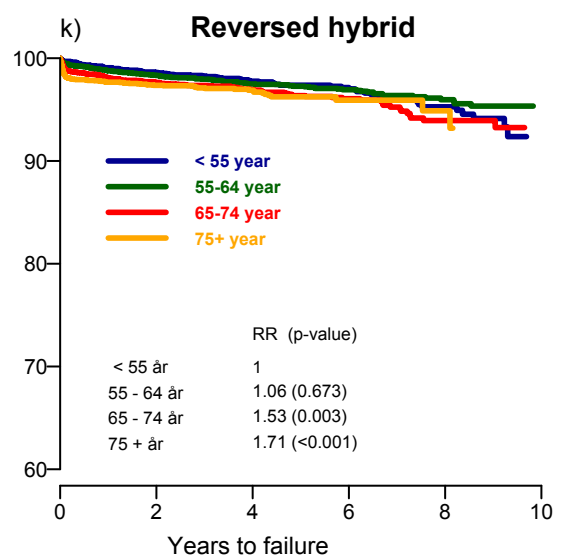
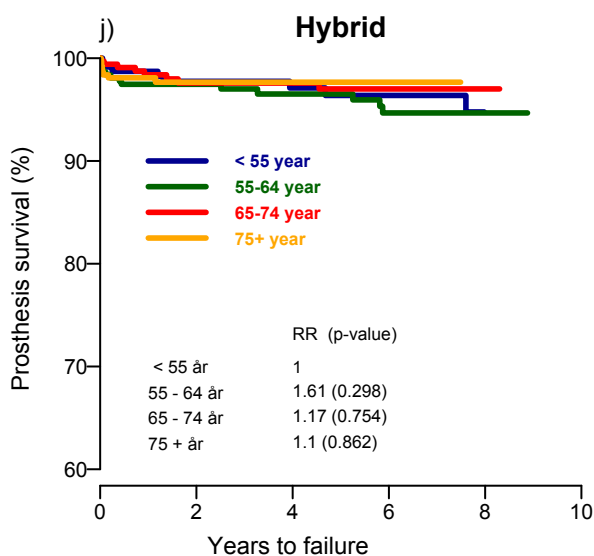
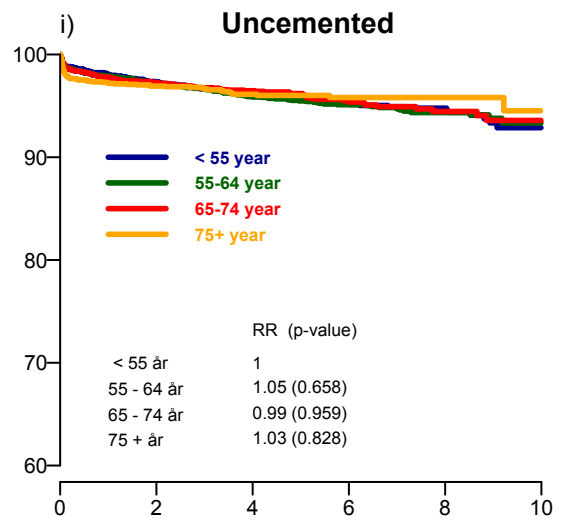
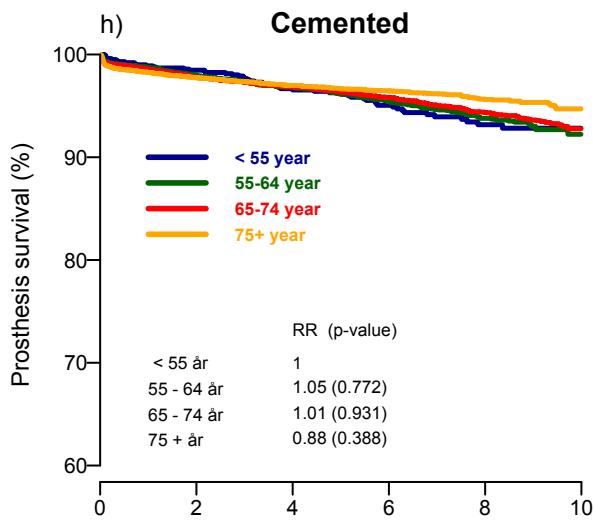
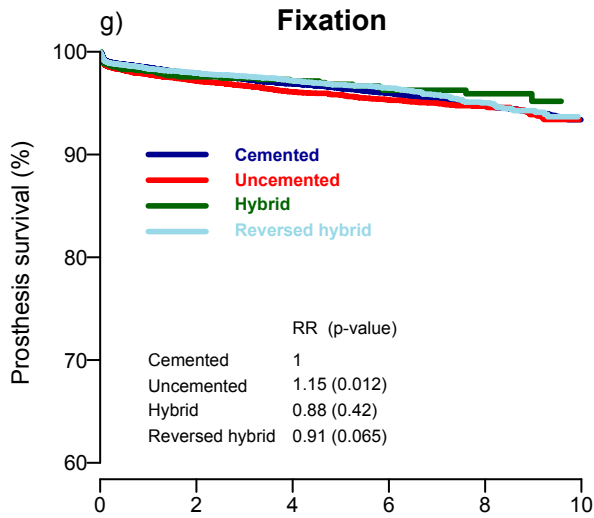
Christoffer Bartz-Johannessen
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Survival of total hip prostheses 1987-2014



Survival curves estimated by the Kaplan–Meier method. Risk ratio (RR) estimates adjusted for age, sex and diagnosis. Endpoint is all revisions. In the Hybrid and Reversed hybrid figures, the percentage of unrevised prostheses was given only for times where > 50 hips remained at risk.

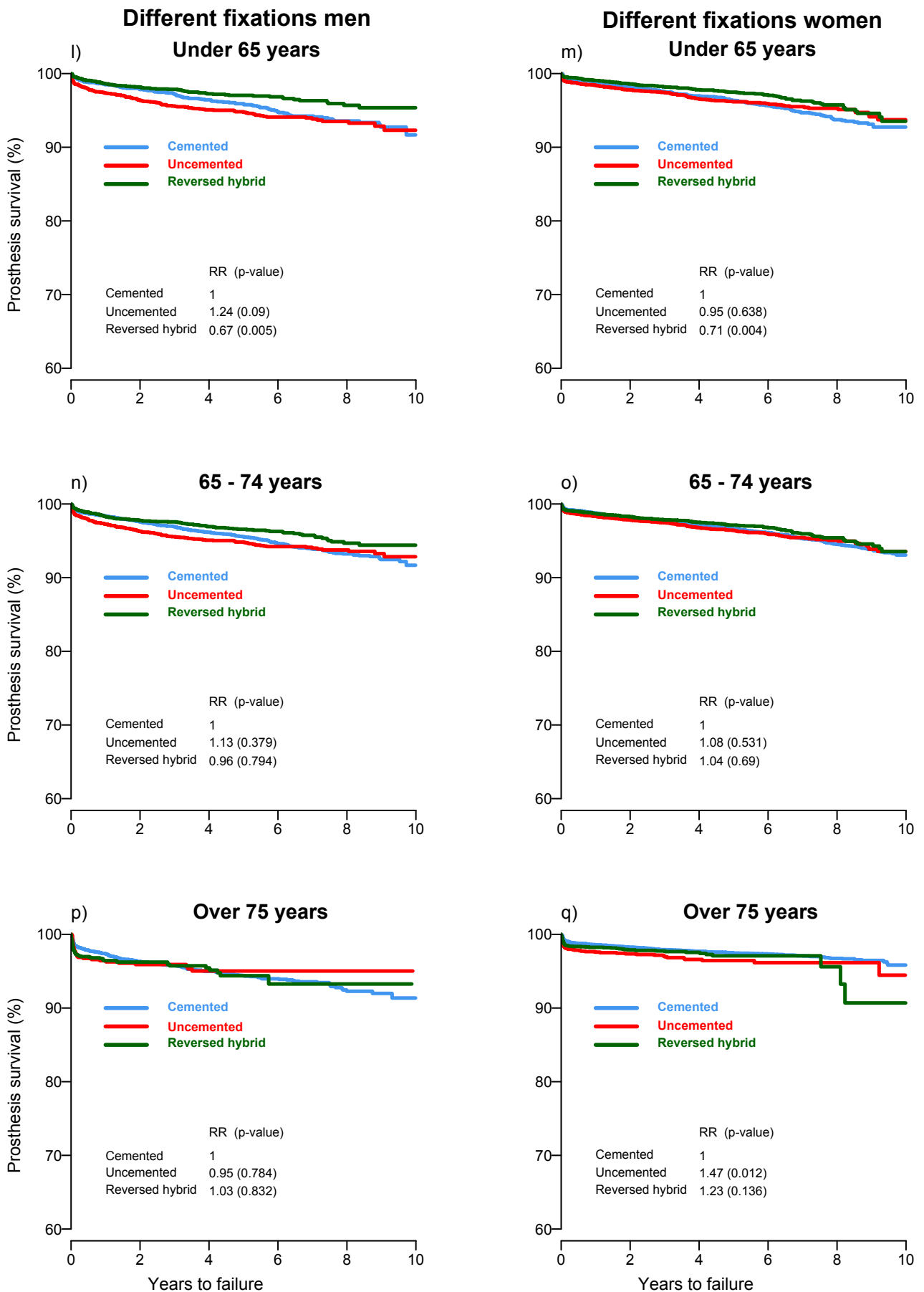
Survival of total hip prostheses 2005-2014



Survival curves estimated by the Kaplan-Meier method. Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

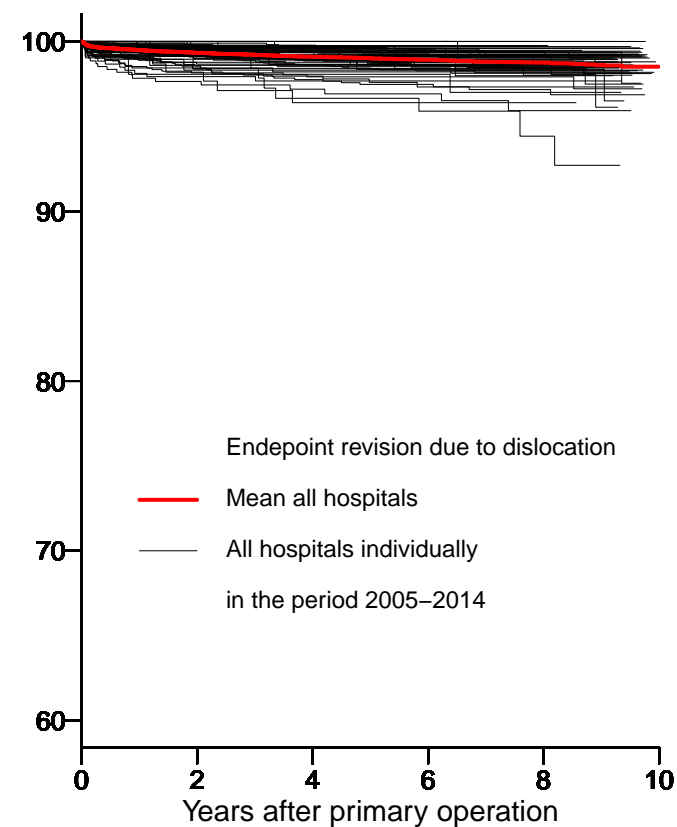
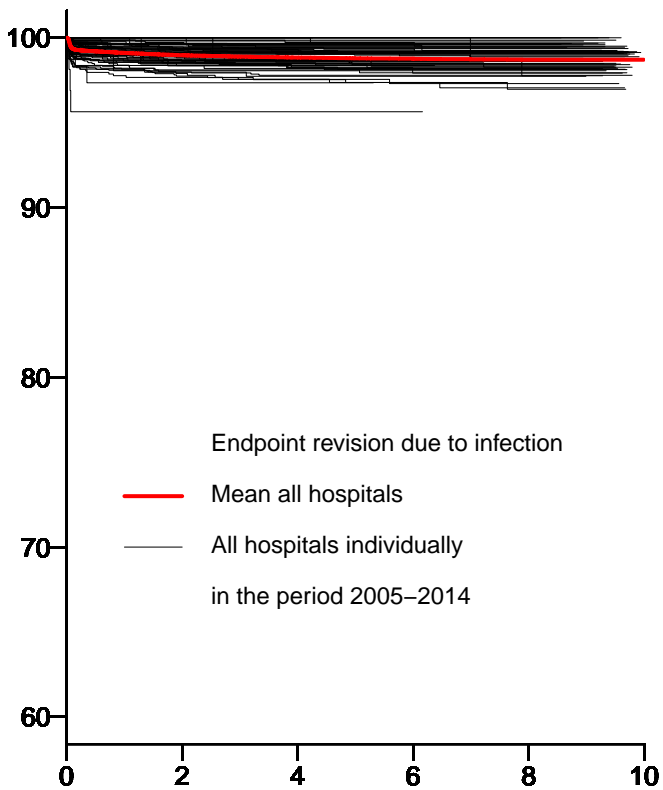
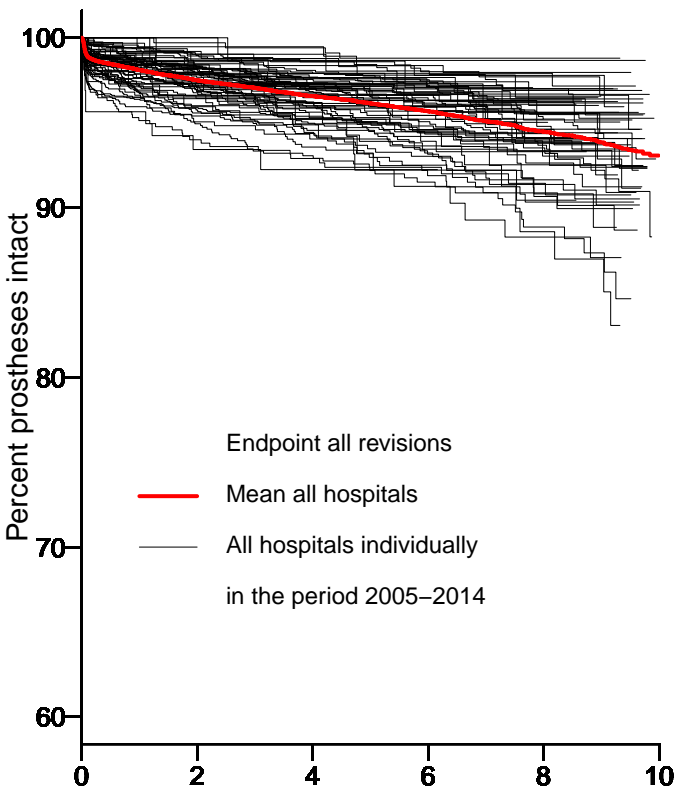
In the Hybrid and Reversed hybrid figure, the percentage of unrevised prostheses was given only for times where > 50 hips remained at risk.

Survival of total hip prostheses 2005-2014



Survival curves estimated by the Kaplan–Meier method. Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

Total hip arthroplasty – Last 10 years survival curves for all hospitals individually



One stage bilateral hip prosthesis operations

Year	1987-2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Sum:
Number of patients	136	13	12	15	13	19	15	15	18	26	23	22	327

A one stage bilateral operation is an operation where the patient is operated on both hips during the same operation or on the same day. Only primary operations are included.

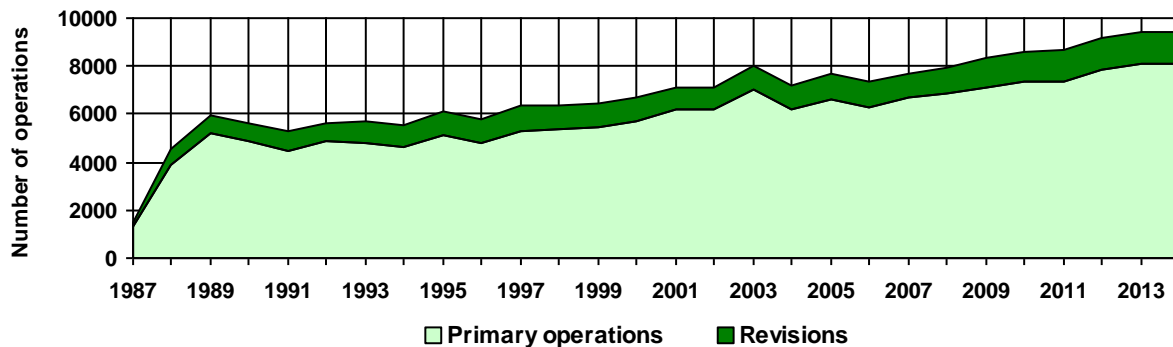
TOTAL HIP REPLACEMENT

Table 1: Annual numbers of operations

Year	Primary operations		Revisions		Total
2014	8 099	(86,3%)	1 284	(13,7%)	9 383
2013	8 087	(86,1%)	1 307	(13,9%)	9 394
2012	7 842	(85,7%)	1 306	(14,3%)	9 148
2011	7 359	(85,1%)	1 284	(14,9%)	8 643
2010	7 330	(85,4%)	1 258	(14,6%)	8 588
2009	7 115	(85,5%)	1 210	(14,5%)	8 325
2008	6 849	(85,9%)	1 122	(14,1%)	7 971
2007	6 660	(86,4%)	1 051	(13,6%)	7 711
2006	6 319	(86,3%)	1 007	(13,7%)	7 326
2005	6 597	(86,2%)	1 058	(13,8%)	7 655
2004	6 219	(86,9%)	940	(13,1%)	7 159
2003	7 040	(87,7%)	990	(12,3%)	8 030
2002	6 174	(86,6%)	956	(13,4%)	7 130
2001	6 170	(87,0%)	922	(13,0%)	7 092
2000	5 695	(85,4%)	975	(14,6%)	6 670
1999	5 471	(85,3%)	942	(14,7%)	6 413
1998	5 331	(83,5%)	1 050	(16,5%)	6 381
1997	5 318	(84,0%)	1 011	(16,0%)	6 329
1996	4 822	(82,8%)	1 004	(17,2%)	5 826
1995	5 105	(83,8%)	985	(16,2%)	6 090
1994	4 606	(83,5%)	910	(16,5%)	5 516
1993	4 819	(85,1%)	845	(14,9%)	5 664
1992	4 879	(86,4%)	769	(13,6%)	5 648
1991	4 490	(85,2%)	783	(14,8%)	5 273
1990	4 848	(86,9%)	732	(13,1%)	5 580
1989	5 204	(87,5%)	741	(12,5%)	5 945
1988	3 925	(85,8%)	651	(14,2%)	4 576
1987	1 317	(88,0%)	179	(12,0%)	1 496
Totalt	163 690	(85,7%)	27 272	(14,3%)	190 962

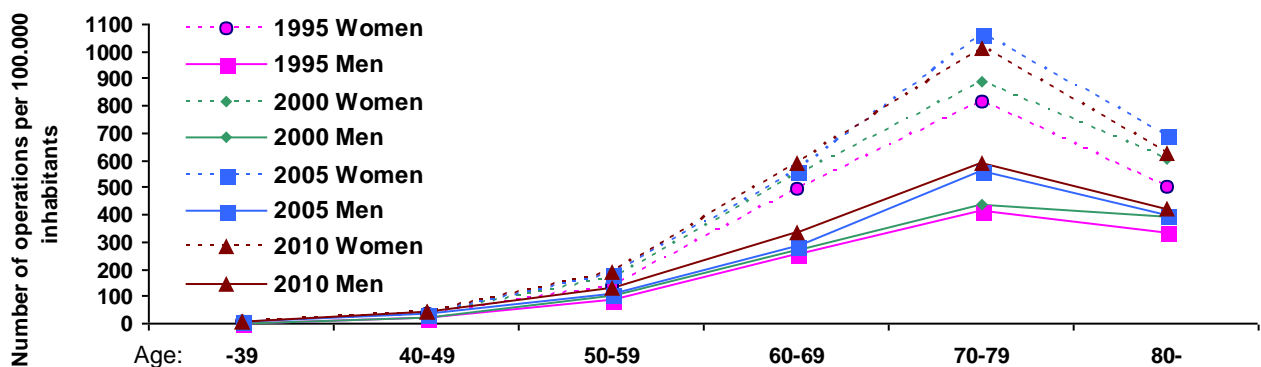
Registration complete from 1989. 83 of the revisions were soft tissue debridements for infection.

Figure 1: Annual numbers of operations



55 % of all operations were performed on the right side. 67,4 % performed in women.
 Mean age at primary surgery was 69,0 years, 69,9 years for women and 67,1 years for men

Figure 2: Incidence of primary hip prostheses



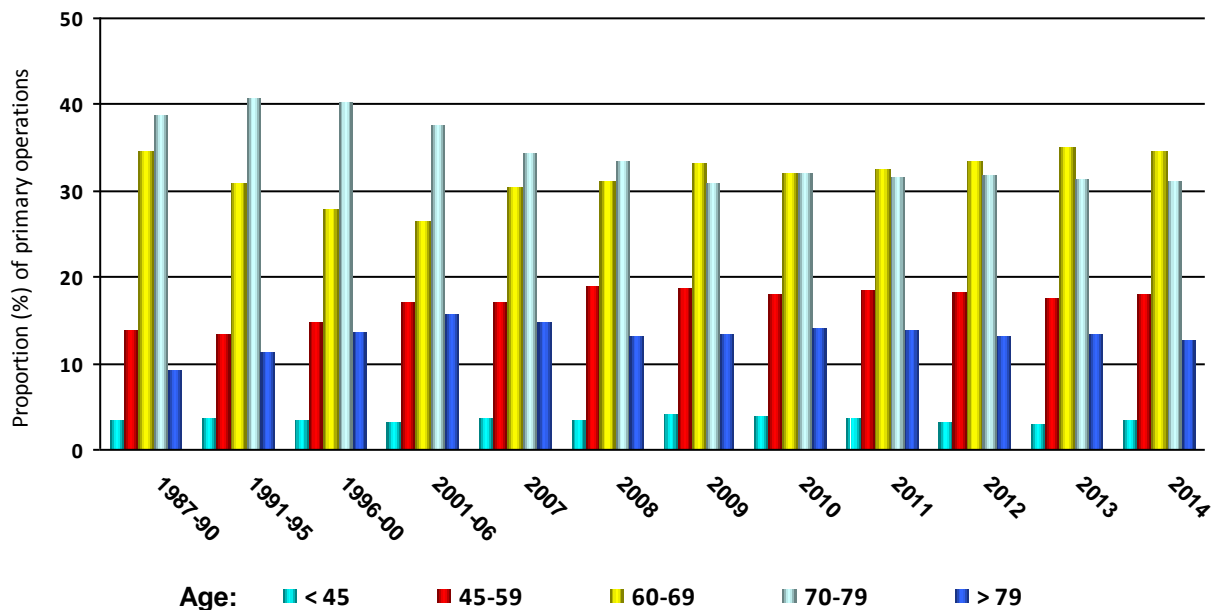
Reasons for primary operations

Table 2:

Year	Idiopathic coxarthrosis	Rheumatoid arthritis	Acute fracture of the femoral neck	Congenital dysplasia	Cong. dysplasia with dislocation	Epiphysiol./Perthes' disease	Bechterew	Acute fracture of the femoral neck	Caput necrosis	Sequelae after acetabular fracture	Other	Missing information
2014	6369	114	350	646	18	86	28	283	249	22	183	39
2013	6397	125	350	607	10	115	31	288	173	26	208	36
2012	6218	157	363	615	12	92	44	198	186	15	219	15
2011	5787	132	372	573	24	96	26	186	138	21	249	30
2010	5734	130	355	594	36	88	20	160	151	15	312	50
2009	5515	131	389	560	26	127	24	150	174	11	304	33
2008	5359	144	443	498	25	99	21	144	145	19	260	6
2007	5166	146	475	457	21	80	22	157	174	20	199	15
2006	4819	147	485	445	17	83	24	129	172	18	225	13
2005	5097	166	549	437	29	87	22	98	143	10	175	14
2004	4681	141	531	414	17	85	20	94	117	13	157	3
2003	5304	171	584	511	26	69	25	86	35	9	230	11
2002	4621	168	534	433	29	82	37	56	68	12	159	16
2001	4551	175	566	438	31	82	26	53	100	12	149	39
2000	4173	168	548	380	21	81	26	60	74	11	115	62
1999	3890	175	585	424	33	74	31	35	55	16	134	54
1998	3759	165	654	362	27	71	25	29	52	9	128	66
1997	3705	194	672	348	31	72	20	41	47	7	112	70
1996	3327	181	624	337	35	58	26	25	41	18	113	38
1995	3587	172	632	380	44	65	21	12	41	20	118	13
1994	3211	186	571	347	50	61	23	16	17	17	92	15
1993	3309	169	634	384	54	73	26	22	28	18	80	22
1992	3305	210	589	422	55	73	25	8	19	17	99	57
1991	2987	162	646	338	87	58	19	8	13	22	94	56
1990	3258	161	658	397	81	63	20	14	19	18	91	69
1989	3471	192	728	460	103	65	19	13	7	10	95	41
1988	2659	164	514	321	67	47	16	10	9	11	58	49
1987	925	53	167	99	21	13	6	2	3	3	16	9
Total	121184	4399	14568	12227	1030	2145	673	2377	2450	420	4374	941

Diseases are not mutually exclusive. More than one reason for operation is possible

Figure 3: Age by year of operation



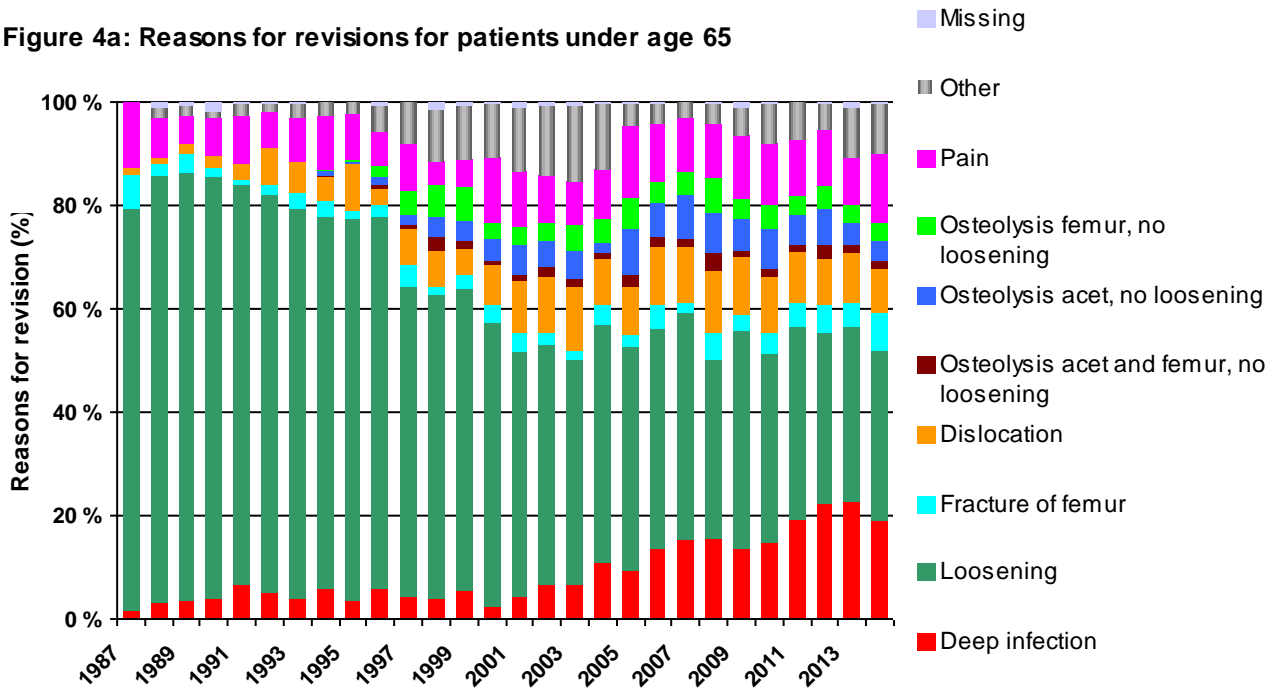
Reasons for revisions

Table 3:

Year of revision	Loosening of acetabular component	Loosening of femoral component	Dislocation	Deep infection	Periprosthetic fracture	Pain	Osteolysis acet., no loosening	Osteolysis femur, no loosening	Polyethylene wear	Previous Girdlestone	Other	Missing information
2014	422	279	216	264	140	148	49	36	48	18	111	5
2013	441	318	209	290	132	142	53	43	55	12	126	6
2012	440	318	200	309	122	168	70	42	49	18	87	6
2011	440	322	219	275	114	146	63	52	66	22	78	3
2010	444	319	229	239	96	154	55	50	55	45	85	10
2009	443	316	215	204	82	131	52	41	80	29	50	9
2008	399	305	192	211	79	131	54	53	63	47	31	5
2007	409	282	187	149	72	120	53	48	66	28	26	2
2006	399	295	198	126	61	119	45	46	48	22	32	2
2005	423	337	164	129	59	113	63	57	65	29	45	3
2004	371	297	152	124	60	101	11	32	78	44	104	1
2003	395	326	154	97	60	82	33	39	71	36	112	12
2002	410	376	136	78	70	66	29	32	57	27	122	8
2001	390	389	132	69	57	74	34	35	77	28	95	5
2000	396	419	119	61	58	101	32	39	106	33	92	2
1999	412	460	115	66	43	57	27	43	72	34	87	6
1998	468	513	131	64	41	72	24	54	55	45	101	6
1997	472	521	110	57	54	79	20	41	35	41	103	1
1996	472	568	98	87	47	68	9	19	16	34	61	5
1995	461	565	104	67	34	76	2	4	9	45	29	1
1994	434	516	61	78	33	81	3	2	4	34	31	2
1993	431	479	61	55	38	78	0	0	6	22	23	2
1992	386	459	52	57	29	64	0	0	7	12	20	4
1991	392	474	37	70	33	67	0	0	6	4	21	8
1990	409	470	26	40	27	62	0	0	3	11	18	15
1989	421	477	39	29	37	73	0	0	7	4	25	5
1988	382	409	18	32	24	70	0	0	1	11	27	6
1987	110	118	7	4	4	32	0	0	1	1	7	0
Total	11472	10927	3581	3331	1706	2675	781	808	1206	736	1749	140

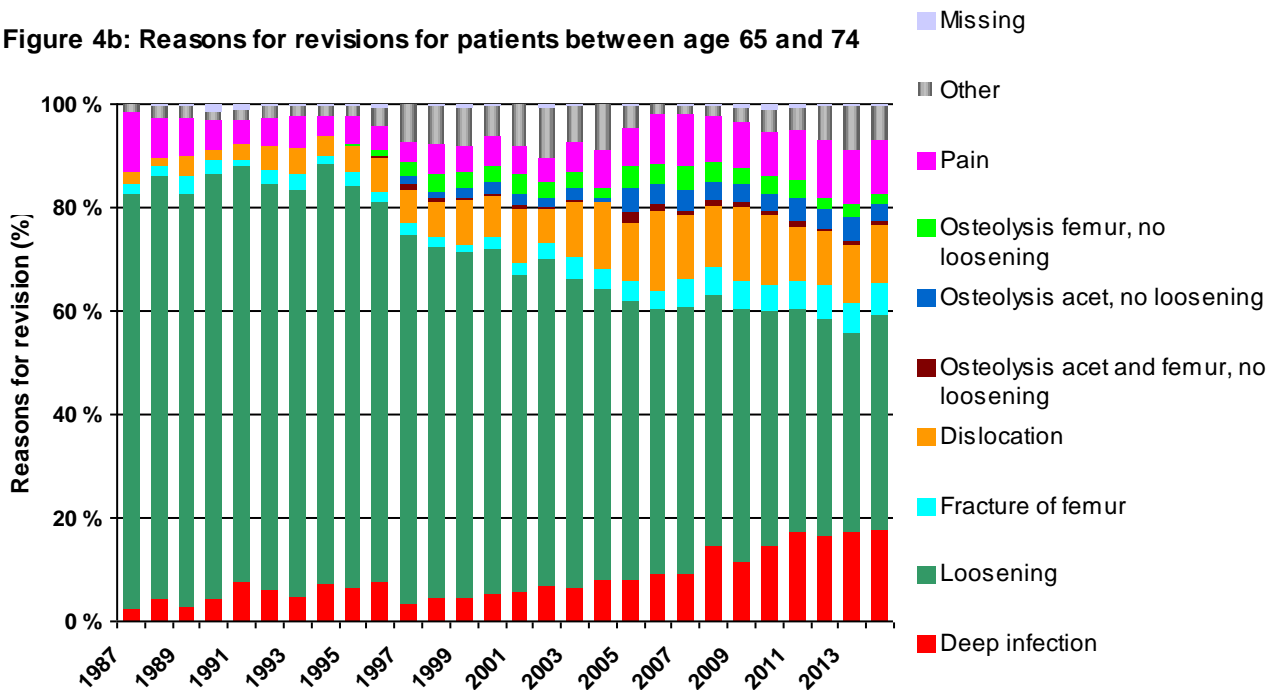
Revision causes are not mutually exclusive. More than one reason of revision is possible

Figure 4a: Reasons for revisions for patients under age 65



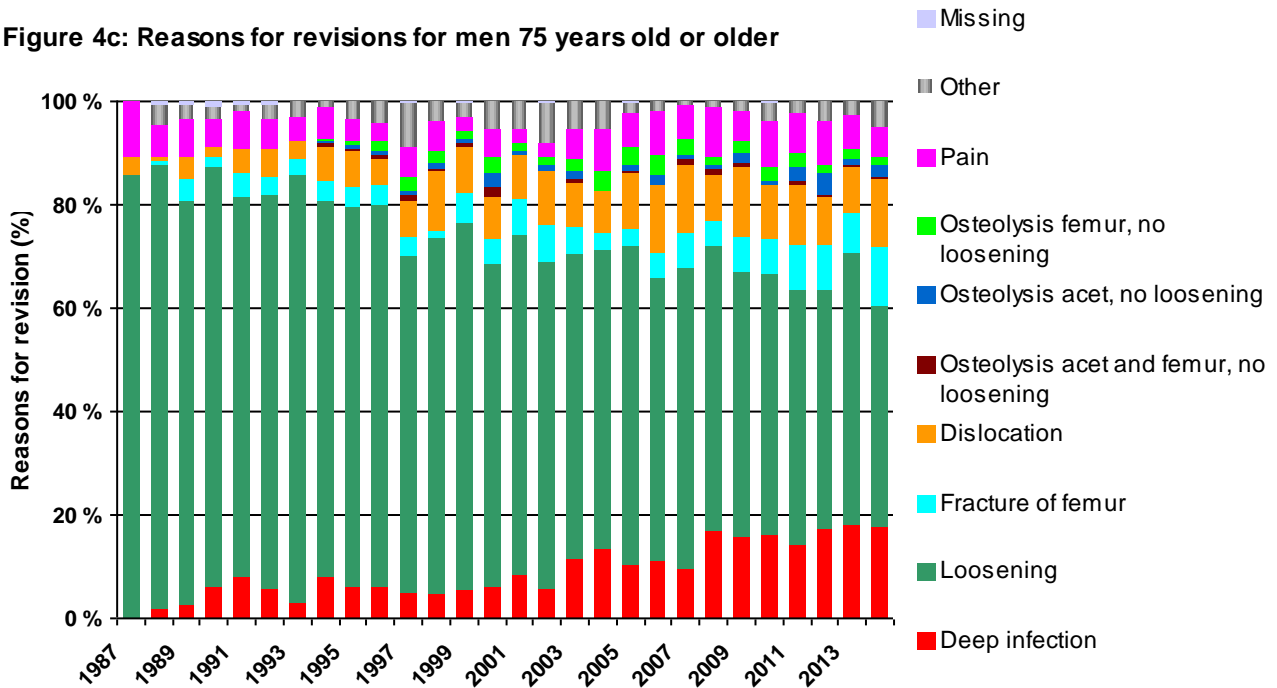
The graph is hierarchical, i.e. if a revision is marked both "Deep infection" and "Loosening", only "Deep infection" is counted. The hierarchy follows the explanation, with "Deep infection" being the highest and "Other" the lowest level.

Figure 4b: Reasons for revisions for patients between age 65 and 74



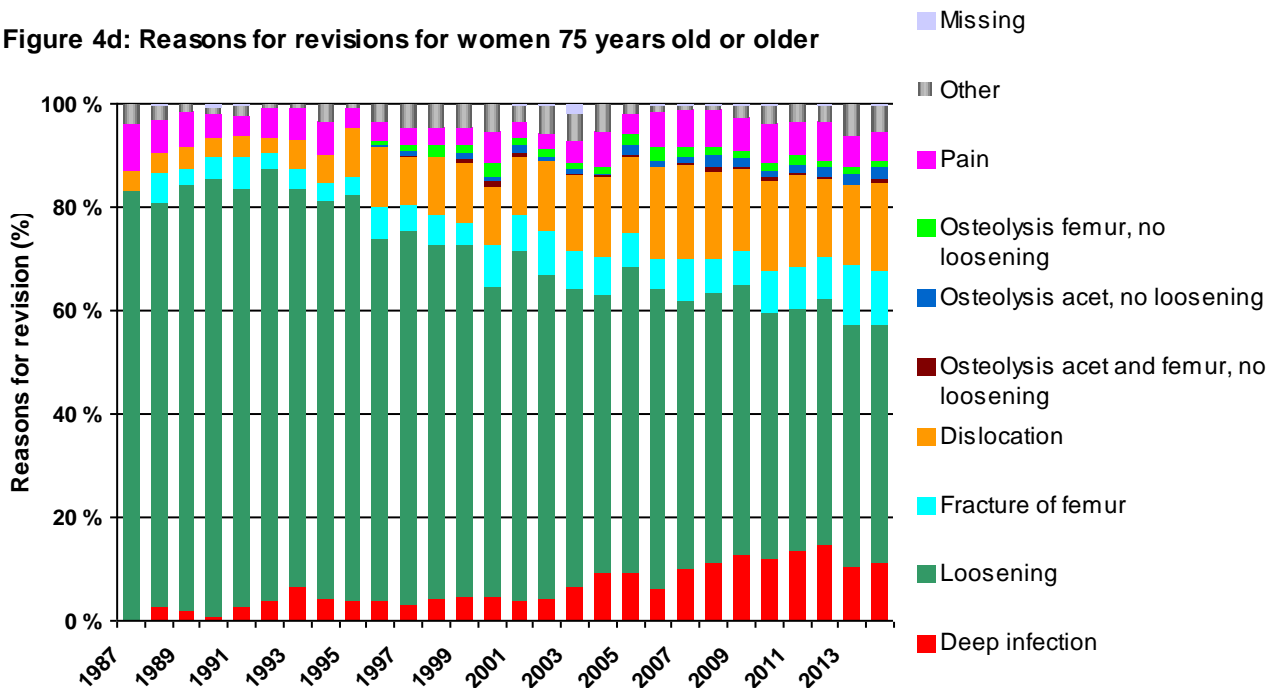
The graph is hierarchical, i.e. if a revision is marked both "Deep infection" and "Loosening", only "Deep infection" is counted. The hierarchy follows the explanation, with "Deep infection" being the highest and "Other" the lowest level.

Figure 4c: Reasons for revisions for men 75 years old or older



The graph is hierarchical, i.e. if a revision is marked both "Deep infection" and "Loosening", only "Deep infection" is counted. The hierarchy follows the explanation, with "Deep infection" being the highest and "Other" the lowest level.

Figure 4d: Reasons for revisions for women 75 years old or older



The graph is hierarchical, i.e. if a revision is marked both "Deep infection" and "Loosening", only "Deep infection" is counted. The hierarchy follows the explanation, with "Deep infection" being the highest and "Other" the lowest level.

Type of revision

Table 4a: Age 75 years old or younger

Year	Exchange of femur and caput	Exchange of femur, PE liner and caput	Exchange of acetabulum	Exchange of caput	Exchange of caput and acetabulum	Exchange of all components	Exchange of PE liner only	Exchange of PE liner and caput	Exchange of PE liner and femur	Removal of prosthesis or cement spacer	Removal of prosthesis and insertion of cement spacer	Insertion of new prosthesis (after Girdlestone)	Soft tissue debridement of infected prosthesis	Other operation	Missing information	Total
2014	63	19	103	33	123	118	3	48	6	12	72	1	41	61	3	706
2013	76	8	86	42	144	136	2	43	5	13	72	2	43	47	8	727
2012	88	8	88	28	147	162	6	38	5	14	66	1	43	28	11	733
2011	83	6	100	47	146	159	3	48	9	28	24	1	36	34	10	734
2010	87	8	114	57	168	175	1	40	4	29	15	8	4	14	18	742
2009	85	6	46	58	230	174	6	54	5	30	10	7		11	4	726
2008	82	6	53	34	179	158	1	37	5	33	18	6	1	12	10	635
2007	71	9	76	33	193	138	3	33	3	29	2	7		22	9	628
2001-06	466	59	534	115	685	914	43	273	25	186	14	72		71	32	3489
1996-00	567	46	333	42	549	1109	21	184	11	137		121		8	11	3139
1991-95	736	3	482	15	96	1328	8	19	2	127		50		12	11	2889
1987-90	383		176	2	9	951			2	44		11		4	21	1603
Total	2787	178	2191	506	2669	5522	97	817	82	682	293	287	168	324	148	16751

Table 4b: Age over 75 years old

Year																Total
2014	80	2	86	27	91	146	5	14	2	23	18		29	50	5	578
2013	92	3	76	15	81	165	2	14	4	13	28	3	34	40	10	580
2012	76	3	98	30	72	155		19	2	19	36	1	32	11	19	573
2011	94	1	96	31	87	140	3	13	5	22	13	2	22	12	9	550
2010	92		87	43	71	143	1	12	1	27	6	5	4	14	10	516
2009	69	3	59	50	93	139	3	12	2	33	5	3		10	3	484
2008	67	3	61	43	87	152		6	1	32	11	5		15	4	487
2007	68	2	60	30	72	136	2	9	1	25	3			14	1	423
2001-06	486	19	390	68	273	819	9	37	7	161	11	41		32	31	2384
1996-00	503	6	184	31	170	764	6	15	2	96		56		7	3	1843
1991-95	387	1	236	3	30	624		3		84		24		6	5	1403
1987-90	145		117		8	397				18		3		1	11	700
Total	2159	43	1550	371	1135	3780	31	154	27	553	131	143	121	212	111	10521

Bone transplantation in revisions

Table 5: Acetabulum

Year	Yes	No	Bone impaction ¹	Missing	Total
2014	110 (8,6 %)	853 (66,4 %)	94 (7,3 %)	227 (17,7 %)	1 284
2013	87 (6,7 %)	839 (64,2 %)	131 (10 %)	250 (19,1 %)	1 307
2012	104 (8 %)	824 (63,1 %)	143 (10,9 %)	235 (18 %)	1 306
2011	109 (8,5 %)	807 (62,9 %)	181 (14,1 %)	187 (14,6 %)	1 284
2010	131 (10,4 %)	787 (62,6 %)	189 (15 %)	151 (12 %)	1 258
2009	111 (9,2 %)	715 (59,1 %)	245 (20,2 %)	139 (11,5 %)	1 210
2008	110 (9,8 %)	668 (59,5 %)	211 (18,8 %)	133 (11,9 %)	1 122
2007	132 (12,6 %)	593 (56,4 %)	193 (18,4 %)	133 (12,7 %)	1 051
2006	115 (11,4 %)	554 (55 %)	201 (20 %)	137 (13,6 %)	1 007
2005	161 (15,2 %)	527 (49,8 %)	230 (21,7 %)	140 (13,2 %)	1 058
2004	161 (17,1 %)	570 (60,6 %)	162 (17,2 %)	47 (5 %)	940
2003	162 (16,4 %)	651 (65,8 %)	147 (14,8 %)	30 (3 %)	990
2002	211 (22,1 %)	621 (65 %)	86 (9 %)	38 (4 %)	956
2001	182 (19,7 %)	578 (62,7 %)	132 (14,3 %)	30 (3,3 %)	922
1996-00	1 104 (22,2 %)	3 110 (62,4 %)	653 (13,1 %)	115 (2,3 %)	4 982
1991-95	1 286 (30 %)	2 902 (67,6 %)	4 (0,1 %)	100 (2,3 %)	4 292
1987-90	607 (26,4 %)	1 662 (72,2 %)	0 (0 %)	34 (1,5 %)	2 303
Total	4 883 (17,9 %)	17 261 (63,3 %)	3 002 (11 %)	2 126 (7,8 %)	27 272

Table 6: Femur

Year	Yes	No	Bone impaction ¹	Missing	Total
2014	63 (4,9 %)	875 (68,1 %)	3 (0,2 %)	343 (26,7 %)	1 284
2013	83 (6,4 %)	870 (66,6 %)	8 (0,6 %)	346 (26,5 %)	1 307
2012	81 (6,2 %)	830 (63,6 %)	21 (1,6 %)	374 (28,6 %)	1 306
2011	114 (8,9 %)	818 (63,7 %)	29 (2,3 %)	323 (25,2 %)	1 284
2010	119 (9,5 %)	798 (63,4 %)	44 (3,5 %)	297 (23,6 %)	1 258
2009	129 (10,7 %)	752 (62,1 %)	45 (3,7 %)	284 (23,5 %)	1 210
2008	144 (12,8 %)	677 (60,3 %)	69 (6,1 %)	232 (20,7 %)	1 122
2007	125 (11,9 %)	600 (57,1 %)	70 (6,7 %)	256 (24,4 %)	1 051
2006	145 (14,4 %)	598 (59,4 %)	81 (8 %)	183 (18,2 %)	1 007
2005	181 (17,1 %)	571 (54 %)	86 (8,1 %)	220 (20,8 %)	1 058
2004	125 (13,3 %)	647 (68,8 %)	119 (12,7 %)	49 (5,2 %)	940
2003	137 (13,8 %)	726 (73,3 %)	97 (9,8 %)	30 (3 %)	990
2002	173 (18,1 %)	646 (67,6 %)	99 (10,4 %)	38 (4 %)	956
2001	158 (17,1 %)	584 (63,3 %)	150 (16,3 %)	30 (3,3 %)	922
1996-00	1 092 (21,9 %)	2 903 (58,3 %)	872 (17,5 %)	115 (2,3 %)	4 982
1991-95	1 089 (25,4 %)	3 098 (72,2 %)	5 (0,1 %)	100 (2,3 %)	4 292
1987-90	380 (16,5 %)	1 889 (82 %)	0 (0 %)	34 (1,5 %)	2 303
Total	4 338 (15,9 %)	17 882 (65,6 %)	1 798 (6,6 %)	3 254 (11,9 %)	27 272

¹ Registration of "Bone impaction" started in 1996.

Bone loss in revisions

Table 7: Acetabulum

Year	Type I	Type IIA	Type IIB	Type IIC	Type IIIA	Type IIIB	Missing	Total
2014	197	166	93	69	41	31	687	1 284
2013	246	185	84	77	58	25	632	1 307
2012	207	235	111	87	73	18	575	1 306
2011	227	183	115	87	65	19	588	1 284
2010	236	176	103	77	62	19	585	1 258
2009	210	165	92	78	76	27	562	1 210
2008	196	181	83	96	67	27	472	1 122
2007	185	142	88	73	55	30	478	1 051
2006	210	136	78	65	59	24	435	1 007
2005	240	137	87	74	59	23	438	1 058

Bone loss in revision - acetabulum (Paprosky Classification):

- Type I: Hemispheric acetabulum without edge defects. Intact posterior and anterior column. Defects in anchoring holes that do not destroy the subchondral bone plate.
- Type IIA: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with small metaphyseal fractures again.
- Type IIB: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with small metaphyseal fractures again and some lack of support superior.
- Type IIC: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with defect in medial wall.
- Type IIIA: Significant component migration, osteolysis and bone loss. Bone loss from 10 o'clock until 2.
- Type IIIB: Significant component migration, osteolysis and bone loss. Bone loss from 9 o'clock until 5.

Table 8: Femur

Year	Type I	Type II	Type IIIA	Type IIIB	Type IV	Missing	Total
2014	162	147	66	12	3	894	1 284
2013	227	151	66	24	4	835	1 307
2012	204	190	68	18	6	820	1 306
2011	177	164	77	20	7	839	1 284
2010	195	150	70	18	8	817	1 258
2009	155	141	68	20	9	817	1 210
2008	156	177	81	11	10	687	1 122
2007	144	129	60	18	10	690	1 051
2006	167	151	58	22	5	604	1 007
2005	210	152	72	23	10	591	1 058

Bone loss in revision - acetabulum (Paprosky Classification):

- Type I: Hemispheric acetabulum without edge defects. Intact posterior and anterior column. Defects in anchoring holes that do not destroy the subchondral bone plate.
- Type IIA: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with small metaphyseal fractures again.
- Type IIB: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with small metaphyseal fractures again and some lack of support superior.
- Type IIC: Hemispheric acetabulum without major edge defects, intact posterior and anterior column, but with defect in medial wall.
- Type IIIA: Significant component migration, osteolysis and bone loss. Bone loss from 10 o'clock until 2.
- Type IIIB: Significant component migration, osteolysis and bone loss. Bone loss from 9 o'clock until 5.

Registration of bone loss started in 2005

Operative approach

Table 9: In primary operations *

Year	Anterior	Anterolateral	Direct lateral	Posterior	Other	Missing information	Total
2014	337 (4,2 %)	1 054 (13 %)	3 163 (39,1 %)	2 999 (37 %)	18 (0,2 %)	528 (6,5 %)	8 099
2013	342 (4,2 %)	1 080 (13,4 %)	3 621 (44,8 %)	2 467 (30,5 %)	25 (0,3 %)	552 (6,8 %)	8 087
2012	438 (5,6 %)	1 023 (13 %)	3 915 (49,9 %)	2 191 (27,9 %)	12 (0,2 %)	263 (3,4 %)	7 842
2011	429 (5,8 %)	748 (10,2 %)	3 896 (52,9 %)	2 081 (28,3 %)	30 (0,4 %)	175 (2,4 %)	7 359
2010	625 (8,5 %)	470 (6,4 %)	3 910 (53,3 %)	2 154 (29,4 %)	56 (0,8 %)	115 (1,6 %)	7 330
2009	326 (4,6 %)	340 (4,8 %)	4 357 (61,2 %)	1 963 (27,6 %)	11 (0,2 %)	118 (1,7 %)	7 115
2008	68 (1 %)	387 (5,7 %)	4 360 (63,7 %)	1 928 (28,2 %)	8 (0,1 %)	98 (1,4 %)	6 849
2007	14 (0,2 %)	404 (6,1 %)	4 417 (66,3 %)	1 711 (25,7 %)	10 (0,2 %)	104 (1,6 %)	6 660
2006	2 (0 %)	452 (7,2 %)	4 270 (67,6 %)	1 482 (23,5 %)	3 (0 %)	110 (1,7 %)	6 319
2005	7 (0,1 %)	521 (7,9 %)	4 419 (67 %)	1 534 (23,3 %)	4 (0,1 %)	112 (1,7 %)	6 597
2004	8 (0,1 %)	463 (7,4 %)	4 286 (68,9 %)	1 437 (23,1 %)	5 (0,1 %)	20 (0,3 %)	6 219
2003	12 (0,2 %)	591 (8,4 %)	4 843 (68,8 %)	1 558 (22,1 %)	3 (0 %)	33 (0,5 %)	7 040
2002	15 (0,2 %)	414 (6,7 %)	4 295 (69,6 %)	1 400 (22,7 %)	17 (0,3 %)	33 (0,5 %)	6 174
2001	6 (0,1 %)	410 (6,6 %)	4 274 (69,3 %)	1 448 (23,5 %)	8 (0,1 %)	24 (0,4 %)	6 170
1996-00	42 (0,2 %)	2 024 (7,6 %)	8 065 (67,8 %)	6 401 (24 %)	14 (0,1 %)	91 (0,3 %)	26 637
1991-95	93 (0,4 %)	1 268 (5,3 %)	6 481 (69 %)	5 897 (24,7 %)	32 (0,1 %)	128 (0,5 %)	23 899
1987-90	22 (0,1 %)	1 084 (7,1 %)	9 717 (63,5 %)	4 340 (28,4 %)	3 (0 %)	128 (0,8 %)	15 294
Total	2 786 (1,7 %)	12 733 (7,8 %)	62 289 (62,5 %)	42 991 (26,3 %)	259 (0,2 %)	2 632 (1,6 %)	163 690

Table 10: Mini invasive surgery in primary surgery

Year	Yes	No	Missing	Total
2014	1 335 (16,5%)	6 502 (80,3%)	262 (3,2%)	8 099
2013	1 407 (17,4%)	6 309 (78,0%)	371 (4,6%)	8 087
2012	1 327 (16,9%)	5 858 (74,7%)	657 (8,4%)	7 842
2011	1 000 (13,6%)	6 004 (81,6%)	355 (4,8%)	7 359
2010	934 (12,7%)	6 171 (84,2%)	225 (3,1%)	7 330
2009	398 (5,6%)	6 670 (93,7%)	47 (0,7%)	7 115
2008	65 (0,9%)	6 756 (98,6%)	28 (0,4%)	6 849
2007	4 (0,1%)	6 568 (98,6%)	88 (1,3%)	6 660
2006	58 (0,9%)	6 006 (95,0%)	255 (4,0%)	6 319
2005	144 (2,2%)	5 814 (88,1%)	639 (9,7%)	6 597

Table 11: In revisions *

Year	Anterior	Anterolateral	Direct lateral	Posterior	Other	Missing information	Total
2014	16 (1,2 %)	25 (1,9 %)	757 (59 %)	423 (32,9 %)	24 (1,9 %)	39 (3 %)	1 284
2013	7 (0,5 %)	31 (2,4 %)	805 (61,6 %)	379 (29 %)	33 (2,5 %)	52 (4 %)	1 307
2012	11 (0,8 %)	35 (2,7 %)	820 (62,8 %)	353 (27 %)	46 (3,5 %)	41 (3,1 %)	1 306
2011	9 (0,7 %)	26 (2 %)	848 (66 %)	335 (26,1 %)	30 (2,3 %)	36 (2,8 %)	1 284
2010	14 (1,1 %)	17 (1,4 %)	843 (67 %)	347 (27,6 %)	19 (1,5 %)	18 (1,4 %)	1 258
2009	24 (2 %)	42 (3,5 %)	770 (63,6 %)	342 (28,3 %)	12 (1 %)	20 (1,7 %)	1 210
2008	3 (0,3 %)	52 (4,6 %)	787 (70,1 %)	251 (22,4 %)	10 (0,9 %)	19 (1,7 %)	1 122
2007	1 (0,1 %)	55 (5,2 %)	705 (67,1 %)	273 (26 %)	2 (0,2 %)	15 (1,4 %)	1 051
2006	1 (0,1 %)	61 (6,1 %)	699 (69,4 %)	231 (22,9 %)	2 (0,2 %)	13 (1,3 %)	1 007
2005	3 (0,3 %)	44 (4,2 %)	790 (74,7 %)	198 (18,7 %)	14 (1,3 %)	9 (0,9 %)	1 058
2004	2 (0,2 %)	52 (5,5 %)	732 (77,9 %)	134 (14,3 %)	1 (0,1 %)	19 (2 %)	940
2003	1 (0,1 %)	85 (8,6 %)	738 (74,5 %)	114 (11,5 %)	6 (0,6 %)	46 (4,6 %)	990
2002	2 (0,2 %)	68 (7,1 %)	722 (75,5 %)	137 (14,3 %)	8 (0,8 %)	19 (2 %)	956
2001	5 (0,5 %)	83 (9 %)	673 (73 %)	131 (14,2 %)	10 (1,1 %)	20 (2,2 %)	922
1996-00	10 (0,2 %)	374 (7,5 %)	3 781 (75,9 %)	749 (15 %)	34 (0,7 %)	34 (0,7 %)	4 982
1991-95	7 (0,2 %)	222 (5,2 %)	3 109 (72,4 %)	920 (21,4 %)	15 (0,3 %)	19 (0,4 %)	4 292
1987-90	11 (0,5 %)	168 (7,3 %)	1 324 (57,5 %)	784 (34 %)	2 (0,1 %)	14 (0,6 %)	2 303
Total	127 (0,5 %)	1 440 (5,3 %)	18 903 (69,3 %)	6 101 (22,4 %)	268 (1 %)	433 (1,6 %)	27 272

* Anterior: Operative approach between sartorius and tensor
 Anterolateral: Operative approach between glut. medius and tensor
 Direct lateral: Operative approach transgluteal
 Posterior: Operative approach behind gluteus medius

Trochanteric osteotomy

Table 12:

Year	Primary operations			Revisions			Total
	No	Yes	Missing	No	Yes	Missing	
2014	7 365 (90,9 %)	21 (0,3 %)	713 (8,8 %)	1 106 (86,1 %)	66 (5,1 %)	112 (8,7 %)	9 383
2013	7 217 (89,2 %)	58 (0,7 %)	812 (10 %)	1 146 (87,7 %)	65 (5 %)	96 (7,3 %)	9 394
2012	7 040 (89,8 %)	37 (0,5 %)	765 (9,8 %)	1 073 (82,2 %)	110 (8,4 %)	123 (9,4 %)	9 148
2011	6 623 (90 %)	29 (0,4 %)	707 (9,6 %)	1 062 (82,7 %)	122 (9,5 %)	100 (7,8 %)	8 643
2010	6 690 (91,3 %)	38 (0,5 %)	602 (8,2 %)	1 061 (84,3 %)	106 (8,4 %)	91 (7,2 %)	8 588
2009	6 585 (92,6 %)	59 (0,8 %)	471 (6,6 %)	1 013 (83,7 %)	121 (10 %)	76 (6,3 %)	8 325
2008	6 249 (91,2 %)	59 (0,9 %)	541 (7,9 %)	954 (85 %)	106 (9,4 %)	62 (5,5 %)	7 971
2007	6 105 (91,7 %)	75 (1,1 %)	480 (7,2 %)	866 (82,4 %)	112 (10,7 %)	73 (6,9 %)	7 711
2006	5 718 (90,5 %)	87 (1,4 %)	514 (8,1 %)	836 (83 %)	104 (10,3 %)	67 (6,7 %)	7 326
2005	5 985 (90,7 %)	112 (1,7 %)	500 (7,6 %)	865 (81,8 %)	102 (9,6 %)	91 (8,6 %)	7 655
2004	5 999 (96,5 %)	130 (2,1 %)	90 (1,4 %)	808 (86 %)	99 (10,5 %)	33 (3,5 %)	7 159
2003	6 706 (95,3 %)	213 (3 %)	121 (1,7 %)	862 (87,1 %)	97 (9,8 %)	31 (3,1 %)	8 030
2002	5 891 (95,4 %)	194 (3,1 %)	89 (1,4 %)	824 (86,2 %)	104 (10,9 %)	28 (2,9 %)	7 130
2001	5 939 (96,3 %)	157 (2,5 %)	74 (1,2 %)	776 (84,2 %)	120 (13 %)	26 (2,8 %)	7 092
1996-00	25 225 (94,7 %)	1 192 (4,5 %)	220 (0,8 %)	4 320 (86,7 %)	582 (11,7 %)	80 (1,6 %)	31 619
1991-95	20 701 (86,6 %)	2 999 (12,5 %)	199 (0,8 %)	3 613 (84,2 %)	636 (14,8 %)	43 (1 %)	28 191
1987-90	11 525 (75,4 %)	3 566 (23,3 %)	203 (1,3 %)	1 652 (71,7 %)	624 (27,1 %)	27 (1,2 %)	17 597
Total	147 563 (90,1 %)	9 026 (5,5 %)	7 101 (4,3 %)	22 837 (83,7 %)	3 276 (12 %)	1 159 (4,2 %)	190 962

Systemic antibiotic prophylaxis

Table 13:

Year	Primary operations			Revisions			Total
	No	Yes	Missing	No	Yes	Missing	
2014	1 (0 %)	8 060 (99,5 %)	38 (0,5 %)	8 (0,6 %)	1 268 (98,8 %)	8 (0,6 %)	9 383
2013	2 (0 %)	8 048 (99,5 %)	37 (0,5 %)	7 (0,5 %)	1 282 (98,1 %)	18 (1,4 %)	9 394
2012	2 (0 %)	7 806 (99,5 %)	34 (0,4 %)	11 (0,8 %)	1 282 (98,2 %)	13 (1 %)	9 148
2011	6 (0,1 %)	7 331 (99,6 %)	22 (0,3 %)	43 (3,3 %)	1 232 (96 %)	9 (0,7 %)	8 643
2010	6 (0,1 %)	7 297 (99,5 %)	27 (0,4 %)	45 (3,6 %)	1 203 (95,6 %)	10 (0,8 %)	8 588
2009	33 (0,5 %)	7 081 (99,5 %)	1 (0 %)	37 (3,1 %)	1 171 (96,8 %)	2 (0,2 %)	8 325
2008	39 (0,6 %)	6 805 (99,4 %)	5 (0,1 %)	38 (3,4 %)	1 077 (96 %)	7 (0,6 %)	7 971
2007	27 (0,4 %)	6 626 (99,5 %)	7 (0,1 %)	30 (2,9 %)	1 014 (96,5 %)	7 (0,7 %)	7 711
2006	37 (0,6 %)	6 282 (99,4 %)	0 (0 %)	28 (2,8 %)	979 (97,2 %)	0 (0 %)	7 326
2005	25 (0,4 %)	6 572 (99,6 %)	0 (0 %)	18 (1,7 %)	1 040 (98,3 %)	0 (0 %)	7 655
2004	1 (0 %)	6 218 (100 %)	0 (0 %)	6 (0,6 %)	929 (98,8 %)	5 (0,5 %)	7 159
2003	1 (0 %)	7 038 (100 %)	1 (0 %)	8 (0,8 %)	975 (98,5 %)	7 (0,7 %)	8 030
2002	5 (0,1 %)	6 167 (99,9 %)	2 (0 %)	10 (1 %)	943 (98,6 %)	3 (0,3 %)	7 130
2001	13 (0,2 %)	6 155 (99,8 %)	2 (0 %)	3 (0,3 %)	918 (99,6 %)	1 (0,1 %)	7 092
1996-00	37 (0,1 %)	26 597 (99,8 %)	3 (0 %)	31 (0,6 %)	4 945 (99,3 %)	6 (0,1 %)	31 619
1991-95	339 (1,4 %)	23 537 (98,5 %)	23 (0,1 %)	67 (1,6 %)	4 213 (98,2 %)	12 (0,3 %)	28 191
1987-90	1 462 (9,6 %)	13 808 (90,3 %)	24 (0,2 %)	112 (4,9 %)	2 180 (94,7 %)	11 (0,5 %)	17 597
Total	2 036 (1,2 %)	161 428 (98,6 %)	226 (0,1 %)	502 (1,8 %)	26 651 (97,7 %)	119 (0,4 %)	190 962

Use of cement in primary operations

Figure 5: All patients

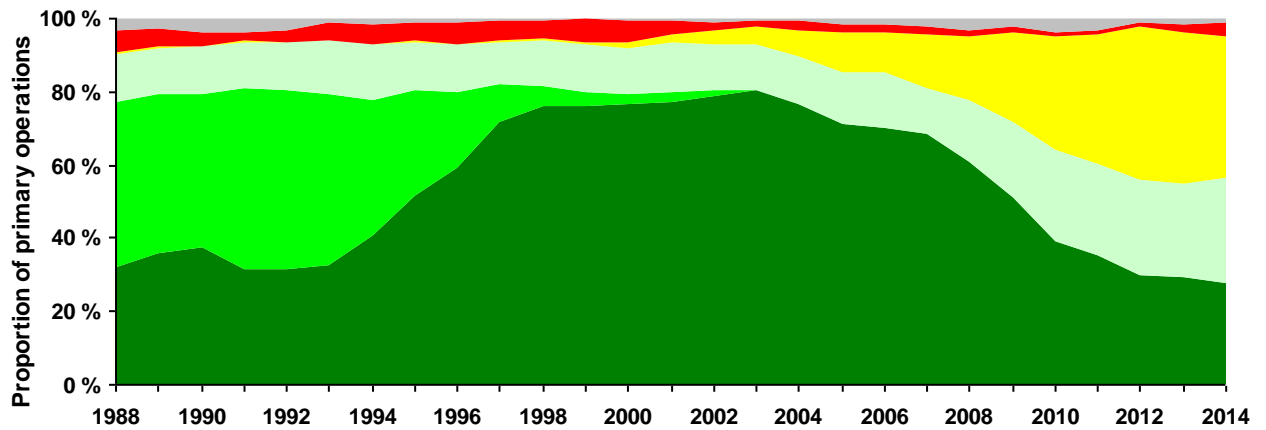


Figure 6: Patients under 65 years old

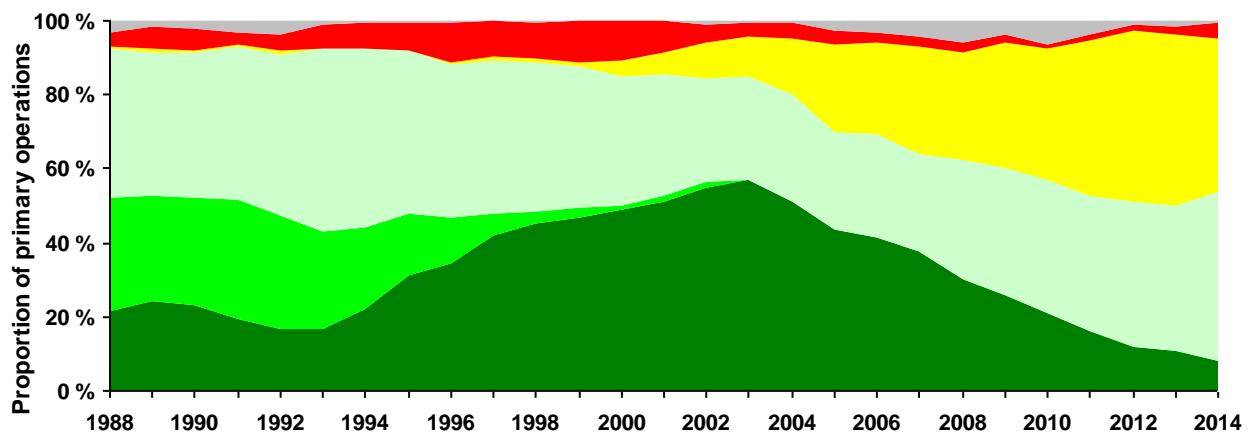
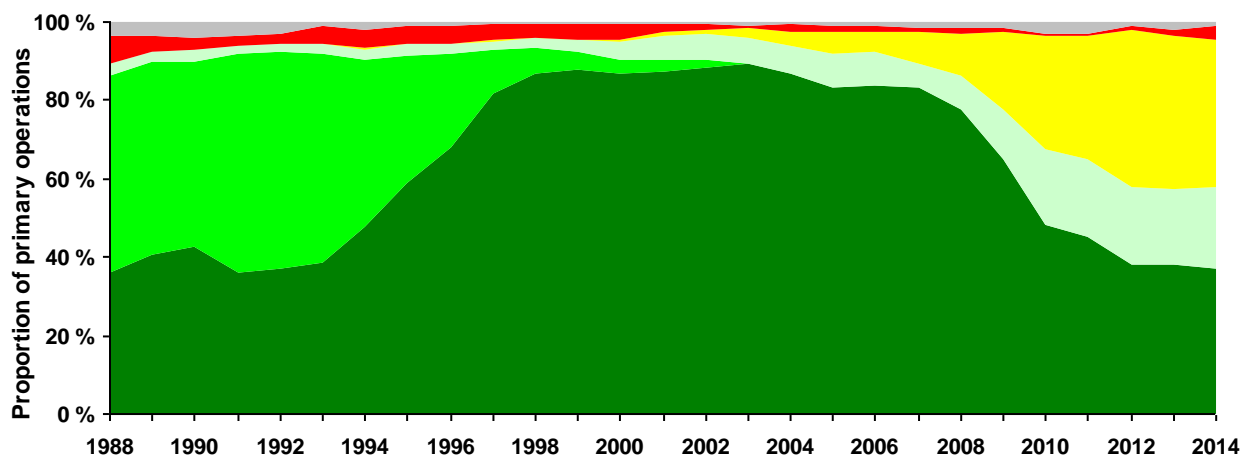


Figure 7: Patients 65 years old or older



- Missing information / Other
- Hybrid (cemented femur)
- Reverse hybrid (cemented acetabulum)
- Uncemented acetabulum and femur
- Cemented acetabulum and femur without antibiotic
- Cemented acetabulum and femur with antibiotic

Use of cement in revisions

Figure 8: Acetabulum - All patients

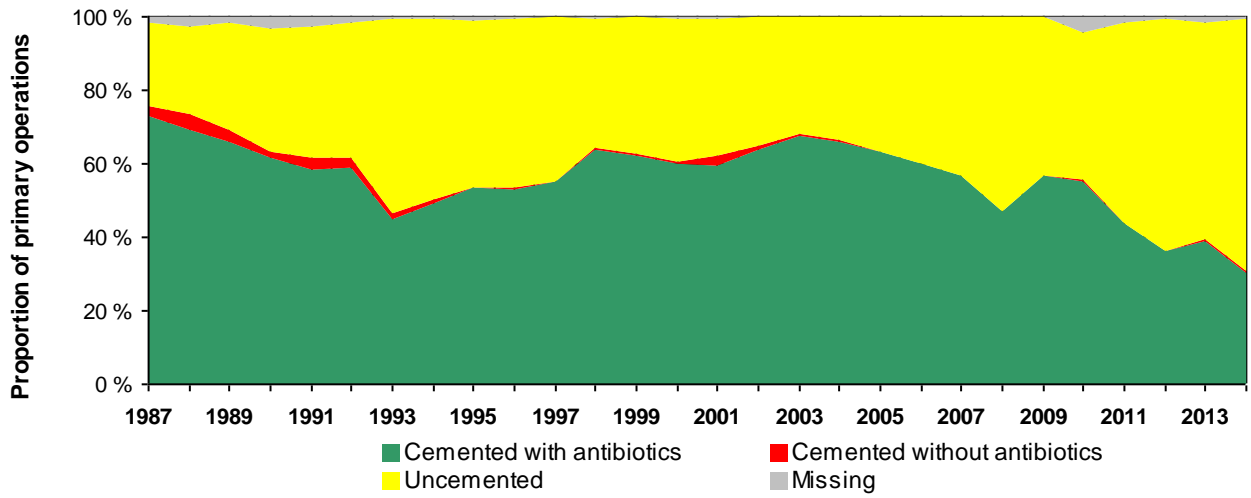
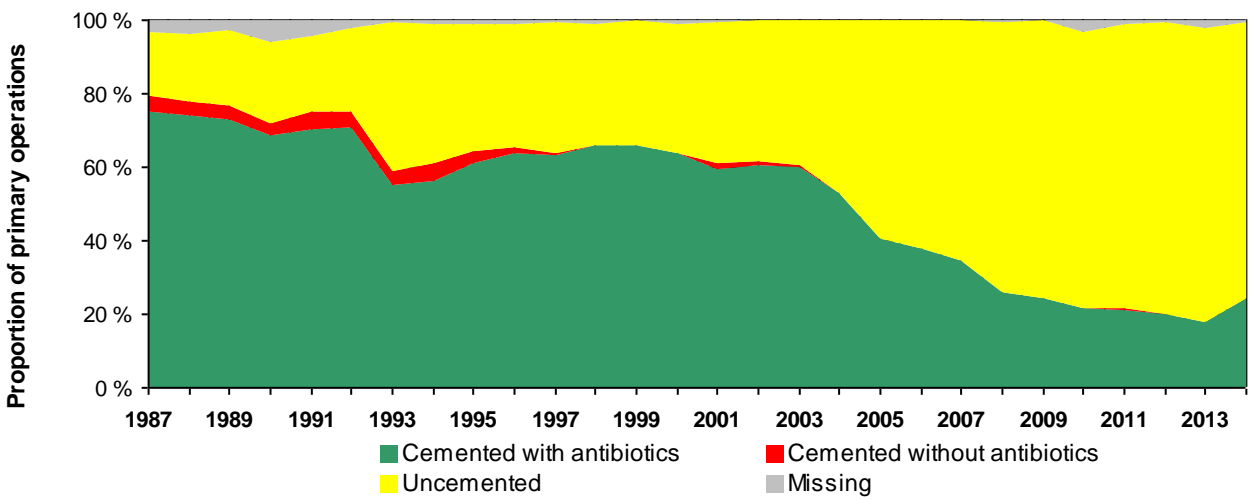


Figure 9: Femur - All patients



Use of cement and bone transplantation in revisions

Table 14: Acetabulum

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2014	26%	9%	56%	8%	259	4%	14%	68%	14%	585
2013	31%	7%	50%	12%	347	4%	11%	71%	13%	522
2012	36%	8%	46%	10%	316	5%	14%	71%	11%	555
2011	42%	7%	44%	6%	377	4%	16%	67%	13%	471
2010	37%	10%	49%	5%	477	3%	23%	66%	8%	347
2009	45%	8%	43%	4%	469	9%	20%	64%	6%	353
2008	47%	7%	41%	6%	348	12%	20%	63%	4%	385
2007	42%	8%	43%	7%	412	5%	29%	61%	4%	309
2001-06	35%	17%	46%	2%	2 516	5%	35%	55%	5%	1 401
1996-00	27%	21%	52%	0%	1 954	9%	49%	41%	1%	1 337
1991-95	0%	29%	69%	1%	1 587	0%	62%	35%	2%	1 289
1987-90	0%	22%	77%	1%	1 187	0%	65%	34%	1%	486
Total	25%	18%	54%	3%	10 249	5%	36%	54%	6%	8 040

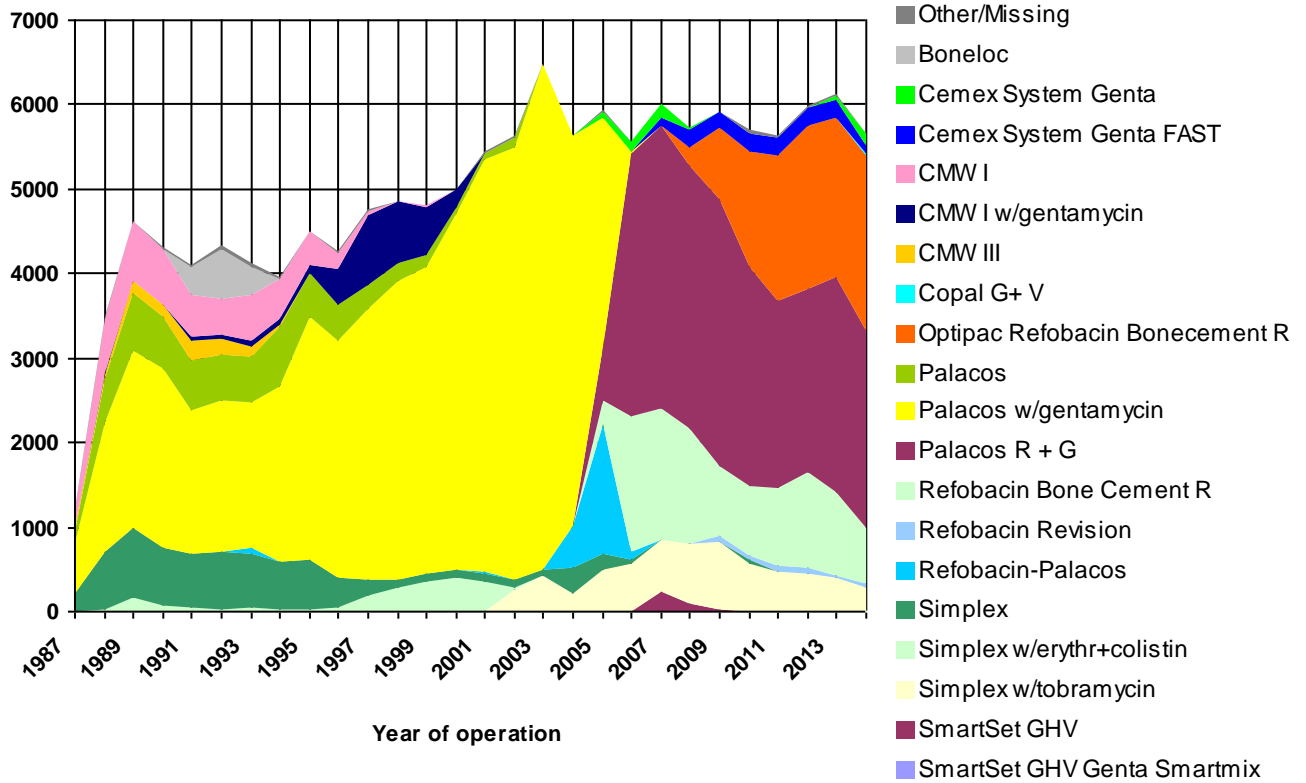
Table 15: Femur

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2014	3%	3%	63%	32%	112	0%	13%	73%	14%	347
2013	7%	4%	61%	28%	92	0%	14%	70%	15%	410
2012	13%	4%	59%	23%	98	1%	15%	70%	14%	383
2011	20%	4%	56%	20%	99	2%	20%	66%	12%	359
2010	29%	5%	59%	7%	108	2%	23%	67%	8%	371
2009	29%	5%	50%	16%	112	1%	26%	63%	11%	348
2008	40%	3%	49%	8%	126	4%	29%	59%	8%	354
2007	29%	10%	47%	14%	146	4%	30%	57%	9%	274
2001-06	33%	10%	55%	2%	1 535	6%	42%	49%	3%	1 361
1996-00	33%	17%	50%	1%	2 069	16%	56%	27%	1%	1 094
1991-95	0%	19%	79%	2%	2 128	0%	64%	34%	2%	1 012
1987-90	0%	6%	92%	2%	1 472	0%	68%	31%	1%	394
Total	17%	13%	67%	3%	8 097	5%	40%	49%	6%	6 707

Registration of "Bone impaction" started in 1996

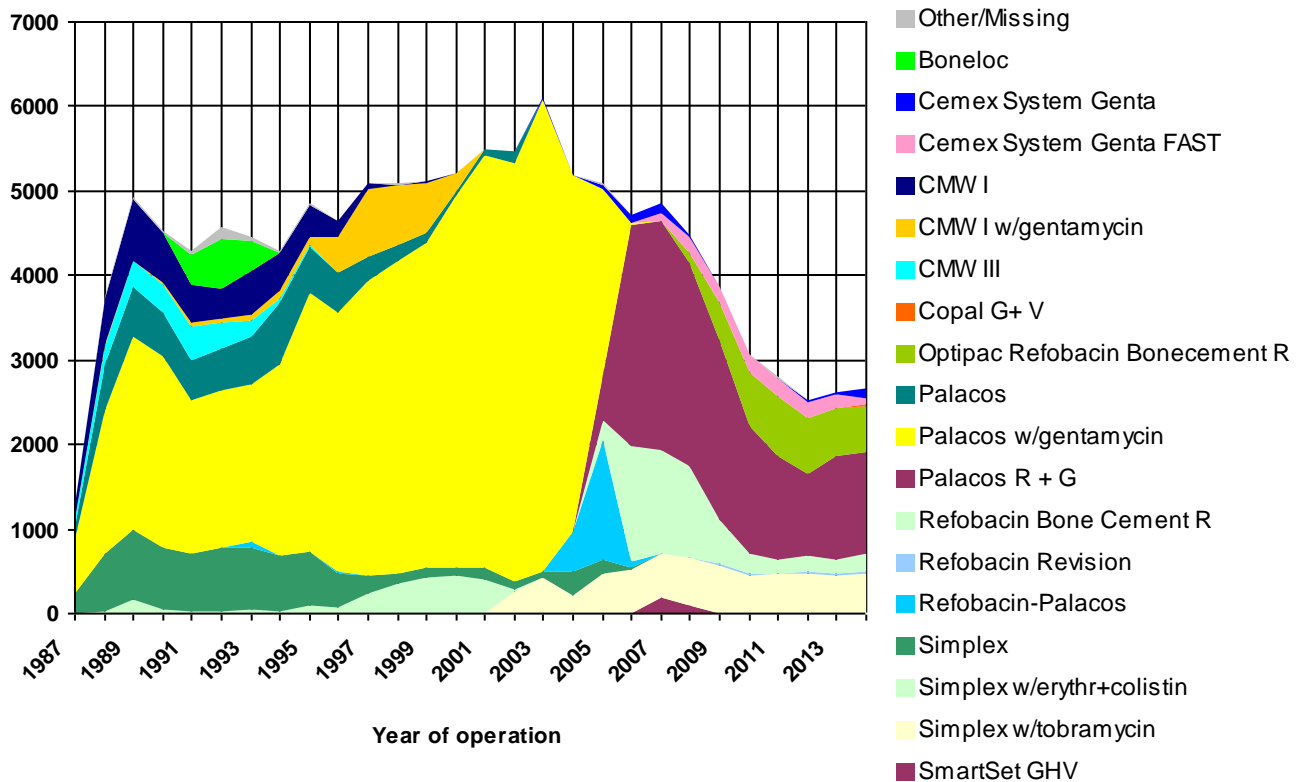
Cements used in Acetabulum

Figure 10: In primary- and revision



Cements used in femur

Figure 11: In primary- and revision



Cemented primary prostheses

Table 16: (The 45 most common combinations of cup and stem)

Acetabulum	Femur	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
CHARNLEY	CHARNLEY	38443	665	368	345	223	115	112	65	39	40375
EXETER	EXETER	10191	729	689	577	496	155	80	25		12942
REFLECTION CEM. ALL POLY	SPECTRON-EF	6973	972	876	546	134	112	85	32	1	9731
TITAN	TITAN	6388	186	222	152	7					6955
IP	LUBINUS SP II	1392	483	505	569	627	524	471	415	278	5264
CONTEMPORARY	EXETER	962	654	695	701	734	627	188	104	54	4719
EXETER X3 RIMFIT	EXETER					54	604	982	1171	1152	3963
SPECTRON	ITH	2405									2405
KRONOS	TITAN	1201	147	65	54	16					1483
MARATHON	CHARNLEY MODULAR			8	182	323	282	202	196	225	1418
ELITE	TITAN	930	107	148	39						1224
ELITE	CHARNLEY	934				2	1				937
REFLECTION CEM. ALL POLY	ITH	926									926
REFLECTION CEM. ALL POLY	BIO-FIT	898									898
WEBER ALLO PRO	MS-30	797	14	2							813
ELITE	EXETER	351	179	147	69	31		1			778
ZCA	CPT	756									756
CHARNLEY	CHARNLEY MODULAR	44	199	284	129		1	1		1	659
IP	LUBINUS	587									587
ELITE	ELITE	575	2		1	1					579
CHARNLEY	EXETER	492	72	7							571
TITAN	FJORD	523									523
ELITE	CHARNLEY MODULAR	6	68	120	111	53	57	48	30	21	514
SPECTRON	SP I	432									432
MODULAR HIP SYSTEM	BIO-FIT	430									430
SPECTRON	TITAN	411									411
CHARNLEY	C-STEM	378									378
CHARNLEY	ELITE	375									375
OPERA	SPECTRON-EF	352	1	2	1						356
ELITE	MS-30	292	38	1							331
LUBINUS	LUBINUS SP II	13							125	167	305
MARATHON	EXETER			4	18	17	18	69	80	88	294
PEARL	TITAN	285									285
MODULAR HIP SYSTEM	ITH	277									277
AVANTAGE	EXETER	3			18	29	37	41	47	61	236
SPECTRON	BIO-FIT	226									226
IP	SP I	213									213
LMT	LMT	191									191
ELITE	CPT	120	8	13	24	16	1				182
ZCA	CPS-PLUS	168									168
MÜLLER TYPE	MÜLLER TYPE	168									168
PE-PLUS	CPS-PLUS	159			5						164
ELITE	C-STEM	119	1	1							121
MODULAR HIP SYSTEM	LUBINUS SP II	120									120
ELITE	SPECTRON-EF	112	4								116

Uncemented primary prostheses

Table 17: (The 45 most common combinations of cup and stem)

Acetabulum	Femur	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
REFLECTION UNCEMENTED	CORAIL	298	52	144	209	520	529	674	745	822	3993
IGLOO	FILLER	1549	142	166	144	208	228	249	210	171	3067
TROPIC	CORAIL	2659									2659
TRILOGY	CORAIL	579	132	155	306	182	128	182	216	272	2152
PINNACLE	CORAIL	37	81	119	91	117	296	456	356	317	1870
ATOLL	CORAIL	1280									1280
DURALOC	CORAIL	389	2	28	84	188	239	72	62		1064
BICON-PLUS	ZWEYMÜLLER	444	67	59	16						586
REFLECTION UNCEMENTED	SECURFIT			33	83	128	146	91	32		513
TRILOGY	SCP/UNIQUE	471	25	6	3	3			1		509
TRILOGY	HACTIV	199	67	64	57	38	4	12	7		448
GEMINI	PROFILE	407									407
BICON-PLUS	HACTIV	386									386
DURALOC	PROFILE	332									332
REFLECTION UNCEMENTED	OMNIFIT	1	50	102	72	47	22	6			300
R3	POLARSTEM					21	68	56	79	41	265
TRILOGY	FILLER	12	32	41	33	45	40	38	18		259
DURALOC	SCP/UNIQUE	254									254
ENDLER	ZWEYMÜLLER	247									247
EUROPEAN CUP SYSTEM	TAPERLOC	240									240
PLASMACUP	BICONTACT	228	4								232
LMT	TAPERLOC	224									224
REFLECTION UNCEMENTED	SCP/UNIQUE	44	22	53	36	13	6	1	14	25	214
TRIDENT	ABG II					6	22	29	52	81	190
Continuum Acetabular System	CORAIL									187	187
TI-FIT	BIO-FIT	175									175
REFLECTION UNCEMENTED	SL-PLUS MIA				12	157					169
SECURFIT	OMNIFIT	166									166
ABG I	ABG I	165									165
HARRIS/GALANTE	HARRIS/GALANTE	158									158
TRIDENT	CORAIL		1	12	8	24	3	16	23	70	157
ABG II	ABG II	155									155
COXA	FEMORA	155									155
PARHOFER	PARHOFER	152									152
BICON-PLUS	CORAIL	125	9	3	9		2			1	149
REFLECTION UNCEMENTED	PROFEMUR GLADIATOR					3	37	60	37	1	138
TRILOGY	OMNIFIT	52	20	30	23	9					134
TITAN	CORAIL	116									116
TRIDENT	ACCOLADE II								41	75	116
AVANTAGE	CORAIL	3	8	17	25	19	12	16	4	2	106
REFLECTION UNCEMENTED	BICONTACT	82	19								101
MORSCHER	OMNIFIT	55	11	15	8	7	4				100
REFLECTION UNCEMENTED	ZWEYMÜLLER			16	70	5					91
OMNIFIT	OMNIFIT	91									91
IGLOO	CORAIL	90									90
TRILOGY	BICONTACT	90									90

Hybrid primary prostheses

Table 18: Hybrid primary prostheses. (The 20 most common)

Acetabulum (uncemented)	Femur (cemented)	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
TROPIC	TITAN	869									869
TRILOGY	EXETER	276	10	21	20	29	53	44	88	201	742
MORSCHER	MS-30	531	38	43	30	25					667
TRILOGY	CHARNLEY	363	19								382
ENDLER	TITAN	336									336
DURALOC	CHARNLEY	153									153
REFLECTION UNCEMENTED	BIO-FIT	142									142
REFLECTION UNCEMENTED	SPECTRON-EF	107		2	11			1	1		122
ATOLL	TITAN	105									105
TRIDENT	EXETER	30	18	23	18	3	1		1	10	104
IP	SP I	101									101
REFLECTION UNCEMENTED	LUBINUS SP II	3		1			1	2	32	62	101
TRILOGY	CPT	87	1								88
HG II	ANATOMIC CC	80									80
GEMINI	CHARNLEY	77									77
AVANTAGE	EXETER			17	2	2	8	20	7	10	66
TI-FIT	BIO-FIT	53									53
TROPIC	EXETER	47									47
AVANTAGE	SPECTRON-EF	14	12	16	3						45
TRILOGY	CENTRALIGN	41									41

Table 19: Reverse hybrid primary prostheses. (The 20 most common)

Acetabulum (cemented)	Femur (uncemented)	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
MARATHON	CORAIL			7	390	1127	1759	2734	2936	2763	11716
ELITE	CORAIL	723	365	363	334	249	227	205	86	70	2622
REFLECTION CEM. ALL POLY	CORAIL	338	132	204	268	193	15	25	21	22	1218
TITAN	CORAIL	379	75	114	181	132	48	1			930
CONTEMPORARY	CORAIL		6	45	183	202	236	6	2	1	681
KRONOS	CORAIL	152	98	157	121	98	7				633
REFLECTION CEM. ALL POLY	HACTIV	79	68	78	63	26	49	91	20	1	475
EXETER X3 RIMFIT	CORAIL		1			2	59	42	70	89	263
REFLECTION CEM. ALL POLY	FILLER	50	27	41	24	10	12	23	26	19	232
IP	CORAIL	26	9	40	47	43	16	4	11	3	199
EXETER	CORAIL	54	18	28	45	26		2			173
EXETER	ABG II	172									172
REFLECTION CEM. ALL POLY	TAPERLOC	106	49								155
EXETER X3 RIMFIT	ABG II					10	69	60	8		147
CHARNLEY	CORAIL	55	34	13	12	2				1	117
EXETER X3 RIMFIT	ACCOLADE II								59	49	108
ELITE	SCP/UNIQUE	63	7	10	8	2	3	2	2	1	98
AVANTAGE	CORAIL	5	1		5	15	23	11	15	19	94
OPERA	CORAIL	59	20	5	5						89
EXETER X3 RIMFIT	FILLER						1		22	35	58

Acetabular prostheses in primary operations

Table 20: (The 45 most common)

Acetabulum	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
CHARNLEY	40495	980	679	489	230	117	114	66	40	43210
REFLECTION CEM. ALL POLY	9685	1271	1215	926	387	193	234	107	53	14071
MARATHON			32	659	1556	2139	3084	3314	3175	13959
EXETER	10636	753	718	625	522	156	84	26	1	13521
TITAN	7660	264	342	340	161	48	1			8816
ELITE	4410	818	837	615	391	304	261	118	94	7848
IP	2360	498	552	634	715	558	488	441	285	6531
REFLECTION UNCEMENTED	974	187	376	511	907	767	848	932	969	6471
CONTEMPORARY	979	670	748	891	957	889	195	110	56	5495
TRILOGY	2585	328	347	455	340	243	292	349	507	5446
EXETER X3 RIMFIT		1			71	745	1103	1367	1355	4642
TROPIC	3822	1								3823
SPECTRON	3652									3652
IGLOO	1761	146	171	145	211	230	249	211	174	3298
KRONOS	1393	257	233	184	119	7				2193
PINNACLE	49	95	133	110	158	326	468	384	329	2052
DURALOC	1282	2	28	85	207	245	72	62		1983
ATOLL	1491									1491
BICON-PLUS	1045	76	63	25		2			1	1212
ZCA	1037		10	9	6					1062
AVANTAGE	124	51	65	97	104	109	119	102	117	888
MODULAR HIP SYSTEM	878									878
MORSCHER	633	54	65	48	37	6				843
WEBER ALLO PRO	812	16	2							830
TRIDENT	41	25	58	41	38	33	49	152	338	775
ENDLER	662									662
BIRMINGHAM HIP RESURFACING	94	75	105	103	78	42	21	2		520
GEMINI	510									510
OPERA	421	23	7	6						457
EUROPEAN CUP SYSTEM	332									332
LUBINUS	31						1	125	168	325
TI-FIT	312									312
R3					22	75	57	79	73	306
PEARL	287									287
PLASMACUP	279	4								283
LMT (Uncemented)	275									275
POLARCUP				3	5	46	58	79	64	255
HARRIS/GALANTE	252									252
PE-PLUS	233	4	4	6						247
MÜLLER TYPE	244									244
ABG II	236									236
COXA	220									220
LMT (Cemented)	208									208
Continuum Acetabular System									191	191
ABG I	177									177

Acetabular prostheses in revisions

Table 21: (The 45 most common)

Acetabulum	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
CHARNLEY	2734	48	23	25	17	9	5	3		2864
TROPIC	1880	2	2	1						1885
ELITE	1183	108	118	66	55	33	19	12	6	1600
TRILOGY	787	102	91	94	83	70	50	51	56	1384
AVANTAGE	309	115	135	151	169	149	126	105	87	1346
EXETER	818	53	38	18	12	1	3			943
REFLECTION CEM. ALL POLY	675	56	67	54	32	11	7	4	3	909
PINNACLE	63	89	70	83	93	86	97	82	117	780
MARATHON			6	63	135	130	164	138	65	701
TRABECULAR METAL		8	14	36	50	97	118	161	212	696
TITAN	465	5	20	26	11					527
IGLOO	291	30	39	22	22	28	24	17	15	488
REFLECTION UNCEMENTED	45	12	16	44	48	62	78	94	82	481
POLARCAP				12	41	50	84	121	111	419
ATOLL	396									396
IP	181	17	9	16	10	7	10	4	3	257
CONTEMPORARY	29	19	34	57	42	45	9	3		238
KRONOS	171	19	16	13	6					225
CHRISTIANSEN	197									197
SPECTRON	189									189
TRIDENT	18	11	8	12	9	24	25	25	37	169
DURALOC	75			11	8	16	10	5	11	136
EXETER X3 RIMFIT					2	23	24	30	25	104
OPERA	66	18	10	7						101
HARRIS/GALANTE	99									99
ZCA	95			1						96
MODULAR HIP SYSTEM	95									95
EUROPEAN CUP SYSTEM	73									73
CAPTIV	69	1	1							71
LMT (Uncemented)	67									67
ENDLER	66									66
BICON-PLUS	46			2		1	2	3		54
HG II	53									53
MORSCHER	28	4	8	4	4	3				51
GEMINI	47									47
SECURFIT	45									45
OCTOPUS	30	5	2	3						40
REGENEREX RINGLOC			2	6	9	13	7	2		39
TRITANIUM							14	16	9	39
TI-FIT	36									36
PARHOFER	35									35
PCA	33						1			34
S-ROM	27									27
ORIGINAL M.E. MÜLLER	25									25
COXA	25									25

Femoral prostheses in primary operations

Table 22: (The 45 most common)

Femur	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
CHARNLEY	40543	702	369	359	233	117	116	67	43	42549
CORAIL	7756	1087	1506	2429	3258	3685	4492	4631	4701	33545
EXETER	12555	1674	1614	1441	1455	1558	1460	1565	1642	24964
TITAN	10992	452	449	256	36	3				12188
SPECTRON-EF	7760	1011	903	574	145	119	92	36	10	10650
LUBINUS SP II	1641	488	515	590	658	557	519	621	582	6171
FILLER	1696	210	255	212	295	295	321	373	330	3987
ITH	3723									3723
CHARNLEY MODULAR	54	271	422	435	394	352	257	237	262	2684
BIO-FIT	1993									1993
MS-30	1667	97	50	35	27	1				1877
HACTIV	716	149	149	126	79	58	108	38	10	1433
SCP/UNIQUE	938	79	96	85	47	23	15	33	36	1352
CPT	1036	10	13	30	21	2		1	2	1115
ZWEYMÜLLER	822	79	102	94	5					1102
ELITE	1015	4		4	1	2	3	1		1030
PROFILE	890									890
OMNIFIT	397	104	172	113	70	28	6			890
ABG II	396	3		6	62	105	94	78	81	825
SP I	779			1						780
TAPERLOC (Uncemented)	683	85		3						771
FJORD	650	1		1						652
LUBINUS	624									624
SECURFIT			35	91	136	167	94	32		555
C-STEM	503	1	8	19	9			1	2	543
CPS-PLUS	481		1	7	7					496
TAPERLOC (Cemented)	452	4								456
BICONACT	420	23								443
POLARSTEM					23	101	83	105	91	403
ABG I	304									304
ACCOLADE II								110	137	247
TI-FIT	221									221
MÜLLER TYPE	217									217
KAR	90	9	13	11	14	8	19	29	8	201
FEMORA	182									182
SL-PLUS MIA				12	165					177
HARRIS/GALANTE	169									169
PROFEMUR GLADIATOR					4	48	71	38	4	165
PARHOFER	159									159
BI-METRIC	58		2	35	33	15	5	2	3	153
KAREY	136									136
MÜLLER TYPE V	132									132
ECHELON	113		2	4	2					121
ANATOMIC CC	113									113
CENTRALIGN	111									111

Femoral prostheses in revisions

Table 23: (The 45 most common)

Femur	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
CHARNLEY	2925	16	8	11	12	6	1	1	2	2982
KAR	1497	129	165	175	112	116	114	135	44	2487
EXETER	1360	74	72	61	64	70	72	61	62	1896
CORAIL	1139	36	27	43	70	84	86	77	117	1679
TITAN	525	2	4	5	1	1				538
CPT	442	5	7	7	7	6	7	2	5	488
FJORD	472	2	1	1						476
RESTORATION	39	20	36	42	42	39	57	67	63	405
SPECTRON-EF	266	23	23	16	13	14	4	8	3	370
FILLER	218	18	27	17	19	18	13	13	16	359
ELITE	335	7	4	3	2			1	1	353
TTHR	17	14	8	28	40	61	71	52	36	327
REEF	199	29	37	30	21	3	5	2		326
LUBINUS SP II	152	4	2	3	3	2	9	8	30	213
ANATOMIC BR	192									192
ITH	192									192
BIO-FIT	167									167
MP RECONSTRUCTION	29	3	2	2	12	21	24	26	18	137
BI-METRIC	44	4	7	10	21	15	16	16	1	134
TAPERLOC (Uncemented)	115									115
HACTIV	50	16	15	7	14		4	4		110
ZWEYMÜLLER	80	2			1					83
REACTIV		4	23	9	9	6	3	6	19	79
Profemur		1		4	26	16	11	14	5	77
ECHELON	43	6	8	5	5	1				68
SP I	66									66
SCAN HIP	59									59
REVITAN					1		7	27	20	55
LUBINUS	51									51
HARRIS/GALANTE	44									44
FEMORA	43									43
PARHOFER	43									43
AURA	10	2	8	7	11					38
PROFEMUR GLADIATOR					1	6	19	9	3	38
CHARNLEY MODULAR	1	10	4	3	4	3	3	3	3	34
MS-30	30			3	1					34
MÜLLER TYPE	34									34
LANDOS (Reconstruction)	33									33
ARCOS						1	3	11	17	32
OMNIFIT	27	2	2			1				32
CPS-PLUS	20	5	1							26
RECLAIM							1	13	9	23
CENTRALIGN	22									22
TAPERLOC (Cemented)	22									22
Securus								6	14	20

Monoblock and modular caput

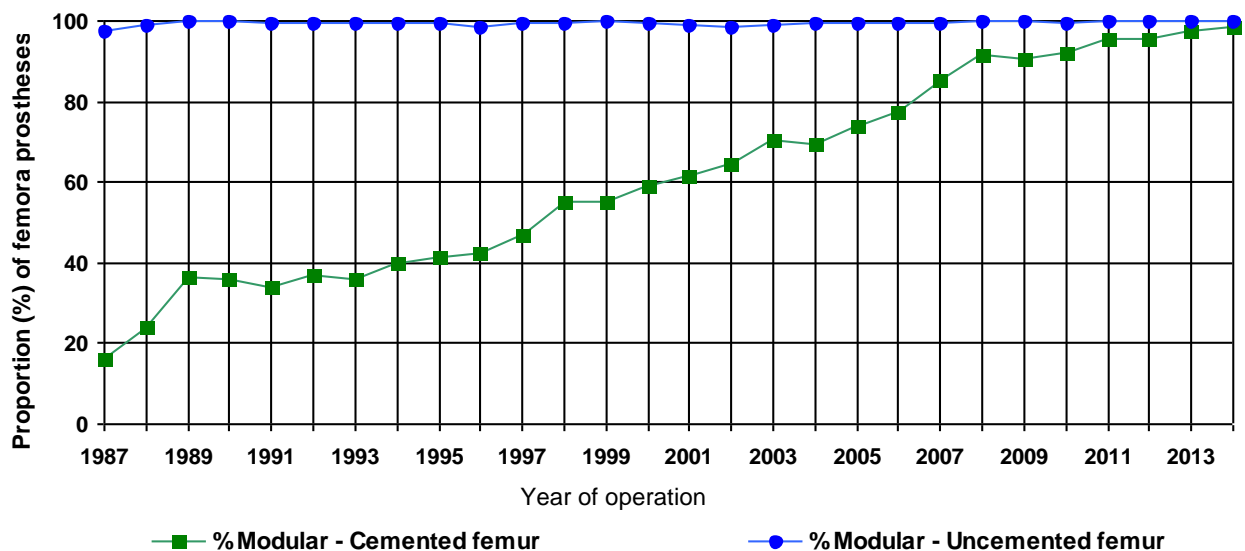
Table 24: Primary operations and revisions - Cemented femur

Caput	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
Monoblock	45725	721	382	368	236	113	116	67	41	47769
Modular	48251	4132	4086	3492	2826	2675	2407	2558	2618	73045
Missing	138	3	1	1	6	13	1	4	3	170
Total	94114	4856	4469	3861	3068	2801	2524	2629	2662	120984

Table 25: Primary operations and revisions - Uncemented femur

Caput	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
Monoblock	60	4		2	3			2		71
Modular	20312	2091	2702	3579	4561	4880	5743	5898	5850	55616
Missing	84	3	6	1	10	3	3	3	5	118
Total	20456	2098	2708	3582	4574	4883	5746	5903	5855	55805

Figure 12: Proportion (%) modular femoral prostheses

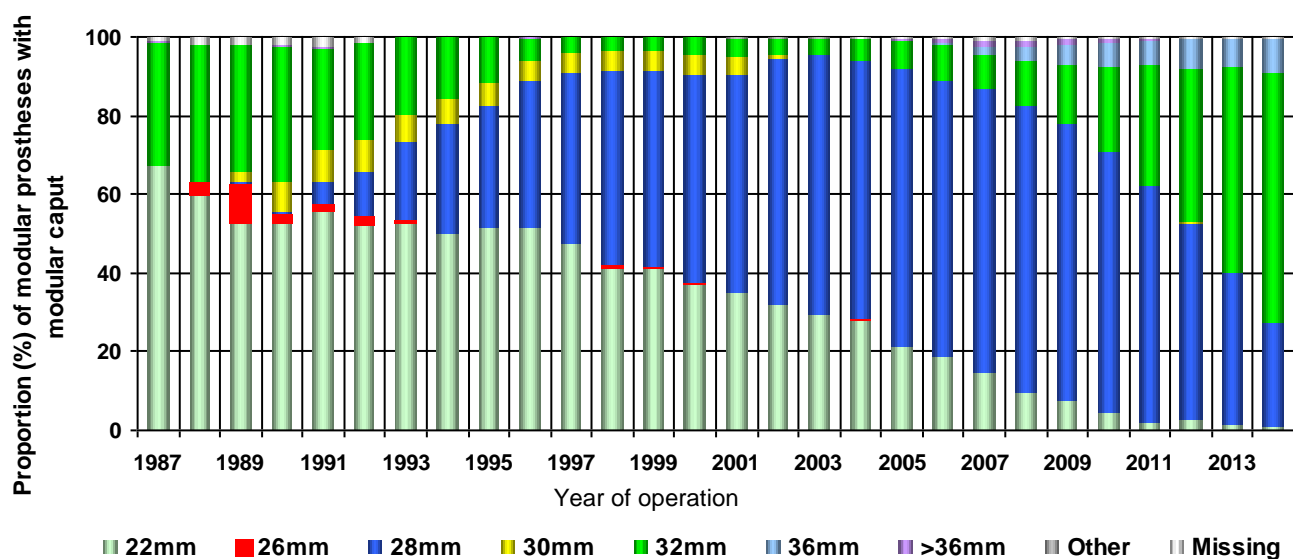


Caput diameter

Table 26: In primary operations and revisions

Year	22 mm	26 mm	28 mm	30 mm	32 mm	36 mm	>36 mm	Other	Missing	Total
2014	98		2 417	1	5 818	790	4	5	43	9 176
2013	154	2	3 566	1	4 831	672	3	7	38	9 274
2012	213		4 516	3	3 498	671	25	8	29	8 963
2011	186		5 058		2 605	522	52	3	28	8 454
2010	385		5 570	3	1 826	481	82	1	52	8 400
2009	629	2	5 720	4	1 241	385	115	2	54	8 152
2008	761	2	5 629	2	880	279	136	3	66	7 758
2007	1 094		5 429	2	666	147	112	2	63	7 515
2006	1 324	6	5 015	3	638	58	60	5	36	7 145
2005	1 586	9	5 255		522	4	41	2	29	7 448
2004	1 943	25	4 548	7	393		6	3	27	6 952
2003	2 262	24	5 136	13	309		3	14	16	7 777
2002	2 174	16	4 320	62	274		2	24	14	6 886
2001	2 385	18	3 809	317	342		1	3	15	6 890
2000	2 392	6	3 425	347	269			3	8	6 450
1999	2 546	26	3 104	337	198			2	7	6 220
1998	2 505	66	3 036	305	224			2	5	6 143
1997	2 860	24	2 627	297	226		6	1	7	6 048
1996	2 865	7	2 102	287	306	1	15		5	5 588
1995	3 014	4	1 821	342	673		7		5	5 866
1994	2 639	13	1 474	359	806		5		7	5 303
1993	2 812	70	1 043	390	1 045		2		11	5 373
1992	2 775	124	605	404	1 332		8		70	5 318
1991	2 708	102	274	380	1 264		12		133	4 873
1990	2 731	117	27	398	1 778	1	20		106	5 178
1989	2 875	566	5	151	1 757		23		100	5 477
1988	2 281	133	1	1	1 334		15		71	3 836
1987	778	1	1		359		6		13	1 158
Total	50 975	1 363	85 533	4 416	35 414	4 011	761	90	1 058	183 621

Figure 13: In primary operations and revisions



Caput prostheses

Table 27: In primary operations and revisions (The 50 most common)

Prosthesis	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
EXETER	14107	1822	1777	1588	1471	1140	867	743	651	24166
LANDOS	17045	658	917	1199	1157	671	72	7	15	21741
UNIVERSAL	13713	1053	975	658	198	176	149	108	50	17080
CERAMTEC	989	371	375	688	1013	1797	2688	2577	2436	12934
FJORD	7549	847	998	1028	768	510	62	6	2	11770
CORAIL		2	5	152	650	1253	2023	2399	2697	9181
SP II	1822	507	530	617	695	605	566	680	640	6662
LFIT ANATOMIC		8	25	56	225	677	877	1242	1424	4534
ELITE	1961	271	387	355	296	191	158	194	186	3999
IGLOO	1350	159	196	173	228	252	254	207	207	3026
PROTEK	1748	104	52	44	32	4	1			1985
SCANOS	818	179	193	185	124	63	102	28	30	1722
CPT	1489	18	27	41	32	11	7	9	2	1636
PLUS ENDO	992	115	132	142	103	38	29	34	30	1615
PROFILE	1204	105	95	1	9	14	1			1429
PINNACLE		2	12	83	187	150	306	340	248	1328
TAPERLOC	1088									1088
BIOTECHNI	708	59	57	40	57	56	44	29	4	1054
OXINIUM	127	113	123	207	172	73	68	68	47	998
HARRIS/GALANTE	830	8	6	4	6	9	7	6		876
MALLORY-HEAD	498	47	19	55	60	43	34	42	65	863
HIPBALL PREMIUM	2	12	21	23	75	143	188	235	164	863
OMNIFIT	473	59	99	73	65	36	19	20	1	845
" OSTEONICS Heads" , C-taper head	1	57	139	154	168	182	94	20		815
ZIRCONIA	762		1							763
BICONTACT	453	25	4	1		3	1	3	6	496
BIRMINGHAM HIP RESURFACING	90	72	92	77	73	39	20	2		465
ABG I	352	7	2	8	11	9	7	3	7	406
SURGIVAL	372									372
ZWEYMÜLLER	342									342
BIOBALL	1	3	5	19	25	49	66	42	62	272
CERAMIC OSTEO	220									220
VERSYS	15	7	8	12	21	45	41	38	29	216
FEMORA	213									213
PARHOFER	179	2		1	1			1		184
TI-FIT	122	7	2	7	3					141
SMITH & NEPHEW CERAMIC HEADS				2	126					128
STRYKER Heads			3	2	18	44	22	15	23	127
CHRISTIANSEN	126									126
PCA	98	1	1	1	3	2	1	1		108
FURLONG								7	70	77
BIOLOX DELTA							16	42	5	63
BIRMINGHAM HIP MODULAR	4	3	13	25	9	3	1			58
ABG II	48									48
ASR MODULAR	3	25	14	3						45
LINK Rippensystem	38									38
HASTINGS HIP	29									29
AURA II	14	2	5	2	4		2			29
WEBER	28									28
ASR RESURFACING	12	7	4							23
BIOLOX	18				2	1		2		23

Dual Mobility articulation

Table 28 In primary operation

Prosthesis	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
AVANTAGE	117	51	65	95	100	109	118	100	108	863
POLARCUP				3	5	46	58	76	57	245
Restoration ADM						1	8	8	5	22
FURLONG EVOLUTION							2	6	1	9

Table 29 In revisions

Prosthesis	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
AVANTAGE	412	164	199	244	269	258	245	205	198	2194
POLARCUP				15	46	96	140	198	171	666
Restoration ADM						2	24	21	19	66
FURLONG EVOLUTION							6	9	9	24

ASA classification

Figure 14: Primary operations

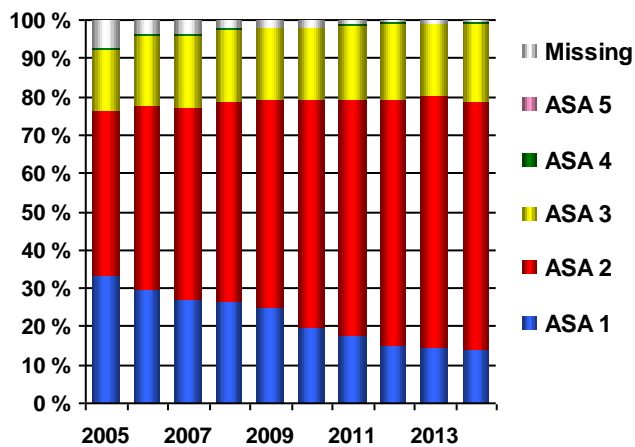
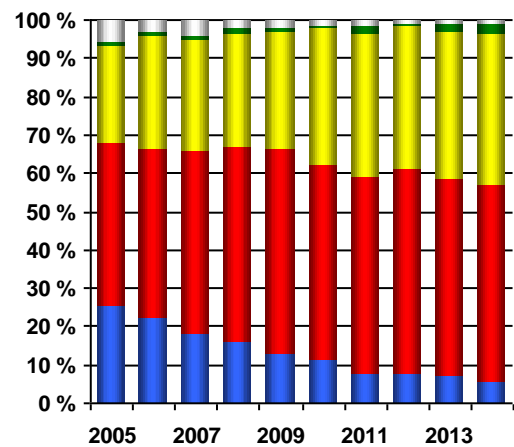


Figure 15: Revisions



ASA 1 = Healthy patients who smoke less than 5 cigarettes a day.

ASA 2 = Patients with an asymptomatic condition who are kept under medical control (f.ex. hypertension), or with diet (f. ex. diabetes mellitus type 2), and otherwise healthy patients who smoke five cigarettes or more daily.

ASA 3 = Patients having a condition that can cause symptoms. However, patients are kept under medical control (f. ex. moderate angina pectoris and mild asthma).

ASA 4 = Patients with a condition that is out of control (f. ex. heart failure and asthma).

ASA 5 = A moribund patient who is not expected to survive the operation.

Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 30: Primary operations *

Year	1	2	3	4	Missing	Total
2014	1112 (14%)	5929 (73%)	952 (12%)	31 (0%)	75 (1%)	8099
2013	1340 (17%)	5627 (70%)	1047 (13%)	10 (0%)	63 (1%)	8087
2012	1579 (20%)	4851 (62%)	1321 (17%)	9 (0%)	82 (1%)	7842
2011	2219 (30%)	4304 (58%)	795 (11%)	3 (0%)	38 (1%)	7359
2010	2365 (32%)	4308 (59%)	610 (8%)	4 (0%)	43 (1%)	7330
2009	2606 (37%)	3861 (54%)	578 (8%)	3 (0%)	67 (1%)	7115
2008	3133 (46%)	3059 (45%)	574 (8%)	8 (0%)	75 (1%)	6849
2007	3546 (53%)	2432 (37%)	530 (8%)	10 (0%)	142 (2%)	6660
2006	3927 (62%)	1544 (24%)	678 (11%)	15 (0%)	155 (2%)	6319
2005	4393 (67%)	679 (10%)	1093 (17%)	6 (0%)	426 (6%)	6597

Table 31: Revisions *

Year	1	2	3	4	Missing	Total
2014	224 (17%)	916 (71%)	116 (9%)	8 (1%)	20 (2%)	1 284
2013	221 (17%)	903 (69%)	151 (12%)	6 (0%)	26 (2%)	1 307
2012	240 (18%)	815 (62%)	215 (16%)	10 (1%)	26 (2%)	1 306
2011	317 (25%)	755 (59%)	184 (14%)	8 (1%)	20 (2%)	1 284
2010	438 (35%)	683 (54%)	125 (10%)	2 (0%)	10 (1%)	1 258
2009	421 (35%)	650 (54%)	126 (10%)	5 (0%)	8 (1%)	1 210
2008	477 (43%)	531 (47%)	94 (8%)	5 (0%)	15 (1%)	1 122
2007	501 (48%)	408 (39%)	106 (10%)	1 (0%)	35 (3%)	1 051
2006	587 (58%)	273 (27%)	122 (12%)	4 (0%)	21 (2%)	1 007
2005	706 (67%)	122 (12%)	162 (15%)	4 (0%)	64 (6%)	1 058

Figure 16: Primary operations

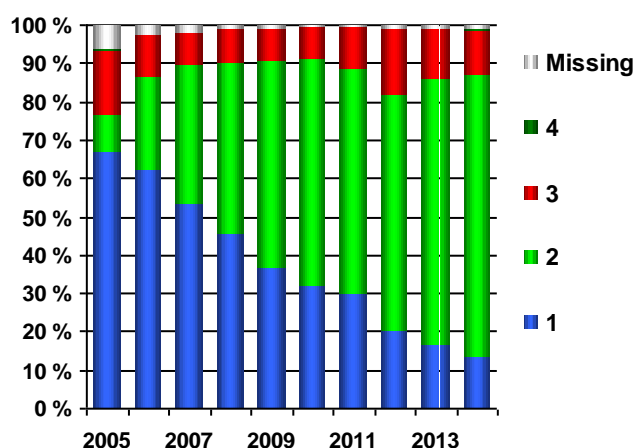
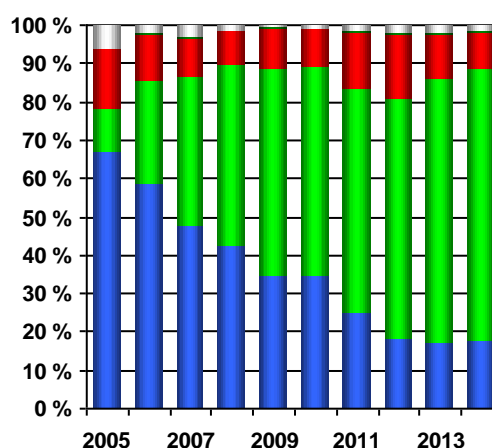


Figure 17: Revisions



*
 1 = Yes - Medication started preoperatively
 2 = Yes - Medication started postoperatively
 3 = Yes - Missing information on medication start
 4 = No

Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 32: All operations

Drugs	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)			0,1 %	0,1 %	0,1 %				0,1 %	0,4 %
Apixiban (Eliquis)								0,1 %	1,2 %	1,5 %
Dabigatranetixalat (Re-Novate, Pradaxa)	2,4 %	0,3 %		0,2 %	0,2 %					0,1 %
Dalteparin (Fragmin)	45,6 %	48,5 %	54,9 %	61,0 %	50,7 %	63,2 %	65,1 %	63,1 %	56,1 %	51,6 %
Dekstran (Macrodex, Dextran)			0,1 %	0,1 %		0,1 %	0,3 %	0,1 %	0,1 %	0,1 %
Enoksaparin (Klexane)	41,7 %	44,6 %	41,2 %	35,1 %	44,0 %	31,5 %	25,5 %	24,6 %	27,9 %	31,4 %
Rivaroksaban (Xarelto)						0,3 %	2,9 %	2,0 %	2,3 %	2,2 %
Warfarin (Marevan)	0,1 %	0,1 %	0,1 %	0,1 %	0,1 %	0,1 %		0,1 %		
Ximelagatran (Exanta, Malagatran)	1,7 %	0,6 %		0,1 %	0,1 %	0,1 %				
Other				0,1 %	0,1 %					0,1 %
Combination of 2 drugs	1,2 %	1,2 %	1,0 %	1,2 %	3,3 %	3,9 %	5,2 %	8,4 %	10,8 %	10,6 %
Clinical study	0,4 %	1,7 %	0,3 %	1,1 %	0,7 %	0,1 %				
Unknown								0,1 %		0,1 %
No drugs			0,1 %	0,1 %	0,1 %					
Missing	6,8 %	3,0 %	2,2 %	0,9 %	0,7 %	0,7 %	0,9 %	1,5 %	1,4 %	2,0 %
Total	7655	7326	7711	7971	8325	8591	8660	9176	9445	9400

Figure 18: Drugs - All operations

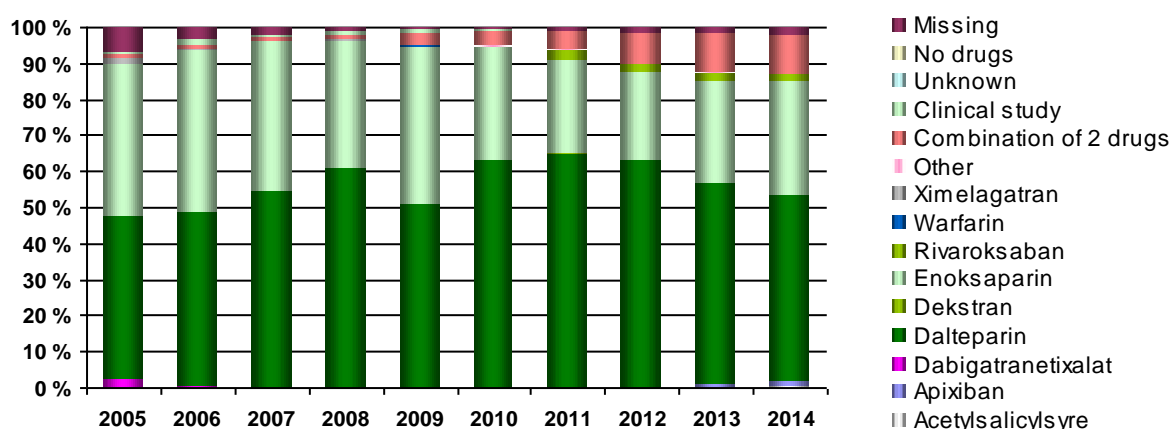


Table 33: Duration - All operations

Year	Days:	1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2014		1386	2268	574	903	2931	45	0	1293	9400
2013		1428	1400	596	1480	3227	63	0	1251	9445
2012		1163	1594	702	1496	3091	34	0	1096	9176
2011		700	1744	695	1397	3197	40	1	886	8660
2010		758	2172	636	1078	3154	44	2	747	8591
2009		881	2404	668	785	2637	37	6	907	8325
2008		838	2479	787	701	2166	124	5	871	7971
2007		847	2223	1230	388	2042	44	6	931	7711
2006		978	2096	1093	276	1738	111	0	1034	7326
2005		1036	2073	1203	363	1417	231	0	1332	7655

Registration of thrombosis prophylaxis started in 2005

Articulations

Table 34: In primary operations - All patients

Cup + Caput	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
UHMWPE + Steel	61756	2562	2256	1909	1450	747	341	153	69	71243
UHMWPE + Cobalt-chrome	24633	1996	1741	1356	1267	1013	638	526	234	33404
Highly crosslinked PE + Cobalt-chrome	102	281	595	905	1157	1886	2740	3550	4132	15348
Highly crosslinked PE + Alumina	141	431	855	1000	1508	1511	2010	1916	1763	11135
UHMWPE + Alumina	8332	615	516	602	354	293	146	44	8	10910
Alumina + Alumina	1933	174	202	227	322	368	246	201	108	3781
Highly crosslinked PE + Steel	1	14	13	157	278	532	651	726	713	3085
Highly crosslinked PE + Alumina/Zirconium ¹	5	43	34	292	368	512	478	419	540	2691
UHMWPE + Titanium	1903	42	15	19	4	1	2	4	1	1991
UHMWPE + Missing	1669	24	23	8	1	2	1	0	1	1729
UHMWPE + Zirconium	1397	4	1	0	0	0	0	0	0	1402
Alumina/Zirconium + Alumina/Zirconium ¹	32	80	95	70	92	145	226	196	176	1112
Cobalt-chrome + Cobalt-chrome	475	118	159	127	98	46	37	16	14	1090
Highly crosslinked PE + Oxinium	40	84	101	185	149	56	61	51	39	766
Missing + Cobalt-chrome	481	10	18	10	24	50	39	41	34	707
Steel + Cobalt-chrome	83	43	34	44	58	90	95	106	126	679
Missing + Missing	529	13	19	9	10	8	9	16	14	627
Missing + Steel	270	6	9	11	10	6	5	3	5	325
UHMWPE + Alumina/Zirconium ¹	6	53	78	81	40	18	0	3	1	280
Missing + Alumina	142	9	31	9	19	8	13	12	7	250
Steel + Steel	21	5	23	37	39	30	37	24	20	236
Missing + Titanium	158	2	1	2	3	1	1	1	7	176
Missing + Alumina/Zirconium ¹	3	13	5	10	17	3	19	28	15	113
Highly crosslinked PE + Missing	15	8	10	23	37	10	24	24	29	180
UHMWPE + Oxinium	66	8	1	1	0	0	0	0	0	76
Other (n<50)	156	22	14	21	25	23	22	27	40	350
Total	104349	6660	6849	7115	7330	7359	7841	8087	8096	163686

¹Alumina/Zirconium = Aluminum oxide and zirconium oxide composite.

Articulations

Table 35: In primary operations - Patients <65 years

Cup + Caput	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
UHMWPE + Steel	12494	555	462	381	283	124	45	15	3	14362
UHMWPE + Alumina	5747	412	334	343	190	176	79	30	6	7317
UHMWPE + Cobalt-chrome	5634	344	353	266	250	177	101	82	67	7274
Highly crosslinked PE + Alumina	102	272	569	602	820	863	1035	959	916	6138
Highly crosslinked PE + Cobalt-chrome	23	77	152	223	227	429	569	798	946	3444
Alumina + Alumina	1318	112	124	131	177	197	108	85	49	2301
Highly crosslinked PE + Alumina/Zirconium ¹	4	19	11	180	212	215	246	259	314	1460
UHMWPE + Zirconium	932	2	0	0	0	0	0	0	0	934
UHMWPE + Titanium	805	27	11	9	2	0	0	2	1	857
Cobalt-chrome + Cobalt-chrome	265	103	134	102	75	36	20	4	7	746
Alumina/Zirconium + Alumina/Zirconium ¹	29	57	53	35	44	80	153	133	122	706
UHMWPE + Missing	675	8	6	0	0	2	0	0	0	691
Highly crosslinked PE + Steel	1	4	9	38	34	109	108	132	117	552
Highly crosslinked PE + Oxinium	13	41	56	85	60	21	26	22	18	342
Missing + Missing	281	6	10	2	3	4	4	5	5	320
Missing + Cobalt-chrome	197	4	2	2	8	5	5	4	2	229
Steel + Cobalt-chrome	32	17	11	21	15	25	14	20	30	185
Missing + Alumina	107	4	24	7	16	4	9	8	4	183
UHMWPE + Alumina/Zirconium ¹	6	33	40	38	21	4	0	2	1	145
Missing + Steel	75	1	0	2	3	2	2	0	0	85
Missing + Alumina/Zirconium ¹	3	13	3	8	8	0	13	22	12	82
Highly crosslinked PE + Missing	0	4	4	7	13	2	8	12	8	58
Other (n<50)	186	18	20	26	23	24	20	14	27	358
Total	28929	2133	2388	2508	2484	2499	2565	2608	2655	48769

¹Alumina/Zirconium = Alumina oxide and zirconium oxide composite.

Table 36: In primary operations - Patients >=65 years

Cup + Caput	1987-06	2007	2008	2009	2010	2011	2012	2013	2014	Total
UHMWPE + Steel	49262	2007	1794	1528	1167	623	296	138	66	56881
UHMWPE + Cobalt-chrome	18999	1652	1388	1090	1017	836	537	444	167	26130
Highly crosslinked PE + Cobalt-chrome	79	204	443	682	930	1457	2171	2752	3186	11904
Highly crosslinked PE + Alumina	39	159	286	398	688	648	975	957	847	4997
UHMWPE + Alumina	2585	203	182	259	164	117	67	14	2	3593
Highly crosslinked PE + Steel	0	10	4	119	244	423	543	594	596	2533
Alumina + Alumina	615	62	78	96	145	171	138	116	59	1480
Highly crosslinked PE + Alumina/Zirconium ¹	1	24	23	112	156	297	232	160	226	1231
UHMWPE + Titanium	1098	15	4	10	2	1	2	2	0	1134
UHMWPE + Missing	994	16	17	8	1	0	1	0	1	1038
Steel + Cobalt-chrome	51	26	23	23	43	65	81	86	96	494
Missing + Cobalt-chrome	284	6	16	8	16	45	34	37	32	478
UHMWPE + Zirconium	465	2	1	0	0	0	0	0	0	468
Highly crosslinked PE + Oxinium	27	43	45	100	89	35	35	29	21	424
Alumina/Zirconium + Alumina/Zirconium ¹	3	23	42	35	48	65	73	63	54	406
Cobalt-chrome + Cobalt-chrome	210	15	25	25	23	10	17	12	7	344
Missing + Missing	248	7	9	7	7	4	5	11	9	307
Missing + Steel	195	5	9	9	7	4	3	3	5	240
Steel + Steel	16	4	18	32	32	23	31	22	19	197
UHMWPE + Alumina/Zirconium ¹	0	20	38	43	19	14	0	1	0	135
Missing + Titanium	122	0	0	0	1	1	0	1	4	129
Missing + Alumina	35	5	7	2	3	4	4	4	3	67
Highly crosslinked PE + Missing	0	2	2	6	5	0	9	9	17	50
Other (n<50)	92	17	7	15	39	17	22	24	24	257
Total	75420	4527	4461	4607	4846	4860	5276	5479	5441	114917

¹Alumina/Zirconium = Alumina oxide and zirconium oxide composite.

Completeness analysis for hip replacements in the Norwegian Arthroplasty Register, 2008-2011

A completeness analysis for the Norwegian Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Hip Arthroplasty Register (NAR). A report on the analysis and results will be published on www.helsedirektoratet.no. There are separate statistics on primary operations and revisions.

NCSF codes for combining data from NPR hospital stays and the Norwegian Arthroplasty Register

Type	Code	Description
Primary operation	NFB 20	Primary total prosthetic replacement of hip joint not using cement
	NFB 30	Primary total prosthetic replacement of hip joint using hybrid technique
	NFB 40	Primary total prosthetic replacement of hip joint using cement
	NFB 99	Other primary prosthetic replacement of hip joint
Reoperation	NFC 2*	Secondary implantation of total prosthesis in hip joint not using cement
	NFC 3*	Secondary implantation of total prosthesis in hip joint using hybrid technique
	NFC 4*	Secondary implantation of total prosthesis in hip joint using cement
	NFC 99	Other secondary prosthetic replacement in hip joint
	NFU 1*	Removal of total prosthesis from hip joint

* All codes beginning with this in the NCSF

The completeness for the Norwegian Arthroplasty Register was calculated as follows:

$$\frac{\text{(Only NAR + Inclusion in both registers)}}{\text{(Only NPR + Only NAR + Inclusion in both registers)}}$$

Completeness for the NPR was calculated in a similar way:

$$\frac{\text{(Only NPR + Inclusion in both registers)}}{\text{(Only NAR + Only NPR + Inclusion in both registers)}}$$

Primary operations. From 2008 to 2011, 29 656 primary hip replacements were reported to one or both of the registers. 96.5% of these were reported to the NAR while 97.2% were reported to the NPR. Completeness by hospital is presented in Tables 38 to 42, divided into health regions; these show a completeness for the Hip Arthroplasty Register ranging from 74.2% to 100% between the different hospitals. For hospitals with a low completeness for the Norwegian Arthroplasty Register, either the form was not sent to the NAR or other interventions than hip arthroplasties were incorrectly coded with NFB20/30/40/99 (There were only 53 operations in the category NFB99 during the period).

Procedure codes to be used for primary operations: NFB 20 - NFB 30 - NFB 40

Revision operations. From 2008 to 2011, 5529 revisions were reported to one or both of the registers. 88.1% of these were reported to the NAR while 83.8% were reported to the NPR. Completeness by hospital is presented in Tables 38 to 42, showing that the completeness for the Norwegian Arthroplasty Register varied between 16.7% and 100%. A low completeness may mean that the form was not sent to the NRL, or that other interventions than removal, replacement or insertion of a secondary prosthesis were incorrectly coded with NFC 2/3/4/99 or NFU1. The analysis shows that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:

NFC2*- NFC3*- NFC4*- NFC99 - NFU1*

New: This completeness analysis is based on data from 2008 to 2011. From 2012, revisions due to infection, even where parts of the prosthesis are not removed or replaced, are to be reported on the form to the NRL. These must be coded **NFS 19, NFS 49 or NFW 69**.

Helse Sør-Øst

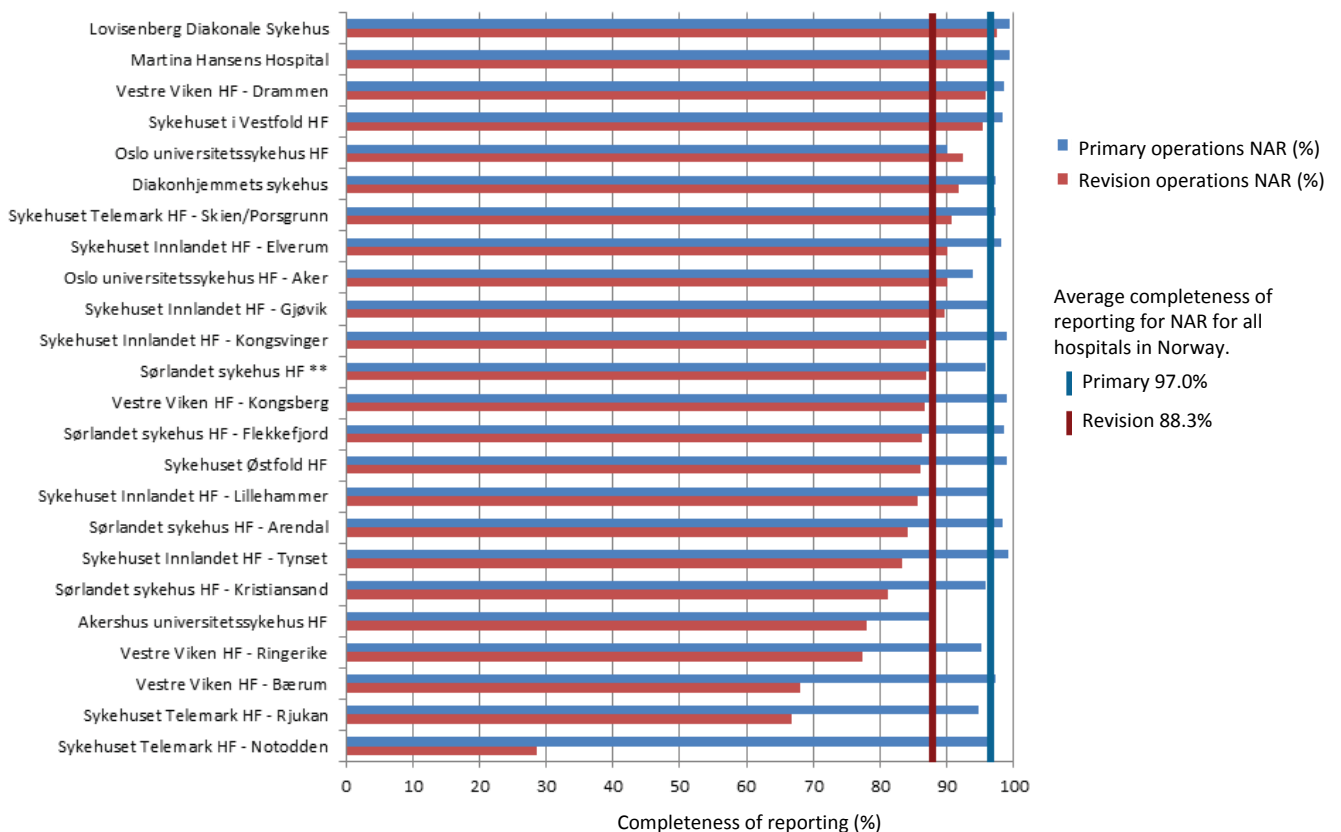
Table 38: Completeness of reporting for hip prosthesis operations, 2008-2012

Helse Sør-Øst:	Primary operations			Revision operations		
	NCSF-codes: NFB 20 / NFB 30 / NFB 40 / NFB 99			NFC2* / NFC3* / NFC4* / NFC99 / NFU1*		
	Total number	NAR(%)	NPR(%)	Total number	NAR(%)	NPR(%)
Lovisenberg Diakonale Sykehus	2 639	99,5	99,7	319	97,5	49,5
Martina Hansens Hospital	2 427	99,5	99	386	96,1	90,9
Vestre Viken HF - Drammen	1 373	98,5	98,8	370	95,9	85,7
Sykehuset i Vestfold HF	1 724	98,4	99	318	95,3	90,9
Oslo universitetssykehus HF	921	90	93,2	640	92,5	79,1
Diakonhjemmets sykehus	932	97,3	97,1	230	91,7	83
Sykehuset Telemark HF - Skien/Porsgrunn	769	97,3	98,3	120	90,8	63,3
Sykehuset Innlandet HF - Elverum	1 007	98,1	97	253	90,1	92,9
Oslo universitetssykehus HF - Aker	130	93,8	98,5	20	90	95
Sykehuset Innlandet HF - Gjøvik	769	96,2	97,4	155	89,7	81,3
Sykehuset Innlandet HF - Kongsvinger	580	99	98,1	77	87	94,8
Sørlandet sykehus HF **	849	95,9	99,1	137	86,9	83,2
Vestre Viken HF - Kongsberg	775	99	98,8	45	86,7	62,2
Sørlandet sykehus HF - Flekkefjord	220	98,6	95,9	29	86,2	82,8
Sykehuset Østfold HF	1 453	98,9	97,7	331	86,1	83,7
Sykehuset Innlandet HF - Lillehammer	643	96,9	98,1	180	85,6	52,2
Sørlandet sykehus HF - Arendal	701	98,3	98,7	76	84,2	86,8
Sykehuset Innlandet HF - Tynset	978	99,1	98,1	6	83,3	100
Sørlandet sykehus HF - Kristiansand	438	95,9	97,3	133	81,2	79,7
Akershus universitetssykehus HF	971	88,2	97,3	222	77,9	80,2
Vestre Viken HF - Ringerike	477	95,2	95,6	31	77,4	74,2
Vestre Viken HF - Bærum	481	97,3	92,1	191	68,1	87,4
Sykehuset Telemark HF - Rjukan	348	94,8	99,1	6	66,7	83,3
Sykehuset Telemark HF - Notodden	67	97	98,5	7	28,6	71,4

* All possible values in fifth sign

** Reporting unit can not be given more accurate in NPR

Figure 17: Completeness of reporting for hip prosthesis operations Helse Sør-Øst, primary operations and revisions



Helse Vest

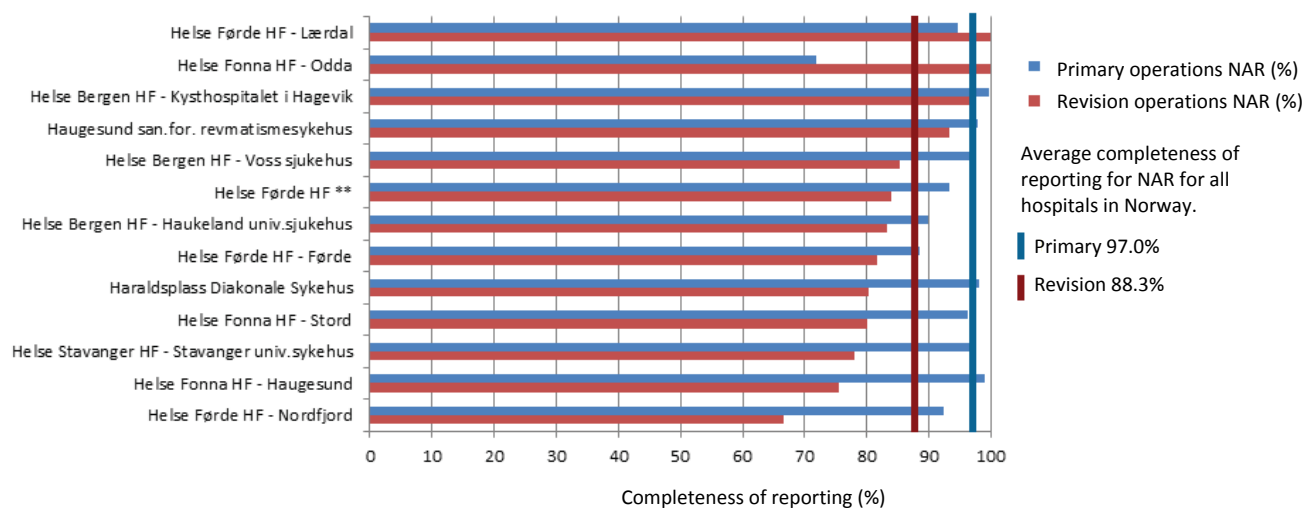
Table 39: Completeness of reporting for hip prosthesis operations, 2008-2012

Helse Vest:	Primary operations			Revision operations		
	NCSF-codes: NFB 20 / NFB 30 / NFB 40 / NFB 99			NFC2* / NFC3* / NFC4* / NFC99 / NFU1*		
	Total number	NAR(%)	NPR(%)	Total number	NAR(%)	NPR(%)
Helse Førde HF - Lærdal	171	94,7	98,8	2	100	50
Helse Fonna HF - Odda	32	71,9	90,6	2	100	50
Helse Bergen HF - Kysthospitalet i Hagevik	1 756	99,6	99,8	364	96,4	97,8
Haugesund san.for. revmatismesykehus	140	97,9	97,9	15	93,3	86,7
Helse Bergen HF - Voss sjukehus	307	97,1	97,1	34	85,3	97,1
Helse Førde HF **	664	93,2	98,9	75	84	84
Helse Bergen HF - Haukeland univ.sjukehus	472	89,8	94,5	233	83,3	89,3
Helse Førde HF - Førde	183	88,5	95,6	38	81,6	94,7
Haraldsplass Diakonale Sykehus	854	98,2	99,3	51	80,4	100
Helse Fonna HF - Stord	470	96,2	96,6	5	80	60
Helse Stavanger HF - Stavanger univ.sykehus	1 354	96,9	96,3	292	78,1	91,4
Helse Fonna HF - Haugesund	464	98,9	96,8	69	75,4	82,6
Helse Førde HF - Nordfjord	52	92,3	100	3	66,7	100

*All possible values in fifth sign

** Reporting unit can not be given more accurate in NPR

Figure 18: Completeness of reporting for hip prosthesis operations Helse Vest, primary operations and revisions



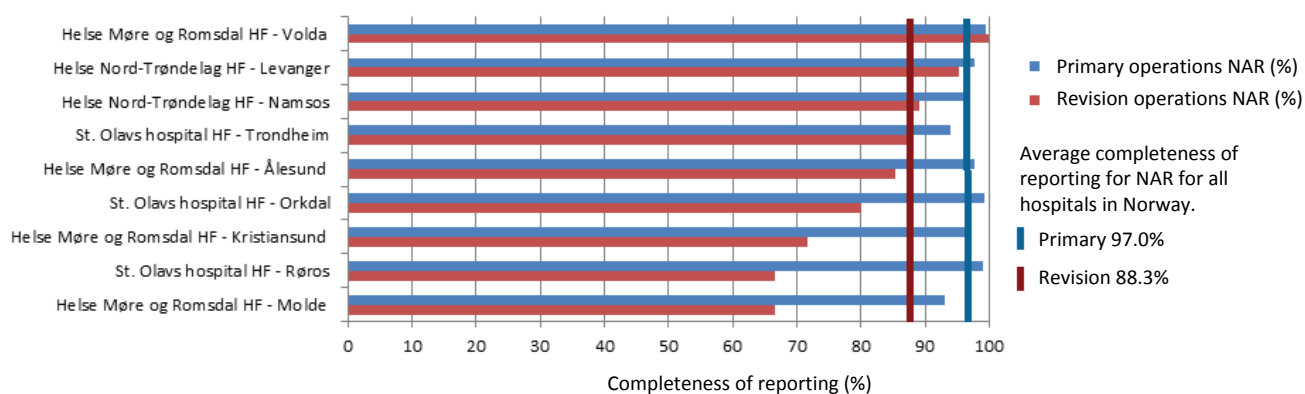
Helse Midt-Norge

Table 40: Completeness of reporting for hip prosthesis operations, 2008-2012

Helse Midt-Norge:	Primary operations			Revision operations		
	NCSP-codes: NFB 20 / NFB 30 / NFB 40 / NFB 99			NFC2* / NFC3* / NFC4* / NFC99 / NFU1*		
	Total number	NAR(%)	NPR(%)	Total number	NAR(%)	NPR(%)
Helse Møre og Romsdal HF - Volda	337	99,4	99,7	8	100	0
Helse Nord-Trøndelag HF - Levanger	646	97,7	97,5	124	95,2	85,5
Helse Nord-Trøndelag HF - Namsos	454	96	98,7	83	89,2	83,1
St. Olavs hospital HF - Trondheim	1 168	94	95,7	616	87,2	91,7
Helse Møre og Romsdal HF - Ålesund	643	97,7	99,4	116	85,3	96,6
St. Olavs hospital HF - Orkdal	646	99,2	98,6	10	80	70
Helse Møre og Romsdal HF - Kristiansund	626	96,3	98,2	99	71,7	79,8
St. Olavs hospital HF - Røros	586	99	99,7	3	66,7	66,7
Helse Møre og Romsdal HF - Molde	175	93,1	98,9	6	66,7	33,3

*All possible values in fifth sign

Figure 19: Completeness of reporting for hip prosthesis operations Helse Midt-Norge, primary operations and revisions



Helse Nord

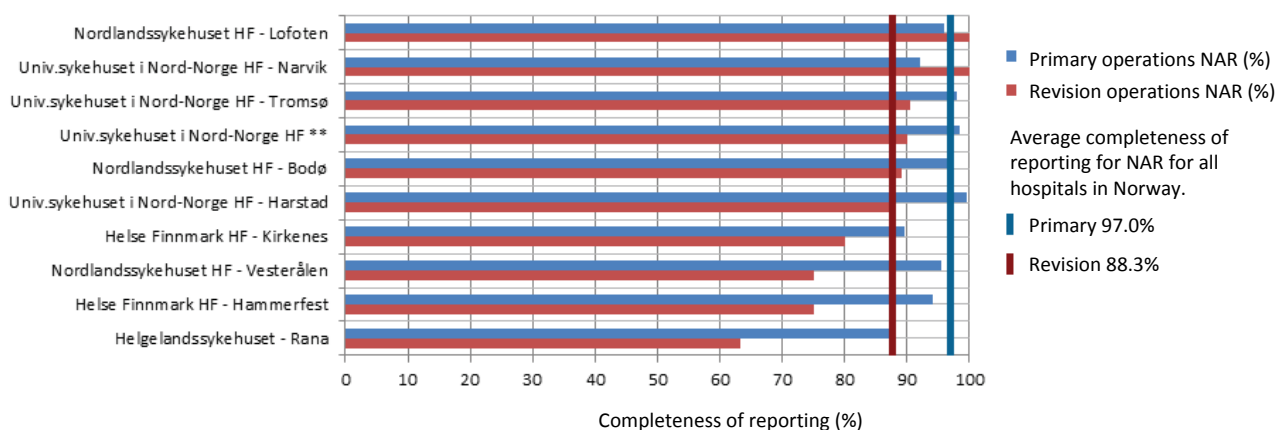
Table 41: Completeness of reporting for hip prosthesis operations, 2008-2012

Helse Nord:	Primary operations			Revision operations		
	NCSF-codes: NFB 20 / NFB 30 / NFB 40 / NFB 99			NFC2* / NFC3* / NFC4* / NFC99 / NFU1*		
	Total number	NAR(%)	NPR(%)	Total number	NAR(%)	NPR(%)
Nordlandssykehuset HF - Lofoten	125	96	97,6	1	100	0
Univ.sykehuset i Nord-Norge HF - Narvik	101	92,1	99	2	100	50
Univ.sykehuset i Nord-Norge HF - Tromsø	664	97,9	98,8	149	90,6	89,3
Univ.sykehuset i Nord-Norge HF **	191	98,4	99,5	40	90	82,5
Nordlandssykehuset HF - Bodø	644	96,6	95	195	89,2	82,1
Univ.sykehuset i Nord-Norge HF - Harstad	222	99,5	98,6	16	87,5	43,8
Helse Finnmark HF - Kirkenes	116	89,7	94,8	5	80	60
Nordlandssykehuset HF - Vesterålen	194	95,4	97,9	4	75	50
Helse Finnmark HF - Hammerfest	289	94,1	97,6	16	75	75
Helgelandssykehuset - Rana	445	87,4	96	30	63,3	60

*All possible values in fifth sign

** Reporting unit can not be given more accurate in NPR

Figure 20: Completeness of reporting for hip prosthesis operations Helse Nord, primary operations and revisions



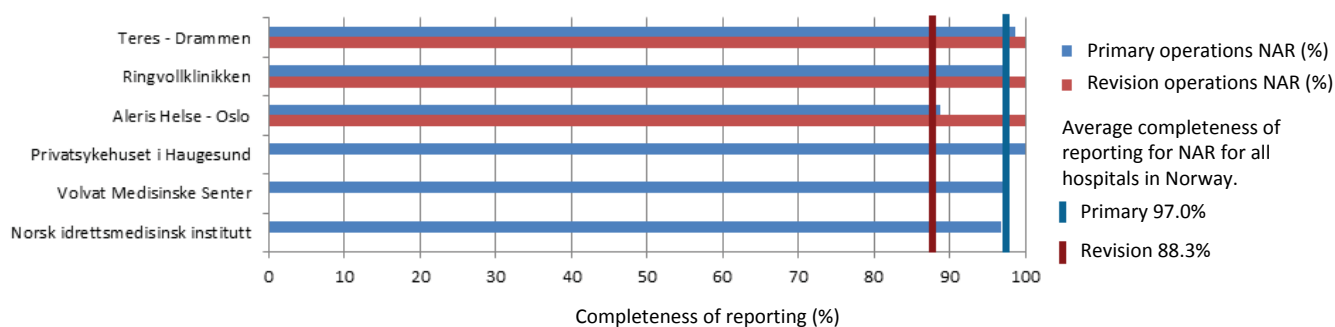
Private hospitals

Table 42: Completeness of reporting for hip prosthesis operations, 2008-2012

Private sykehus med avtale med RHF:	Primary operations			Revision operations		
	NCSP-codes: NFB 20 / NFB 30 / NFB 40 / NFB 99			NFC2* / NFC3* / NFC4* / NFC99 / NFU1*		
	Total number	NAR(%)	NPR(%)	Total number	NAR(%)	NPR(%)
Teres - Drammen	225	98,7	35,6	2	100	0
Ringvollklinikken	130	96,9	86,9	1	100	0
Aleris Helse - Oslo	203	88,7	76,8	3	100	33,3
Privatsykehuset i Haugesund	16	100	0			
Volvat Medisinske Senter	106	97,2	53,8			
Norsk idrettsmedisinsk institutt	95	96,8	50,5			

*All possible values in fifth sign

Figure 21: Completeness of reporting for hip prosthesis operations private hospitals, primary operations and revisions



HIP ARTHROPLASTY SURVIVAL RATES IN NORWEGIAN HOSPITALS

For the first time, we present ten-year survival rates for arthroplasties performed at hospitals in Norway. We have included prostheses from 2003-2014 from hospitals with more than 50 operations during this period. The Kaplan-Meier method with a 95% confidence interval was used. We provide the unadjusted rate for all types of total hip replacements. Results for hemi-prostheses are available in the report of the Hip Fracture Register. Only hospitals that performed operations in 2014 are included.

The results must be interpreted with caution, because differences in reoperation rates may be due to a number of factors:

1. Hospitals that are more rigorous in reporting their complications and reoperations to the Register could have unfairly negative results in the analysis.
2. If surgeons at one hospital are more diligent in facilitating check-ups for patients than at other hospitals, and thus discover more complications, this could lead to unfortunate results despite the fact that this hospital in reality is doing a better job than other hospitals.
3. If the waiting time for reoperations is longer in some hospitals than others, the longer wait could erroneously lead to better results than those of hospitals with a short waiting time.
4. If the surgeons at one hospital have a higher threshold for recommending reoperation than at other hospitals and thus prolong patients' problems, this will also give skewed results in the statistics.
5. Poor hospital results from an earlier period will remain with the hospital, even though the hospital may have acted upon previous problems by switching to better prostheses and improving procedures and surgical skills.

The completeness analysis shows the proportion of primary operations and revisions each hospital has reported to NPR. If the completeness of revisions is low in a hospital, it may indicate that the result found in our survival analysis is too high.

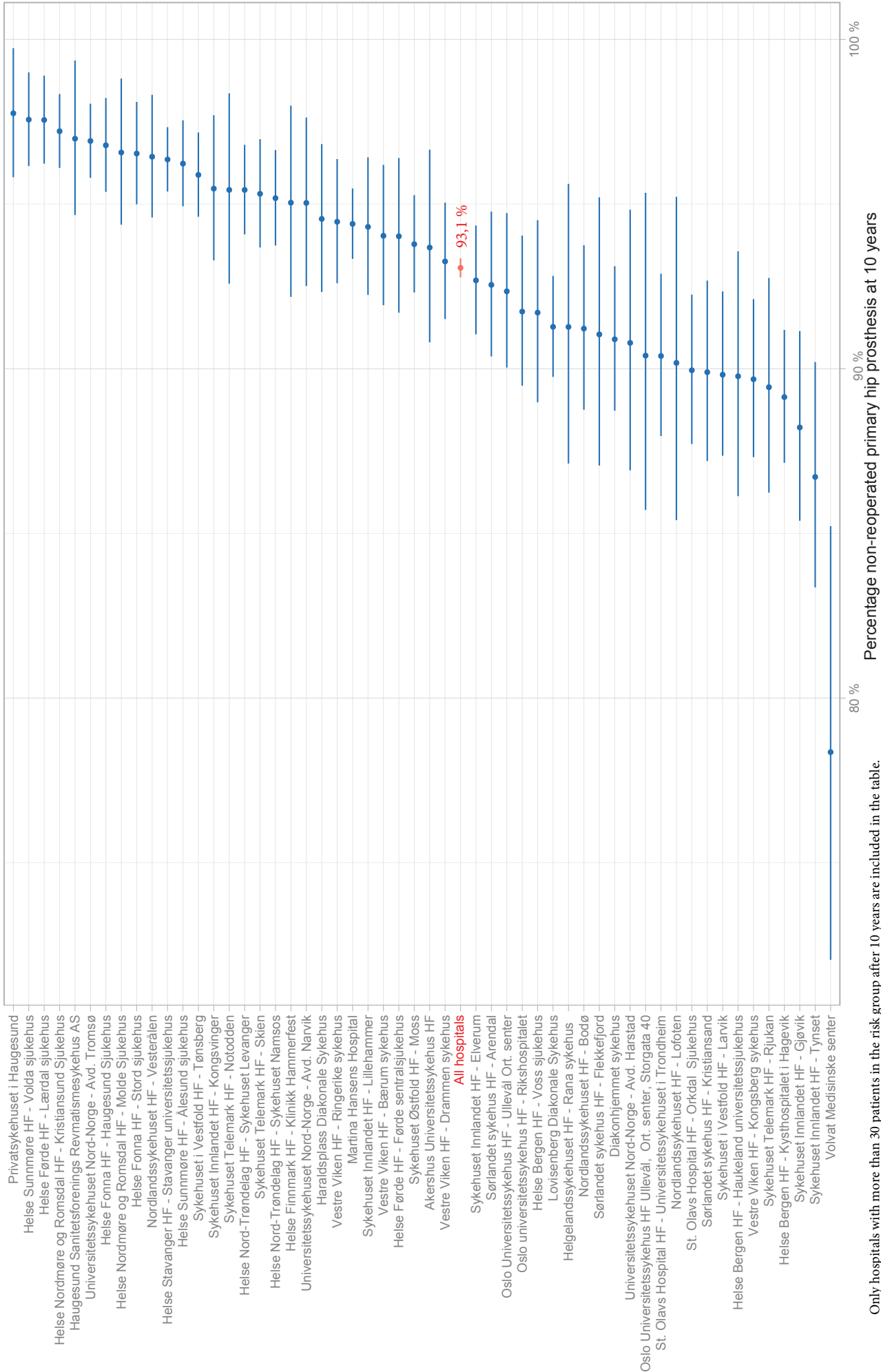
Ranking of hospitals

There is statistical uncertainty in the ranking lists because the data from the NAR are poorly suited for such calculations. The NAR was designed to compare the results of implants and surgical procedures nationwide. To compare quality in hospitals is a complex matter, because some hospitals operate on more patients with poor prognosis than other hospitals, and because many hospitals, especially the small ones, have so few reoperations that the statistics are too weak, and are further weakened by the fact that the hospitals' completeness (reporting rate) of reoperations varies from 16.7% to 100%. This issue is explained in detail in the following articles: Ranstam J, Wagner P, Robertsson O, Lidgren L. Health-care quality registers: outcome-orientated ranking of hospitals

is unreliable. *J Bone Joint Surg Br.* 2008 and Ranstam J, Wagner P, Robertsson O, Lidgren L. [Ranking in health care results in wrong conclusions]. *Läkartidningen.* 2008 Aug 27-Sep 2;105(35):2313-4.

Moreover, it is a well-known phenomenon in quality assurance that if those who report their complications and errors receive bad publicity, the reporting deteriorates. If league tables of hospitals are publicised, there is thus a danger that hospitals' reporting of reoperations may become less reliable, leading to inferior quality of the registers.

In order to achieve complete reporting of reoperations (revisions), reporting to the Register should be linked to performance-based financing, reporting should be made mandatory, and the requirement for the patient's written consent to reporting of the operation to the Register should be waived and replaced by presumed consent.



Only hospitals with more than 30 patients in the risk group after 10 years are included in the table.

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ARTHROPLASTY OF THE KNEE AND OTHER JOINTS 2015 ANNUAL REPORT

In the period 1994-2014, a total of 68 317 knee replacements and 15 108 replacements of other joints than the hip and knee were recorded. There has been an increase of 11% in primary knee replacements since 2013. Osteoarthritis is the dominant cause of knee arthroplasties. The number of shoulder prostheses has increased by 14% since 2013, with an increase for both anatomic and reverse total shoulder prostheses. The number of hemiarthroplasties has remained almost constant.

NEW TABLES FOR KNEE PROSTHESES

We have created new tables for the use of fibrinolysis inhibitor, perioperative complications, previous surgery in the joints and the use of drains. A new and more detailed table of subtypes of the most commonly used total knee prostheses in the past two years has also been compiled.

QUALITY OF ARTHROPLASTY IN NORWAY

Survival curves show a gradual improvement since 1994 in results of total knee prostheses, where the endpoint is revision surgery. In a study based on our register data, hospitals that performed more than 100 knee arthroplasties per year had fewer reoperations than hospitals with a lower number of such operations (Badawy M 2013).

For the first time in many years, the results for unicondylar knee replacements have improved.

A study shows that hospitals with few operations per year have more reoperations than hospitals with over 40 operations annually (Badawy M 2014). We believe it would be an advantage to concentrate unicondylar replacements at a smaller number of hospitals.

More patients with osteoarthritis receive total shoulder prostheses. For these operations, recent years have seen a welcome improvement, with fewer reoperations than in previous years. The improvement is greatest for standard total anatomic prostheses. There is a worrying increase in revisions of cup prostheses (resurfacing)(Fevang BT2015).

For thumb joint prostheses (CMC I), results have deteriorated in recent years (Krukhaug Y 2014). The results for newer prostheses are no better than those for the old silicone prostheses, based on survival analysis. Scientific studies do not support widespread use of thumb joint prostheses.

For ankle prostheses, recent results are poorer. More ankle arthroplasties are being performed on patients with osteoarthritis and after injuries. These patients are younger and more often male than rheumatic patients. There is an urgent need for randomised trials to clarify which patients should have ankle prostheses and which patients should have arthrodesis surgery.

KNEE ARTHROPLASTY REVISIONS

There were 453 knee arthroplasty revisions reported to the Register in 2014. PhD candidate Tesfaye Leta is conducting a study of knee arthroplasty revisions. The first article was published in Acta 2015 (Leta T 2015). We found no statistically significant improvement in knee arthroplasty revisions in recent years, but a tendency towards better results with longer follow-up. Revision of the whole prosthesis gives better results than revision of individual components. 22% of prosthesis revisions are operated again after 10 years, and half of the reoperations take place within two years. Most early reoperations are because of infection and instability. Results for reoperations are significantly worse than for primary operations. We find that the use of a stem is often not checked on the form. When a stem is used, it must be indicated whether it was a tibial or femoral stem, and a sticker must be attached to the back

of the form. Some prostheses use both a femoral and tibial stem, and if this is not checked, we have no way of knowing where the stem was used.

COMPLETENESS ANALYSIS AND PROSTHESIS SURVIVAL AT THE HOSPITAL LEVEL We publish completeness analyses for the years 2008-2012 for knee prostheses. These analyses are performed jointly by the Norwegian Patient Register/Directorate of Health (NPR), the Arthroplasty Register and the SKDE, and are scheduled for every second year. We are currently making completeness analyses for joints other than the hip and knee. An excerpt of the completeness rate at hospital level is published in this year's report, together with the individual hospitals' ten-year survival percentages for primary knee replacements. The analysis is unadjusted and published with an explanation of weaknesses. The arthroplasty registers record prosthetic interventions geographically by hospital, but the NPR cannot distinguish all individual hospitals under each hospital trust. Please ask the management at your hospital to create a special identification number for your hospital so that the NPR can recognise it. There is generally good reporting for primary prostheses, but some hospitals have poor reporting of revisions. The two hospitals with the lowest level of reporting of revisions reported only 50 percent of them. This means that the calculated risk of revision may be only half as high as the actual revision risk. Please remember to report revisions for infection and revisions with component removal. We encourage every hospital to study its coverage analysis. It should be a realistic goal to have over 95% of all revisions and 99% of primary operations reported by all hospitals. Please contact us if you need help to study the report, which is on the website of the Directorate of Health.

SUMMARY OF SIGNIFICANT SCIENTIFIC FINDINGS LAST YEAR

In the past year, we published an article on shoulder prostheses (Fevang BT 2015) showing that the revision results for shoulder prostheses have improved in recent years, particularly for anatomic total prostheses. The results were generally somewhat better for cemented implants. Results for cup prostheses (resurfacing) have deteriorated in recent years, and were especially poor for uncemented cup prostheses. Several RCTs have shown that the outcomes of conservative treatment and hemiarthroplasties are equally good for dislocated three or four fragment fractures. However, the use of reverse shoulder prostheses in acute fractures is increasing. There is a need for RCTs to study the efficacy of this type of prosthesis.

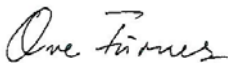
Cemented LCS rotating platform knee replacement leads to more aseptic loosening of the tibial component than fixed platform prostheses in Norway (Gøthesen Ø 2013). The first results from an analysis of retrieved prostheses, tissue and blood samples (retrieval analysis) in LCS Complete tibial components was presented at the EFORT meeting in 2014 (Kutzner I 2014, presentation). The loosening takes place between the prosthesis and the cement. It appears to be due to poor mechanical fixation and is not caused by wear particles. An article is in progress.

In an international partnership between six registers (International Consortium of Orthopaedic Registries - ICOR), we have been involved in three published articles on knee replacement. One study compared a rotating platform knee system (without posterior stabilisation) with a fixed-bearing PCR and found a 43% increase in revisions (RR 1.43 (1.36-1.51)) with a rotating platform knee system (Namba R 2014). This is the kind of knee prosthesis used in Norway and the results correspond with findings from Norway (Gøthesen 2013). In another study, fixed-bearing PCR was compared with posterior stabilised knee prosthesis (PS). Here, there were more revisions with the posterior stabilised knee. There were particularly poor

results if a patella component was not used in the PS knees. This study supports the use of fixed-bearing PCR, as in Norway. The study has only up to nine years of follow-up (Comfort T 2014). The third study compared fixed-bearing PS with rotating platform PS, and found that in the first two years the rotating platform had an 86% greater risk of revision than the fixed-bearing prosthesis (Graves S 2014). Neither of these types of knee prosthesis is commonly used in Norway.

Hilde Apold has published a study of 225 908 people, linking data from the Knee Arthroplasty Register and the Norwegian Health Surveys. The study shows that weight gain increases the risk of later knee replacement in both men and women. The effect of increased weight is greatest among young people (Apold H 2014). In another study, Apold showed that high BMI and work strain increased the risk of knee replacement (Apold H 2014). Apold defended her PhD thesis in February 2015. Congratulations!

Bergen, 03.06.2015



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Consultant Orthopaedic Surgeon/Professor
Surgery of Knees and Other Joints



Anne Marie Fenstad
Statistician/Researcher



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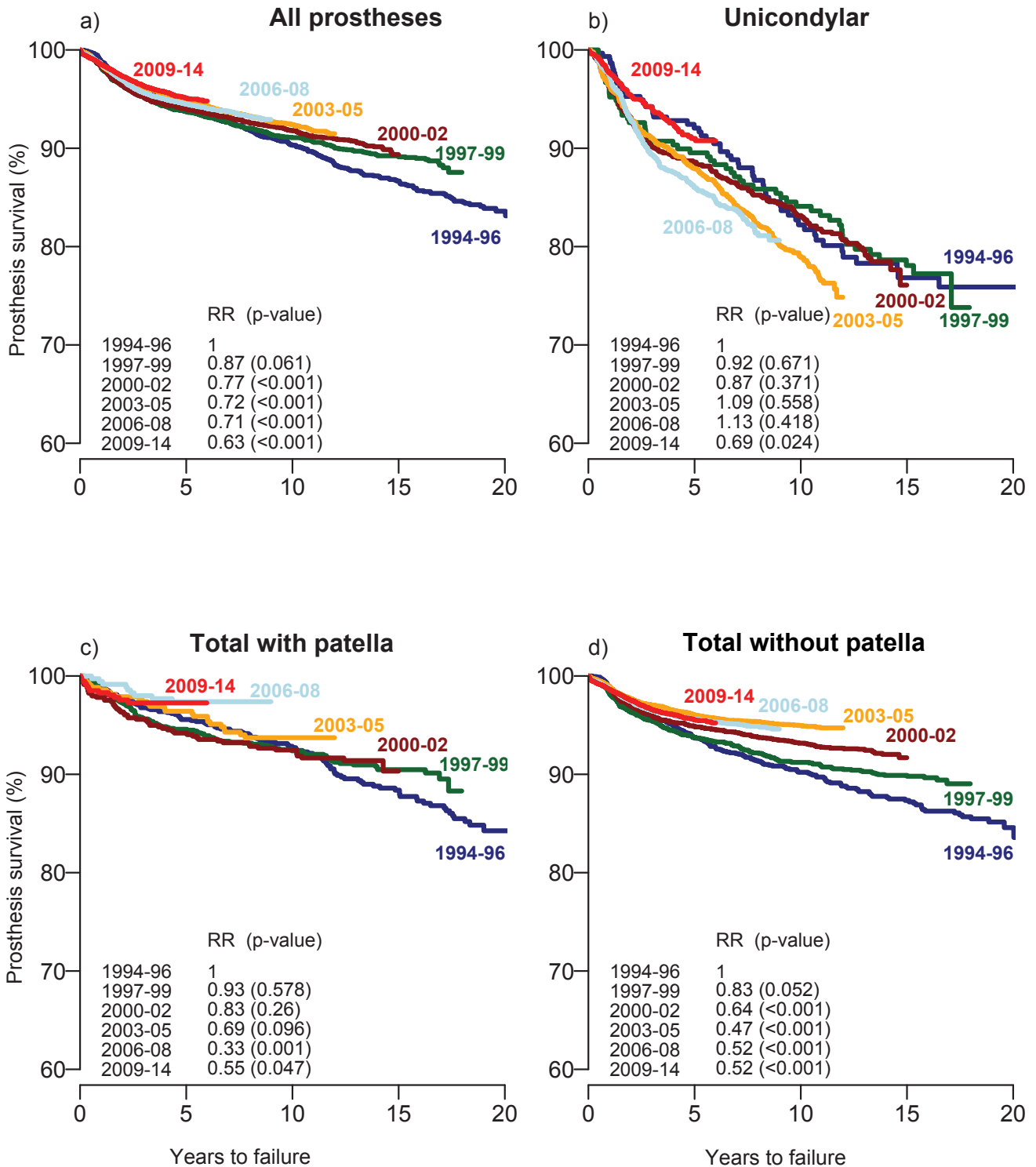


Irina A Kvinnesland
IT Consultant



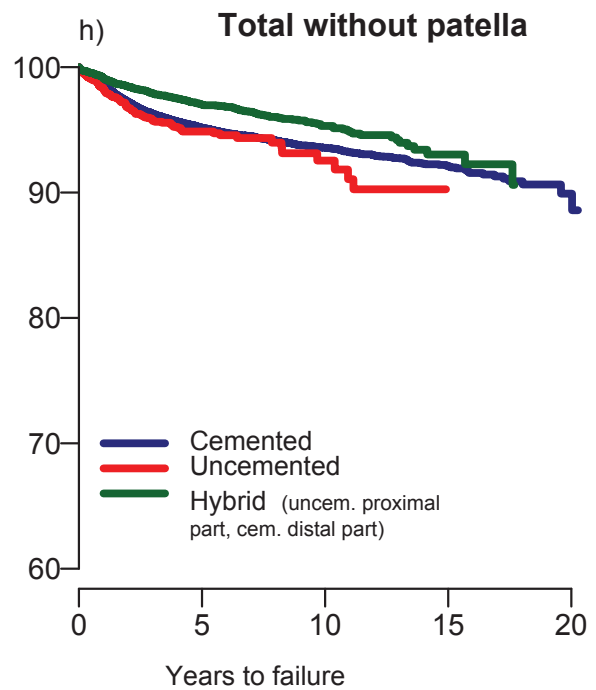
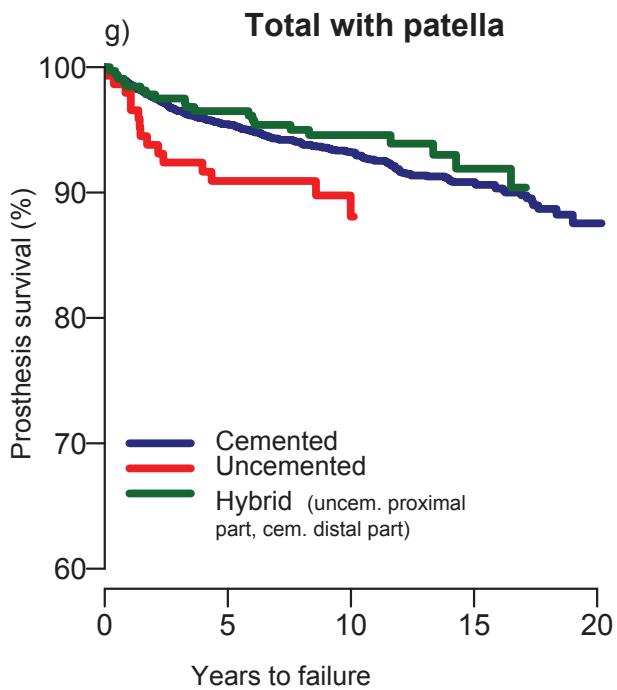
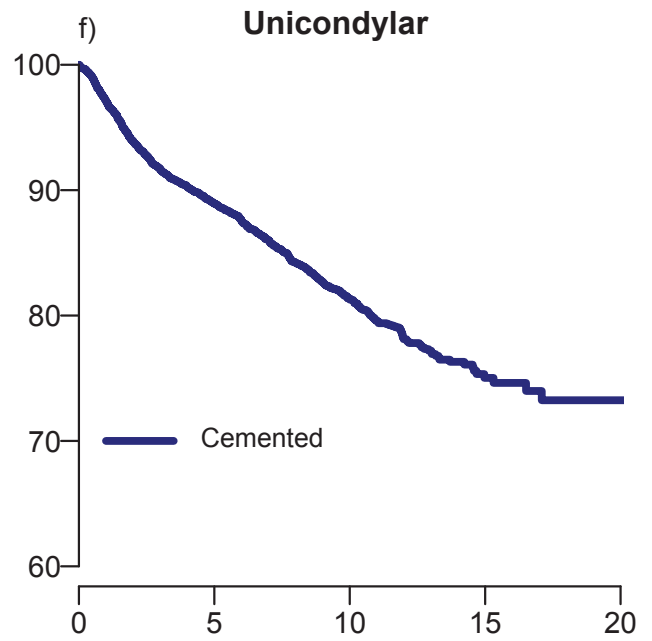
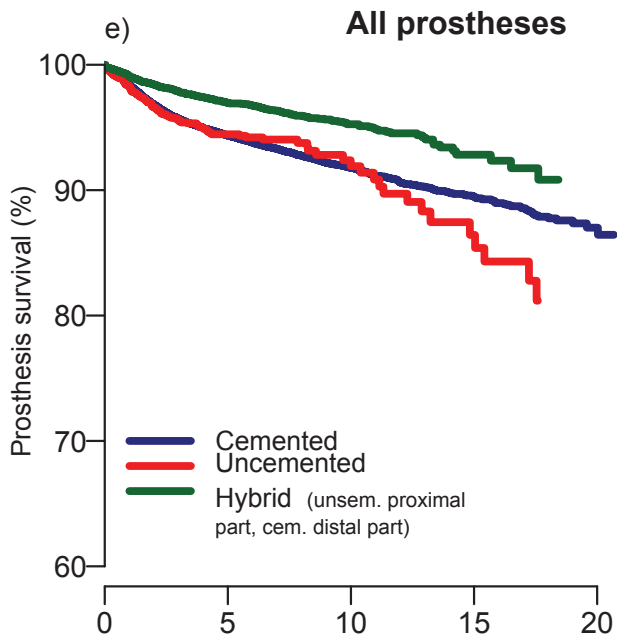
Christoffer Bartz-Johannessen
Statistician/Researcher

Survival of knee prostheses

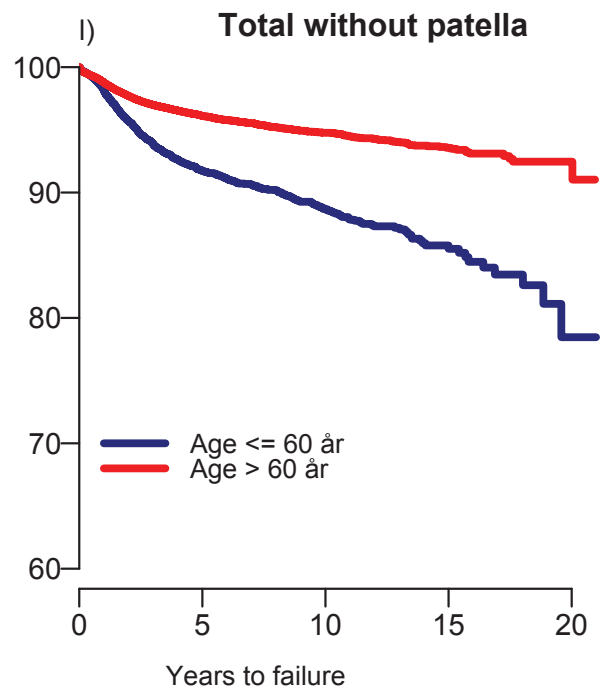
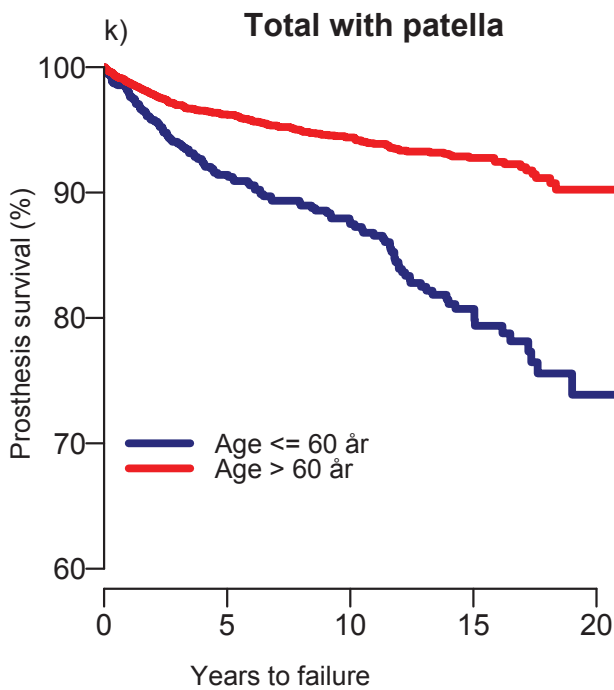
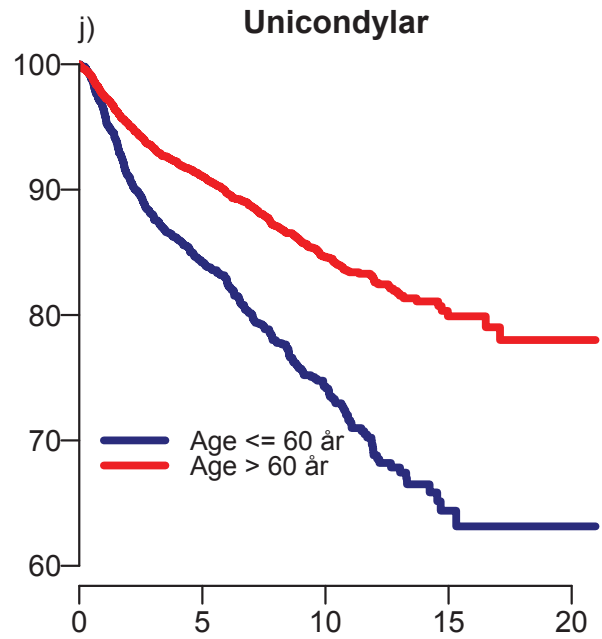
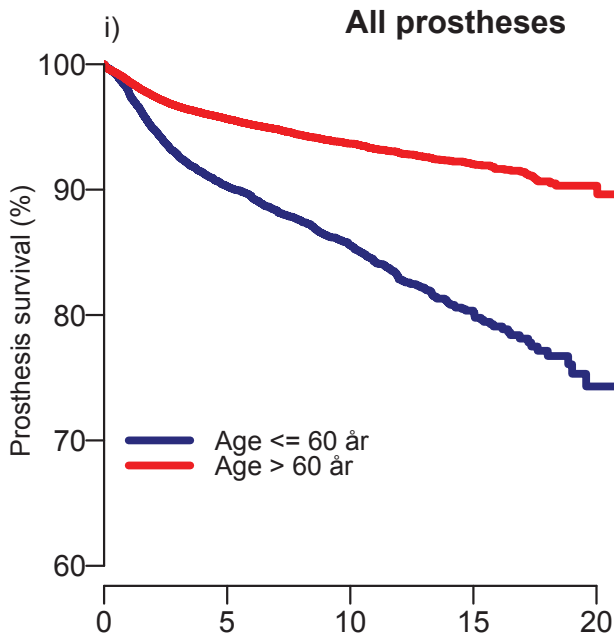


Survival curves estimated by the Kaplan–Meier method. Risk ratio (RR) estimates adjusted for age and sex. Endpoint all revisions.

Survival of knee prostheses - Fixation 1994 - 2014



Survival of knee prostheses - Age 1994 - 2014



One stage bilateral knee prosthesis operations

Year	1994-2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Sum:
Number of patients	34	4	4	6	3	8	8	8	6	21	21	38	161

A one stage bilateral operation is an operation where the patient is operated in both knees during the same operation or on the same day. Only primary operations are included.

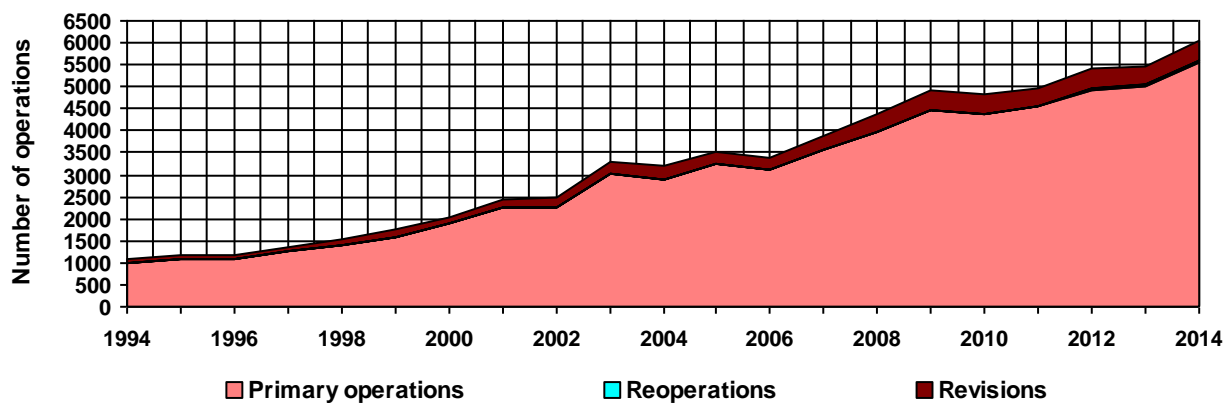
KNEE PROSTHESES

Table 1: Annual numbers of operations

Year	Primary operations	Reoperations *	Revisions	Total
2014	5 557 (91,8%)	44 (0,7%)	453 (7,5%)	6 054
2013	5 001 (91,2%)	48 (0,9%)	432 (7,9%)	5 481
2012	4 914 (90,9%)	33 (0,6%)	459 (8,5%)	5 406
2011	4 541 (91,4%)	18 (0,4%)	407 (8,2%)	4 966
2010	4 400 (91,4%)	(0,0%)	412 (8,6%)	4 812
2009	4 468 (91,1%)	(0,0%)	438 (8,9%)	4 906
2008	3 990 (91,6%)	(0,0%)	368 (8,4%)	4 358
2007	3 588 (92,3%)	(0,0%)	301 (7,7%)	3 889
2006	3 108 (92,1%)	(0,0%)	267 (7,9%)	3 375
2005	3 254 (92,8%)	(0,0%)	251 (7,2%)	3 505
2004	2 906 (90,2%)	(0,0%)	317 (9,8%)	3 223
2003	3 037 (92,4%)	(0,0%)	250 (7,6%)	3 287
2002	2 274 (91,3%)	(0,0%)	218 (8,7%)	2 492
2001	2 237 (91,8%)	(0,0%)	200 (8,2%)	2 437
2000	1 874 (91,7%)	(0,0%)	169 (8,3%)	2 043
1999	1 595 (91,1%)	(0,0%)	155 (8,9%)	1 750
1998	1 414 (91,6%)	(0,0%)	129 (8,4%)	1 543
1997	1 242 (90,9%)	(0,0%)	124 (9,1%)	1 366
1996	1 075 (90,9%)	(0,0%)	107 (9,1%)	1 182
1995	1 091 (92,7%)	(0,0%)	86 (7,3%)	1 177
1994	995 (93,1%)	(0,0%)	74 (6,9%)	1 069
Total	62 561 (91,6%)	143 (0,2%)	5 617 (8,2%)	68 321

* Reoperation where prosthetic parts were not changed or removed (soft tissue debridements for infected prosthesis, prosthetic parts were not changed)

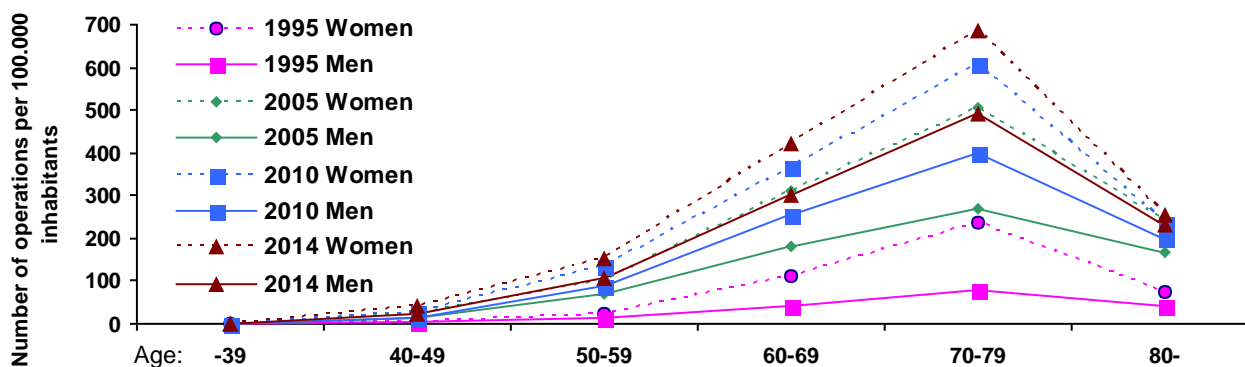
Figure 1: Annual numbers of operations



53,5 % of all operations were performed on the right side. 64,8 % performed in women.

Mean age at primary surgery was 68,7 years, 69,4 years for women and 67,4 years for men

Figure 2: Incidence of primary knee prostheses



Age by year of primary operation

Figure 3: Age at the insertion of primary total knee prostheses

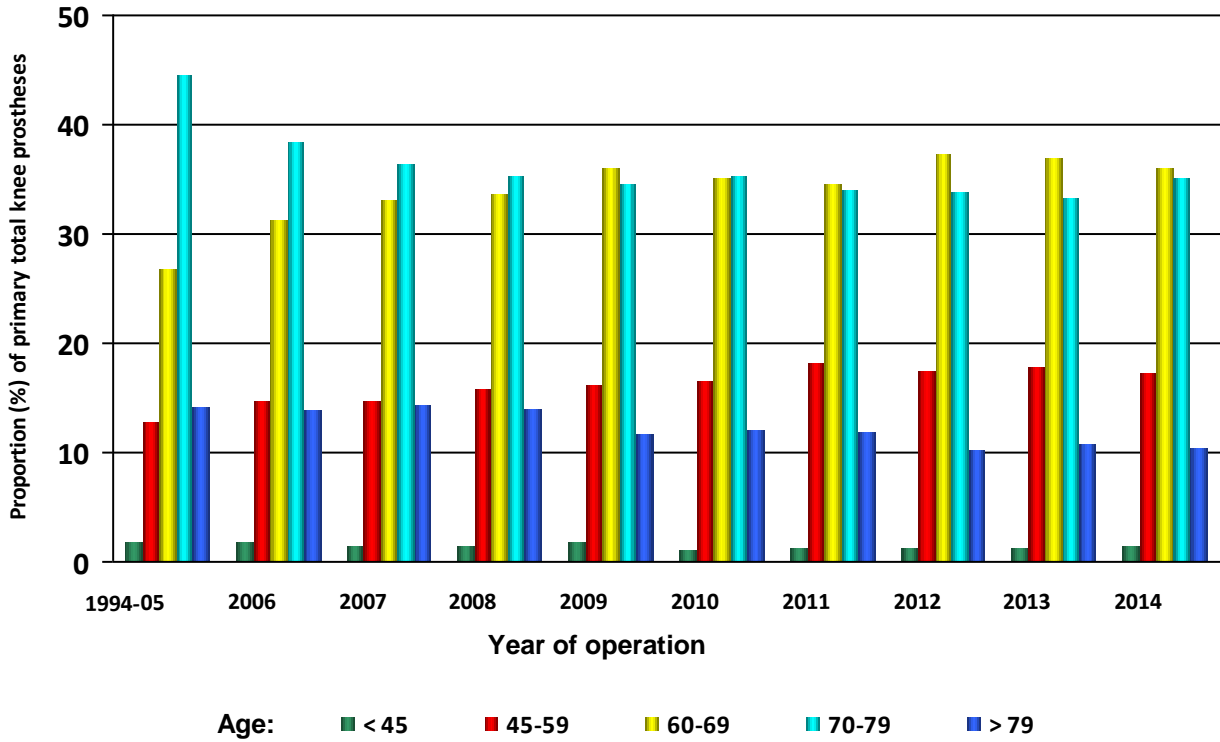
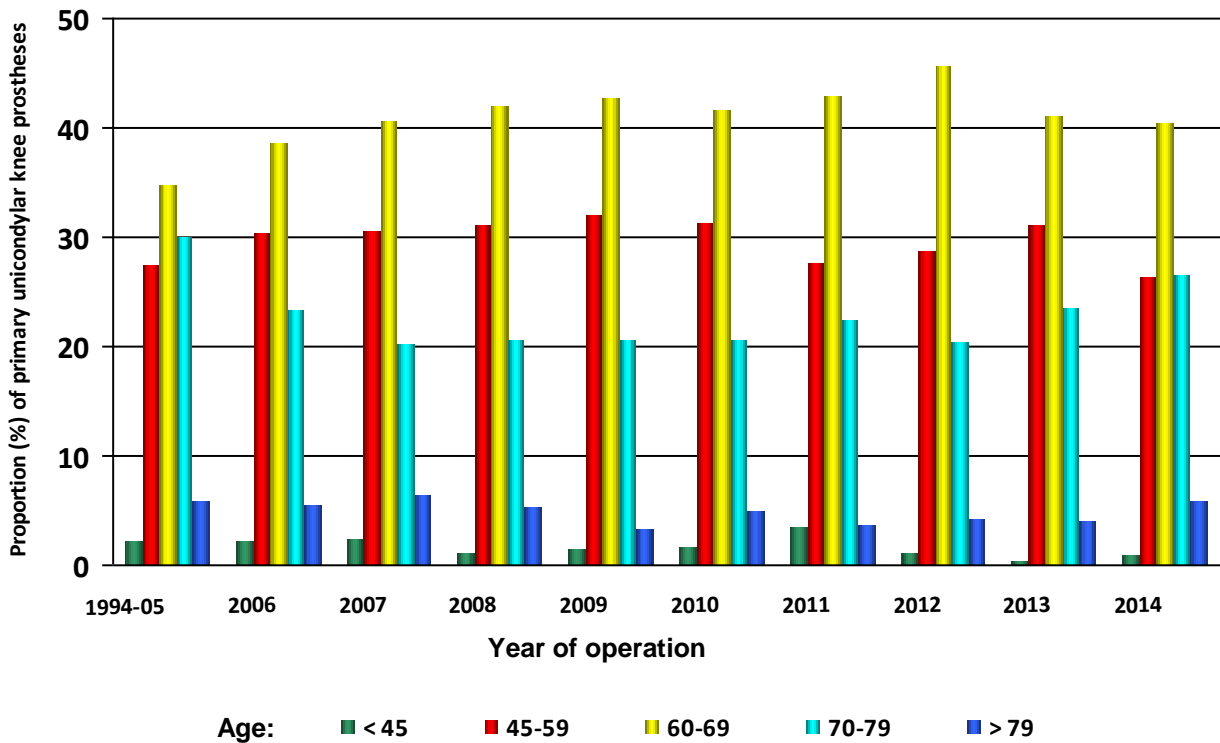


Figure 4: Age at the insertion of primary unicondylar knee prostheses

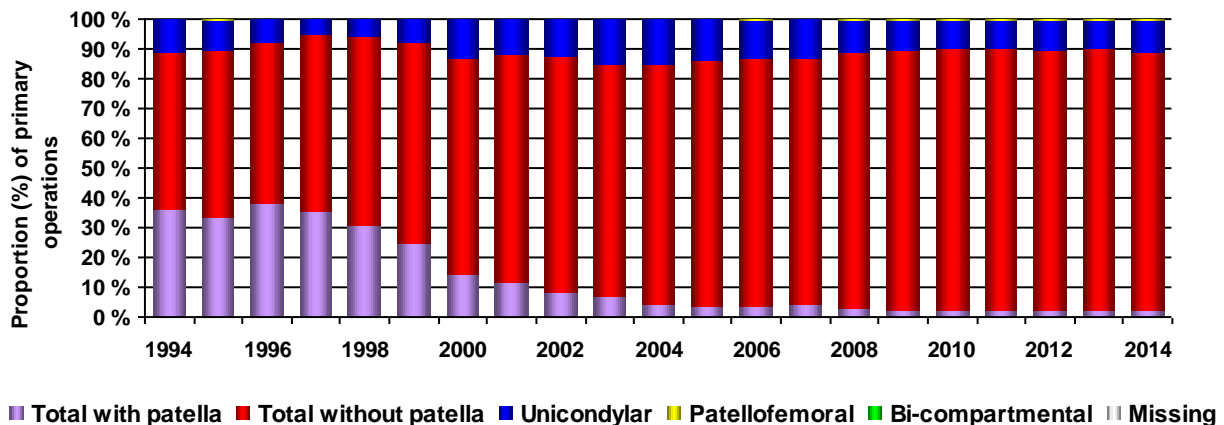


Types of knee prostheses

Table 2: Primary operations

Year	Total with patella	Total without patella	Unicondylar	Patello-femoral	Bicompartmental	Missing	Total
2014	109 (2,0%)	4 821 (86,8%)	584 (10,5%)	36 (0,6%)			5 557
2013	86 (1,7%)	4 399 (88,0%)	470 (9,4%)	38 (0,8%)		2 (0,0%)	5 001
2012	99 (2,0%)	4 295 (87,4%)	473 (9,6%)	33 (0,7%)		2 (0,0%)	4 914
2011	88 (1,9%)	3 974 (87,5%)	438 (9,6%)	29 (0,6%)			4 541
2010	88 (2,0%)	3 866 (87,9%)	415 (9,4%)	23 (0,5%)			4 400
2009	96 (2,1%)	3 886 (87,0%)	463 (10,4%)	19 (0,4%)	1 (0,0%)	1 (0,0%)	4 468
2008	115 (2,9%)	3 413 (85,5%)	440 (11,0%)	21 (0,5%)	1 (0,0%)		3 990
2007	141 (3,9%)	2 971 (82,8%)	466 (13,0%)	8 (0,2%)	1 (0,0%)		3 588
2006	113 (3,6%)	2 583 (83,1%)	399 (12,8%)	11 (0,4%)		1 (0,0%)	3 108
1994-05	3 505 (15,2%)	16 698 (72,6%)	2 753 (12,0%)	37 (0,2%)		1 (0,0%)	22 994
Total	4 440 (7,1%)	50 906 (81,4%)	6 901 (11,0%)	255 (0,4%)	3 (0,0%)	7 (0,0%)	62 561

Figure 5: Primary operations



Classification of stability and modularity in primary total prostheses

Table 3:

Year	----- MS -----		----- PS -----		CCK	Rotating platform	Hinged prostheses	Total
	All poly	MBT	All poly	MBT				
2014	2	3339	0	124	21	1 412	19	4 917
2013	2	3111	0	52	25	1 254	9	4 453
2012	1	2684	0	25	14	1 487	17	4 228
2011	1	2375	0	15	8	1 485	19	3 903
2010	0	2335	0	23	4	1 425	17	3 804
2009	0	2424	0	18	2	1 411	5	3 860
2008	0	2067	0	44	1	1 317	9	3 438
2007	0	1816	0	29	1	1 148	6	3 000
2006	0	1569	0	10	2	1 008	4	2 593
2005	0	1506	0	11	0	1 117	3	2 637
2004	0	1302	0	9	2	853	2	2 168
2003	3	1497	0	8	0	699	1	2 208
2002	2	1001	0	20	0	614	3	1 640
2001	0	909	0	44	1	606	3	1 563
2000	0	818	0	24	1	376	2	1 221
1999	1	827	0	30	0	277	2	1 137
1994-98	2	4006	0	66	41	349	14	4 478

MS = Minimally stabilized = Posterior cruciate retaining prosthesis = (cruciate ligament retaining and deep dish)

PS = Posterior cruciate stabilizing prostheses = cruciate ligament replacement

CCK = Constrained Condylar Knee = stabilizing (high level)

MBT = Metal backed tibia = Metal tibia

All poly = All polyethylene tibial component = whole plastic tibial component

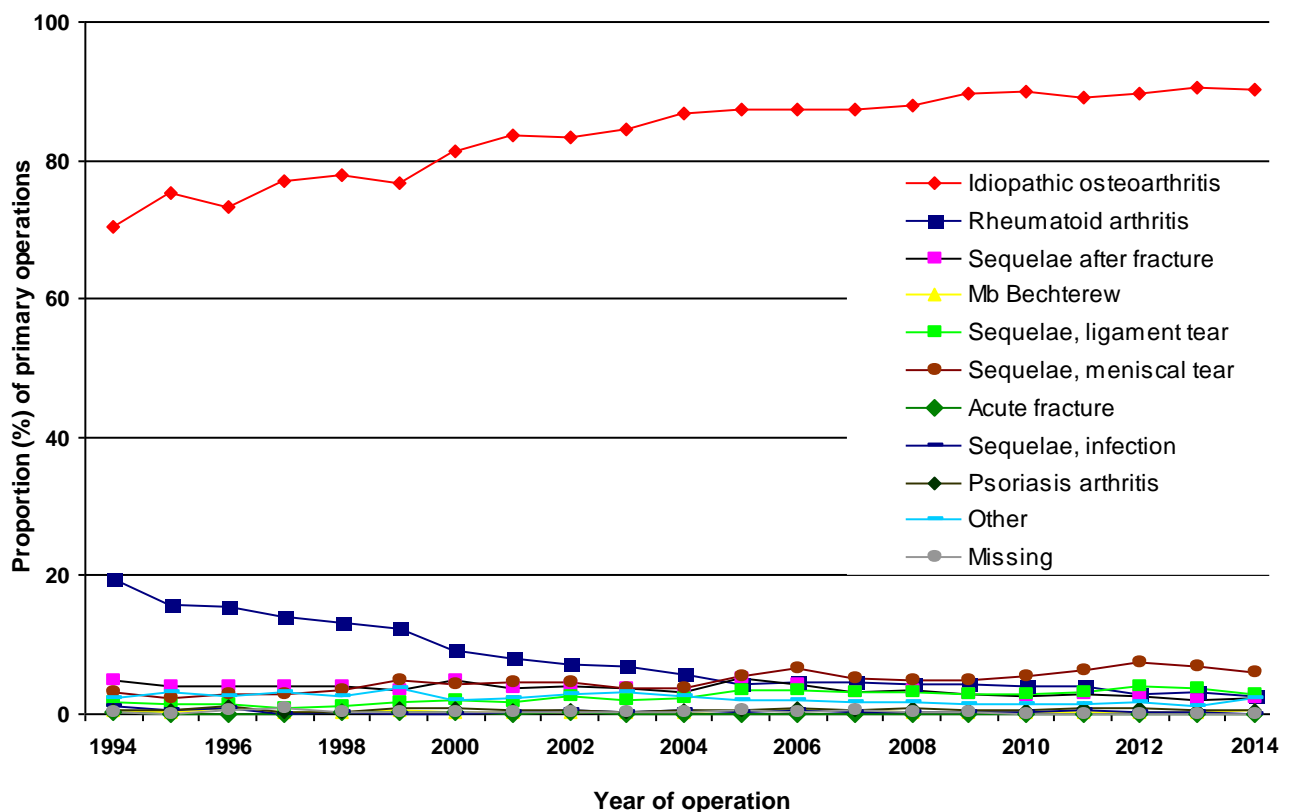
Reasons for primary operations - Total knee prostheses

Table 4:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Acute fracture	Sequelae, infection	Psoriasis arthritis	Other	Missing
2014	4 450	134	120	22	138	302	3	7	30	108	1
2013	4 056	144	94	11	172	307	1	16	28	50	4
2012	3 945	126	110	15	182	332	2	13	33	72	4
2011	3 614	161	114	12	134	260	1	18	35	64	2
2010	3 552	156	101	13	117	216	1	9	25	61	3
2009	3 573	167	118	11	116	200	2	13	25	53	10
2008	3 105	149	125	14	116	169	3	9	30	64	8
2007	2 719	146	95	17	98	162	4	11	17	55	16
2006	2 352	123	114	14	92	178	0	12	23	51	5
2005	2 434	120	145	13	94	155	2	11	19	60	14
2004	2 129	138	76	6	59	89	0	15	14	60	10
2003	2 167	174	94	9	49	98	2	11	8	79	6
2002	1 648	144	79	7	54	90	3	10	12	55	5
2001	1 645	157	75	5	35	90	1	6	11	45	8
2000	1 324	151	79	6	35	69	3	2	14	32	4
1999	1 124	180	50	9	24	73	3	2	13	54	3
1998	1 033	177	55	3	15	47	5	5	3	33	4
1997	907	167	49	3	10	34	1	1	5	38	10
1996	725	154	40	8	14	29	1	8	12	26	6
1995	735	154	39	4	13	22	0	6	6	30	1
1994	624	173	44	5	15	29	2	10	4	20	2
Total	47 861	3 195	1 816	207	1 582	2 951	40	195	367	1 110	126

Diseases are not mutually exclusive. More than one reason for operation is possible

Figure 6:



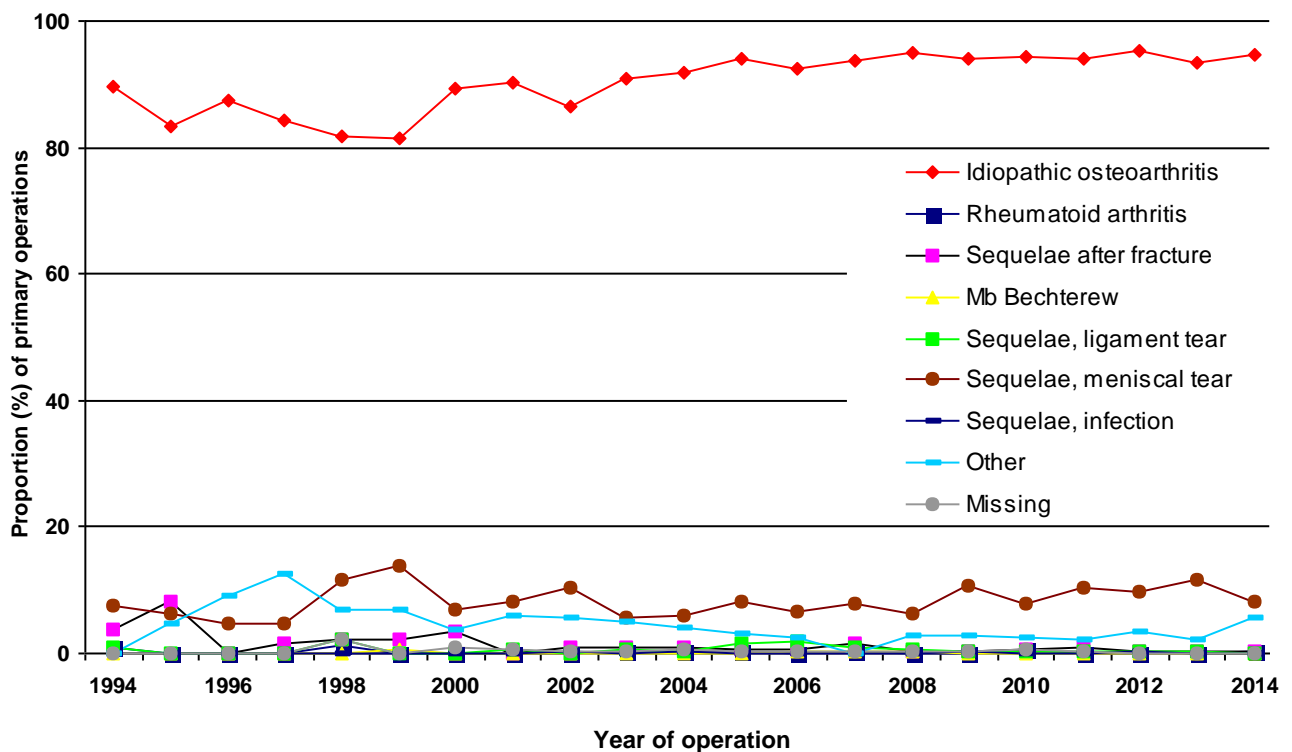
Reasons for primary operations - Unicondylar knee prostheses

Table 5:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Sequelae, infection	Other	Missing
2014	552	2	2	0	0	48	0	33	0
2013	439	0	1	0	1	55	0	10	0
2012	450	0	1	0	1	46	1	17	0
2011	412	0	4	0	1	45	0	10	1
2010	391	2	3	0	1	33	0	11	3
2009	435	0	1	0	2	50	1	13	2
2008	418	0	2	1	3	27	0	13	2
2007	436	2	7	1	4	37	0	0	2
2006	369	0	2	1	8	26	0	10	1
2005	429	2	3	0	7	38	0	14	1
2004	411	1	4	0	1	27	2	18	3
2003	426	2	5	0	3	27	0	23	1
2002	251	0	3	0	0	30	1	16	1
2001	241	0	0	0	2	22	0	16	2
2000	216	0	8	0	0	17	0	9	2
1999	105	0	3	1	0	18	0	9	0
1998	71	1	2	0	2	10	0	6	2
1997	53	0	1	0	0	3	0	8	0
1996	76	0	0	0	0	4	0	8	0
1995	91	0	9	0	0	7	0	5	0
1994	96	1	4	0	1	8	0	0	0
Total	6 368	13	65	4	37	578	5	249	23

Diseases are not mutually exclusive. More than one reason for operation is possible

Figure 7:



Use of cement - Primary total knee prostheses

Figure 8: Femur

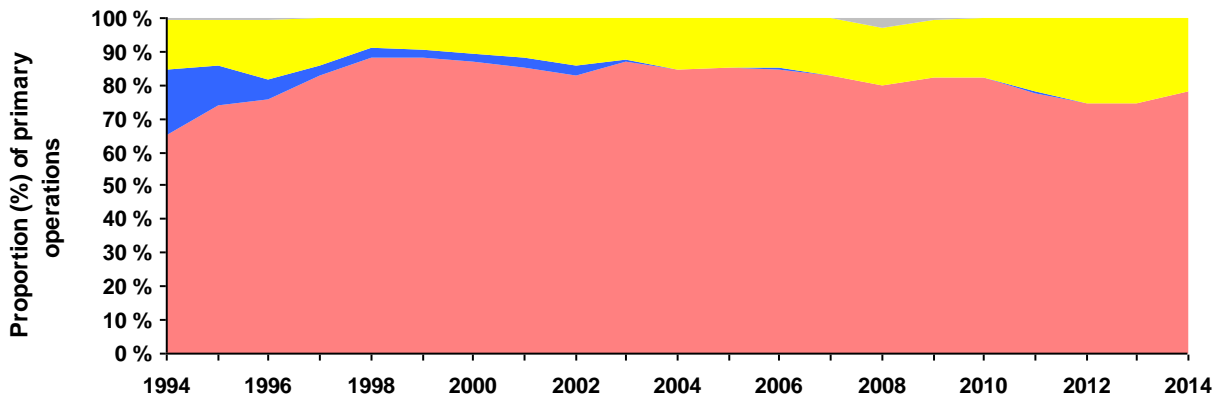


Figure 9: Tibia

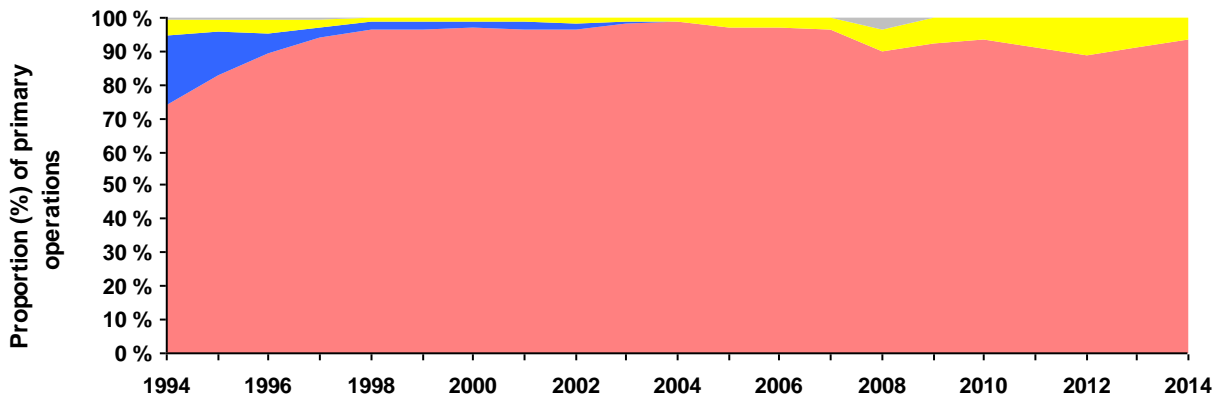
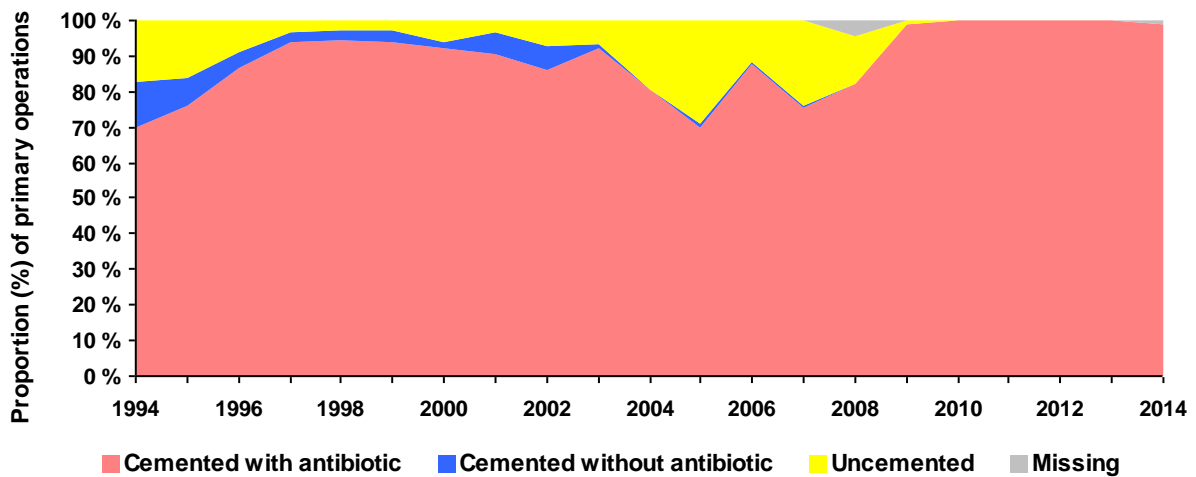


Figure 10: Patella



Use of cement in total knee prostheses

Figure 11: Primary operations

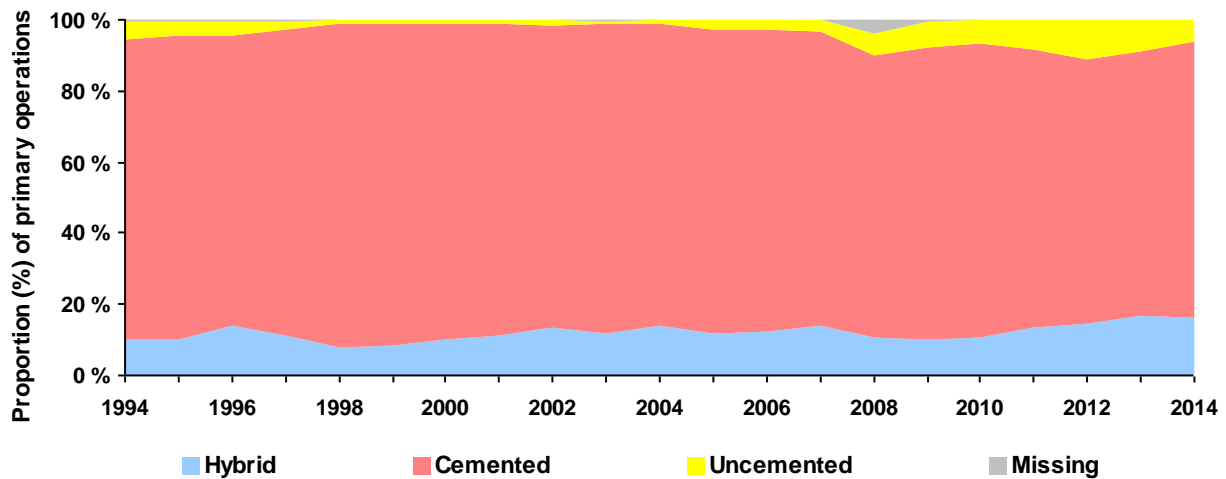
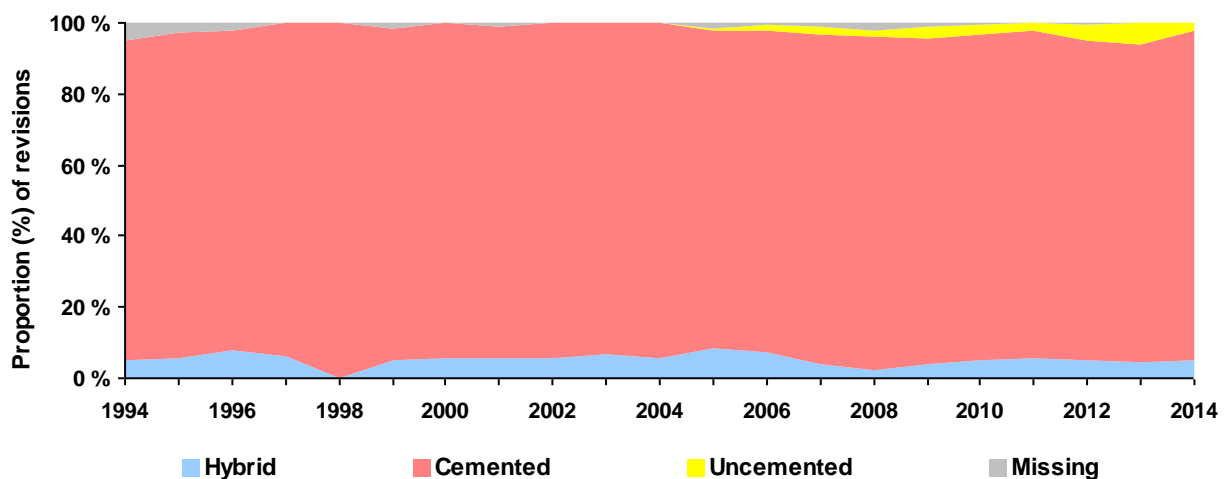


Figure 12: Revisions



The 7 most common primary total prostheses without patella component in 2013-2014

Table 6:

Product	Cemented *	Uncemented *	Hybrid	All poly	Rotating platform	HXLPE plastic	Stabilization			Total
							MS	PS	CCK	
NexGen	3 592	120	265	0	0	172	3791	175	65	3 981
LCS Complete	1 214	58	239	0	1 514	0	1514	1	0	1 514
PFC-Sigma	713	358	84	0	1 152	0	1152	2	1	1 156
PROFIX	681	147	317	2	0	0	1146	0	0	1 146
Legion	258	1	546	0	0	19	791	16	2	806
Triathlon	377	17	78	0	0	456	461	7	6	473
Vanguard TM	196	0	0	0	0	0	195	13	0	196

Hybrid = Uncemented femur and cemented tibia

All poly = All polyethylene tibial component = whole plastic tibial component

HXLPE = Crosslinked plastic (Highly cross linked polyethylene)

MS = Minimally stabilized = Posterior cruciate retaining prostheses = (cruciate ligament retaining and deep dish)

PS = Posterior cruciate stabilizing prostheses = cruciate ligament replacement

CCK = Constrained Condylar Knee = stabilizing (high level)

* Surgeon checks for use of cement

Total knee prostheses

Table 7: Femoral prostheses in primary operations

Prosthesis	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Profix	5279	1106	1125	1097	1216	1155	1169	1388	1032	114	14681
LCS Complete	556	822	1153	1315	1373	1420	1491	1487	802	712	11131
NexGen	652	162	155	172	205	251	218	655	1588	2393	6451
AGC	2659	349	377	352	341	290	247	224	27		4866
LCS	4730	88									4818
Genesis I	3293										3293
Duracon	600	1	214	463	508	470	396	101			2753
Triathlon			51	48	178	164	287	329	244	229	1530
PFC-Sigma	1						3	1	453	703	1161
Tricon -C with Pro-Fit	1085										1085
Legion								3	136	673	812
Vanguard TM	1			3	66	144	198	149	147	65	773
E-motion	262	133	8	9	46	10					468
Kinemax	411										411
Tricon M	337										337
Advance	79			15	38	29	44	43	51	12	311
Scorpio	9	29	22	44	7	12	2	2			127
Interax I.S.A.	105	1									106
AGC Dual	43										43
Search	39	1									40
NexGen Rotating Hinge	1	1	3	6	3	4	7	2		12	39
Kotz	33										33
Other (n<15)	25	2	3	3		5		7	4	14	63
Total	20200	2695	3111	3527	3981	3954	4062	4391	4484	4927	55332

Table 8: Femoral prostheses in revisions

Prosthesis	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Profix	291	53	49	53	48	53	46	40	43	6	682
LCS Complete	23	31	52	60	71	61	59	57	42	31	487
NexGen	48	20	21	26	34	30	39	59	107	102	486
Genesis I	210	1									211
LCS	167	10	4								181
Triathlon					1	10	17	29	34	24	115
Scorpio		1	10	16	19	25	16	7			94
AGC	52	7	6	7	1	3	2	4	1		83
NexGen Rotating Hinge	3	8	8	9	11	7	7	3	4	19	79
Duracon	31		5	9	17	5	5	4			76
Vanguard TM				1	17	24	21	3	2		68
AGC Dual	62										62
Legion				1	8	7		1	6	26	49
PFC-Sigma									12	21	33
Dual Articular 2000	14	7	6	3							30
Tricon -C with Pro-Fit	21										21
RT-Plus Modular					3		1	6	7	1	18
Kinemax	16										16
E-motion	3	1	2	4	5	1					16
Other (n<15)	55	1	2	4	9	3	13	5	4	3	99
Total	996	140	165	193	244	229	226	218	262	233	2906

Total knee prostheses

Table 9: Tibial prostheses in primary operations

Prosthesis	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Profix	5273	1106	1125	1097	1216	1155	1169	1388	1032	114	14675
LCS Complete	558	797	1136	1307	1373	1419	1490	1487	802	712	11081
NexGen	652	162	155	172	205	251	218	655	1588	2393	6451
AGC	2669	348	377	351	341	290	247	224	27		4874
LCS	4361	110	18	8							4497
Genesis I	3293										3293
Duracon	600	1	214	463	508	470	396	101			2753
Triathlon			51	48	178	164	287	329	244	229	1530
Tricon II	1417										1417
PFC-Sigma	1						3	1	453	703	1161
Legion								3	136	673	812
Vanguard TM	1			3	66	144	198	148	146	65	771
E-motion	262	133	8	9	46	10					468
Kinemax	411										411
LCS Universal	371	2									373
Advance	79			15	38	29	44	43	51	12	311
Scorpio	9	29	22	44	7	12	2	2			127
Interax I.S.A.	105	1									106
Search	39	1									40
NexGen Rotating Hinge	1	1	3	6	3	4	7	2		12	39
Kotz	33										33
AGC Dual	27										27
Other (n<15)	30	3	3	4		5		8	5	14	72
Total	20192	2694	3112	3527	3981	3953	4061	4391	4484	4927	55322

Table 10: Tibial prostheses in revisions

Prosthesis	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Profix	297	54	51	49	47	52	44	45	44	7	690
LCS Complete	23	41	70	81	94	73	79	66	55	46	628
NexGen	47	20	21	27	33	31	39	60	111	109	498
Genesis I	256			2			1				259
LCS	216	14	6								236
Triathlon					1	10	18	31	35	24	119
Duracon	35		6	12	21	12	14	11	7		118
Scorpio		1	10	16	19	26	17	8			97
AGC	57	5	6	7	1	4	2	4			86
NexGen Rotating Hinge	3	8	8	9	11	7	7	3	4	19	79
Tricon II	70										70
Vanguard TM					17	23	21	4	3		68
AGC Dual	59										59
Legion				1	8	7		1	6	26	49
PFC-Sigma									12	19	31
Dual Articular 2000	15	6	5	3							29
Maxim	14	5	2			1					22
E-motion	3	1	2	4	6	1		1			18
RT-Plus Modular					3		1	6	7	1	18
Kinemax	17										17
Other (n<15)	28	1	1	4	5	3	6	9	3	3	63
Total	1140	156	188	215	266	250	249	249	287	254	3254

Unicondylar knee prostheses

Table 11: Femoral prostheses in primary operations

Prosthesis	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Oxford UNI (III)	1809	345	405	400	444	400	412	334	225	193	4967
Oxford Partial Knee							1	104	205	368	678
Genesis UNI	341	1	2	1	1						346
Miller/Galante UNI	241	14	27	10	4						296
MOD III	200										200
Preservation	57	39	31	20	7	11					165
LINK Schlitten UNI	9						3	14	20	12	58
Duracon	49										49
Oxford UNI (II)	45										45
Sigma High Performance Uni							8	6	11	6	31
ZUK (Unicondylar)				9	7	3	8	1			28
Journey Uni							6	14	3	1	24
Other (n<15)	1		1			1			5	2	10
Total	2752	399	466	440	463	415	438	473	469	582	6897

Table 12: Tibial prostheses in primary operations

Prosthesis	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Oxford UNI (III)	1808	345	405	399	444	400	412	334	224	193	4964
Oxford Partial Knee							1	104	206	368	679
Genesis UNI	341	1	2	1	1						346
Miller/Galante UNI	234	13	27	10	4						288
MOD III	201										201
Preservation	57	39	31	20	7	11					165
LINK Schlitten UNI	9						3	14	20	12	58
Duracon	49										49
Oxford UNI (II)	45			1							46
Sigma High Performance Uni							8	6	11	6	31
ZUK (Unicondylar)				9	7	3	8	1			28
Journey Uni							5	14	3	1	23
Other (n<15)	1					1	1		5	2	10
Total	2745	398	465	440	463	415	438	473	469	582	6888

Patellofemoral prostheses

Table 13: Femoral prostheses in primary operations

	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Journey PFJ			3	16	18	21	25	14	18	22	137
NexGen PFJ Gender						2	4	19	16	14	55
Patella Mod III / II	24	6	2								32
LCS PFJ	9	5	3		1						18
Other (n<5)	3			5					4		12
Total	36	11	8	21	19	23	29	33	38	36	254

Table 14: Patella prostheses in primary operations

	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Journey PFJ			3	14	18	21	25	14	18	22	135
NexGen PFJ Gender						2	4	16	16	12	50
Patella Mod III / II	25	6	2								33
LCS PFJ	9	5	3								17
NexGen								3		2	5
Other (n<5)	3			5	1				4		13
Total	37	11	8	19	19	23	29	33	38	36	253

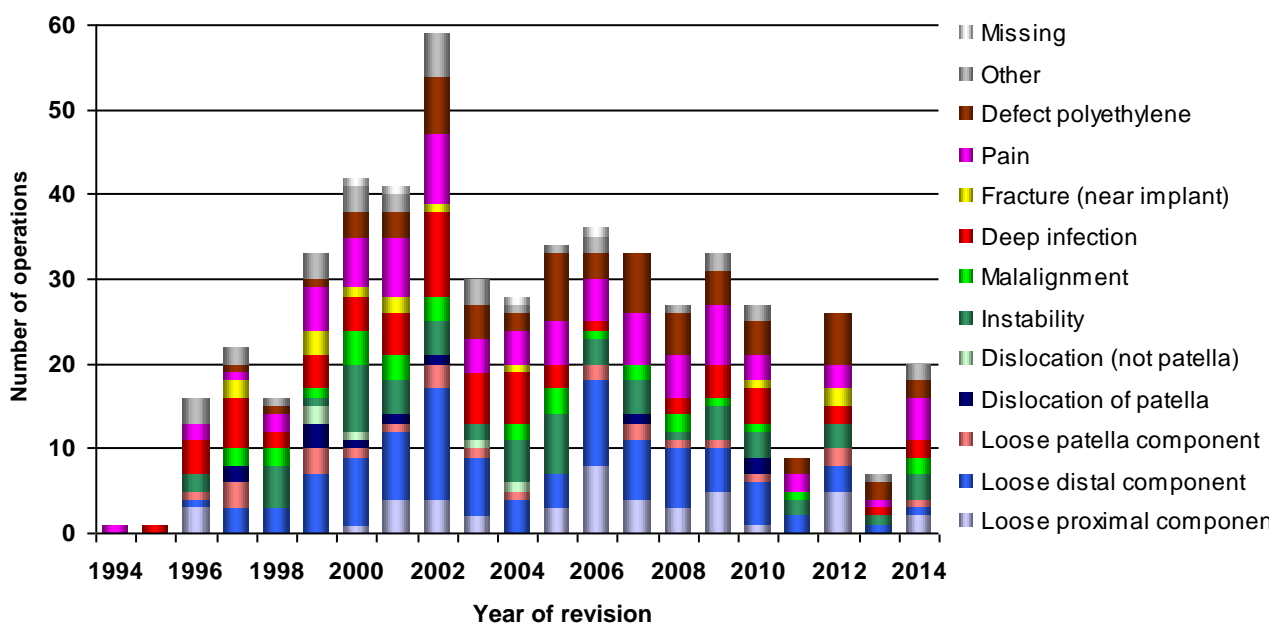
Reasons for revisions

Table 15: Reasons for revisions of total knee prostheses with patella

Year of revision	Loose proximal comp.	Loose distal comp.	Loose patella comp.	Dislocation of patella	Dislocation (not patella)	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2014	2	1	1	0	0	3	2	2	0	5	2	2	0
2013	0	1	0	0	0	1	0	1	0	1	2	1	0
2012	5	3	2	0	0	3	0	2	2	3	6	0	0
2011	0	2	0	0	0	2	1	0	0	2	2	0	0
2010	1	5	1	2	0	3	1	4	1	3	4	2	0
2009	5	5	1	0	0	4	1	4	0	7	4	2	0
2008	3	7	1	0	0	1	2	2	0	5	5	1	0
2007	4	7	2	1	0	4	2	0	0	6	7	0	0
2006	8	10	2	0	0	3	1	1	0	5	3	2	1
2005	3	4	0	0	0	7	3	3	0	5	8	1	0
2004	0	4	1	0	1	5	2	6	1	4	2	1	1
2003	2	7	1	0	1	2	0	6	0	4	4	3	0
2002	4	13	3	1	0	4	3	10	1	8	7	5	0
2001	4	8	1	1	0	4	3	5	2	7	3	2	1
2000	1	8	1	1	1	8	4	4	1	6	3	3	1
1999	0	7	3	3	2	1	1	4	3	5	1	3	0
1998	0	3	0	0	0	5	2	2	0	2	1	1	0
1997	0	3	3	2	0	0	2	6	2	1	1	2	0
1996	3	1	1	0	0	2	0	4	0	2	0	3	0
1995	0	0	0	0	0	0	0	1	0	0	0	0	0
1994	0	0	0	0	0	0	0	0	0	1	0	0	0
Total	45	99	24	11	5	62	30	67	13	82	65	34	4

Revision causes are not mutually exclusive. More than one reason for revision is possible

Figure 13: Reasons for revisions of total knee prostheses with patella



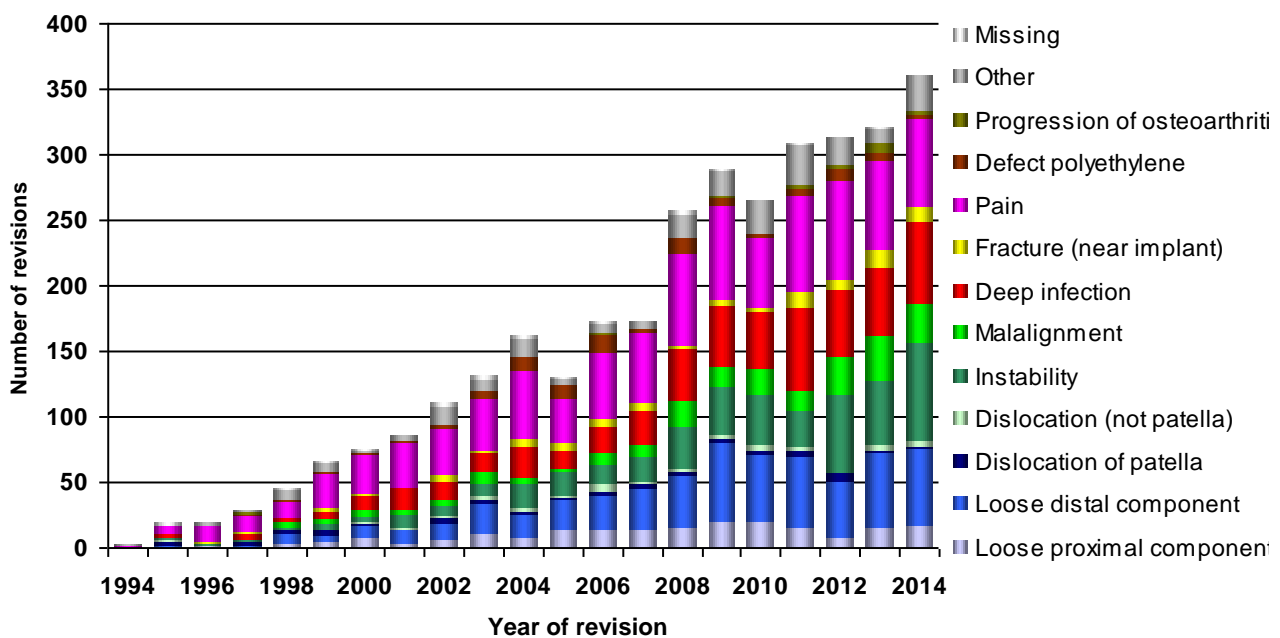
Reasons for revisions

Table 16: Reasons for revisions of total knee prostheses without patella

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation of patella	Dislocation (not patella)	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2014	16	60	2	4	74	31	61	13	66	4	2	28	0
2013	15	58	1	5	49	34	51	14	68	6	8	11	1
2012	8	42	7	0	60	28	52	7	77	9	3	21	0
2011	15	54	5	3	27	16	63	12	73	7	3	30	1
2010	20	51	4	4	38	19	44	3	53	4		25	0
2009	20	60	4	2	36	16	47	5	71	6	1	20	1
2008	15	39	4	3	32	19	40	3	69	12		19	2
2007	13	33	3	1	19	10	25	7	53	3		5	0
2006	14	26	3	5	16	9	20	6	50	13	1	8	2
2005	13	23	2	2	17	4	13	6	34	11		4	2
2004	7	19	2	3	18	4	24	7	51	11		13	3
2003	10	23	4	2	10	9	15	2	38	6		10	3
2002	6	12	4	3	7	4	14	6	35	3		13	3
2001	3	10	0	2	11	3	16	0	36	1		4	0
2000	8	9	1	2	4	5	11	1	30	1		3	1
1999	4	5	4	0	5	4	6	2	26	1		8	2
1998	3	7	3	0	2	4	3	0	13	2		7	1
1997	0	1	4	0	1	0	4	2	13	1	1	2	0
1996	1	0	1	0	1	0	0	1	13	0		2	0
1995	0	2	3	1	1	1	2	0	7	0		0	2
1994	0	0	0	0	0	0	0	0	2	0		1	0
Total	191	534	61	42	428	220	511	97	878	101	19	234	24

Revision causes are not mutually exclusive. More than one reason for revision is possible

Figure 14: Reasons for revisions of total knee prostheses without patella



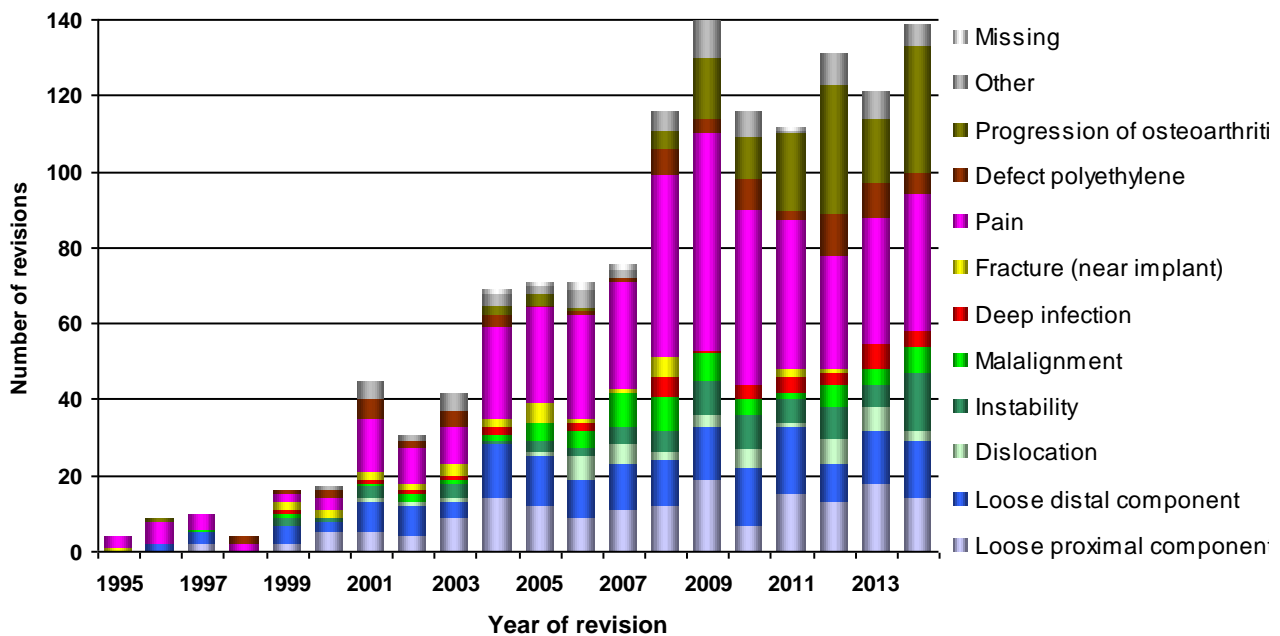
Reasons for revisions

Table 17: Reasons for revisions of unicondylar knee prostheses

Year of revision	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Progression of osteoarthritis	Other	Missing
2014	14	15	3	15	7	4	0	36	6	33	6	0
2013	18	14	6	6	4	7	0	33	9	17	7	0
2012	13	10	7	8	6	3	1	30	11	34	8	0
2011	15	18	1	6	2	4	2	39	3	20	1	1
2010	7	15	5	9	4	4	0	46	8	11	7	0
2009	19	14	3	9	7	1	0	57	4	16	10	0
2008	12	12	2	6	9	5	5	48	7	5	5	0
2007	11	12	5	5	9	0	1	28	1	1	2	2
2006	9	10	6	2	5	2	1	27	1	1	5	2
2005	12	13	1	3	5	0	5	25	1	3	2	1
2004	14	14	0	1	2	2	2	24	3	3	3	1
2003	9	4	1	4	1	1	3	10	4		5	0
2002	4	8	1	0	2	1	2	9	2		2	0
2001	5	8	1	3	1	1	2	14	5		5	0
2000	5	3	0	1	0	0	2	3	2		1	0
1999	2	5	0	2	1	1	2	2	1		0	0
1998	0	0	0	0	0	0	0	2	2		0	0
1997	2	3	0	0	1	0	0	4	0		0	0
1996	0	2	0	0	0	0	0	6	0	1	0	0
1995	0	0	0	0	0	0	1	3	0		0	0
Total	171	180	42	80	66	36	29	446	70	144	69	7

Revision causes are not mutually exclusive. More than one reason for revision is possible

Figure 15: Reasons for revisions of unicondylar knee prostheses

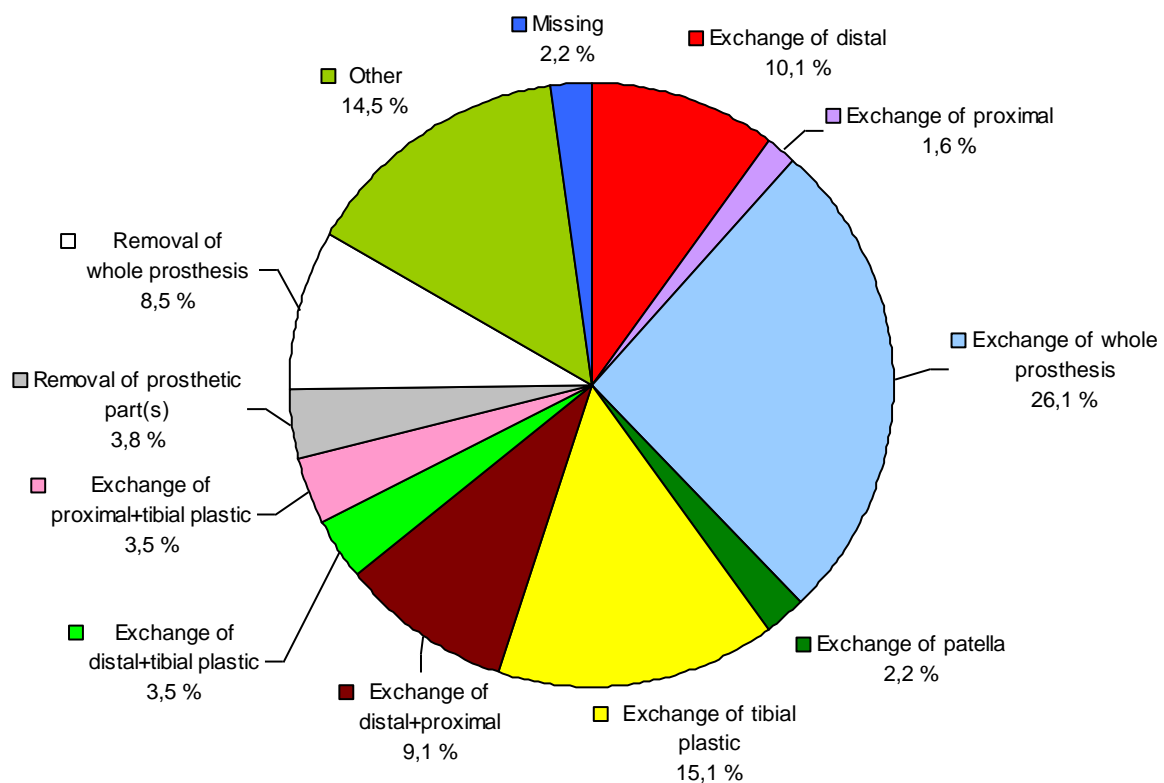


Type of revision

Table 18: Total knee prostheses with patella

Year of primary operation	Exchange of distal	Exchange of distal+tibial plastic	Exchange of distal+proximal	Exchange of whole prosthesis	Exchange of patella	Exchange of tibial plastic	Exchange of proximal	Exchange of proximal+tibial plastic	Removal of whole prosthesis	Removal of prosthetic part(s)	Other	Missing	Total
2014						2						1	3
2012		1				1							2
2011						1							1
2010						1							1
2009						2		1			1		5
2008				1		1		1	1				4
2007				1		2				1			4
2006		1			1			1					3
2005		1		1					1		1		4
2004		1		2		3		1		1			8
2003	1	1		6		2			1		2		13
2002	4		1	3	1	2			1		1		13
2001	6			2	1	2	2		3	1	1		18
2000	2		5	6		4		1	3	1	1		23
1999	5	3	6	6	1	4		1	6		2		34
1998	3		2	8	1	7		1	1	4	6	2	35
1997	5	1	4	8		2		1	3	1	9	1	35
1996	4	1	2	11		4		2	3	2	7	2	38
1995	1		7	14		6	2	1	4		9		44
1994	1	1	2	14	2	2	1			1	6	1	31
Total	32	11	29	83	7	48	5	11	27	12	46	7	319

Figure 16: Total knee prostheses with patella

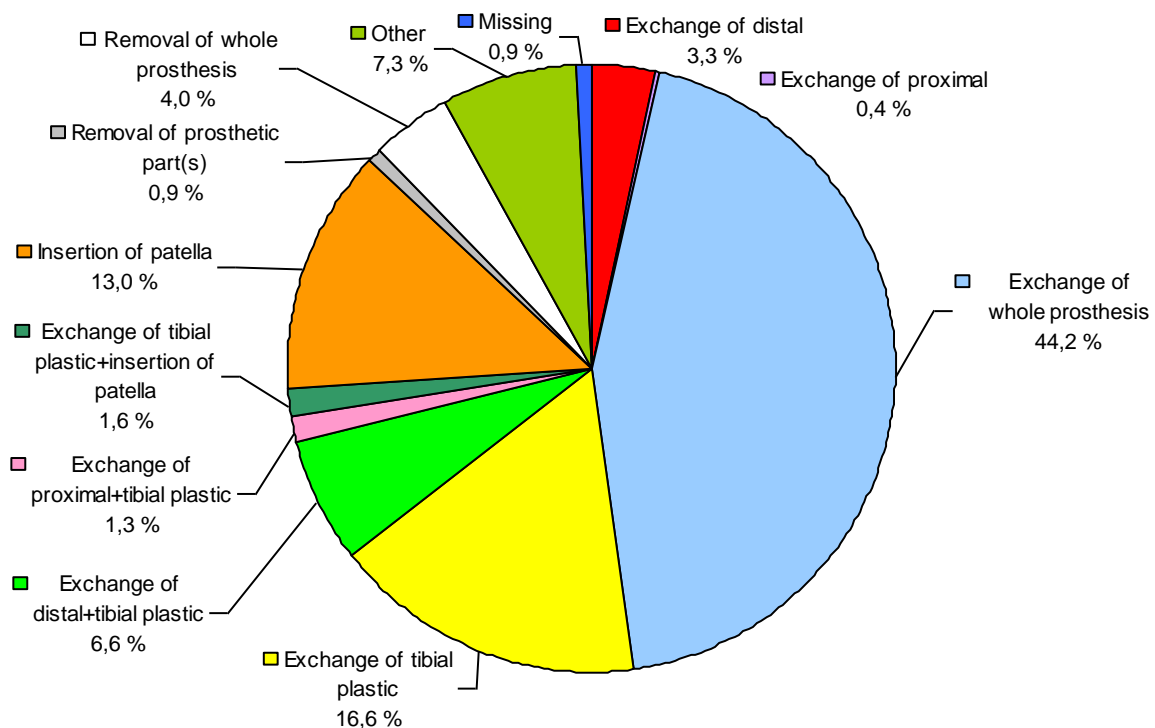


Type of revision

Table 19: Total knee prostheses without patella

Year of primary operation	Exchange of distal	Exchange of distal+tibial plastic	Exchange of whole prosthesis	Exchange of tibial plastic+inns. patella	Exchange of tibial plastic	Exchange of proximal	Exchange of proximal+tibial	Removal of whole prosthesis	Removal of prosthetic part(s)	Insertion of patella	Other	Missing	Total
2014		5	10		25			4			4		48
2013	1	6	34		30		3	1			7		82
2012	1	16	62		40			3	2		7	1	132
2011	1	23	116		49		2	6			17	1	215
2010	1	18	96	2	39		2	6	2	1	12		179
2009	4	20	106	1	46		6	9	1	13	14		220
2008	1	18	95	6	42	1	2	9	2	14	13	1	204
2007	1	13	110	4	28	1	2	5	1	12	11		188
2006	5	11	76	4	13	1	2	9	1	22	14	1	159
2005	6	11	56	1	12		2	6		22	18		134
2004	9	10	50	2	26		5	9		18	8	2	139
2003	5	6	64	1	26		2	12		24	12	1	153
2002	9	11	50	6	20		2	5	1	26	7	1	138
2001	14	4	47	7	11	1	4	6	1	39	6	2	142
2000	5	3	67	1	14	1	1	1	4	24	11		132
1999	10	4	40	4	13	2	1	5	1	32	7	3	122
1998	8	1	18	2	9			5	1	23	5	4	76
1997	3	1	40	1	6	2		1	2	26	7	1	90
1996	5	2	22	3	6	1		5	3	20	9	2	78
1995			32		5	1		1	1	23	4	2	69
1994	3		42		3		1	3	1	24	10	3	90
Total	92	183	1233	45	463	11	37	111	24	363	203	25	2790

Figure 17: Total knee prostheses without patella

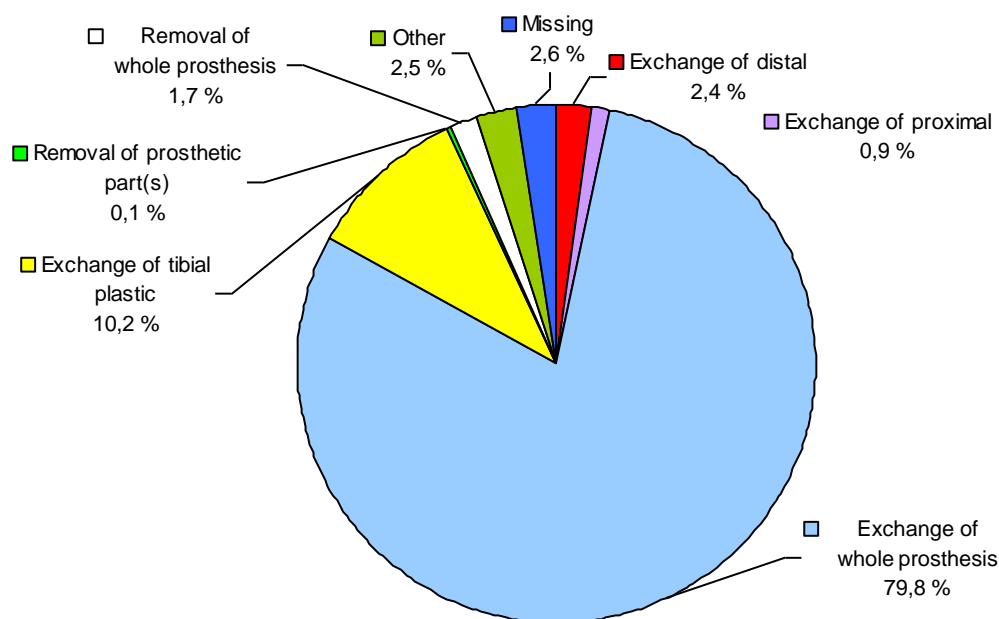


Type of revision

Table 20: Unicondylar prostheses

Year of primary operation	Exchange of distal	Exchange of whole prosthesis	Exchange of tibial plastic	Exchange of proximal	Removal of whole prosthesis	Removal of prosthetic part(s)	Other	Missing	Total
2014			1						1
2013		5	6		1				12
2012	2	14	9		1				26
2011		19	5				1	1	26
2010		31	9				1		41
2009		37	11		1		1		50
2008	1	50	6		2				59
2007		68	7	1	2		4	2	84
2006	1	64	6	1	1		3	2	78
2005	1	66	8				1	4	80
2004		82	5		2			2	91
2003	4	94	6	1			7	6	118
2002		29	6	2	2	1			40
2001	7	37	6		2		2	1	55
2000	1	51	4		1		1	1	59
1999	2	19		1				3	25
1998	2	16		1			1		20
1997		12		1					13
1996		9			1			1	11
1995	1	21							22
1994		21					1	1	23
Total	22	745	95	8	16	1	23	24	934

Figure 18: Unicondylar prostheses



ASA classification all knee prostheses

Table 21: Primary operations

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2014	574	3 853	1 047	9		74	5 557
2013	544	3 492	890	5	1	69	5 001
2012	667	3 274	901	8		64	4 914
2011	581	3 018	871	6		65	4 541
2010	661	2 845	797	7		90	4 400
2009	832	2 740	793	8		95	4 468
2008	785	2 352	765	8	1	79	3 990
2007	747	2 060	709			72	3 588
2006	769	1 717	541	10	1	70	3 108
2005	913	1 565	559	2		214	3 253

Table 22: Revisions

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2014	48	296	137	2		14	497
2013	44	291	133			12	480
2012	52	286	135	3		16	492
2011	54	243	119			9	425
2010	77	198	123	1		13	412
2009	93	212	117	1		15	438
2008	102	164	89			13	368
2007	73	141	69	2		16	301
2006	57	134	57	4		15	267
2005	61	94	70			26	251

Figure 19: Primary operations

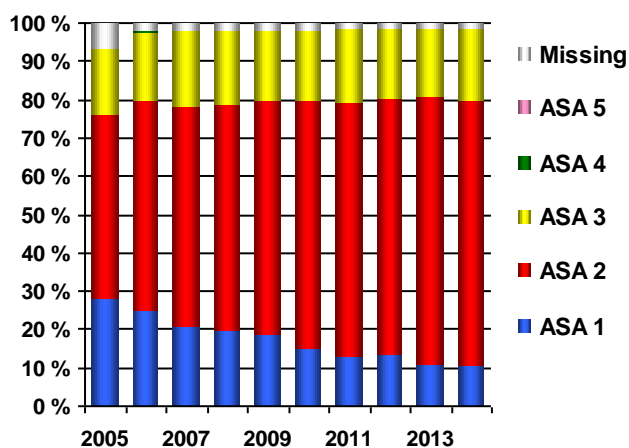
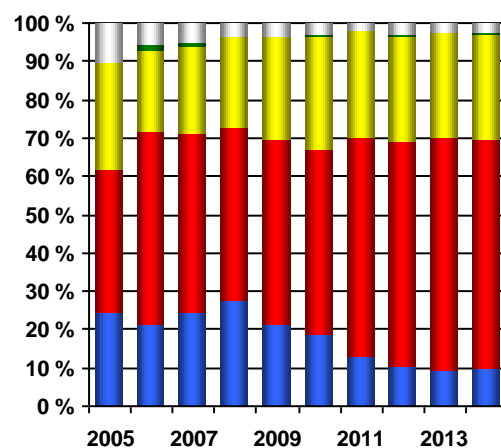


Figure 20: Revisions



ASA 1 = Healthy patients who smoke less than 5 cigarettes a day.

ASA 2 = Patients with an asymptomatic condition who are kept under medical control (f.ex. hypertension), or with diet (f. ex. diabetes mellitus type 2), and otherwise healthy patients who smoke five cigarettes or more daily.

ASA 3 = Patients having a condition that can cause symptoms. However, patients are kept under medical control (f. ex. moderate angina pectoris and mild asthma).

ASA 4 = Patients with a condition that is out of control (f. ex. heart failure and asthma).

ASA 5 = A moribund patient who is not expected to survive the operation.

Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 23: Primary operations

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2014	787	3 968	752	24	26	5 557
2013	893	3 328	715	10	55	5 001
2012	1 131	2 877	871	7	28	4 914
2011	1 265	2 286	953	8	29	4 541
2010	1 412	2 408	533	8	39	4 400
2009	1 607	2 386	424	10	41	4 468
2008	1 648	1 828	463	13	38	3 990
2007	1 876	1 259	416	5	32	3 588
2006	1 802	675	577	14	40	3 108
2005	2 021	388	702	8	135	3 254

Table 24: Revisions

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2014	68	349	68	7	5	497
2013	76	316	77	6	5	480
2012	103	268	112	6	3	492
2011	90	229	101	2	3	425
2010	106	229	70	6	1	412
2009	93	262	74	4	5	438
2008	107	184	62	7	8	368
2007	146	96	46	4	9	301
2006	139	62	54	3	9	267
2005	138	38	56	4	15	251

* Missing information on medication start

Figure 21: Primary operations

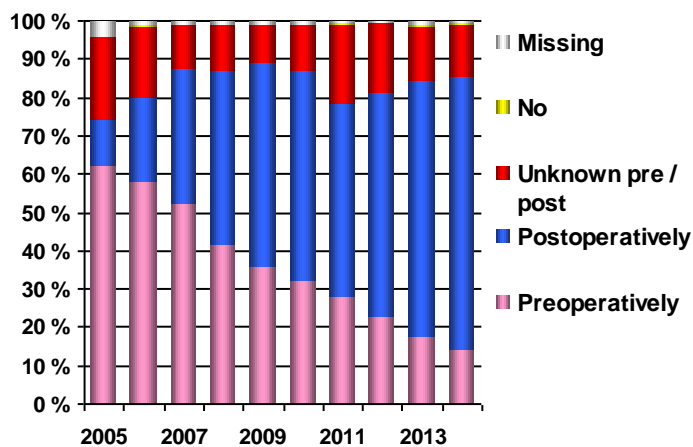
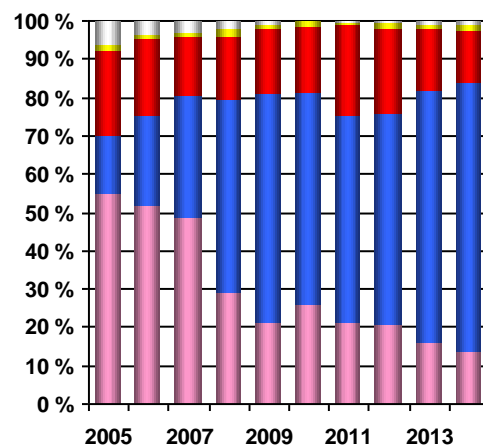


Figure 22: Revisions



Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 25: Drugs - All operations

Drugs	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Apixiban (Eliquis)									1,2%	1,1%
Dalteparin (Fragmin)	48,0%	51,2%	56,1%	57,2%	52,6%	62,4%	64,5%	59,2%	53,9%	50,4%
Enoksaparin (Klexane)	42,2%	42,9%	39,6%	38,0%	43,4%	32,8%	28,1%	29,2%	30,2%	32,2%
Rivaroksaban (Xarelto)						0,1%	2,2%	2,6%	2,5%	1,8%
Ximelagatran (Exanta, Malagatran)	2,5%	1,0%								
Clinical study		0,3%	0,7%	1,1%						
Combination of 2 drugs	1,7%	1,6%	1,3%	1,2%	2,1%	3,1%	3,5%	7,3%	10,1%	12,2%
No drugs	0,3%	0,5%	0,2%	0,5%	0,3%	0,3%	0,2%	0,2%	0,3%	0,5%
Other	0,6%	0,4%	0,2%	0,3%	0,1%	0,1%	0,1%	0,2%	0,2%	0,6%
Missing	4,6%	2,1%	1,9%	1,7%	1,5%	1,1%	1,4%	1,4%	1,6%	1,2%

Figure 23: Drugs

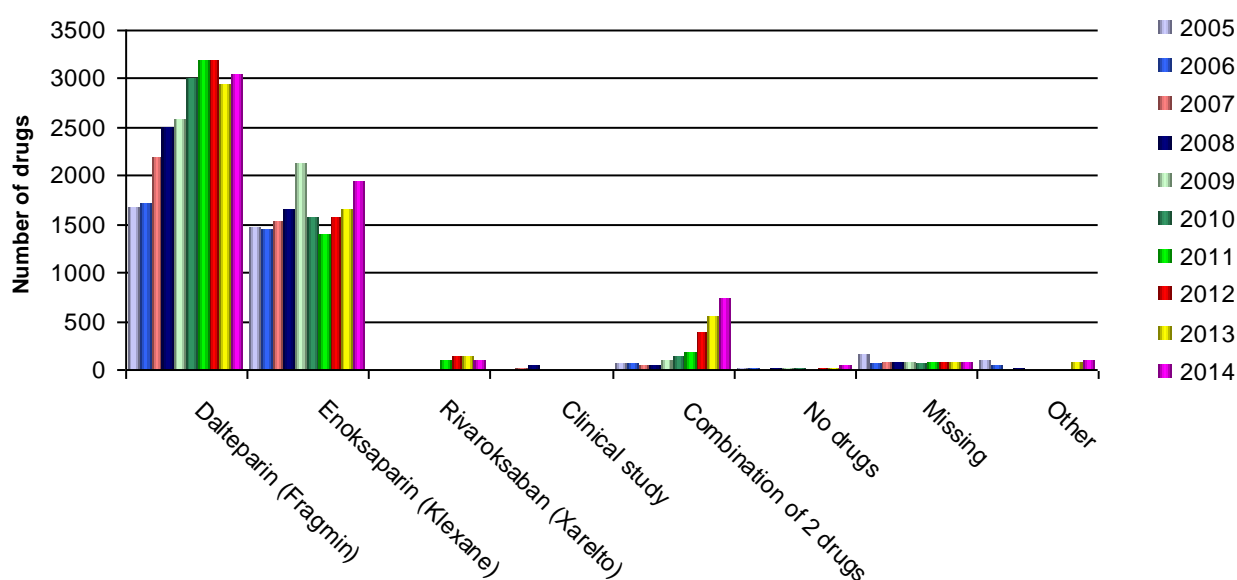


Table 26: Duration - All operations

Year	Days:	1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2014		940	1 777	1 003	369	1 060	158	31	719	6 057
2013		701	1 580	997	408	993	131	16	655	5 481
2012		564	1 632	1 200	346	890	105	13	656	5 406
2011		285	1 343	1 363	412	793	107	10	653	4 966
2010		347	1 346	1 320	242	776	57	14	710	4 812
2009		398	1 586	1 164	229	760	10	14	745	4 906
2008		424	1 454	827	171	749	38	20	675	4 358
2007		489	1 175	793	121	740	16	9	546	3 889
2006		440	1 035	572	115	540	20	17	636	3 375
2005		546	1 059	618	116	526	73	12	555	3 505

Registration of thrombosis prophylaxis started in 2005

Fibrinolysis Inhibitor

Table 27: Drugs - Primary operations

Drugs	2010	2011	2012	2013	2014
Cyclokapron (Tranexam acid)	2	1369	3482	3911	4661
Mangler		74	153	116	112
Total	2	1443	3635	4027	4773

Registration of fibrinolysis inhibitor started in 2011

Perioperative complications

Table 28: For primary total prostheses (the 10 most common)

Type	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Technical problem with cement	10	2	6	1	6	6	10	6	6	5	58
Rupture / damage MCL (medial colateral ligament)				1	7	14	5	12	12	5	56
Patella tendon rupture / Avulsion fractures / ligament rupture / tendon injury						1	13	12	10	20	56
Fracture of distal bone	20	2	3	4	4	6	8	3	3	3	56
Failure of instruments	7	4	5	7	3	4	3	5	3	7	48
Blood tourniquet failing	19	1	1	8	1	4	5	4	3		46
Fissure in the distal bone	12	4	2	4	5	1	8	4	2	1	43
Adm. failure (missing comp. mm.)	10	5	2		4	1	2	7	7	2	40
Fracture of proximal bone	8	4	1	3	3	3	1	4	5	3	35
Problem due to difficult anatomy	1		2	7	2	5	3	6	3	5	34
Other periop. compl.	67	12	19	21	25	29	32	29	35	40	309

Previous operation in relevant joints

Table 29: For primary total prostheses

Type	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Meniscus	1717	331	336	321	411	511	582	706	699	764	6378
Osteotomy	1260	111	109	114	122	121	109	116	110	131	2303
Synovectomy	635	63	72	72	100	58	69	65	64	66	1264
Osteosynthesis of intraarticular joint fracture	454	69	54	76	89	77	84	74	61	94	1132
Ligament	94	16	9	18	13	16	18	23	24	64	295
Prosthesis	2						7	10	9	8	36
Arthrodesis	18	1	1	2		1	2	2	1		28
Other previous op.	872	174	167	123	163	217	227	283	266	305	2797

Mini-invasive surgery

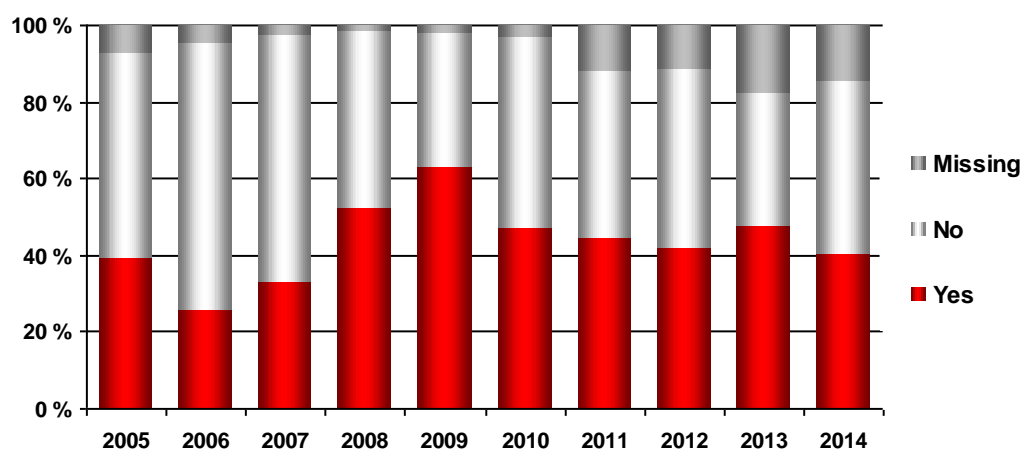
Table 30: Primary operations - Total knee prostheses

Year	Yes	No	Missing	Total
2014	5 (0%)	4 281 (87%)	644 (13%)	4 930
2013	11 (0%)	3 759 (84%)	715 (16%)	4 485
2012	16 (0%)	3 694 (84%)	684 (16%)	4 394
2011	15 (0%)	3 584 (88%)	463 (11%)	4 062
2010	21 (1%)	3 748 (95%)	185 (5%)	3 954
2009	25 (1%)	3 793 (95%)	164 (4%)	3 982
2008	14 (0%)	3 357 (95%)	157 (4%)	3 528
2007	22 (1%)	2 961 (95%)	129 (4%)	3 112
2006	3 (0%)	2 578 (96%)	115 (4%)	2 696
2005	5 (0%)	2 484 (89%)	300 (11%)	2 789

Table 31: Primary operations - Unicondylar knee prostheses

År	Yes	No	Missing	Total
2014	237 (41%)	262 (45%)	85 (15%)	584
2013	223 (47%)	163 (35%)	84 (18%)	470
2012	199 (42%)	220 (47%)	54 (11%)	473
2011	196 (45%)	190 (43%)	52 (12%)	438
2010	196 (47%)	206 (50%)	13 (3%)	415
2009	293 (63%)	161 (35%)	9 (2%)	463
2008	230 (52%)	204 (46%)	6 (1%)	440
2007	155 (33%)	299 (64%)	12 (3%)	466
2006	104 (26%)	276 (69%)	19 (5%)	399
2005	179 (39%)	244 (54%)	33 (7%)	456

Figure 24: Primary operations - Unicondylar knee prostheses



Registration of MIS started in 2005

Computernavigation

Table 32: Primary operations - Total knee prostheses

Year	Yes	No	Missing	Total
2014	417 (8%)	3 868 (78%)	645 (13%)	4 930
2013	381 (8%)	3 382 (75%)	722 (16%)	4 485
2012	416 (9%)	3 297 (75%)	681 (15%)	4 394
2011	442 (11%)	3 175 (78%)	445 (11%)	4 062
2010	658 (17%)	3 111 (79%)	185 (5%)	3 954
2009	761 (19%)	3 062 (77%)	159 (4%)	3 982
2008	741 (21%)	2 641 (75%)	146 (4%)	3 528
2007	374 (12%)	2 619 (84%)	119 (4%)	3 112
2006	253 (9%)	2 334 (87%)	109 (4%)	2 696
2005	185 (7%)	2 332 (84%)	272 (10%)	2 789

Figure 25: Primary operations - Total knee prostheses

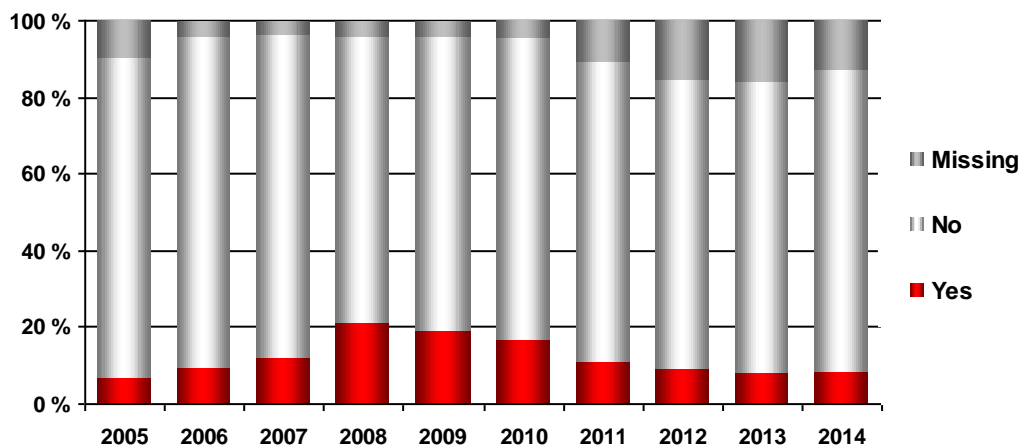


Table 33: Primary operations - Unicondylar knee prostheses

Year	Yes	No	Missing	Total
2014	0	498 (85%)	86 (15%)	584
2013	0	384 (82%)	86 (18%)	470
2012	0	417 (88%)	56 (12%)	473
2011	1 (0%)	386 (88%)	51 (12%)	438
2010	7 (2%)	395 (95%)	13 (3%)	415
2009	3 (1%)	452 (98%)	8 (2%)	463
2008	15 (3%)	416 (95%)	9 (2%)	440
2007	4 (1%)	448 (96%)	14 (3%)	466
2006	15 (4%)	364 (91%)	20 (5%)	399
2005	2 (0%)	419 (92%)	35 (8%)	456

Registration of CAOS started in 2005

Cements used in total knee prostheses

Table 34: Primary operations - Femur

Cement	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Palacos w/gentamicin	14662	1									14663
Palacos R + G	242	1089	1311	1447	1779	1667	1310	1274	1390	1419	12928
Optipac Refobacin Bonecement R	1		1	157	679	1100	1326	1314	1320	1730	7628
Refobacin Bone Cement R	240	954	1004	910	531	365	410	396	349	355	5514
Cemex w/gentamycin	96	197	196	88	118	110	173	189	216	209	1592
Refobacin-Palacos	1543	34									1577
Simplex w/Tobramycin	230	44	64	86	169	78					671
SmartSet GHV Genta. Smartmix						1	22	189	183	268	663
Palacos	425										425
Cemex System Genta FAST			23	88	44	34	13				202
Simplex	188		1	2							191
CMW I w/gentamicin	169			1						1	171
SmartSet GHV			32	45	15						92
CMW I	54										54
Other (n<50)	121	7	4	3	2		4	3	7	7	158
Missing information	4		1	44	7	9	15	4	2		86
Total	17975	2326	2637	2871	3344	3364	3273	3369	3467	3989	46615

Table 35: Primary operations - Tibia

Cement	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Palacos R + G	301	1433	1751	1847	2263	2189	1949	1951	2113	2161	17958
Palacos w/gentamicin	17773	9									17782
Optipac Refobacin Bonecement R	1		1	175	727	1178	1416	1446	1468	1896	8308
Refobacin Bone Cement R	246	1036	1058	948	564	393	448	471	394	376	5934
Cemex w/gentamycin	107	232	252	110	118	112	181	190	214	222	1738
Refobacin-Palacos	1588	32				1					1621
Simplex w/Tobramycin	234	47	64	85	168	77					675
SmartSet GHV Genta. Smartmix		1					22	189	182	269	663
Palacos	453										453
Cemex System Genta FAST			53	116	61	38	13				281
Simplex	196		1	1							198
CMW I w/gentamicin	191	1		1		1		1			195
SmartSet GHV			40	44	15						99
CMW I	55										55
Boneloc	45		4	1							50
Other (n<50)	86	1	1	7	6	1	3	5	11	7	128
Missing information	4		1	47	8	10	9	3	3	1	86
Total	21280	2792	3226	3382	3930	4000	4041	4256	4385	4932	56224

Cements used in unicondylar knee prostheses

Table 36: Primary operations - Femur

Cement	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Palacos w/gentamicin	2199	3		1							2203
Palacos R + G	33	146	210	209	244	233	220	254	279	373	2201
Optipac Refobacin Bonecement R				27	100	110	158	164	158	165	882
Refobacin Bone Cement R	44	203	193	140	56	46	40	49	18	25	814
Refobacin-Palacos	268	1									269
Simplex w/Tobramycin	102	23	29	10	35	14	4		2	2	221
Cemex w/gentamycin	15	22	17	6	3						63
Cemex System Genta FAST			7	26	22	7					62
Simplex	40			1							41
SmartSet GHV			9				7	6	11	6	39
Other (n<20)	54	1	1	5		3	8		2	3	77
Total	2755	399	466	425	460	413	437	473	470	574	6872

Table 37: Primary operations - Tibia

Cement	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Palacos R + G	32	149	217	205	247	237	220	254	278	375	2214
Palacos w/gentamicin	2188	3									2191
Optipac Refobacin Bonecement R				27	100	107	158	163	156	164	875
Refobacin Bone Cement R	45	198	187	144	55	46	40	49	18	25	807
Refobacin-Palacos	265	1									266
Simplex w/Tobramycin	96	23	29	8	35	14	4	1	2	2	214
Cemex w/gentamycin	15	22	15	8	3						63
Cemex System Genta FAST			7	25	22	7					61
Simplex	39			1							40
SmartSet GHV			8				8	6	11	6	39
Other (n<20)	51	1	2	4		3	7		2	3	73
Total	2731	397	465	422	462	414	437	473	467	575	6843

Systemic antibiotic prophylaxis

Table 38: Primary operations

Drugs	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Cefalotin (Keflin)	17436	2701	2935	3274	3696	3628	3729	3938	4164	4847	50348
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	2734	101	153	168	141	172	205	162	91	13	3940
Kloksacillin (Ekvacillin)	637	55	79	130	206	249	234	265	185	134	2174
Dikloksacillin (Diclocil, Dicillin)	1151	113	163	101	67	13	27	17	22	8	1682
Klindamycin (Dalacin, Clindamycin)	280	73	78	99	125	112	146	215	227	280	1635
Imipenem (Tienam)	51										51
Cefazolin (Cephazolin)	30		4		5			1		1	41
Cefaleksin (Keflex, Cefalexin)	19							1		1	21
Benzylpenicillin (Penicillin G)	16		1	1					1	1	20
Erytromycin (Ery-max, Abbotcin)	16								1		17
Combination of 2 drugs	480	60	166	187	182	175	154	271	272	214	2161
Other (n<10)	20		3	6	2		3	2	2	2	40
Missing	124	5	6	24	44	51	43	42	36	56	431
Total	22994	3108	3588	3990	4468	4400	4541	4914	5001	5557	62561

Table 39: Revisions

Drugs	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Cefalotin (Keflin)	1258	186	216	257	281	277	272	291	299	289	3626
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	270	6	6	5	10	8	6	12	2	1	326
Klindamycin (Dalacin, Clindamycin)	63	15	15	18	26	12	17	27	23	27	243
Dikloksacillin (Diclocil, Dicillin)	153	8	4	15	4	3	8	12	8	3	218
Kloksacillin (Ekvacillin)	67	4	6	5	3	6	19	9	18	21	158
Vankomycin (Vancomycin, Vancocin)	15	4	16	10	14	16	11	13	21	19	139
Benzylpenicillin (Penicillin G)	12	2	1	2	6	5	2		3	2	35
Ampicillin (Pentrexyl, Pondocillin, Doktacilin)	8	2					2		1		13
Combination of 2 drugs	150	31	30	31	64	62	64	121	98	121	772
Other (n<10)	18	1	3	2	1	4	1	1	1	6	38
Missing	66	8	4	23	29	19	23	6	6	8	192
Total	2080	267	301	368	438	412	425	492	480	497	5760

Patient specific instruments

Table 40:

Year	Yes	No	Missing	Total
2014	22	5432	1 552	7 006
2013	25	4645	1 777	6 447
2012	88	4239	1 958	6 285
2011	65	1686	4 138	5 889

Registration started in 2011

Drain

Table 41:

Year	Yes	No	Missing	Total
2014	2 241	3857	908	7 006
2013	2 070	3326	1 051	6 447
2012	2 207	2838	1 240	6 285
2011	1 095	1119	3 675	5 889

Registration started in 2011

Completeness analysis for the Knee replacements in the Norwegian Arthroplasty Register (NAR), 2008-2012

A completeness analysis for the Knee Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Arthroplasty Register (NAR). A report on the analysis and further results will be published on www.helsedirektoratet.no. There are separate statistics on primary operations and revisions. Some hospitals have few knee arthroplasty operations and the completeness must be seen in this light.

NCSF codes for combining data from NPR hospital stays and the Norwegian Arthroplasty Register

Type	Code	Description
Primary operation	NGB 0*	Primary partial prosthetic replacement of knee joint not using cement
	NGB 1*	Primary partial prosthetic replacement of knee joint using cement
	NGB 20	Primary total prosthetic replacement of knee joint not using cement
	NGB 30	Primary total prosthetic replacement of knee joint using hybrid technique
	NGB 40	Primary total prosthetic replacement of knee joint using cement
	NGB 99	Other primary prosthetic replacement of knee joint
Reoperation	NGC 0*	Secondary implantation of partial prosthesis in knee joint not using cement
	NGC 1*	Secondary implantation of partial prosthesis in knee joint using cement
	NGC 2*	Secondary implantation of total prosthesis in knee joint not using cement
	NGC 3*	Secondary implantation of total prosthesis in knee joint using hybrid technique
	NGC 4*	Secondary implantation of total prosthesis in knee joint using cement
	NGC 99	Other secondary prosthetic replacement in knee joint
	NGU 0*	Removal of partial prosthesis from knee joint
	NGU 1*	Removal of total prosthesis from knee joint

* All codes beginning with this in the NCSF

The completeness for the Norwegian Arthroplasty Register was calculated as follows:

$$\frac{\text{(Only NAR + Inclusion in both registers)}}{\text{(Only NAR + Only NPR + Inclusion in both registers)}}$$

Completeness for the NPR was calculated in a similar way:

$$\frac{\text{(Only NPR + Inclusion in both registers)}}{\text{(Only NAR + Only NPR + Inclusion in both registers)}}$$

Primary operations. From 2008 to 2012, 23 352 primary knee replacements were reported to one or both of the registers. 95.3% of these were reported to the NAR, while 97.6% were reported to the NPR. The analysis by hospital, divided into health regions, shows a completeness for the Norwegian Arthroplasty Register ranging from 78.3% to 100% between the different hospitals (Tables 38-42). For hospitals with a low completeness for the Norwegian Arthroplasty Register, either the form was not sent in or other interventions than knee arthroplasties were incorrectly coded with NGB0*/NGB1*/NGB20/NGB30/NGB40 (There were only 92 operations in the category NGB99 during the period).

Procedure codes to be used for primary operations:

NGB 0* - NGB 1* - NGB 20 - NGB 30 - NGB 40

Revision operations. From 2008 to 2012, 2393 revisions were reported to one or both of the registers. 88.9% of these were reported to the NAR, while 88.5% were reported to the NPR. The completeness by hospital is presented in Tables 38 to 42, showing that the completeness for the Norwegian Arthroplasty Register varied between 48% and 100%. A low completeness may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:

NGC 0* - NGC 1* - NGC 2* - NGC 3* - NGC 4* - NGC 99 - NGU 0* - NGU 1*

New: From 2012, revisions due to infection, even where parts of the prosthesis are not removed or replaced, are to be reported on the form to the NAR. These must be coded NGS 19, NGS 49 or NGW 69.

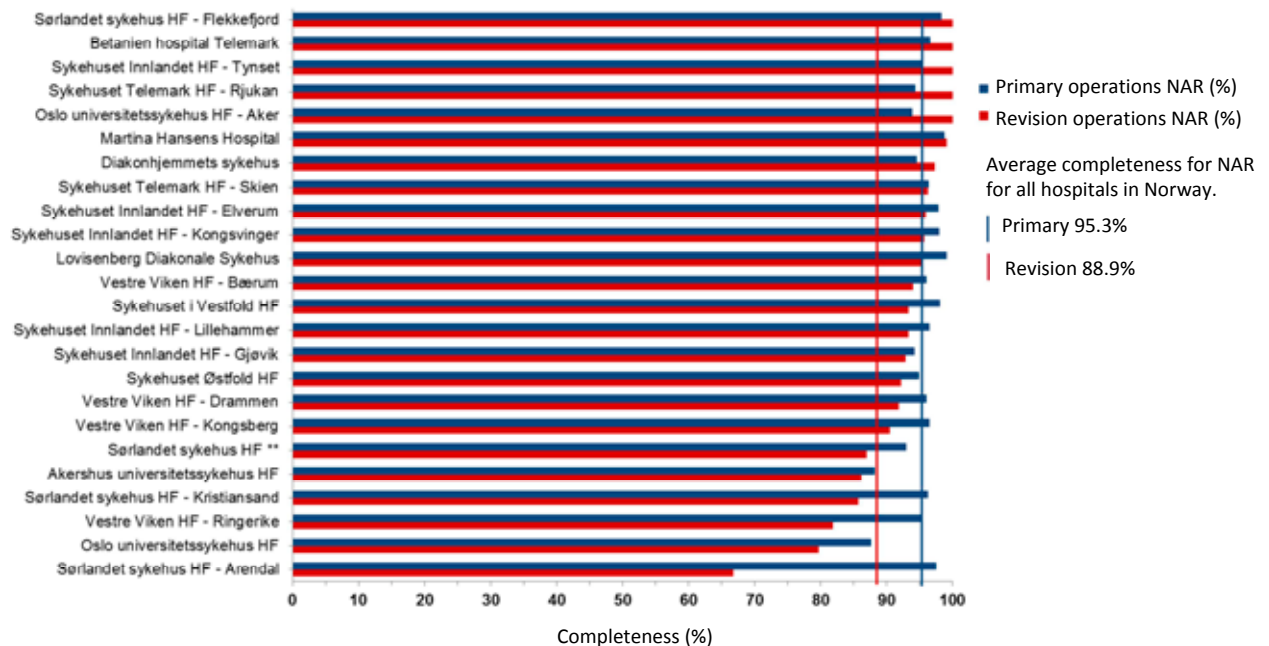
Helse Sør-Øst

Tabell 38: Completeness of reporting knee prosthesis operations, 2008-2012

Helse Sør-Øst	Primary operations			Revision operations		
	NGB 0*/NGB 1*/NGB 20/ NGB 30/NGB 40			NGC 0*/NGC 1*/NGC 2*/NGC 3*/ NGC 4*/NGC 99/NGU 0*/NGU 1*		
	Total number	NAR (%)	NPR (%)	Total number	NAR (%)	NPR (%)
Sørlandet sykehus HF - Flekkefjord	116	98,3	99,1	4	100,0	100,0
Betanien hospital Telemark	118	96,6	92,4	6	100,0	66,7
Sykehuset Innlandet HF - Tynset	714	95,5	98,6	8	100,0	75,0
Sykehuset Telemark HF - Rjukan	315	94,3	97,8	5	100,0	100,0
Oslo universitetssykehus HF - Aker	49	93,9	98,0	5	100,0	80,0
Sykehuset Telemark HF – Notodden***	1	0,0	100,0	1	100,0	100,0
Martina Hansens Hospital	1 684	98,8	98,8	111	99,1	86,5
Diakonhjemmets sykehus	685	94,6	99,0	145	97,2	89,7
Sykehuset Telemark HF - Skien	527	96,4	97,5	53	96,2	79,2
Sykehuset Innlandet HF - Elverum	572	97,9	98,1	73	95,9	93,2
Sykehuset Innlandet HF - Kongsvinger	447	98,0	99,6	23	95,7	82,6
Lovisenberg Diakonale Sykehus	1 957	99,1	99,7	131	95,4	87,8
Vestre Viken HF - Bærum	456	96,1	96,9	116	94,0	94,8
Sykehuset i Vestfold HF	1 008	98,1	98,8	60	93,3	81,7
Sykehuset Innlandet HF - Lillehammer	315	96,5	98,4	15	93,3	93,3
Sykehuset Innlandet HF - Gjøvik	327	94,2	100,0	14	92,9	50,0
Sykehuset Østfold HF	828	94,9	97,7	115	92,2	87,8
Vestre Viken HF - Drammen	330	96,1	98,5	86	91,9	95,3
Vestre Viken HF - Kongsberg	343	96,5	98,0	21	90,5	76,2
Sørlandet sykehus HF **	382	92,9	98,4	23	87,0	82,6
Akershus universitetssykehus HF	473	88,2	98,9	36	86,1	86,1
Sørlandet sykehus HF - Kristiansand	321	96,3	98,4	35	85,7	77,1
Vestre Viken HF - Ringerike	379	95,5	96,0	22	81,8	86,4
Oslo universitetssykehus HF	460	87,6	96,1	261	79,7	93,1
Sørlandet sykehus HF - Arendal	354	97,5	98,0	12	66,7	100,0

* All possible values in fifth sign
 ** Reporting unit can not be given more accurate in NPR
 *** Not in figure

Figure 27: Completeness of reporting knee prosthesis operations Helse Sør-Øst, primary operations and revisions



Helse Vest

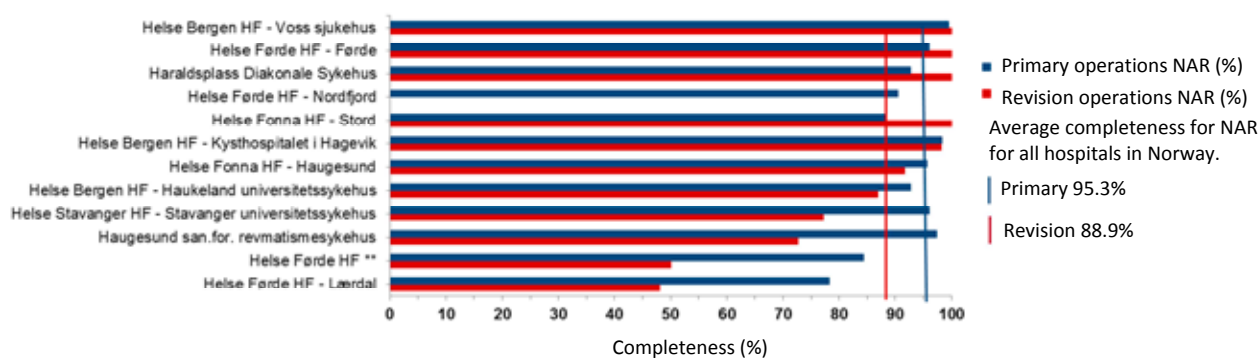
Tabell 39: Completeness of reporting knee prosthesis operations, 2008-2012

Helse Vest	Primary operations			Revision operations				
	NGB 0*/NGB 1*/NGB 20/ NGB 30/NGB 40			NGC 0*/NGC 1*/NGC 2*/NGC 3*/ NGC 4*/NGC 99/NGU 0*/NGU 1*				
	Total number	NAR + NPR	NAR(%)	NPR(%)	Total number	NAR + NPR	NAR(%)	NPR (%)
Helse Bergen HF - Voss sjukehus	238	99,6	99,6	99,6	32	100,0	96,9	
Helse Førde HF - Førde	51	96,1	98,0	98,0	1	100,0	100,0	
Haraldsplass Diakonale Sykehus	579	92,7	99,5	99,5	41	100,0	87,8	
Helse Førde HF - Nordfjord	21	90,5	100,0	100,0				
Helse Fonna HF - Stord	119	88,2	98,3	98,3	3	100,0	0,0	
Helse Bergen HF - Kysthospitalet i Hagevik	546	98,4	99,8	99,8	56	98,2	94,6	
Helse Fonna HF - Haugesund	351	95,7	98,3	98,3	12	91,7	75,0	
Helse Bergen HF - Haukeland	235	92,8	98,3	98,3	69	87,0	63,8	
Helse Stavanger HF - Stavanger	637	96,1	98,3	98,3	35	77,1	85,7	
Haugesund san.for. revmatismesykehus	155	97,4	98,7	98,7	11	72,7	72,7	
Helse Førde HF **	766	84,3	99,1	99,1	28	50,0	100,0	
Helse Førde HF - Lærdal	469	78,3	97,9	97,9	25	48,0	96,0	

* All possible values in fifth sign

** Reporting unit can not be given more accurate in NPR

Figure 28: Completeness of reporting knee prosthesis operations Helse Vest, primary operations and revisions



Helse Midt-Norge

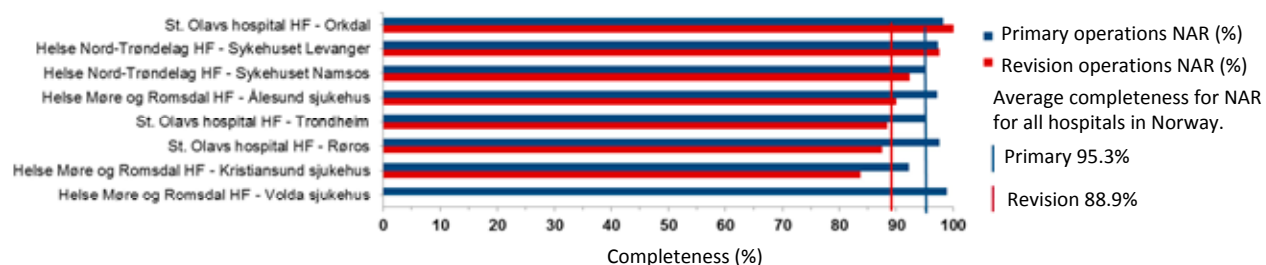
Tabell 40: Completeness of reporting knee prosthesis operations, 2008-2012

Helse Midt-Norge	Primary operations			Revision operations		
	NGB 0*/NGB 1*/NGB 20/ NGB 30/NGB 40			NGC 0*/NGC 1*/NGC 2*/NGC 3*/ NGC 4*/NGC 99/NGU 0*/NGU 1*		
	Total number	NRL(%)	NPR(%)	Total number	NRL(%)	NPR(%)
St. Olavs hospital HF - Orkdal	546	98,2	99,5	16	100,0	87,5
Helse Møre og Romsdal HF - Molde sjukehus**	2	0,0	100,0			
Helse Nord-Trøndelag HF - Sykehuset Levanger	445	97,3	99,8	41	97,6	73,2
Helse Nord-Trøndelag HF - Sykehuset Namsos	338	95,0	99,1	13	92,3	76,9
Helse Møre og Romsdal HF - Ålesund sjukehus	387	97,2	99,2	50	90,0	96,0
St. Olavs hospital HF - Trondheim	600	95,3	98,0	346	88,4	96,0
St. Olavs hospital HF - Røros	362	97,5	99,4	8	87,5	100,0
Helse Møre og Romsdal HF - Kristiansund	525	92,2	98,3	55	83,6	80,0
Helse Møre og Romsdal HF - Volda sjukehus	167	98,8	98,8	1	0,0	100,0

* All possible values in fifth sign

** Not in figure

Figure 29: Completeness of reporting knee prosthesis operations Helse Midt-Norge, primary operations and revisions



Helse Nord

Tabell 41: Completeness of reporting knee prosthesis operations, 2008-2012

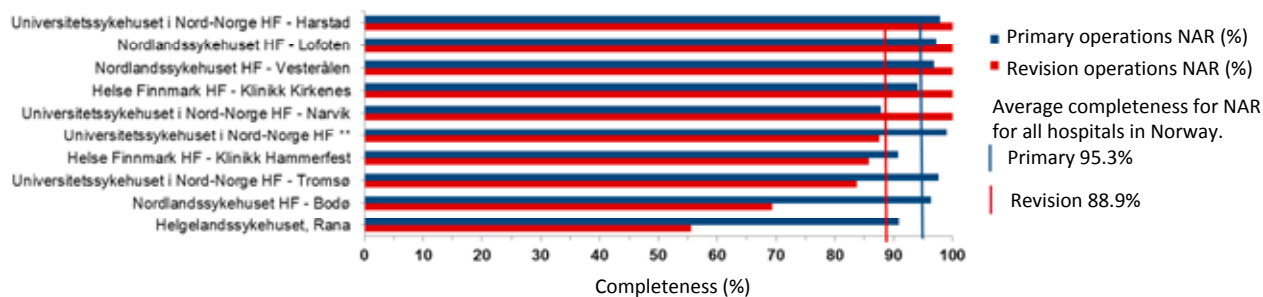
Helse Nord	Primary operations			Revision operations		
	NCSF-codes: NGB 0*/NGB 1*/NGB 20/ NGB 30/NGB 40			NGC 0*/NGC 1*/NGC 2*/NGC 3*/ NGC 4*/NGC 99/NGU 0*/NGU 1*		
	Total number	NAR(%)	NPR(%)	Total number	NAR(%)	NPR (%)
Universitetssykehuset i Nord-Norge HF - Harstad	185	97,8	94,1	3	100,0	0,0
Nordlandssykehuset HF - Lofoten	35	97,1	97,1			
Nordlandssykehuset HF - Vesterålen	218	96,8	98,2	1	100,0	0,0
Helse Finnmark HF - Klinikk Kirkenes	67	94,0	97,0	1	100,0	0,0
Universitetssykehuset i Nord-Norge HF - Narvik	41	87,8	97,6	1	100,0	100,0
Universitetssykehuset i Nord-Norge HF **	103	99,0	99,0	16	87,5	93,8
Helse Finnmark HF - Klinikk Hammerfest	290	90,7	98,6	21	85,7	81,0
Universitetssykehuset i Nord-Norge HF - Tromsø	336	97,6	99,4	55	83,6	96,4
Nordlandssykehuset HF - Bodø	458	96,3	96,3	52	69,2	92,3
Helgelandssykehuset, Rana	197	90,9	97,0	9	55,6	77,8
Helgelandssykehuset, Mosjøen***				1	0,0	100,0

* All possible values in fifth sign

** Reporting unit can not be given more accurate in NPR

*** Not in figure

Figure 30: Completeness of reporting knee prosthesis operations Helse Nord, primary operations and revisions



Private hospitals

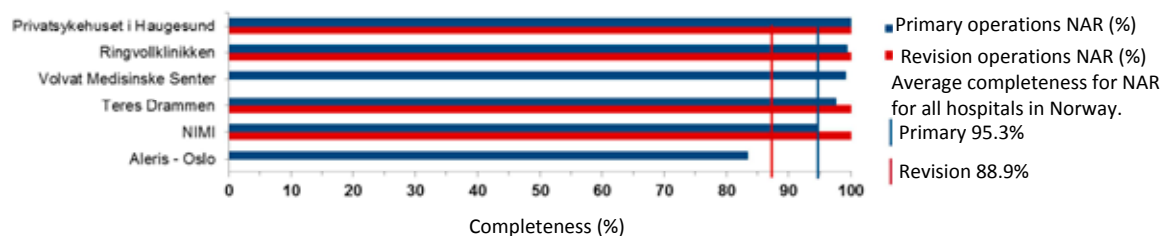
Tabell 42: Completeness of reporting knee prosthesis operations, 2008-2012

Private sykehus	Primary operations NGB 0*/NGB 1*/NGB 20/ NGB 30/NGB 40			Revision operations NGC 0*/NGC 1*/NGC 2*/NGC 3*/ NGC 4*/NGC 99/NGU 0*/NGU 1*		
	Total number NAR + NPR	NAR(%)	NPR(%)	Total number NAR + NPR	NAR(%)	NPR (%)
Privatsykehuset i Haugesund	9	100,0	0,0	1	100,0	0,0
Idrettsklinikken AS**	1	100,0	0,0			
Ringvollklinikken	153	99,3	81,0	1	100,0	0,0
Volvat Medisinske Senter	125	99,2	66,4			
Teres Drammen	161	97,5	49,7	3	100,0	0,0
Norsk idrettsmedisinsk institutt (NIMI)	92	94,6	44,6	2	100,0	0,0
Aleris - Oslo	181	83,4	89,5	1	0,0	100,0

* All possible values in fifth sign

** Not in figure

Figure 31: Completeness of reporting knee prosthesis operations private hospitals, primary operations and revisions



KNEE ARTHROPLASTY SURVIVAL RATES IN NORWEGIAN HOSPITALS

For the first time, we present ten-year survival rates for arthroplasties performed at hospitals in Norway. We have included prostheses from 2003-2014 from hospitals with more than 50 operations during this period. The Kaplan-Meier method with a 95% confidence interval was used. We provide the unadjusted rate for all types of knee replacements (total knee prostheses, unicondylar and hinged). Only hospitals that performed operations in 2014 are included.

The results must be interpreted with caution, because differences in reoperation rates may be due to a number of factors:

1. Hospitals that are more rigorous in reporting their complications and reoperations to the Register could have unfairly negative results in the analysis.
2. If surgeons at one hospital are more diligent in facilitating check-ups for patients than at other hospitals, and thus discover more complications, this could lead to unfortunate results despite the fact that this hospital in reality is doing a better job than other hospitals.
3. If the waiting time for reoperations is longer in some hospitals than others, the longer wait could erroneously lead to better results than those of hospitals with a short waiting time.
4. If the surgeons at one hospital have a higher threshold for recommending reoperation than at other hospitals and thus prolong patients' problems, this will also give skewed results in the statistics.
5. Poor hospital results from an earlier period will remain with the hospital, even though the hospital may have acted upon previous problems by switching to better prostheses and improving procedures and surgical skills.

The completeness analysis shows the proportion of primary operations and revisions each hospital has reported to NPR. If the completeness of revisions is low in a hospital, it may indicate that the result found in our survival analysis is too high.

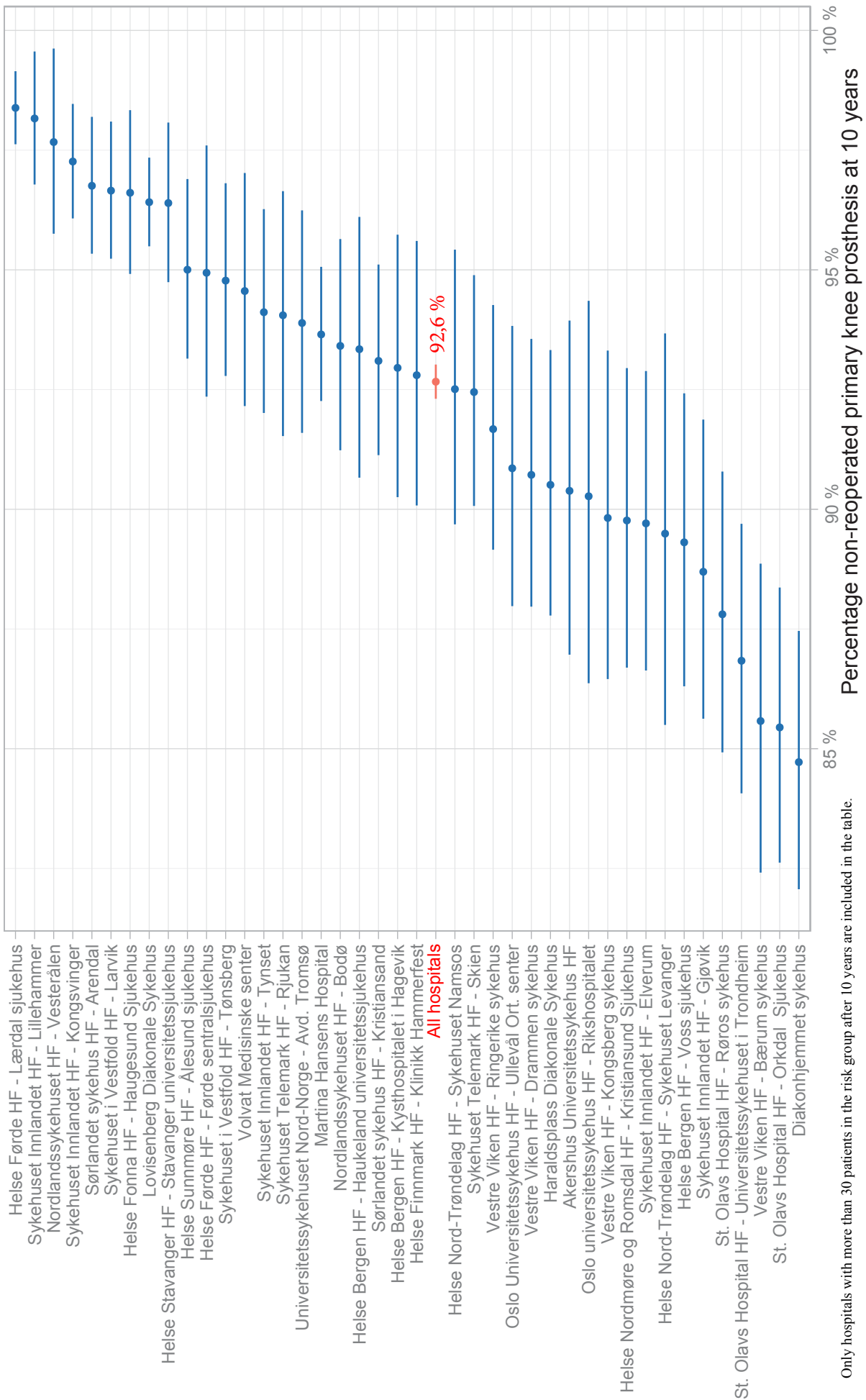
Ranking of hospitals

There is statistical uncertainty in the ranking lists because the data from the NAR are poorly suited for such calculations. The NAR was designed to compare the results of implants and surgical procedures nationwide. To compare quality in hospitals is a complex matter, because some hospitals operate on more patients with poor prognosis than other hospitals, and because many hospitals, especially the small ones, have so few reoperations that the statistics are too weak, and are further weakened by the fact that the hospitals' completeness (reporting rate) of reoperations varies from 0% to 100%. This issue is explained in detail in the following articles: Ranstam J, Wagner P, Robertsson O, Lidgren L. Health-care quality registers: outcome-orientated ranking of hospitals is unreliable.

J Bone Joint Surg Br. 2008 and Ranstam J, Wagner P, Robertsson O, Lidgren L. [Ranking in health care results in wrong conclusions]. Läkartidningen. 2008 Aug 27-Sep 2;105(35):2313-4.

Moreover, it is a well-known phenomenon in quality assurance that if those who report their complications and errors receive bad publicity, the reporting deteriorates. If league tables of hospitals are publicised, there is thus a danger that hospitals' reporting of reoperations may become less reliable, leading to inferior quality of the registers.

In order to achieve complete reporting of reoperations (revisions), reporting to the Register should be linked to performance-based financing, reporting should be made mandatory, and the requirement for the patient's written consent to reporting of the operation to the Register should be waived and replaced by presumed consent.



Only hospitals with more than 30 patients in the risk group after 10 years are included in the table.

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Lumbar disc prostheses

Annual number of prostheses	127
Back disease in primary operations	127
Use of cement	128
Prostheses	128

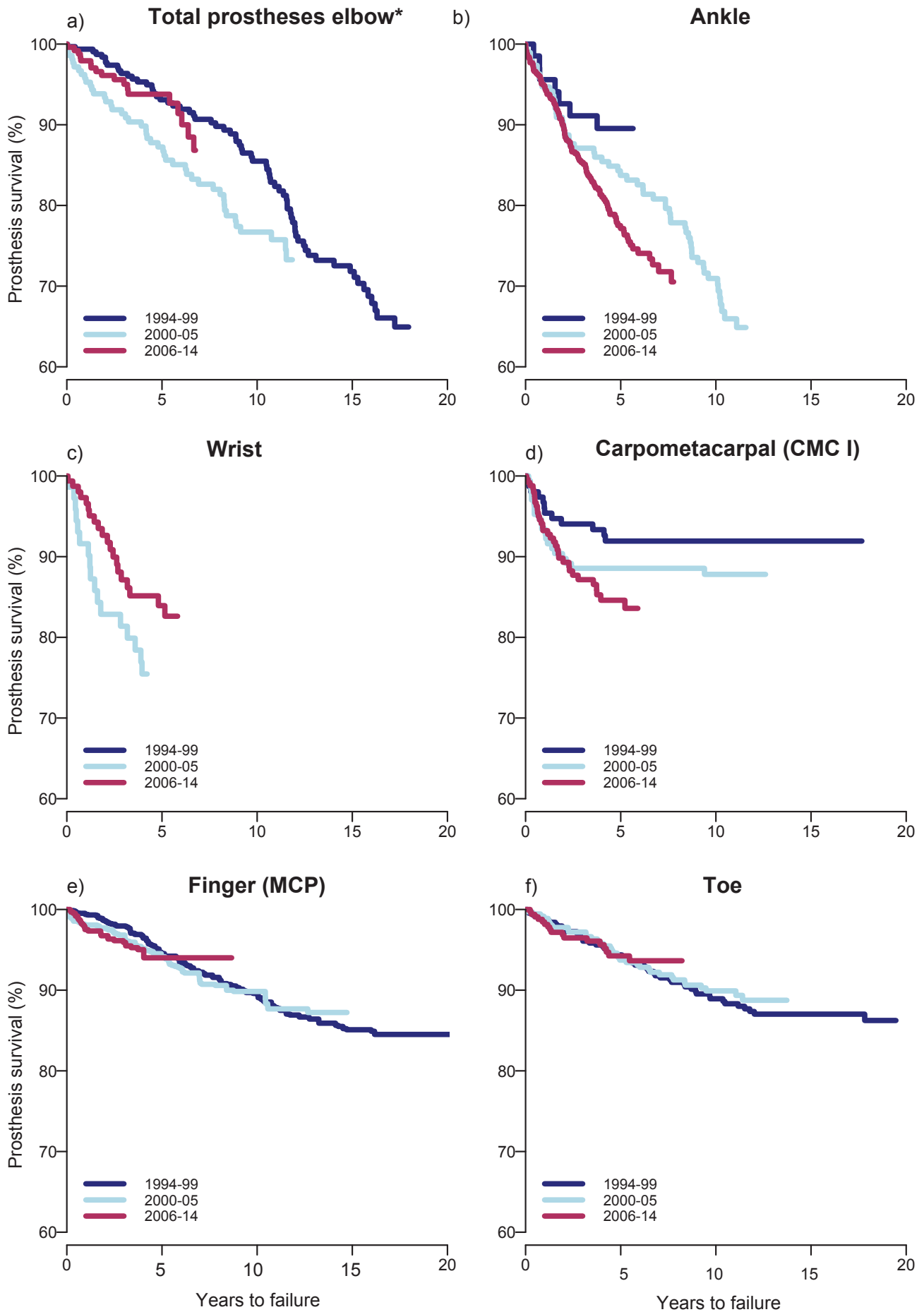
Shoulder prostheses

Annual number of prostheses	129
Reasons for primary operations	130
Use of cement	131
Prostheses	132
Reasons for revisions	136

Toe joint prostheses

Annual number of prostheses	139
Toe disease in primary operations	139
Use of cement	140
Prostheses	141
Reasons for revisions	141

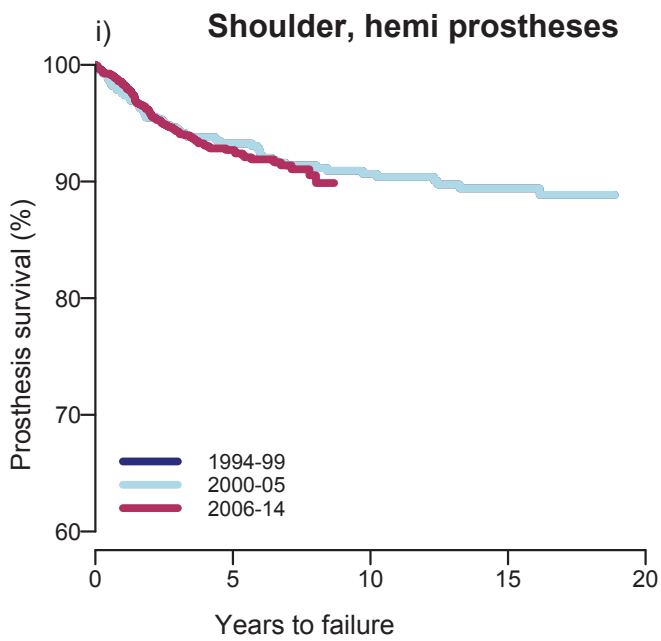
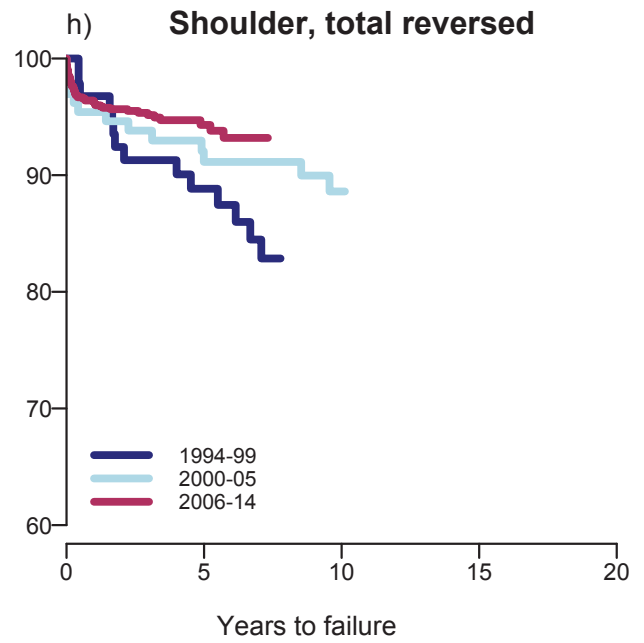
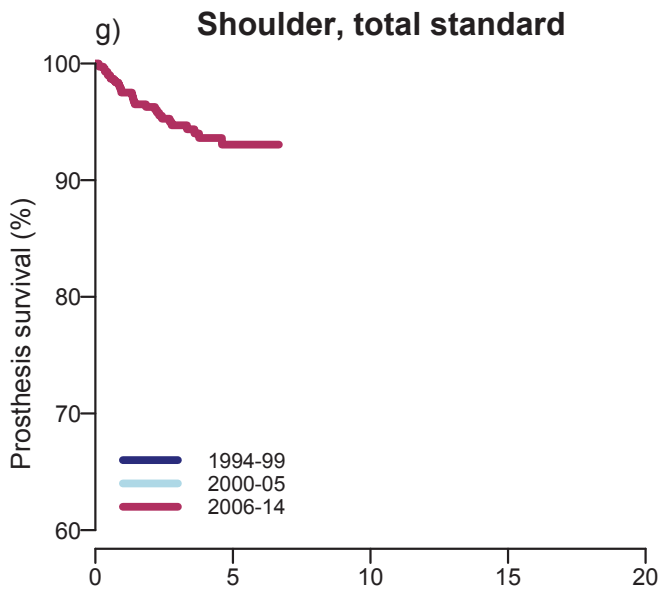
Survival of joint prostheses



*Caput radii prostheses for acute fracture is not included.

Survival curves estimated by the Kaplan-Meier method. In all figures, the percentage of unrevised prostheses was given only for times where > 50 prostheses remained at risk.

Survival of prostheses in the shoulder



Survival curves estimated by the Kaplan–Meier method.

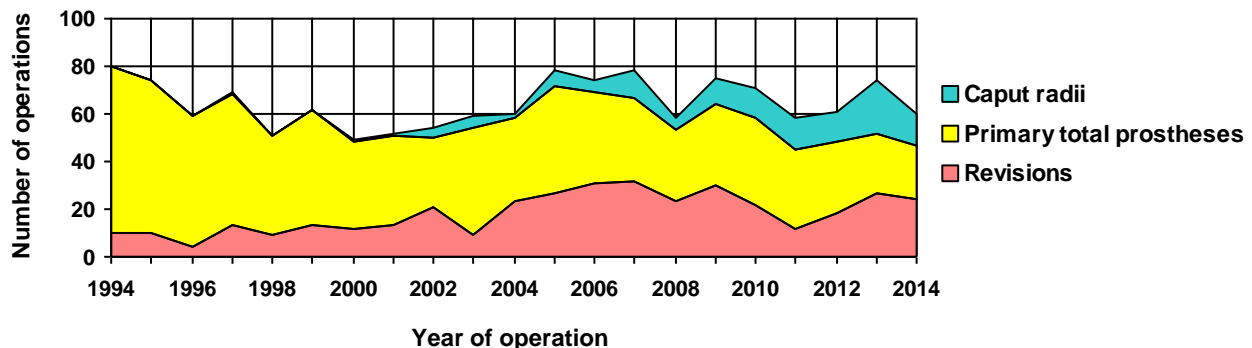
In all figures, the percentage of unrevised prostheses was given only for times where > 50 prostheses remained at risk

ELBOW PROSTHESES

Table 1: Annual number of prostheses

Year	Primary operations			Total
	Total prosthesis	Caput radii	Revisions	
2014	23 (38,3%)	13 (21,7%)	24 (40,0%)	60
2013	25 (33,8%)	22 (29,7%)	27 (36,5%)	74
2012	30 (49,2%)	13 (21,3%)	18 (29,5%)	61
2011	33 (56,9%)	13 (22,4%)	12 (20,7%)	58
2010	36 (50,7%)	13 (18,3%)	22 (31,0%)	71
2009	34 (45,3%)	11 (14,7%)	30 (40,0%)	75
2008	30 (51,7%)	5 (8,6%)	23 (39,7%)	58
2007	35 (44,9%)	11 (14,1%)	32 (41,0%)	78
2006	38 (51,4%)	5 (6,8%)	31 (41,9%)	74
2005	45 (57,7%)	6 (7,7%)	27 (34,6%)	78
2004	35 (58,3%)	2 (3,3%)	23 (38,3%)	60
2003	45 (76,3%)	5 (8,5%)	9 (15,3%)	59
2002	29 (53,7%)	4 (7,4%)	21 (38,9%)	54
2001	38 (73,1%)	1 (1,9%)	13 (25,0%)	52
2000	36 (73,5%)	1 (2,0%)	12 (24,5%)	49
1999	49 (79,0%)	0 (0,0%)	13 (21,0%)	62
1994-98	286 (85,9%)	1 (0,3%)	46 (13,8%)	333
Total	847 (62,5%)	126 (9,3%)	383 (28,2%)	1356

Figure 1: Annual numbers of operations



53 % of all operations were performed on the right side. 75,5 % performed in women. Mean age: 62 years.

Table 2: Elbow disease in primary operations

Year	Idiopathic osteo-arthritits	Rheumatoid arthritis	Sequelae after fracture	Mb. Becht-erew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	1	14	8			16			
2013	3	9	7		1	29		3	
2012	2	16	8			17		1	
2011	6	18	8			16		1	
2010	6	19	7			15		4	
2009	1	18	6		1	18	1	6	
2008	1	19	3			11	1	1	
2007	3	22	4			13		6	
2006	3	19	14			5		2	
2005	8	26	11	3	2	8		2	1
2004	3	23	3	2		6		2	2
2003	5	32	7			5		3	
2002	2	24	2			5		3	
2001	2	33	2	1		1	1		
2000	2	32	2			1		2	
1999		45	1			1		4	1
1994-98	8	263	14			4		7	4
Total	56	632	107	6	4	171	3	47	8

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in elbow prostheses

Table 3: Primary operations - Humerus

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014	16 (80,0%)	1 (5,0%)		3 (15,0%)	20
2013	25 (86,2%)	1 (3,4%)	2 (6,9%)	1 (3,4%)	29
2012	23 (88,5%)		3 (11,5%)		26
2011	26 (86,7%)		1 (3,3%)	3 (10,0%)	30
2010	30 (88,2%)		4 (11,8%)		34
2009	29 (85,3%)		4 (11,8%)	1 (2,9%)	34
2008	24 (82,8%)		2 (6,9%)	3 (10,3%)	29
2007	31 (88,6%)		4 (11,4%)		35
2006	24 (75,0%)		8 (25,0%)		32
2005	23 (59,0%)		16 (41,0%)		39
2004	16 (48,5%)		17 (51,5%)		33
2003	25 (56,8%)	3 (6,8%)	16 (36,4%)		44
2002	14 (48,3%)	3 (10,3%)	11 (37,9%)	1 (3,4%)	29
2001	12 (31,6%)	3 (7,9%)	23 (60,5%)		38
2000	19 (52,8%)	5 (13,9%)	12 (33,3%)		36
1999	16 (32,7%)	14 (28,6%)	18 (36,7%)	1 (2,0%)	49
1994-98	159 (59,3%)	66 (24,6%)	40 (14,9%)	3 (1,1%)	268
Total	512 (63,6%)	96 (11,9%)	181 (22,5%)	16 (2,0%)	805

Table 4: Primary operations - Ulna/radius

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014	19 (61,3%)	2 (6,5%)	8 (25,8%)	2 (6,5%)	31
2013	22 (51,2%)	1 (2,3%)	20 (46,5%)		43
2012	24 (55,8%)		19 (44,2%)		43
2011	39 (84,8%)		4 (8,7%)	3 (6,5%)	46
2010	44 (89,8%)		1 (2,0%)	4 (8,2%)	49
2009	37 (82,2%)		6 (13,3%)	2 (4,4%)	45
2008	29 (82,9%)		3 (8,6%)	3 (8,6%)	35
2007	42 (91,3%)		3 (6,5%)	1 (2,2%)	46
2006	35 (81,4%)		8 (18,6%)		43
2005	42 (82,4%)		9 (17,6%)		51
2004	28 (75,7%)		9 (24,3%)		37
2003	41 (82,0%)	4 (8,0%)	4 (8,0%)	1 (2,0%)	50
2002	19 (63,3%)	3 (10,0%)	8 (26,7%)		30
2001	30 (78,9%)	3 (7,9%)	5 (13,2%)		38
2000	25 (67,6%)	5 (13,5%)	6 (16,2%)	1 (2,7%)	37
1999	34 (69,4%)	13 (26,5%)	1 (2,0%)	1 (2,0%)	49
1994-98	197 (68,6%)	67 (23,3%)	22 (7,7%)	1 (0,3%)	287
Total	707 (73,6%)	98 (10,2%)	136 (14,2%)	19 (2,0%)	960

Prostheses used in elbow prostheses

Table 5: Primary operations - Humerus

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Norway	180						1				181
Kudo	162										162
Discovery	15	9	16	9	21	24	21	18	19	9	161
IBP	99	13	6	3	4	5	2	3	1		136
GSB III	32	1	10	9	7	5	2	4	3	3	76
NES	36	9	1	7	1						54
Mark II			2		1		1	1		1	6
Latitude Anatomic hemi									4	2	6
IBP Reconstruction	5										5
Other (n < 5)	7			1			3		2	5	18
Total	536	32	35	29	34	34	30	26	29	20	805

Table 6: Primary operations - Ulna/radius

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Norway	179										179
Kudo	162										162
Discovery	15	9	16	9	21	24	21	18	19	9	161
IBP	99	13	6	3	4	5	2	3	1		136
GSB III	32	1	10	9	7	5	2	4	3	3	76
rHead	14	9	6	4	9	9	8	1		2	62
NES	37	9	1	7	1						55
Acumed anatomic radial head				1			4	11	16	5	37
Radial Head	11	1	5	1	2	5					25
Silastic H.P. 100	20										20
Explor							2	2	3	4	11
Link radius							2	1		4	7
Mark II			2		1		1	1		1	6
Evolve	1	1		1				2			5
IBP Reconstruction	5										5
Other (n < 5)	4					1	4		1	3	13
Total	579	43	46	35	45	49	46	43	43	31	960

Reasons for revisions

Table 7:

Year	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2014	4	5		1	1	6	2	4	6	4	1
2013	4	3	1	2		8	2	1	10	8	
2012	1	3	2	1		7		1	5	8	
2011	3	5	2	1		1	2	2	3	3	1
2010	3	8	1	2	2	3	7	2	2	6	1
2009	6	11		3	2	2	5	4	5	11	
2008	6	5		1	4	6	4	3	2	6	
2007	5	12	1	2	1	4	1	5	4	10	
2006	11	13	2	3	1	3	4	1	2	7	1
2005	11	9	4	1	1	2	5	3	3		
2004	8	11	2	3		3	5	2	2	3	
2003	4	4	1			3	2	1		1	
2002	4	7	1	4	3	2	5	6	1	3	1
2001	7	8	1		1		1	4	1	1	1
2000	3	4	2	2			2	5	2	2	
1999	6	4	2			1	2	3		2	
1994-98	26	22	1	2	2	3	9	4		7	1
Total	112	134	23	28	18	54	58	51	48	82	7

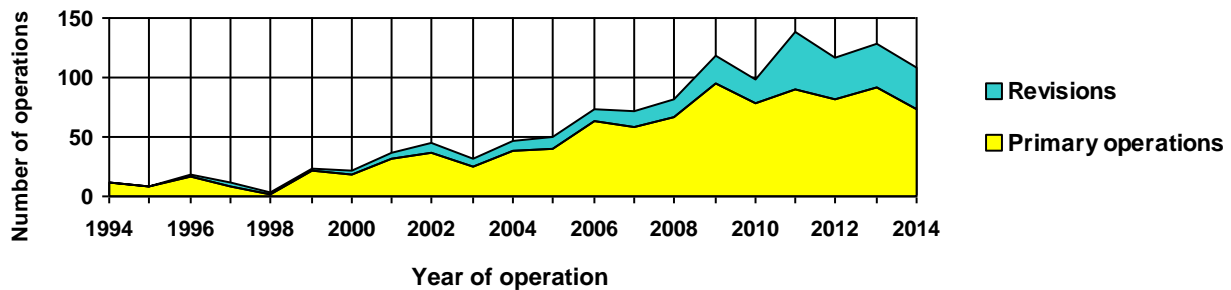
More than one reason for revision is possible

ANKLE PROSTHESES

Table 1: Annual number of operations

Year	Primary operations	Revisions	Total
2014	74 (68,5%)	34 (31,5%)	108
2013	92 (71,3%)	37 (28,7%)	129
2012	82 (70,7%)	34 (29,3%)	116
2011	90 (65,2%)	48 (34,8%)	138
2010	79 (79,8%)	20 (20,2%)	99
2009	95 (79,8%)	24 (20,2%)	119
2008	66 (80,5%)	16 (19,5%)	82
2007	58 (80,6%)	14 (19,4%)	72
2006	63 (86,3%)	10 (13,7%)	73
2005	40 (80,0%)	10 (20,0%)	50
2004	39 (83,0%)	8 (17,0%)	47
2003	25 (78,1%)	7 (21,9%)	32
2002	36 (80,0%)	9 (20,0%)	45
2001	32 (88,9%)	4 (11,1%)	36
2000	19 (86,4%)	3 (13,6%)	22
1999	22 (95,7%)	1 (4,3%)	23
1994-98	46 (85,2%)	8 (14,8%)	54
Total	958 (76,9%)	287 (23,1%)	1245

Figure 1: Annual numbers of operations



56,2 % of all operations were performed on the right side. 55,6 % performed in women. Mean age: 59,2 years.

Table 2: Ankle disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Bechterew Mb.	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	21	11	27	1	10			5	
2013	36	20	25	1	16			2	1
2012	21	8	44		9		1	2	
2011	32	18	35		5		1	3	
2010	22	20	29		9			5	
2009	31	26	27		13		1	1	
2008	20	15	24		7		2	2	
2007	13	16	20	2	6			2	
2006	19	14	24		5			5	
2005	15	9	18		3			1	
2004	8	10	17		1			3	1
2003	7	11	2	1				4	
2002	7	21	4	1				5	
2001	7	14	9	1				4	
2000	5	12	2					3	
1999	5	12	2	1	1			3	
1994-98	1	40	3					2	
Total	270	277	312	8	85	0	4	52	2

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in ankle prostheses

Table 3: Primary operations - Tibia

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			74 (100,0%)		74
2013			91 (100,0%)		91
2012			82 (100,0%)		82
2011			90 (100,0%)		90
2010			79 (100,0%)		79
2009	5 (5,3%)		88 (92,6%)	2 (2,1%)	95
2008	1 (1,5%)		61 (92,4%)	4 (6,1%)	66
2007			58 (100,0%)		58
2006			63 (100,0%)		63
2005	1 (2,5%)		39 (97,5%)		40
2004			39 (100,0%)		39
2003	1 (4,0%)		24 (96,0%)		25
2002			36 (100,0%)		36
2001			32 (100,0%)		32
2000			19 (100,0%)		19
1999			22 (100,0%)		22
1998			2 (100,0%)		2
1997	3 (37,5%)		5 (62,5%)		8
1996	7 (41,2%)	3 (17,6%)	7 (41,2%)		17
1995	5 (62,5%)	3 (37,5%)			8
1994	6 (54,5%)	4 (36,4%)		1 (9,1%)	11
Total	29 (3,0%)	10 (1,0%)	911 (95,2%)	7 (0,7%)	957

Table 4: Primary operations - Talus

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			74 (100,0%)		74
2013			91 (100,0%)		91
2012			82 (100,0%)		82
2011			90 (100,0%)		90
2010			79 (100,0%)		79
2009	5 (5,3%)		88 (92,6%)	2 (2,1%)	95
2008	1 (1,5%)		61 (92,4%)	4 (6,1%)	66
2007			58 (100,0%)		58
2006	1 (1,6%)		62 (98,4%)		63
2005	1 (2,5%)		39 (97,5%)		40
2004			39 (100,0%)		39
2003	1 (4,0%)	1 (4,0%)	23 (92,0%)		25
2002	1 (2,8%)		35 (97,2%)		36
2001			32 (100,0%)		32
2000			19 (100,0%)		19
1999			22 (100,0%)		22
1998			2 (100,0%)		2
1997	3 (37,5%)		5 (62,5%)		8
1996	7 (41,2%)	3 (17,6%)	7 (41,2%)		17
1995	5 (62,5%)	3 (37,5%)			8
1994	7 (63,6%)	4 (36,4%)			11
Total	32 (3,3%)	11 (1,1%)	908 (94,9%)	6 (0,6%)	957

Prostheses used in ankle prostheses

Table 5: Primary operations - Tibia

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Link S.T.A.R.	218	62	52	59	57	40	50	39	38		615
Mobility			4	2	25	26	16	12	15		100
Salto Talaris									26	62	88
CCI				4	12	13	17	12	11	9	78
Norwegian TPR	32										32
Rebalance							7	8			15
Salto Mobile								11	1		12
Hintegra	6	1	2	1	1						11
TM Total Ankle										3	3
AES	3										3
Total	259	63	58	66	95	79	90	82	91	74	957

Table 6: Primary operations - Talus

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Link S.T.A.R.	218	62	52	59	57	40	50	39	38		615
Mobility			4	2	25	26	16	12	15		100
Salto Talaris									22	61	83
CCI				4	12	13	17	12	11	9	78
Norwegian TPR	32										32
Rebalance							7	8			15
Salto Mobile								11	1		12
Hintegra	6	1	2	1	1						11
Salto XT									4	1	5
TM Total Ankle										3	3
AES	3										3
Total	259	63	58	66	95	79	90	82	91	74	957

Reasons for revisions

Table 7:

Year	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2014	14	11		1	4	1		14	8	3	
2013	6	3	1	5	9	3	1	14	18	4	
2012	7	4		2	1	3	1	14	9	3	
2011	9	6	1	8	7	5	1	17	10	2	
2010	2	1		3	3	1	2	12	3	3	
2009	7	3	1	5	7	3	1	9	4		
2008	3	4	1	2	5		1	4	2	3	
2007	2	2		2	1	1		7	3	1	
2006	3	2		2	2	1	1	4	1		
2005	1	3		1	2	1		4	1	1	
2004	5	4		1	1	2		1	1	1	
2003	3	3			2	1		2	1		
2002	4	1		1	1			4	1		
2001	2	2						2		1	
2000	2				2			2			
1999				1	1		1				
1994-98	7	7		1	1			2		1	
Total	77	56	4	35	49	22	9	112	62	23	0

More than one reason for revision is possible

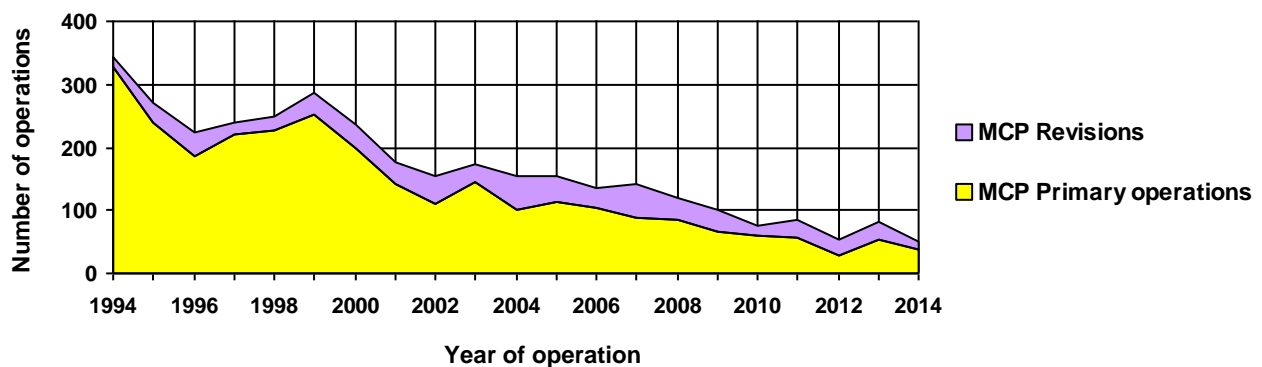
FINGER JOINT PROSTHESES

Table 1: Annual number of operations - MCP

Year	Primary operations	Revisions	Total
2014	38 (77,6%)	11 (22,4%)	49
2013	55 (67,9%)	26 (32,1%)	81
2012	27 (50,9%)	26 (49,1%)	53
2011	57 (66,3%)	29 (33,7%)	86
2010	59 (76,6%)	18 (23,4%)	77
2009	66 (65,3%)	35 (34,7%)	101
2008	84 (70,0%)	36 (30,0%)	120
2007	88 (61,5%)	55 (38,5%)	143
2006	104 (77,6%)	30 (22,4%)	134
2005	112 (72,7%)	42 (27,3%)	154
2004	101 (66,0%)	52 (34,0%)	153
2003	145 (83,8%)	28 (16,2%)	173
2002	110 (71,4%)	44 (28,6%)	154
2001	141 (79,7%)	36 (20,3%)	177
2000	198 (83,9%)	38 (16,1%)	236
1999	253 (88,5%)	33 (11,5%)	286
1994-98	1200 (90,7%)	123 (9,3%)	1323
Total	2838 (81,1%)	662 (18,9%)	3500

Table 2: Annual number of operations - PIP

Year	Primary operations	Revisions	Total
2014	4 (100,0%)		4
2013	6 (100,0%)		6
2011	3 (100,0%)		3
2010	6 (100,0%)		6
2009	3 (100,0%)		3
2008	4 (57,1%)	3 (42,9%)	7
2007	6 (85,7%)	1 (14,3%)	7
2006	7 (87,5%)	1 (12,5%)	8
2005	6 (85,7%)	1 (14,3%)	7
2004	7 (87,5%)	1 (12,5%)	8
2003		1 (100,0%)	1
2002	6 (100,0%)		6
2001	2 (100,0%)		2
2000	4 (100,0%)		4
1999	7 (100,0%)		7
1994-98	12 (66,7%)	6 (33,3%)	18
Total	83 (85,6%)	14 (14,4%)	97

Figure 1: Annual number of operations


61,3 % of all operations were performed on the right side. 88 % performed in women. Mean age: 61,3 years.

Reasons for primary operations

Table 3: MCP prostheses - Finger disease

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014		27					1	8	
2013		53	1					3	
2012		25	1					1	
2011	1	50						6	
2010	3	53	1					2	
2009	2	62						2	
2008	2	81						1	
2007	2	85		1				4	
2006	10	91	1		1			3	
2005	9	91	9				1	3	1
2004	5	95						1	1
2003	1	132		3				9	
2002	2	103						6	
2001	5	132						5	
2000	9	186					1	3	
1999	2	249		3				2	
1998	12	213		1		1		5	1
1997	3	215						5	
1996		181		1				5	
1995	1	228	3					9	
1994		323						5	
Total	69	2675	16	9	1	1	3	88	3

More than one reason for primary operation is possible

Table 4: PIP prostheses - Finger disease

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	3		1						
2013	1	5							
2011		2	1						
2010		2	2		1			1	
2009	2						1		
2008	2		1					1	
2007	3		1		1				1
2006	4	3							
2005	4	2	1						
2004	6	1						1	
2002	3	2	1					2	
2001		2							
2000	1	3							
1999	1	6						1	
1998		4							
1996	1	2	1			1			
1995		1				1			
1994		1							
Total	31	36	9	0	2	2	1	6	1

More than one reason for primary operation is possible

Use of cement in MCP prostheses

Table 5: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			35 (97,2%)	1 (2,6%)	36
2013			52 (98,1%)	1 (1,9%)	53
2012			27 (100,0%)		27
2011			57 (100,0%)		57
2010			59 (100,0%)		59
2009			66 (100,0%)		66
2008	1 (1,2%)		83 (98,8%)		84
2007			88 (100,0%)		88
2006			103 (99,0%)	1 (1,0%)	104
2005		2 (1,8%)	109 (97,3%)	1 (0,9%)	112
2004	1 (1,0%)		100 (99,0%)		101
2003			145 (100,0%)		145
2002			108 (99,1%)	1 (0,9%)	109
2001	1 (0,7%)		140 (99,3%)		141
2000		1 (0,5%)	197 (99,5%)		198
1999			253 (100,0%)		253
1998			228 (100,0%)		228
1997			216 (98,6%)	3 (1,4%)	219
1996			187 (100,0%)		187
1995			238 (100,0%)		238
1994			326 (99,4%)	2 (0,6%)	328
Total	3 (0,1%)	3 (0,1%)	2 817 (99,4%)	10 (0,4%)	2 833

Table 6: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			1 (100,0%)		1
2011			2 (100,0%)		2
2010			1 (100,0%)		1
2009			1 (100,0%)		1
2008			2 (100,0%)		2
2007			2 (100,0%)		2
2006			7 (100,0%)		7
2005			4 (100,0%)		4
2004			1 (100,0%)		1
2003			1 (100,0%)		1
2002			5 (100,0%)		5
2001			1 (100,0%)		1
2000			1 (100,0%)		1
1996			2 (100,0%)		2
1995			4 (100,0%)		4
Total			35 (100,0%)		35

Use of cement in PIP prostheses

Table 7: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			4 (100,0%)		4
2013			5 (83,3%)	1 (16,7%)	6
2011			2 (66,7%)	1 (33,3%)	3
2010			6 (100,0%)		6
2009			3 (100,0%)		3
2008			4 (100,0%)		4
2007			5 (100,0%)		5
2006			7 (100,0%)		7
2005			6 (100,0%)		6
2004			7 (100,0%)		7
2002			6 (100,0%)		6
2001			2 (100,0%)		2
2000			4 (100,0%)		4
1999			7 (100,0%)		7
1998			4 (100,0%)		4
1996			5 (100,0%)		5
1995			2 (100,0%)		2
1994			1 (100,0%)		1
Total			80 (97,6%)	2 (2,4%)	82

Table 8: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			1 (100,0)		1
2011			2 (100,0)		2
2010			2 (100,0)		2
2008			1 (100,0)		1
2007			2 (100,0)		2
2006			4 (80,0%)	1 (20,0%)	5
2005			5 (100,0)		5
2004			5 (100,0)		5
2002			1 (100,0)		1
1996			3 (100,0)		3
1995			1 (100,0)		1
Total			27 (96,4%)	1 (3,6%)	28

Finger prostheses

Table 9: MCP prostheses in primary operations - Proximal

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Silastic HP 100	1514	80	80	81	61	53	49	27	25		1970
Avanta	543	10	1			1					555
NeuFlex	181	7	5	1	4						198
Silastic HP 100 II						4	6		28	37	75
Ascension MCP	14	7	2	2	1	1	2			1	30
MCS	6										6
Moje	1										1
Total	2259	104	88	84	66	59	57	27	53	38	2835

Table 10: MCP prostheses in primary operations - Distal

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Ascension MCP	12	7	2	2	1	1	2			1	28
MCS	6										6
Moje	1										1
Total	19	7	2	2	1	1	2			1	35

Table 11: PIP prostheses in primary operations - Proximal

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Silastic HP 100	19	2							4	2	27
Ascension MCP	10	5	2	1							18
SR Avanta			3	3	3	4	1		1	1	16
NeuFlex	7										7
Ascension PIP PyroCarbon						2	2			1	5
MCS	4										4
Avanta	3								1		4
Moje	1										1
Total	44	7	5	4	3	6	3		6	4	82

Table 12: PIP prostheses in primary operations - Distal

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Ascension MCP	10	5	2	1							18
Ascension PIP PyroCarbon						2	2			1	5
MCS	4										4
Moje	2										2
Total	16	5	2	1		2	2			1	29

Finger prostheses - Reasons for revisions

Table 13: MCP prostheses - Reasons for revisions

Year	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Fractured/defect component	Other	Missing
2014		1		4					1		5	
2013				4	13			13		10	1	
2012			1	2	4			10	4	13	1	
2011					6	2		13		12	8	
2010	1	1	2				2	3		10	3	
2009	2	2	3	2	2	4		7	3	22	5	
2008		1	2	4	15	4		13	5	10	5	
2007		3	11	8	2	1		16		39		4
2006			4	10	4	1		7	4	11		1
2005			5	6	6			12	5	24	4	2
2004	2	5		8	8			12		30	5	4
2003		1	1		9			8	1	17	2	
2002		3		12	7			15		27	4	1
2001		3	3	4	7			11	3	9	9	2
2000		2	1	2	1	4	8	4		20	5	1
1999		1	4	3	6		4	7		14	8	
1998		1	1	3	5		1	2		11	1	
1997		1	3	4	4	1		8		11	1	
1996				8				13		22	7	2
1995	4				4		7	12		13	5	
1994					1		1	1		2	4	6
Total	9	25	41	84	104	17	23	187	26	327	83	23

Revision reasons are not mutually exclusive. More than one reason for revision is possible

Table 14: PIP prostheses - Reasons for revisions

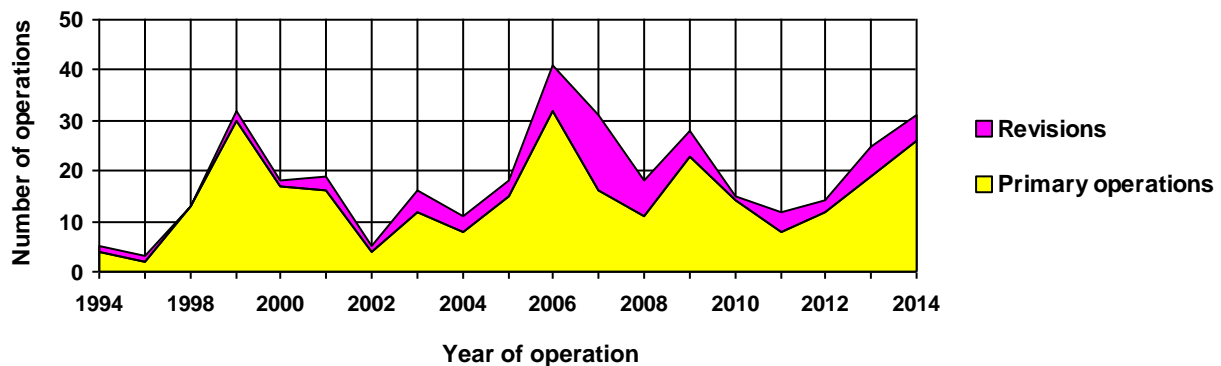
Year	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Fractured/defect component	Other	Missing
2008	1	1	1	1	1			2				
2007								1			1	
2006					1							
2005										1		
2004	1	1										
2003	1	1										
1998				1						1		
1997										4		
1996	1											
Total	4	3	1	2	2	0	0	3	0	6	1	0

Revision reasons are not mutually exclusive. More than one reason for revision is possible

WRIST PROSTHESES

Table 1: Annual number of operations

Year	Primary operations	Revisions	Total
2014	26 (83,9%)	5 (16,1%)	31
2013	19 (76,0%)	6 (24,0%)	25
2012	12 (85,7%)	2 (14,3%)	14
2011	8 (66,7%)	4 (33,3%)	12
2010	14 (93,3%)	1 (6,7%)	15
2009	23 (82,1%)	5 (17,9%)	28
2008	11 (61,1%)	7 (38,9%)	18
2007	16 (51,6%)	15 (48,4%)	31
2006	32 (78,0%)	9 (22,0%)	41
2005	15 (83,3%)	3 (16,7%)	18
2004	8 (72,7%)	3 (27,3%)	11
2003	12 (75,0%)	4 (25,0%)	16
2002	4 (80,0%)	1 (20,0%)	5
2001	16 (84,2%)	3 (15,8%)	19
2000	17 (94,4%)	1 (5,6%)	18
1999	30 (93,8%)	2 (6,3%)	32
1998	13 (100,0%)		13
1995	2 (66,7%)	1 (33,3%)	3
1994	4 (80,0%)	1 (20,0%)	5
Total	282 (79,4%)	73 (20,6%)	355

Figure 1: Annual number of operations


56,9 % of all operations were performed on the right side. 67,6 % performed in women Mean age: 55 years.

Table 2: Wrist disease in primary operations

Year	Idiopathic osteo-arthriti	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	7	1	11		8			3	
2013	4	3	5		3		1	3	
2012	3	5	2		2			1	
2011	1	3	4					2	
2010		4	4		4			2	
2009	4	5	9		4		1	1	
2008	4	2	2		2				1
2007	1	6	6		1			2	
2006	5	19	6		1			3	
2005	5		4					6	
2004		8							
2003	1	5	3					3	
2002		4							
2001		14	2						
2000		16						1	
1999	2	27						1	
1998		12						1	
1995		2							
1994		2		1				1	
Total	37	138	58	1	25	0	2	30	1

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in wrist prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			24 (100,0%)		24
2013			19 (100,0%)		19
2012			11 (91,7%)	1 (8,3%)	12
2011			8 (100,0%)		8
2010			14 (100,0%)		14
2009			21 (91,3%)	2 (8,7%)	23
2008			10 (100,0%)		10
2007			16 (100,0%)		16
2006			32 (100,0%)		32
2005			15 (100,0%)		15
2004	2 (25,0%)		6 (75,0%)		8
2003	1 (8,3%)		11 (91,7%)		12
2002			4 (100,0%)		4
2001	1 (6,3%)	1 (6,3%)	14 (87,5%)		16
2000	3 (17,6%)		14 (82,4%)		17
1999			29 (96,7%)	1 (3,3%)	30
1998			13 (100,0%)		13
1995			2 (100,0%)		2
1994			4 (100,0%)		4
Total	7 (2,5%)	1 (0,4%)	267 (95,7%)	4 (1,4%)	279

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			24 (100,0%)		24
2013			19 (100,0%)		19
2012			12 (100,0%)		12
2011			8 (100,0%)		8
2010			14 (100,0%)		14
2009			20 (95,2%)	1 (4,8%)	21
2008			9 (100,0%)		9
2007			15 (100,0%)		15
2006			32 (100,0%)		32
2005			15 (100,0%)		15
2004	4 (50,0%)		4 (50,0%)		8
2003	3 (25,0%)		9 (75,0%)		12
2002			3 (100,0%)		3
2001	1 (6,7%)		14 (93,3%)		15
2000	1 (5,9%)		16 (94,1%)		17
1999			30 (100,0%)		30
1998			13 (100,0%)		13
Total	9 (3,4%)		257 (96,3%)	1 (0,4%)	267

Wrist prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Motec Wrist ¹		32	15	9	21	14	5	5	4	8	113
Biax	90										90
Remotion Wrist							3	3	10	11	27
Elos ¹	23										23
Scheker Radio-ulnar			1	1				1	3	3	9
Uhead (Druj)								3	2	2	7
Silastic ulnar head	7										7
Eclipse radio-ulnar					2						2
TMW	1										1
Total	121	32	16	10	23	14	8	12	19	24	279

Table 6: Primary operations - Distal

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Motec Wrist ¹		32	15	9	21	14	5	5	4	8	113
Biax	89										89
Remotion Wrist							3	3	10	11	27
Elos ¹	23										23
Uhead (Druj)								3	2	2	7
Scheker Radio-ulnar								1	3	3	7
TMW	1										1
Total	113	32	15	9	21	14	8	12	19	24	267

Table 7: Reasons for revisions

Year	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing	Total
2014		1				1		1		3		6
2013		1			1	1		3	1	1		8
2012					2			1				3
2011		2			1	1		2				6
2010									1			1
2009		2		1	1	1		3				8
2008		4	1			2		2		1		10
2007		6		1	1	5		3	1	2		19
2006	3	5				2				1		11
2005		2		1								3
2004	1	1			2	1		2				7
2003		1			1			2				4
2002			1									1
2001		2		1	2			1				6
2000		1										1
1999	1				1	1		1				4
1995								1				1
1994								1				1
Total	5	28	2	4	12	15	0	23	2	9	0	100

Revision reasons are not mutually exclusive. More than one reason for revision is possible

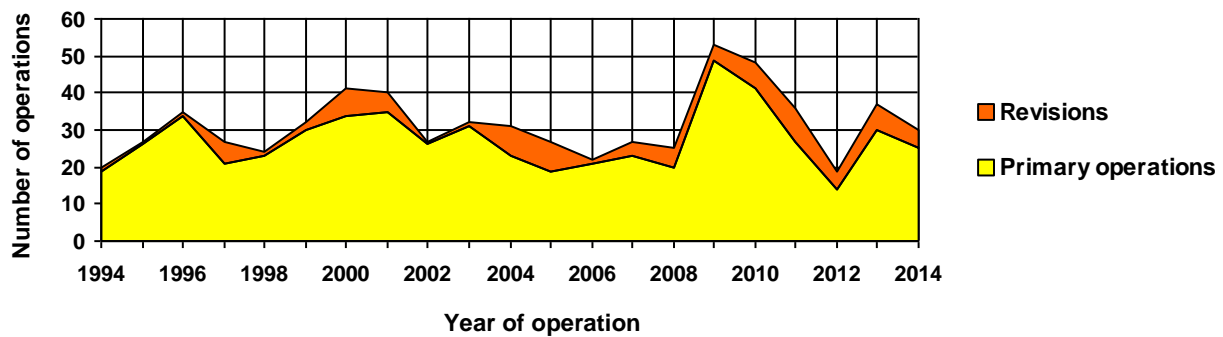
¹Elos are 3 different development models of Motec Wrist. Motec Wrist was previously sold under the name Gibbon.

CARPOMETACARPAL PROSTHESES (CMC I)

Table 1: Annual number of operations

Year	Primary operations	Revisions	Total
2014	25 (83,3%)	5 (16,7%)	30
2013	30 (81,1%)	7 (18,9%)	37
2012	14 (73,7%)	5 (26,3%)	19
2011	27 (75,0%)	9 (25,0%)	36
2010	41 (85,4%)	7 (14,6%)	48
2009	49 (92,5%)	4 (7,5%)	53
2008	20 (80,0%)	5 (20,0%)	25
2007	23 (85,2%)	4 (14,8%)	27
2006	21 (95,5%)	1 (4,5%)	22
2005	19 (70,4%)	8 (29,6%)	27
2004	23 (74,2%)	8 (25,8%)	31
2003	31 (96,9%)	1 (3,1%)	32
2002	26 (96,3%)	1 (3,7%)	27
2001	35 (87,5%)	5 (12,5%)	40
2000	34 (82,9%)	7 (17,1%)	41
1999	30 (93,8%)	2 (6,3%)	32
1994-98	123 (92,5%)	10 (7,5%)	133
Total	571 (86,5%)	89 (13,5%)	660

Figure 1: Annual number of operations



48,3 % of all operations were performed on the right side. 83,5 % performed in women. Mean age: 62,9 years.

Table 2: Carpometacarpal disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Sequelae Bechterew Mb.	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	22	2						1	
2013	23	5		1				1	
2012	13	1							
2011	26		1						
2010	37	4							
2009	47	2						1	
2008	17	3							
2007	17	6						1	
2006	15	4						2	
2005	16	2						1	
2004	21							2	
2003	23	5						3	
2002	20	5						1	
2001	25	8		1				1	
2000	27	4		1				3	
1999	18	10	2	1				1	
1994-98	77	45		1				3	
Total	444	106	3	5	0	0	0	21	0

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in carpometacarpal prostheses

Table 3: Primary operations - Proximal (Single-component)

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			24 (96,0%)	1 (4,0%)	25
2013			30 (100,0%)		30
2012			14 (100,0%)		14
2011			27 (100,0%)		27
2010			40 (97,6%)	1 (2,4%)	41
2009			44 (91,7%)	4 (8,3%)	48
2008			20 (100,0%)		20
2007			23 (100,0%)		23
2006			21 (100,0%)		21
2005			19 (100,0%)		19
2004			23 (100,0%)		23
2003	1 (3,2%)		30 (96,8%)		31
2002	1 (3,8%)		25 (96,2%)		26
2001			35 (100,0%)		35
2000			34 (100,0%)		34
1999	1 (3,3%)		29 (96,7%)		30
1994-98			122 (99,2%)	1 (0,8%)	123
Total	3 (0,5%)		560 (98,2%)	7 (1,2%)	570

Carpometacarpal prostheses - Prosthesis brand

Table 4: Primary operations - Proximal (Single-component)

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Silastic Trapezium	239	19	23	17	16	11	9	6	8	8	356
Swanson Titanium Basal	71					1					72
Motec					21	17	15	2			55
Elektra		2		3	10	12	3	5	4	5	44
Motec II								1	18	12	31
Avanta Trapezium	6				1						7
Custom made	5										5
Total	321	21	23	20	48	41	27	14	30	25	570

Reasons for revisions

Table 5:

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2014	2		2							1	
2013	3		4					1			
2012	4		1					1			
2011	7		2				1	5			
2010	4		3	2		1		3			
2009	1		2					1		1	
2008			2					4			
2007			1	3				1			
2006			1								
2005			4	1				7	1	2	
2004	1		3					6		1	
2003			1								
2002											1
2001			4	1				4	1	1	
2000				2				6			
1999			1					1		1	
1994-98	1		5					3		4	
Total	23	0	36	9	0	1	1	43	2	11	1

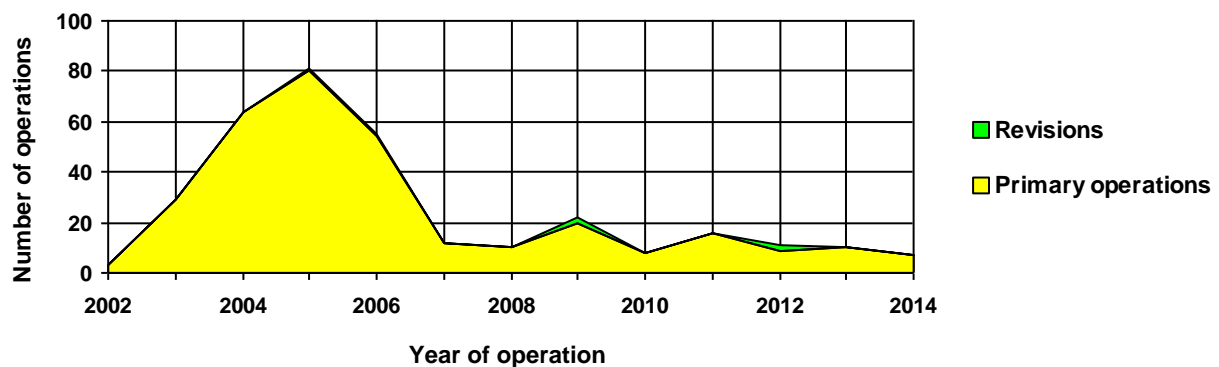
Revision reasons are not mutually exclusive. More than one reason for revision is possible

LUMBAR DISC PROSTHESES

Table 1: Annual number of operations

Year	Primary operations	Revisions	Total
2014	7 (100,0%)		7
2013	10 (100,0%)		10
2012	9 (81,8%)	2 (18,2%)	11
2011	16 (100,0%)		16
2010	8 (100,0%)		8
2009	20 (90,9%)	2 (9,1%)	22
2008	10 (100,0%)		10
2007	12 (100,0%)		12
2006	54 (98,2%)	1 (1,8%)	55
2005	80 (98,8%)	1 (1,2%)	81
2004	64 (100,0%)		64
2003	29 (100,0%)		29
2002	3 (100,0%)		3
Total	322 (98,2%)	6 (1,8%)	328

Figure 1: Annual number of operations



60,7 % performed in women. Mean age: 43,5 years.

Table 2: Back disease - Primary operations

Year	Idiopathic osteoarthritis	Sequelae after fracture	Spondylitis	Sequelae after prolapse surgery	Disc degeneration	Sequelae of infection	Other	Missing
2014			5		2			
2013				1	9			
2012					9			
2011			6		10			
2010				1	6		2	
2009				2	18		1	
2008				4	8		1	
2007				2	12			
2006	2		26	11	22		1	
2005	6	1	52	19	17		2	
2004	1		49			1	15	
2003			22	3			4	
2002	1		1				1	
Totalt	10	1	161	43	113	1	27	0

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in lumbar disc prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			7 (100,0%)		7
2013			10 (100,0%)		10
2012			9 (100,0%)		9
2011			16 (100,0%)		16
2010			8 (100,0%)		8
2009			20 (100,0%)		20
2008			10 (100,0%)		10
2007			12 (100,0%)		12
2006			54 (100,0%)		54
2005			80 (100,0%)		80
2004			64 (100,0%)		64
2003			29 (100,0%)		29
2002			3 (100,0%)		3
Total			322 (100,0%)		322

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			7 (100,0%)		7
2013			10 (100,0%)		10
2012			9 (100,0%)		9
2011			16 (100,0%)		16
2010			8 (100,0%)		8
2009			20 (100,0%)		20
2008	2 (20,0%)		8 (80,0%)		10
2007			11 (91,7%)	1 (8,3%)	12
2006	1 (1,9%)		52 (96,3%)	1 (1,9%)	54
2005			80 (100,0%)		80
2004			64 (100,0%)		64
2003			29 (100,0%)		29
2002			3 (100,0%)		3
Total	3 (0,9%)		317 (98,4%)	2 (0,6%)	322

Lumbar disc prostheses - Prosthesis brand

Table 5: Primary operations - Proximal

Prostheses	2002-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Prodisc	162	48	4	2		4	16	9	10	7	262
Charité	15	7	8	8	20	4					62
Total	177	55	12	10	20	8	16	9	10	7	324

Table 6: Primary operations - Distal

Prostheses	2002-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Prodisc	162	48	4	2		4	16	9	10	7	262
Charité	15	7	8	8	20	4					62
Total	177	55	12	10	20	8	16	9	10	7	324

SHOULDER PROSTHESES

Table 1: Annual number of operations - Anatomic total shoulder prostheses

Year	Primary operations	Revisions	Total
2014	140 (93,3%)	10 (6,7%)	150
2013	116 (90,6%)	12 (9,4%)	128
2012	83 (83,0%)	17 (17,0%)	100
2011	94 (91,3%)	9 (8,7%)	103
2010	79 (85,9%)	13 (14,1%)	92
2009	65 (91,5%)	6 (8,5%)	71
2008	42 (80,8%)	10 (19,2%)	52
2007	32 (78,0%)	9 (22,0%)	41
2006	20 (83,3%)	4 (16,7%)	24
1994-05	70 (72,2%)	27 (27,8%)	97
Total	741 (86,4%)	117 (13,6%)	858

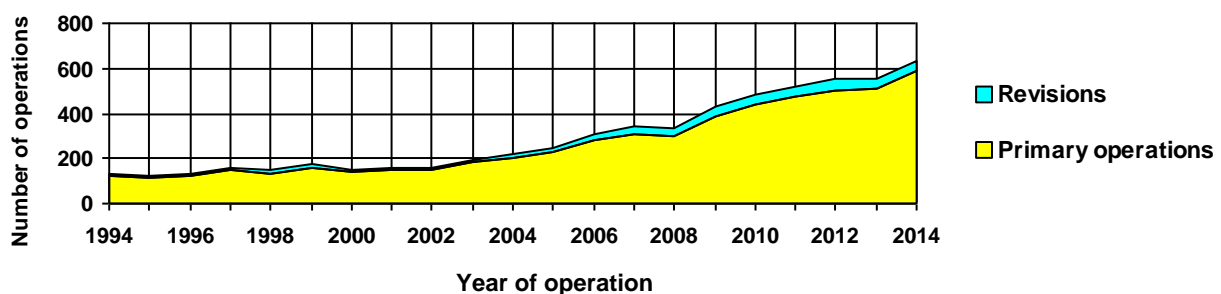
Table 2: Annual number of operations - Reverse total shoulder prostheses

Year	Primary operations	Revisions	Total
2014	300 (89,8%)	34 (10,2%)	334
2013	253 (89,7%)	29 (10,3%)	282
2012	216 (86,1%)	35 (13,9%)	251
2011	161 (87,0%)	24 (13,0%)	185
2010	131 (86,2%)	21 (13,8%)	152
2009	100 (80,6%)	24 (19,4%)	124
2008	76 (84,4%)	14 (15,6%)	90
2007	61 (81,3%)	14 (18,7%)	75
2006	41 (71,9%)	16 (28,1%)	57
1994-05	225 (84,3%)	42 (15,7%)	267
Total	1564 (86,1%)	253 (13,9%)	1817

Table 3: Annual number of operations - Shoulder hemiprosthesis

Year	Primary operations	Revisions	Total
2014	147 (97,4%)	4 (2,6%)	151
2013	139 (95,2%)	7 (4,8%)	146
2012	198 (96,1%)	8 (3,9%)	206
2011	221 (97,4%)	6 (2,6%)	227
2010	232 (96,3%)	9 (3,7%)	241
2009	222 (95,7%)	10 (4,3%)	232
2008	182 (94,8%)	10 (5,2%)	192
2007	215 (95,6%)	10 (4,4%)	225
2006	216 (96,9%)	7 (3,1%)	223
1994-05	1544 (94,2%)	95 (5,8%)	1639
Total	3316 (95,2%)	166 (4,8%)	3482

Figure 1: Annual number of operations - All prostheses



53,3 % of all operations were performed on the right side. 72,5 % performed in women. Mean age: 69,5 years.

Reasons for primary operations

Table 4: Shoulder disease in primary operations - Anatomic total shoulder prostheses

Year	Idiopathic osteo-arthrititis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	113	5	17		3			3	
2013	98	3	11		2	1	1	2	
2012	72	1	4	1	2	1		3	
2011	81	5	10				1		
2010	66	3	3		2			4	1
2009	44	7	12		1		1	2	
2008	30	3	3			2		4	
2007	24	2	3		1			2	
2006	12	2				2	1	3	
1994-05	39	13	13	1				5	1
Total	579	44	76	2	11	6	4	28	2

Diseases are not mutually exclusive. More than one reason for operation is possible.

Table 5: Shoulder disease in primary operations - Reverse total shoulder prostheses

Year	Idiopathic osteo-arthrititis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	115	22	44	2	18	83	2	51	
2013	88	26	37		14	76	1	29	
2012	61	19	50		24	43	4	43	
2011	46	21	30	1	9	30	1	44	1
2010	41	27	26		5	12	4	29	1
2009	42	19	15	1	1	9	2	17	
2008	22	19	19	1	1	5	1	12	
2007	11	13	20			3		18	1
2006	8	14	14		1			8	
1994-05	50	118	34	1	1	4	2	26	
Total	484	298	289	6	74	265	17	277	3

Diseases are not mutually exclusive. More than one reason for operation is possible.

Table 6: Shoulder disease in primary operations - Shoulder hemiprotheses

Year	Idiopathic osteo-arthrititis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	36		17		1	89		8	
2013	46	2	11		1	79		8	
2012	43	6	16	2		126		8	
2011	62	11	31			117		7	
2010	72	15	32	1		110		6	
2009	64	21	33		3	102		9	1
2008	53	24	31	1		70		8	3
2007	70	27	34	2	2	78		7	1
2006	76	32	49		1	53	5	11	2
1994-05	344	430	304	14	8	426	6	86	8
Total	866	568	558	20	16	1250	11	158	15

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in shoulder prostheses

Table 7: Anatomic total shoulder prostheses - Primary operations - Glenoid

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2014	119 (85,6%)		16 (11,5%)	4 (2,9%)	139
2013	91 (79,8%)		23 (20,2%)		114
2012	68 (85,0%)		11 (13,8%)	1 (1,3%)	80
2011	79 (84,0%)		14 (14,9%)	1 (1,1%)	94
2010	64 (82,1%)		13 (16,7%)	1 (1,3%)	78
2009	43 (68,3%)		19 (30,2%)	1 (1,6%)	63
2008	30 (73,2%)		5 (12,2%)	6 (14,6%)	41
2007	22 (71,0%)	1 (3,2%)	8 (25,8%)		31
2006	5 (38,5%)		5 (38,5%)	3 (23,1%)	13
1994-05	16 (22,9%)	2 (2,9%)	52 (74,3%)		70
Total	537 (74,3%)	3 (0,4%)	166 (23,0%)	17 (2,4%)	723

Table 8: Anatomic total shoulder prostheses - Primary operations - Humerus

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2014	24 (17,9%)	1 (0,7%)	107 (79,9%)	2 (1,5%)	134
2013	60 (52,6%)		53 (46,5%)	1 (0,9%)	114
2012	47 (60,3%)		30 (38,5%)	1 (1,3%)	78
2011	59 (64,1%)		33 (35,9%)		92
2010	55 (73,3%)		19 (25,3%)	1 (1,3%)	75
2009	38 (59,4%)		24 (37,5%)	2 (3,1%)	64
2008	29 (69,0%)		6 (14,3%)	7 (16,7%)	42
2007	19 (59,4%)		13 (40,6%)		32
2006	10 (50,0%)		7 (35,0%)	3 (15,0%)	20
1994-05	17 (30,4%)	1 (1,8%)	36 (64,3%)	2 (3,6%)	56
Total	358 (50,6%)	2 (0,3%)	328 (46,4%)	19 (2,7%)	707

Table 9: Reverse total shoulder prostheses - Primary operations - Glenoid

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2014	9 (3,0%)		291 (97,0%)		300
2013	2 (0,8%)		251 (99,2%)		253
2012	1 (0,5%)	1 (0,5%)	213 (98,6%)	1 (0,5%)	216
2011	1 (0,6%)	1 (0,6%)	158 (98,1%)	1 (0,6%)	161
2010	6 (4,6%)	1 (0,8%)	122 (93,1%)	2 (1,5%)	131
2009	2 (2,0%)		96 (96,0%)	2 (2,0%)	100
2008	1 (1,3%)		65 (85,5%)	10 (13,2%)	76
2007	6 (9,8%)		55 (90,2%)		61
2006	6 (14,6%)		35 (85,4%)		41
1994-05	15 (6,7%)	1 (0,4%)	209 (92,9%)		225
Total	49 (3,1%)	4 (0,3%)	1 495 (95,6%)	16 (1,0%)	1 564

Table 10: Reverse total shoulder prostheses - Primary operations - Humerus

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2014	179 (59,7%)	1 (0,3%)	114 (38,0%)	6 (2,0%)	300
2013	142 (56,1%)	1 (0,4%)	108 (42,7%)	2 (0,8%)	253
2012	139 (64,4%)		77 (35,6%)		216
2011	98 (60,9%)	1 (0,6%)	60 (37,3%)	2 (1,2%)	161
2010	72 (55,0%)		57 (43,5%)	2 (1,5%)	131
2009	50 (50,0%)		48 (48,0%)	2 (2,0%)	100
2008	52 (68,4%)		16 (21,1%)	8 (10,5%)	76
2007	44 (72,1%)		17 (27,9%)		61
2006	21 (51,2%)		19 (46,3%)	1 (2,4%)	41
1994-05	61 (27,1%)	1 (0,4%)	163 (72,4%)		225
Total	858 (54,9%)	4 (0,3%)	679 (43,4%)	23 (1,5%)	1 564

Table 11: Shoulder hemiprotheses - Primary operations - Humerus

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2014	84 (61,8%)		48 (35,3%)	4 (2,9%)	136
2013	80 (65,0%)		43 (35,0%)		123
2012	140 (74,1%)	1 (0,5%)	48 (25,4%)		189
2011	133 (61,9%)	2 (0,9%)	69 (32,1%)	11 (5,1%)	215
2010	138 (60,5%)	2 (0,9%)	83 (36,4%)	5 (2,2%)	228
2009	121 (54,8%)		79 (35,7%)	21 (9,5%)	221
2008	89 (48,9%)	2 (1,1%)	49 (26,9%)	42 (23,1%)	182
2007	120 (55,8%)		48 (22,3%)	47 (21,9%)	215
2006	106 (49,1%)		59 (27,3%)	51 (23,6%)	216
1994-05	819 (53,1%)	40 (2,6%)	556 (36,1%)	126 (8,2%)	1 541
Total	1 830 (56,0%)	47 (1,4%)	1 082 (33,1%)	307 (9,4%)	3 266

Anatomic total shoulder prostheses

Table 12: Primary operations - Glenoid

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Aequalis		3	15	22	31	51	51	32	38	4	247
Global	1	2	5	8	20	14	18	14	30	9	121
Aequalis Ascend Flex Anatomic									11	81	92
Bio - Modular	42	1	6		1						50
Tess-Anatomic				3	7	8	14	7	3	3	45
Global Advantage	3		1						2	18	24
Simpliciti								10	10		20
Bigliani/Flatow		1	3	6	1		2	4	1	2	20
Anatomical shoulder								5	8	2	15
Nottingham	13										13
Elos	6	6	1								13
JR-Vaios Anatomic									4	8	12
ECLIPSE TM							1	3	2	4	10
Other (n < 10)	4			2	3	5	8	5	5	8	40
Total	69	13	31	41	63	78	94	80	114	139	722

Table 13: Primary operations - Caput humeri

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Aequalis		3	15	22	31	51	51	33	36	6	248
Global Advantage	3	3	7	8	19	14	18	14	31	27	144
Aequalis Ascend Flex Anatomic									12	66	78
Bio - Modular	37	6	5		1						49
Tess-Anatomic				3	8	8	14	7	4	3	47
Simpliciti								10	12	13	35
Bigliani/Flatow		1	3	7	1		2	4	1	2	21
Nottingham	13	2	1								16
ECLIPSE TM						3	2	4	2	4	15
Anatomical shoulder								5	8	2	15
JR-Vaios Anatomic									4	8	12
Promos standard								1	4	5	10
Other (n < 10)	1	1		2	4	2	7	4	3	3	27
Total	54	16	31	42	64	78	94	82	117	139	717

Table 14: Primary operations - Humerus

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Aequalis		3	15	22	31	51	51	33	36	6	248
Global Advantage	3	2	7	8	18	14	18	14	31	26	141
Aequalis Ascend Flex Anatomic									12	63	75
Bio - Modular	35	7	6	1	1						50
Tess-Anatomic				3	8	8	14	7	4	3	47
Simpliciti								10	12	14	36
Bigliani/Flatow		1	3	6	1		2	4	1	2	20
Nottingham	13	1	1								15
Anatomical shoulder								5	8	1	14
JR-Vaios Anatomic									3	8	11
Promos standard								1	4	5	10
Other (n < 10)	4	5		2	5	2	7	4	3	3	35
Total	55	19	32	42	64	75	92	78	114	131	702

Reverse total shoulder prostheses

Table 15: Primary operations - Glenoid

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Delta Xtend	1		14	50	64	91	114	147	142	178	801
Delta III	224	41	41	5	1	1					313
Tess Reversed				15	30	31	28	32	31	38	205
Aequalis Reversed II							1	18	36	11	66
Aequalis Ascend Flex Reversed									17	38	55
Promos Reverse							9	10	16	19	54
Aequalis-Reversed			6	5	3	8	7	2			31
JRI-Vaios Inverse									9	5	14
Anatomical shoulder Reversed								5		5	10
Other (n < 10)				1	2		2	2	2	6	15
Total	225	41	61	76	100	131	161	216	253	300	1564

Table 16: Primary operations - Caput humeri

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Delta Xtend	1		14	50	64	91	115	147	142	178	802
Delta III	219	42	39	5	1	1					307
Tess Reversed				15	29	31	27	32	30	38	202
Aequalis Ascend Flex Reversed									17	41	58
Promos Reverse							9	10	16	19	54
Aequalis-Reversed			3	5	3	8	8	10	13		50
Aequalis Reversed Fracture								3	15	8	26
JRI-Vaios Inverse									9	5	14
Aequalis Reversed II								6	8		14
Anatomical shoulder Reversed								5		5	10
Other (n < 10)				1	2		2	2	1	6	14
Total	220	42	56	76	99	131	161	215	251	300	1551

Table 17: Primary operations - Humerus

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Delta Xtend	1		14	50	64	91	115	147	142	179	803
Delta III	225	42	41	5	1	1					315
Tess Reversed				15	30	31	27	32	30	38	203
Aequalis-Reversed			6	5	3	8	8	12	19		61
Aequalis Ascend Flex Reversed									17	43	60
Promos Reverse							9	10	16	19	54
Aequalis Reversed Fracture								3	15	8	26
JRI-Vaios Inverse									10	5	15
Anatomical shoulder Reversed								5		5	10
Other (n < 10)				1	2		2	7	4	6	22
Total	226	42	61	76	100	131	161	216	253	303	1569

Shoulder hemiprosthesis

Table 18: Primary operations - Caput humeri

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Bio - Modular	586	33	24	18	21	36	15	20	2	1	756
Global Advantage	177	73	82	55	53	54	66	44	36	40	680
Global Fx	50	6	2	10	26	29	47	50	17	16	253
Global	248										248
Nottingham	120	15	20	28	7	7	3	3			203
EPOCA					27	20	28	24	20	21	140
Tess-Anatomic					5	30	16	13	7	7	78
Delta I	57	3	2								62
Aequalis		1	4	9	6	5	8	7	6		46
ECLIPSE TM						3	6	9	15	10	43
Nottingham 1		1		1	12	15	3	4	2		38
Modular	33										33
Promos standard								8	13	12	33
Aequalis-Fracture			3	6	3	7	7	2	2	3	33
Bigliani/Flatow	5	1	8	4	4	1	3		2		28
Global Unite								1		11	12
Comprehensive								2	4	5	11
Other (n < 10)	6	2	3	5	8	3	2	2	10	18	59
Total	1282	135	148	136	172	210	204	189	136	144	2756

Table 19: Primary operations - Humerus

Prostheses	1994-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Bio - Modular	593	34	26	21	21	34	13	20	2	1	765
Global Advantage	107	40	40	37	45	42	60	41	35	38	485
Global Fx	121	39	44	28	34	41	53	54	18	18	450
Copeland	124	51	40	27	35	12	4	4			297
Global	261										261
Nottingham	121	14	18	26	10	10	4	7			210
EPOCA					27	21	28	24	20	21	141
Global C.A.P.	2	23	19	11	12	8	11	4	2		92
Tess-Anatomic					5	30	16	13	7	7	78
Delta I	58	3	2								63
Scan Shoulder	56										56
Neer II	38	7		2							47
Aequalis		1	4	8	4	5	8	7	5		42
Aequalis-Fracture			3	7	5	7	7	2	3	3	37
Modular	33										33
Promos standard								8	13	12	33
Nottingham 1		1	1	2	10	15	1		2		32
Bigliani/Flatow	6	1	8	4	4	1	3		2		29
Monosperical	13			1							14
Aequalis Resurfacing			6	4	2		1				13
Global Unite								1		11	12
Comprehensive Fracture					1			2	4	5	12
Biomet-Bi-Polar				3	4		3				10
Other (n < 10)	8	2	4	1	2	2	3	2	10	18	52
Total	1541	216	215	182	221	228	215	189	123	134	3264

Reasons for revisions

Table 20: Anatomic total shoulder prostheses

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2014				1			1			1	
2013	2			1	1			2		1	
2012	1					1		2		1	
2011		1	1	1		1		1			
2010	1		2	2				1		1	
2009	1		1	2				1			
2008	1										
2007	1							1			
2006								1	5		
2005	1		1						1		
2004			1	1							
2003			1								
2002								1			
2001											
2000	1		1					1			
1999											
1996	2		2			1		3	1	1	
1995	1										
1994			2							1	
Total	12	1	12	8	1	3	1	14	7	6	0

Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

Table 21: Reverse total shoulder prostheses

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2014			1	1		1				1	
2013			1			1				2	
2012	3	3	6			6		1		2	
2011		3	2	2		1	4	1		1	
2010	2	1	2	1		1				1	
2009	2	1								1	
2008	2		3		1	2					
2007	1		2	2		1					
2006	1			1							
2005										1	
2004			3	2						1	
2003	2	2	1					1		1	
2002						1					
2001	1								1		
2000	4	1	1			1			1	1	
1999	1		1	1		2	1	1	1		
1998	1	1	1							1	
1997		1				2					
1996	1					1		1			
1995	5	2				2		1			
1994	3	1								1	
Total	29	16	24	10	1	22	5	6	3	14	0

Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

Table 22: Shoulder hemiprotheses

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2014											
2013			2					3		2	
2012			2	1		3		4			
2011		3	1	2		2		8		4	
2010		1	4	1			1	10		6	1
2009		2	2			2	1	7		4	
2008			1	4		1		11		2	
2007	1	1	1	2		1	1	15		2	
2006	1			1	1	1	1	13	1	5	1
2005		3		3		4	1	17		10	
2004		2	5	1	1	1		11		3	1
2003		2		4		1		11		4	
2002		2	1	2				6		1	1
2001			1	2				8		5	
2000	1	1	1	2				6		4	
1999			3	2				4		1	
1998	1	1	1	2		2	2	10		5	
1997								11		1	1
1996	1	1	1	1				7		3	
1995		1						4		1	
1994		1				1	1	3		1	
Total	5	21	26	30	2	19	8	169	1	64	5

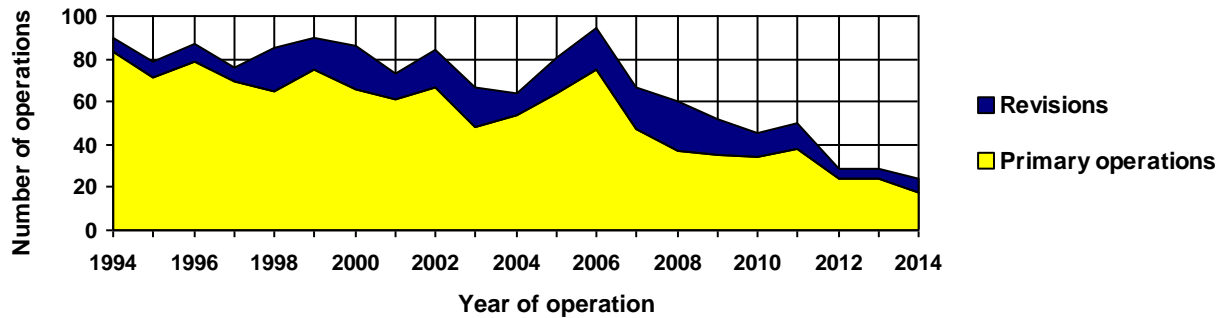
Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

TOE JOINT PROSTHESES

Table 1: Annual number of operations

Year	Primary operations	Revisions	Total
2014	18 (75,0%)	6 (25,0%)	24
2013	24 (82,8%)	5 (17,2%)	29
2012	24 (82,8%)	5 (17,2%)	29
2011	38 (76,0%)	12 (24,0%)	50
2010	34 (75,6%)	11 (24,4%)	45
2009	35 (67,3%)	17 (32,7%)	52
2008	37 (61,7%)	23 (38,3%)	60
2007	47 (70,1%)	20 (29,9%)	67
2006	75 (79,8%)	19 (20,2%)	94
2005	64 (79,0%)	17 (21,0%)	81
2004	54 (84,4%)	10 (15,6%)	64
2003	48 (71,6%)	19 (28,4%)	67
2002	67 (79,8%)	17 (20,2%)	84
2001	61 (83,6%)	12 (16,4%)	73
2000	66 (76,7%)	20 (23,3%)	86
1999	75 (83,3%)	15 (16,7%)	90
1994-98	367 (88,0%)	50 (12,0%)	417
Total	1134 (80,3%)	278 (19,7%)	1 412

Figure 1: Annual number of operations



52,2 % of all operations were performed on the right side. 84,3 % performed in women. Mean age: 60,2 years.

Table 2: Toe disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Bechterew Mb.	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2014	10	8							
2013	11	11	1					1	
2012	15	9							
2011	18	16						4	
2010	13	20	1	1	1	1	1	8	
2009	12	20		1				2	
2008	6	29						2	
2007	13	28		1				4	1
2006	21	46	2					8	
2005	31	22	9				1	10	
2004	13	37						5	
2003	2	41	1	2				3	
2002	8	53		1				6	
2001	4	51		2				3	1
2000	15	51	1						
1999	9	60	1	2				4	
1994-98	21	324	1		1			18	3
Total	222	826	17	10	2	1	2	78	5

Diseases are not mutually exclusive. More than one reason for operation is possible.

Use of cement in toe joint prostheses

Table 3: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2014			18 (100,0%)		18
2013			24 (100,0%)		24
2012			24 (100,0%)		24
2011			35 (92,1%)	3 (7,9%)	38
2010			34 (100,0%)		34
2009			35 (100,0%)		35
2008			37 (100,0%)		37
2007			46 (100,0%)		46
2006			74 (98,7%)	1 (1,3%)	75
2005			64 (100,0%)		64
2004	1 (1,9%)		53 (98,1%)		54
2003	1 (2,1%)		47 (97,9%)		48
2002	1 (1,5%)		65 (97,0%)	1 (1,5%)	67
2001	1 (1,6%)		60 (98,4%)		61
2000	2 (3,0%)		64 (97,0%)		66
1999			75 (100,0%)		75
1998			65 (100,0%)		65
1997			69 (100,0%)		69
1996			79 (100,0%)		79
1995			71 (100,0%)		71
1994			81 (97,6%)	2 (2,4%)	83
Total	6 (0,5%)		1 120 (98,9%)	7 (0,6%)	1 133

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2013			1 (100,0%)		1
2012			1 (100,0%)		1
2011			2 (100,0%)		2
2010			5 (100,0%)		5
2009			7 (100,0%)		7
2008			4 (100,0%)		4
2007			5 (100,0%)		5
2006			13 (100,0%)		13
2005			6 (100,0%)		6
2004			7 (100,0%)		7
2002			4 (100,0%)		4
2001	1 (9,1%)		10 (90,9%)		11
2000	1 (6,7%)		14 (93,3%)		15
1999	1 (9,1%)		10 (90,9%)		11
1998			2 (100,0%)		2
1996				1 (100,0)	1
1995				2 (100,0)	2
Total	3 (3,1%)		91 (93,8%)	3 (3,1%)	97

Toe joint prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Silastic HP 100	687	54	35	30	25	22	22	14	13	10	912
LPT	18	6	5	3	3	6	14	9	10	8	82
Toefit-plus	13	13	5	4	7	5	2	1	1		51
Sutter	24	1	1								26
Biomet Total Toe	25										25
Moje	18										18
LaPorta	13	1									14
Swanson Titanium	4					1					5
Total	802	75	46	37	35	34	38	24	24	18	1133

Table 6: Primary operations - Distal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Toefit-plus	13	13	5	4	7	5	2	1	1		51
Biomet Total Toe	25										25
Moje	18										18
Silastic HP 100	3										3
Total	59	13	5	4	7	5	2	1	1		97

Reasons for revisions

Table 7:

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2014		1		1	1			1	3		
2013					2			3	2		
2012					1			2		3	
2011					3	1		7	1	5	
2010		3			2	2		3	2	3	
2009			1		3	2		7	3	5	
2008				2	10	1		13	1	6	
2007	2	3	2	1	3	2	1	10		6	
2006		1		1	4	2		10	1	6	1
2005	1	1	1		7	2		6	1	5	2
2004					3			7		6	
2003	1	2	1	2	6	2		9		8	
2002	1	1		1	4	4		5		7	3
2001		3		2	5			8	1	4	
2000		2		1	6	2		6	1	6	1
1999		2			3	1		6		6	
1998		2	1	1	4	3		5		6	1
1997		1			3	1		6		1	
1996				1	4		1	4		3	
1995			1	2	2	2		5		1	
1994		1					1	3		2	1
Total	5	23	7	15	76	27	3	126	16	89	9

Revision reasons are not mutually exclusive. More than one reason for revision is possible

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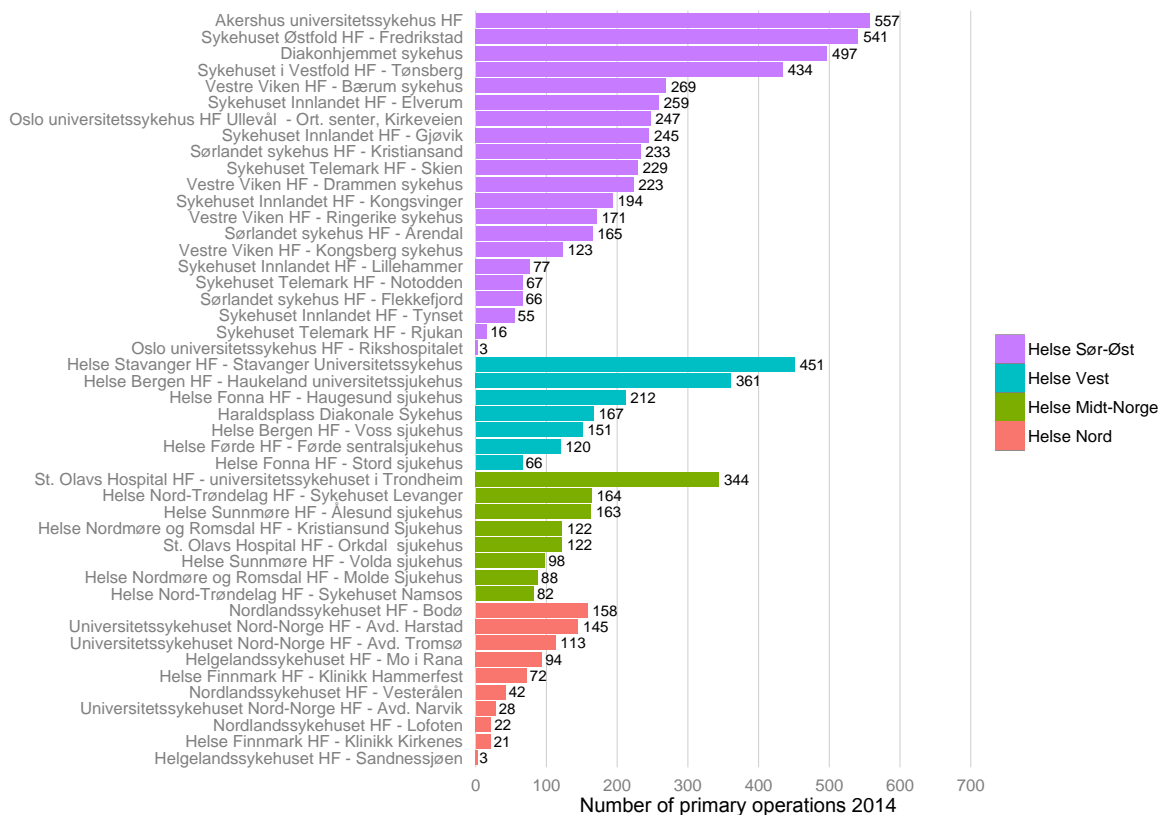
THE NORWEGIAN HIP FRACTURE REGISTER ANNUAL REPORT 2015

The annual number of primary hip fracture operations continues to show a downward trend. Since 2011, we have seen a reduction of about 200 fractures per year (Table 1). This is surprising, since the number of elderly people in society is increasing. Does it indicate that the incidence of hip fractures is falling? An alternative explanation could be poorer reporting to the Hip Fracture Register, but there are no other indications of this, to our knowledge.

Completeness analyses (i.e. validation) of reporting to the Hip Fracture Register (NHFR), compared to the Norwegian Patient Register (NPR), were published in last year's annual report. This validation was for the period 2008-2012 and showed good and stable reporting to NHFR with 94% reporting for primary hemiarthroplasty and 86% reporting for primary osteosynthesis, but only 63% for reoperations.

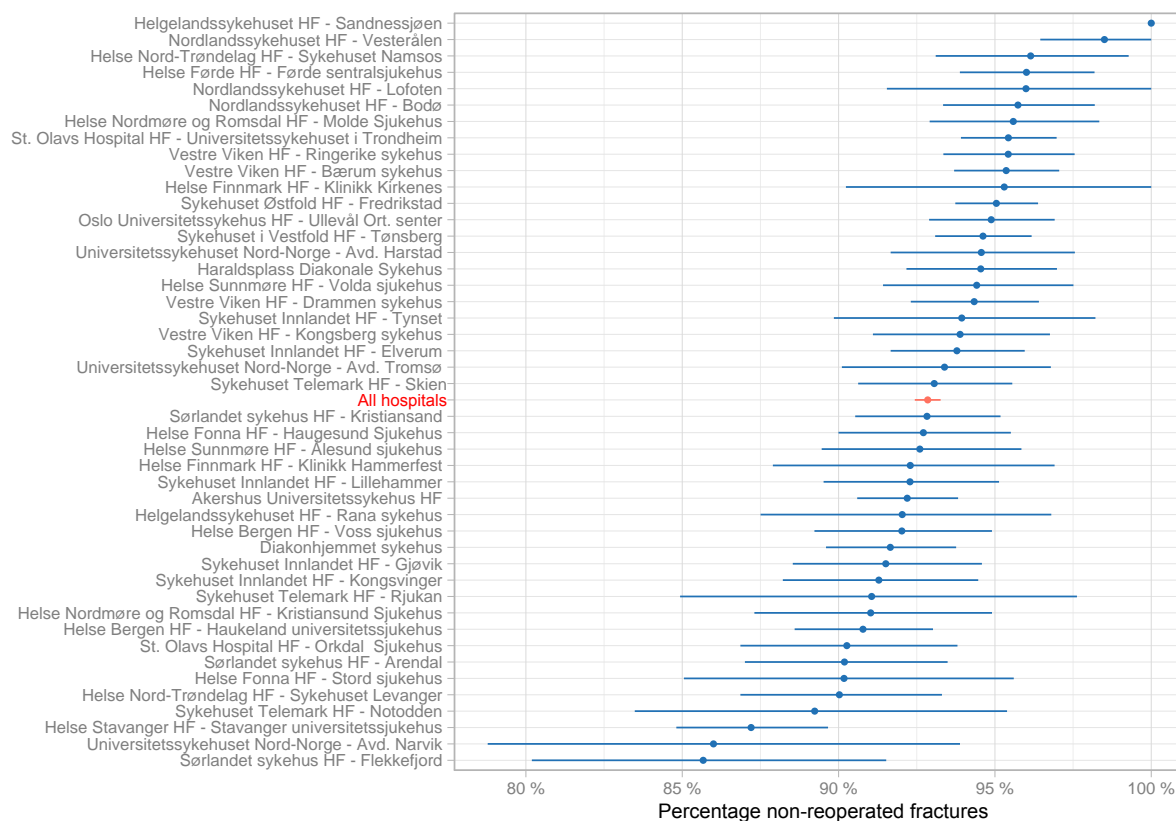
We are about to complete a study of reporting for 2012 from eight of the 54 Norwegian hospitals where hip fracture surgery was performed. To determine the correct number of hip fractures, each hospital's records system, operation protocol, radiographic images and patient administrative system were studied. Preliminary figures show that 93% of all hip fractures from these hospitals were reported to the NHFR. This gives us reason to trust the numbers in the NHFR.

New in this year's report is the publication of the number of hip fracture operations reported from all Norwegian hospitals for 2014. A corresponding figure with the numbers for 2013 was published in the SKDE report for 2014 (<http://www.kvalitetsregistre.no/resultater/>).



The figure below shows the estimated proportion, with 95% confidence interval, of non-reoperated fractures within two years for patients who underwent surgery for hip

fractures at the various hospitals in Norway in the period 2012-2014. (The SKDE report for last year contained a similar figure for the period 2008-2010). Hospitals with fewer than 10 hip fracture operations during this three-year period have been excluded from this figure.



When hospitals are ranked according to the percentage of reoperations, the results must be interpreted with great caution, because there may be many reasons for differences in the reoperation percentage:

1. Hospitals that are more rigorous in reporting their complications and reoperations to the Register could have unfairly negative results in the analysis.
2. If surgeons at one hospital are more diligent in facilitating check-ups for patients than at other hospitals, and thus discover more complications, this could lead to unfortunate results despite the fact that this hospital in reality is doing a better job than other hospitals.
3. If the waiting time for reoperations is longer in some hospitals than others, the longer wait could erroneously lead to better results than those of hospitals with a short waiting time.
4. If the surgeons at one hospital have a higher threshold for recommending reoperation than at other hospitals and thus prolong patients' problems, this will also give skewed results in the statistics.

There is also statistical uncertainty in the ranking lists because the data in our registers are poorly suited for such calculations. The registers were created in order to compare the results of implants and surgical procedures nationwide. To compare quality in hospitals is a complex matter, because some hospitals operate on more patients with poor prognosis than other hospitals, and because many hospitals, especially small ones, have so few reoperations that the statistics are too weak, and are further weakened by the fact that the hospitals' completeness (reporting rate) of reoperations varies from 14.6% to 100%.

The year 2014 was successful from an operational and scientific point of view. Four scientific articles with data from the Hip Fracture Register were published and many national and international presentations were held.

The surgeons are still jointly in charge of the data in the Hip Fracture Register, and we encourage anyone interested in research to contact us at the Register.

We would like to thank you all for good reporting and we look forward to continued good cooperation!

Bergen, 10 June 2015




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HIP FRACTURES

Numbers of operations

Table 1: Annual numbers of operations

Year	Primary operation	Reoperation	Total
2014	8083 (90,3%)	873 (9,8%)	8956
2013	8314 (89,6%)	970 (10,5%)	9284
2012	8451 (89,5%)	996 (10,5%)	9447
2011	8617 (89,4%)	1020 (10,6%)	9637
2010	8372 (89,3%)	1004 (10,7%)	9376
2009	8261 (88,1%)	1120 (11,9%)	9381
2008	8371 (87,6%)	1183 (12,4%)	9554
2007	7879 (86,5%)	1226 (13,5%)	9105
2006	7529 (86,0%)	1230 (14,0%)	8759
2005	5898 (83,3%)	1184 (16,7%)	7082
Total	79775 (88,1%)*	10806 (11,9%)**	90581

51% of primary operations were on the right side. 70% of primary operations were performed on women. Mean age at primary surgery was 80 years: 82 years for women and 77 years for men.

* 1975 (2%) were primary operations with total hip prostheses from the Norwegian Arthroplasty Register.

** 4875 (45%) were reoperations with total hip prostheses from the Norwegian Arthroplasty Register.

Figure 1: Annual numbers of operations

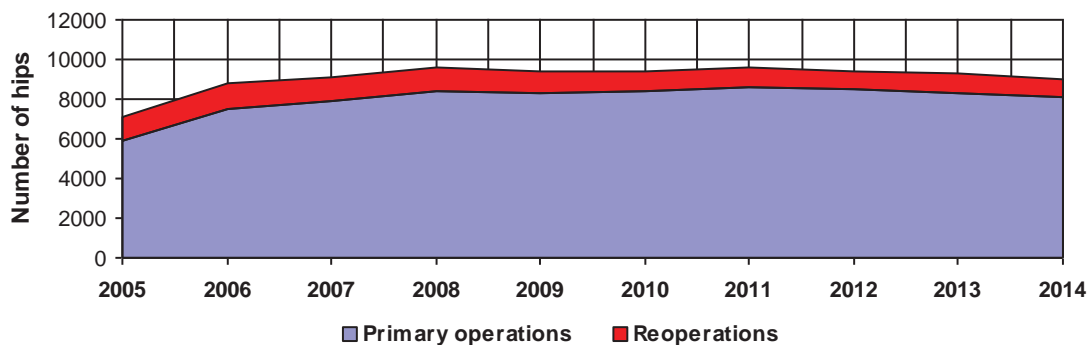
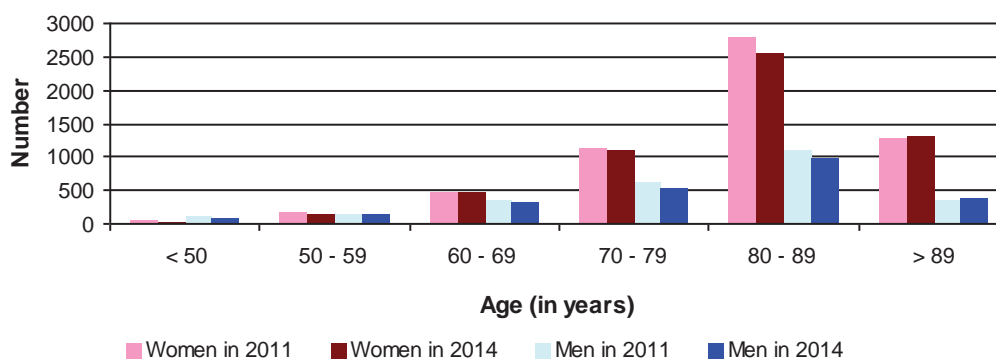


Figure 2: Age by primary operation (in 2011 and 2014)



Time from fracture to operation in hours - primary operations

Table 2: Time from fracture to operation in hours*

	0 - 6	>6 - 12	>12 - 24	>24 - 48	>48	Missing	Total
2014	323 (4,1%)	1148 (14,7%)	2956 (38,0%)	2159 (27,7%)	1031 (13,2%)	170 (2,2%)	7787
2013	314 (3,9%)	1129 (14,1%)	2930 (36,6%)	2260 (28,2%)	1198 (15,0%)	177 (2,2%)	8008
2012	315 (3,8%)	1166 (14,2%)	2936 (35,7%)	2307 (28,1%)	1326 (16,1%)	170 (2,1%)	8220
2011	313 (3,7%)	1206 (14,3%)	2843 (33,8%)	2419 (28,8%)	1421 (16,9%)	203 (2,4%)	8405
2010	355 (4,3%)	1217 (14,8%)	2882 (35,2%)	2216 (27,0%)	1340 (16,3%)	189 (2,3%)	8199
2009	353 (4,4%)	1290 (15,9%)	2857 (35,3%)	2128 (26,3%)	1306 (16,1%)	164 (2,0%)	8098
2008	385 (4,7%)	1320 (16,1%)	2835 (34,5%)	2201 (26,8%)	1292 (15,7%)	178 (2,2%)	8211
2007	452 (5,9%)	1434 (18,6%)	2610 (33,8%)	1872 (24,3%)	1188 (15,4%)	155 (2,0%)	7711
2006	467 (6,3%)	1488 (20,2%)	2647 (35,8%)	1684 (22,8%)	983 (13,3%)	115 (1,6%)	7384
2005	445 (7,7%)	1294 (22,4%)	1975 (34,2%)	1148 (19,9%)	810 (14,0%)	105 (1,8%)	5777
Total	3722 (4,8%)	12692 (16,3%)	27471 (35,3%)	20394 (26,2%)	11895 (15,3%)	1626 (2,1%)	77800

* Total hip prostheses are not counted

Figure 3: Time from fracture to operation - grouped in hours (n=77800)

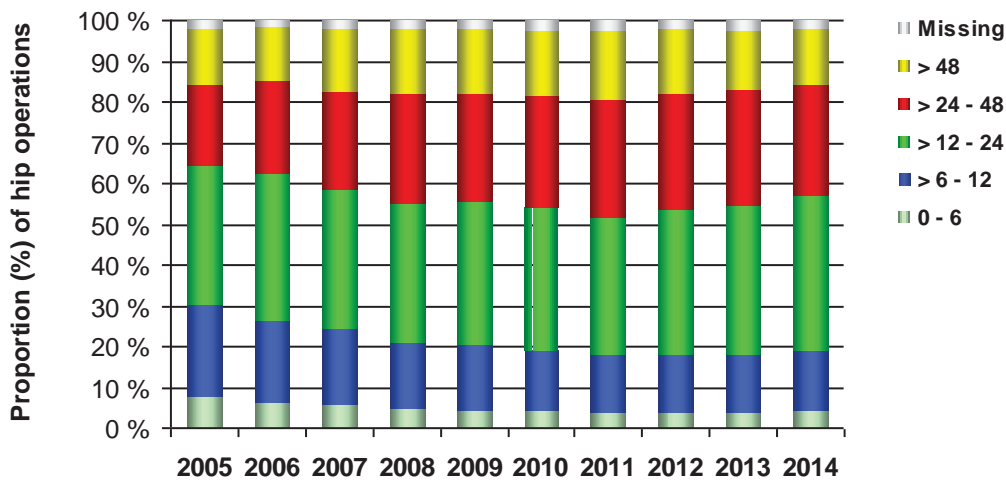
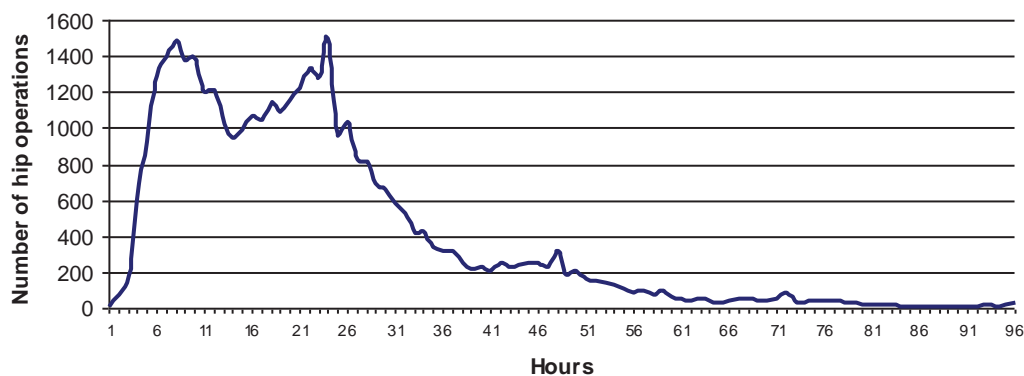


Figure 4: Time from fracture to operation - continuous (n=38337)



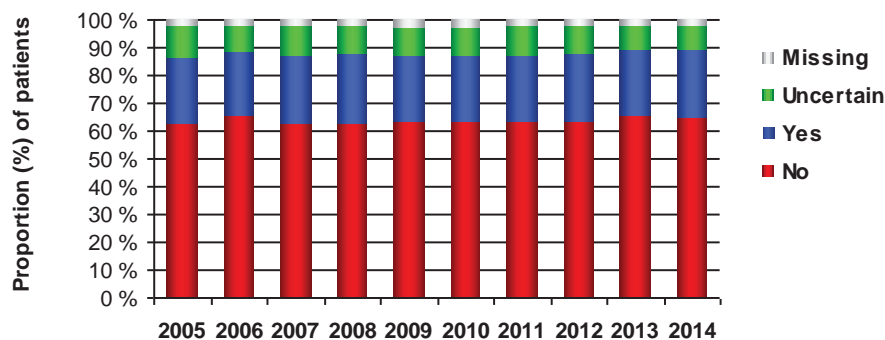
Mean time from fracture to operation was 23 hours (median 20 hours).

Cognitive impairment

Table 3: Cognitive impairment - primary operations*

	No	Yes	Uncertain	Missing	Total
2014	5057 (64,9%)	1921 (24,7%)	636 (8,2%)	173 (2,2%)	7787
2013	5234 (65,4%)	1937 (24,2%)	674 (8,4%)	163 (2,0%)	8008
2012	5217 (63,5%)	2008 (24,4%)	821 (10,0%)	174 (2,1%)	8220
2011	5346 (63,6%)	1990 (23,7%)	901 (10,7%)	168 (2,0%)	8405
2010	5219 (63,7%)	1917 (23,4%)	834 (10,2%)	229 (2,8%)	8199
2009	5155 (63,7%)	1890 (23,3%)	832 (10,3%)	221 (2,7%)	8098
2008	5186 (63,2%)	2026 (24,7%)	794 (9,7%)	205 (2,5%)	8211
2007	4834 (62,7%)	1873 (24,3%)	836 (10,8%)	168 (2,2%)	7711
2006	4846 (65,6%)	1676 (22,7%)	721 (9,8%)	141 (1,9%)	7384
2005	3611 (62,5%)	1385 (24,0%)	649 (11,2%)	132 (2,3%)	5777
Total	49705 (63,9%)	18623 (23,9%)	7698 (9,9%)	1774 (2,3%)	77800

Figure 5: Cognitive impairment - primary operations*

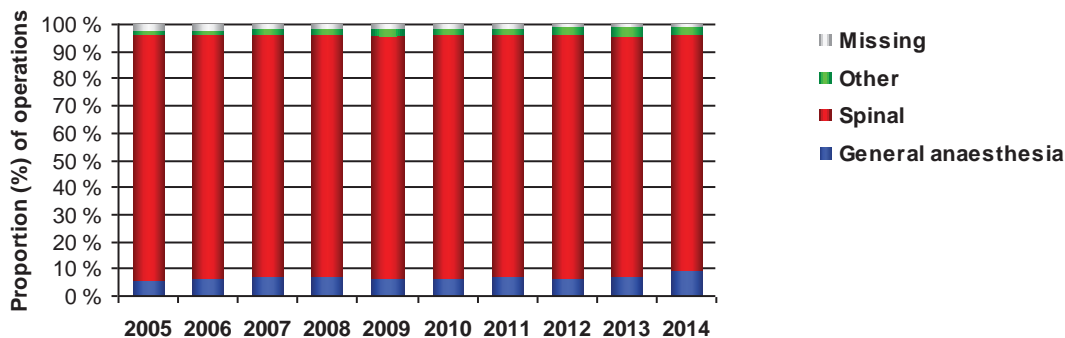


Type of anaesthesia

Table 4: Type of anaesthesia - primary operations*

	General anaesthesia	Spinal	Other	Missing	Total
2014	718 (9,2%)	6808 (87,4%)	201 (2,6%)	60 (0,8%)	7787
2013	588 (7,3%)	7093 (88,6%)	256 (3,2%)	71 (0,9%)	8008
2012	559 (6,8%)	7361 (89,5%)	219 (2,7%)	81 (1,0%)	8220
2011	585 (7,0%)	7505 (89,3%)	219 (2,6%)	96 (1,1%)	8405
2010	565 (6,9%)	7320 (89,3%)	194 (2,4%)	120 (1,5%)	8199
2009	520 (6,4%)	7245 (89,5%)	188 (2,3%)	145 (1,8%)	8098
2008	591 (7,2%)	7297 (88,9%)	182 (2,2%)	141 (1,7%)	8211
2007	550 (7,1%)	6852 (88,9%)	187 (2,4%)	122 (1,6%)	7711
2006	473 (6,4%)	6634 (89,8%)	137 (1,9%)	140 (1,9%)	7384
2005	323 (5,6%)	5225 (90,4%)	123 (2,1%)	106 (1,8%)	5777
Total	5472 (7,0%)	69340 (89,1%)	1906 (2,4%)	1082 (1,4%)	77800

Figure 6: Type of anaesthesia in primary operations*



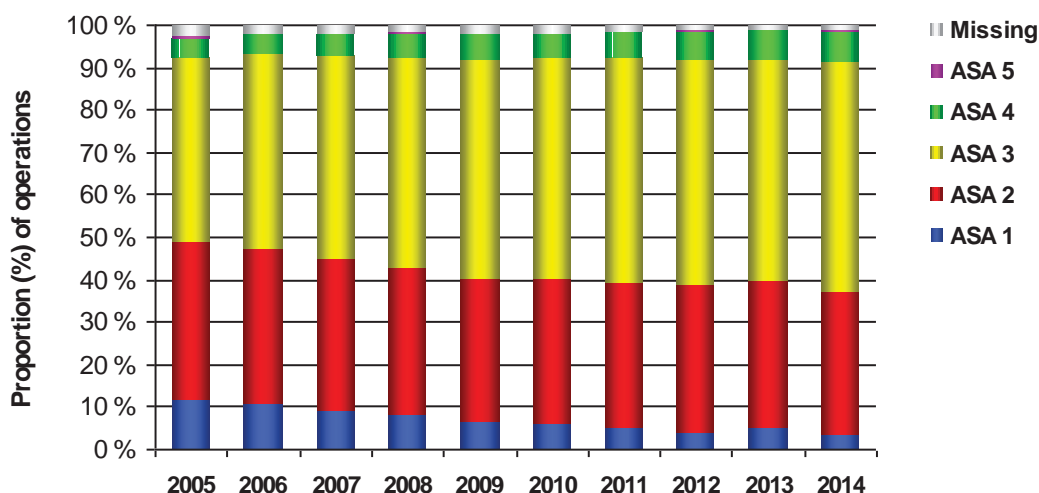
* Total hip prostheses are not counted

ASA classification (ASA = American Society of Anesthesiologists)

Table 5: ASA classification - all operations

	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2014	304 (3,4%)	3025 (33,8%)	4866 (54,3%)	633 (7,1%)	16 (0,2%)	112 (1,3%)	8956
2013	451 (4,9%)	3222 (34,7%)	4854 (52,3%)	639 (6,9%)	17 (0,2%)	101 (1,1%)	9284
2012	406 (4,3%)	3257 (34,5%)	5032 (53,3%)	628 (6,6%)	9 (0,1%)	115 (1,2%)	9447
2011	510 (5,3%)	3292 (34,2%)	5113 (53,1%)	580 (6,0%)	6 (0,1%)	136 (1,4%)	9637
2010	560 (6,0%)	3207 (34,2%)	4899 (52,3%)	525 (5,6%)	17 (0,2%)	168 (1,8%)	9376
2009	643 (6,9%)	3124 (33,3%)	4830 (51,5%)	601 (6,4%)	10 (0,1%)	173 (1,8%)	9381
2008	801 (8,4%)	3297 (34,5%)	4711 (49,3%)	569 (6,0%)	9 (0,1%)	167 (1,7%)	9554
2007	844 (9,3%)	3228 (35,5%)	4376 (48,1%)	478 (5,2%)	7 (0,1%)	172 (1,9%)	9105
2006	932 (10,6%)	3203 (36,6%)	4033 (46,0%)	401 (4,6%)	13 (0,1%)	177 (2,0%)	8759
2005	818 (11,6%)	2638 (37,2%)	3073 (43,4%)	344 (4,9%)	13 (0,2%)	196 (2,8%)	7082
Total	6269 (6,9%)	31493 (34,8%)	45787 (50,5%)	5398 (6,0%)	117 (0,1%)	1517 (1,7%)	90581

Figure 7: ASA classification - all operations



ASA 1: Healthy patients who smoke less than 5 cigarettes a day.

ASA 2: Patients with an asymptomatic condition who are kept under medical control (f.ex. hypertension), or with diet (f. ex. diabetes mellitus type 2), and otherwise healthy patients who smoke five cigarettes or more daily.

ASA 3: Patients having a condition that can cause symptoms. However, patients are kept under medical control (f. ex. moderate angina pectoris and mild asthma).

ASA 4: Patients with a condition that is out of control (f. ex. heart failure and asthma).

ASA 5: A moribund patient who is not expected to survive the operation.

Primary operations

Table 6: Type of fracture (reason for primary operation)

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Type 9	Other	Missing	Total
2014	1038	3287	282	1312	1228	408	285	11	160	63	9	8083
	12,8%	40,7%	3,5%	16,2%	15,2%	5,0%	3,5%	0,1%	2,0%	0,8%	0,1%	
2013	1171	3296	260	1301	1274	446	295	11	167	91	2	8314
	14,1%	39,6%	3,1%	15,6%	15,3%	5,4%	3,5%	0,1%	2,0%	1,1%	0,0%	
2012	1225	3473	261	1275	1272	465	216	15	172	74	3	8451
	14,5%	41,1%	3,1%	15,1%	15,1%	5,5%	2,6%	0,2%	2,0%	0,9%	0,0%	
2011	1315	3444	276	1346	1391	398	191	21	162	73	0	8617
	15,3%	40,0%	3,2%	15,6%	16,1%	4,6%	2,2%	0,2%	1,9%	0,8%	0,0%	
2010	1249	3288	320	1313	1363	431	164	9	167	65	3	8372
	14,9%	39,3%	3,8%	15,7%	16,3%	5,1%	2,0%	0,1%	2,0%	0,8%	0,0%	
2009	1233	3371	328	1306	1208	425	153	10	149	70	8	8261
	14,9%	40,8%	4,0%	15,8%	14,6%	5,1%	1,9%	0,1%	1,8%	0,8%	0,1%	
2008	1316	3223	351	1474	1240	439	150	10	83	82	3	8371
	15,7%	38,5%	4,2%	17,6%	14,8%	5,2%	1,8%	0,1%	1,0%	1,0%	0,0%	
2007	1417	2997	391	1353	1050	438	161	7	0	63	2	7879
	18,0%	38,0%	5,0%	17,2%	13,3%	5,6%	2,0%	0,1%	0,0%	0,8%	0,0%	
2006	1410	2824	342	1311	1009	414	135	10	0	70	4	7529
	18,7%	37,5%	4,5%	17,4%	13,4%	5,5%	1,8%	0,1%	0,0%	0,9%	0,1%	
2005	1076	2293	274	1010	758	318	110	11	0	35	13	5898
	18,2%	38,9%	4,6%	17,1%	12,9%	5,4%	1,9%	0,2%	0,0%	0,6%	0,2%	
Total	12450	31496	3085	13001	11793	4182	1860	115	1060	686	47	79775
	15,6%	39,5%	3,9%	16,3%	14,8%	5,2%	2,3%	0,1%	1,3%	0,9%	0,1%	

Type 1: Intracapsular fracture, undisplaced

Type 2: Intracapsular fracture, displaced

Type 3: Basocervical fracture

Type 4: Trochanteric fracture (2 fragments)

Type 5: Trochanteric fracture (multifragment)

Type 6: Subtrochanteric fracture

Type 7: Intracapsular fracture unspecified (from the Norwegian Arthroplasty Register)

Type 8: Trochanteric fracture unspecified (from the Norwegian Arthroplasty Register)

Type 9: Intertrochanteric fracture (The registration started in 2008)

Table 7: Type of primary operation per type of primary fracture

Type of primary operation	Type of primary fracture										
	Intracapsular fracture, undisplaced	Intracapsular fracture, displaced	Basocervical fracture	Trochanteric fracture (2 fragments)	Trochanteric fracture (multifragment)	Subtrochanteric fracture	Intracapsular fracture - unspecified *	Trochanteric fracture - unspecified*	Intertrochanteric fracture**	Other	Missing
Two screws or pins	11300	6111	119	7	2	1	0	0	0	10	6
Three screws or pins	162	365	2	0	1	0	0	0	0	0	0
Bipolar hemiprosthesis	604	24115	228	33	57	27	0	0	5	131	26
Unipolar hemiprosthesis	4	296	12	0	0	0	0	0	0	2	1
Hip compression screw and plate	276	297	1782	9325	4141	830	0	0	121	106	8
Hip compression screw with lateral support plate	7	24	63	789	4355	1324	0	0	557	157	2
Angle plate	1	0	1	2	1	0	0	0	0	0	0
Short intramedullary nail without distal locking	6	4	28	214	46	4	0	0	3	1	0
Short intramedullary nail with distal locking	16	27	249	2187	2374	354	0	0	157	48	1
Long intramedullary nail without distal locking	0	0	0	5	16	38	0	0	4	5	0
Long intramedullary nail with distal locking	2	7	18	157	518	1529	0	0	186	143	0
Total hip prosthesis	0	0	0	0	0	0	1860	115	0	0	0
Other: Hip compression screw system and additional anti-rotational screw	65	119	554	239	104	16	0	0	2	35	2
Other	7	130	28	40	177	59	0	0	25	48	0
Missing	0	1	0	3	1	0	0	0	0	0	1

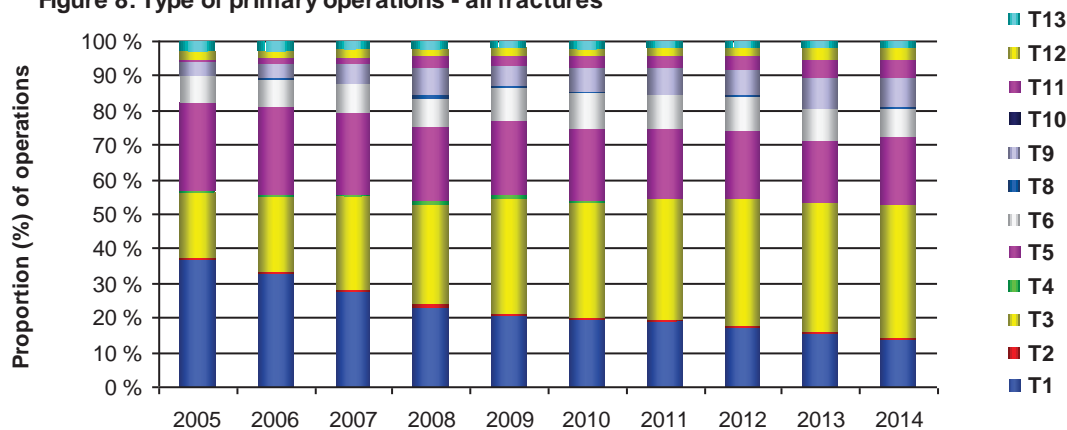
* Total hip prostheses reported to the Norwegian Arthroplasty Register

** The registration started in 2008

Table 8: Type of primary operations - all fractures

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	Total
2014	1115	31	3143	1	1539	683	0	17	716	7	406	296	126	2	8083
	13,8%	0,4%	38,9%	0,0%	19,0%	8,4%	0,0%	0,2%	8,9%	0,1%	5,0%	3,7%	1,6%	0,0%	
2013	1289	32	3100	3	1496	748	0	20	746	4	428	306	142	0	8314
	15,5%	0,4%	37,3%	0,0%	18,0%	9,0%	0,0%	0,2%	9,0%	0,0%	5,1%	3,7%	1,7%	0,0%	
2012	1455	27	3134	5	1630	849	1	19	634	8	332	231	126	0	8451
	17,2%	0,3%	37,1%	0,1%	19,3%	10,0%	0,0%	0,2%	7,5%	0,1%	3,9%	2,7%	1,5%	0,0%	
2011	1648	50	3002	19	1697	870	0	12	658	14	281	212	154	0	8617
	19,1%	0,6%	34,8%	0,2%	19,7%	10,1%	0,0%	0,1%	7,6%	0,2%	3,3%	2,5%	1,8%	0,0%	
2010	1616	83	2781	29	1733	900	0	17	571	4	280	173	185	0	8372
	19,3%	1,0%	33,2%	0,3%	20,7%	10,8%	0,0%	0,2%	6,8%	0,0%	3,3%	2,1%	2,2%	0,0%	
2009	1686	81	2755	82	1765	788	0	50	489	8	228	163	166	0	8261
	20,4%	1,0%	33,3%	1,0%	21,4%	9,5%	0,0%	0,6%	5,9%	0,1%	2,8%	2,0%	2,0%	0,0%	
2008	1943	64	2439	70	1782	692	2	64	686	10	266	160	193	0	8371
	23,2%	0,8%	29,1%	0,8%	21,3%	8,3%	0,0%	0,8%	8,2%	0,1%	3,2%	1,9%	2,3%	0,0%	
2007	2181	50	2115	48	1867	645	0	36	430	6	157	168	175	1	7879
	27,7%	0,6%	26,8%	0,6%	23,7%	8,2%	0,0%	0,5%	5,5%	0,1%	2,0%	2,1%	2,2%	0,0%	
2006	2468	60	1644	34	1888	630	1	43	272	4	127	145	212	1	7529
	32,8%	0,8%	21,8%	0,5%	25,1%	8,4%	0,0%	0,6%	3,6%	0,1%	1,7%	1,9%	2,8%	0,0%	
2005	2155	52	1113	24	1489	473	1	28	211	3	55	121	171	2	5898
	36,5%	0,9%	18,9%	0,4%	25,2%	8,0%	0,0%	0,5%	3,6%	0,1%	0,9%	2,1%	2,9%	0,0%	
Total	17556	530	25226	315	16886	7278	5	306	5413	68	2560	1975	1650	6	79775
	22,0%	0,7%	31,6%	0,4%	21,2%	9,1%	0,0%	0,4%	6,8%	0,1%	3,2%	2,5%	2,1%	0,0%	

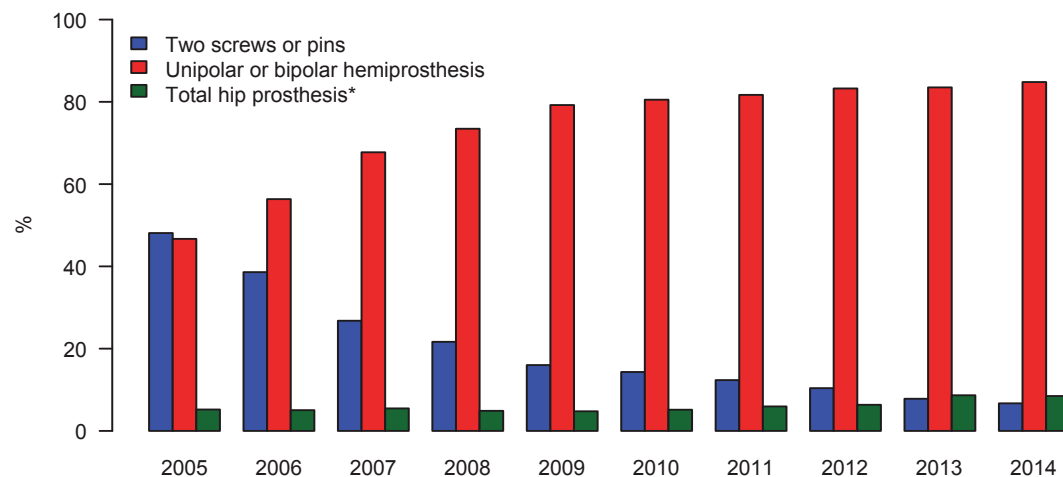
Figure 8: Type of primary operations - all fractures



- T1: Two screws or pins
- T2: Three screws or pins
- T3: Bipolar hemiprosthesis
- T4: Unipolar hemiprosthesis
- T5: Hip compression screw and plate
- T6: Hip compression screw with lateral support plate
- T7: Angle plate
- T8: Short intramedullary nail without distal locking
- T9: Short intramedullary nail with distal locking
- T10: Long intramedullary nail without distal locking
- T11: Long intramedullary nail with distal locking
- T12: Total hip prosthesis
- T13: Other*
- T14: Missing

* Proportion (%) of operations with combination: Hip compression screw system and additional anti-rotational screw is 1,3 %

Figure 9a: Time trend for treatment of displaced femoral neck fractures



* Total hip prostheses for femoral neck fracture were reported to the Norwegian Arthroplasty Register without information about dislocation fracture

Figure 9b: Time trend for treatment of trochanteric fractures

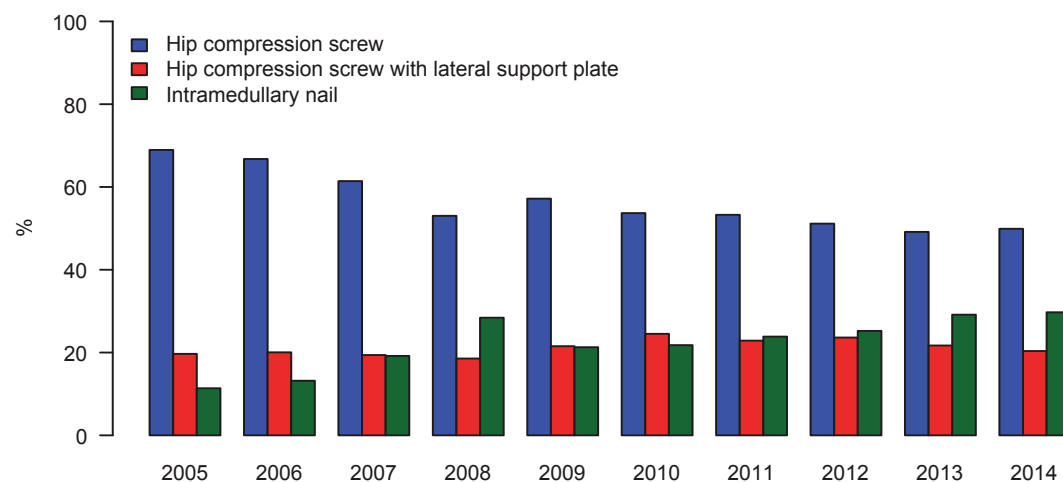
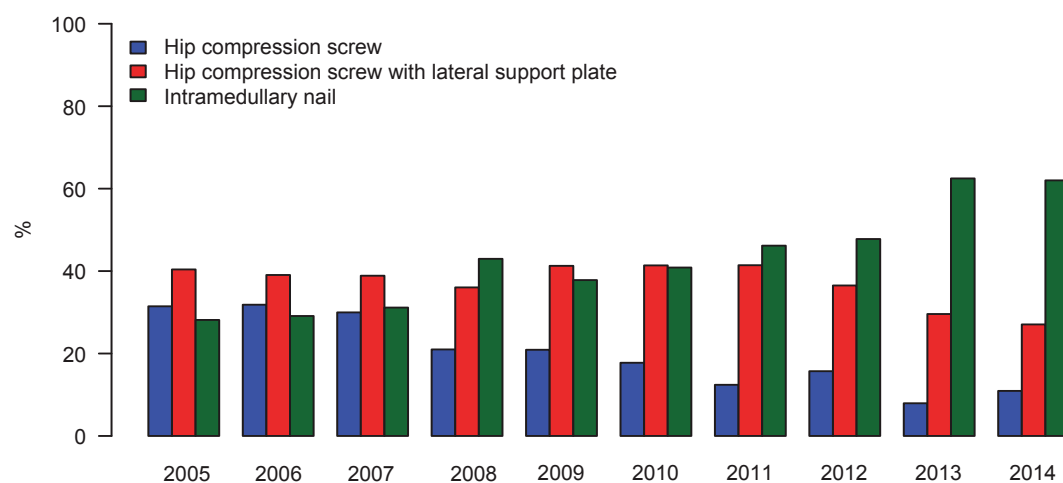


Figure 9c: Time trend for treatment of inter-* and subtrochanteric fractures



* Intertrochanteric fracture (AO OTA type A3)

Figure 10a: Quality of life (EQ-5D) among patients with hip fractures

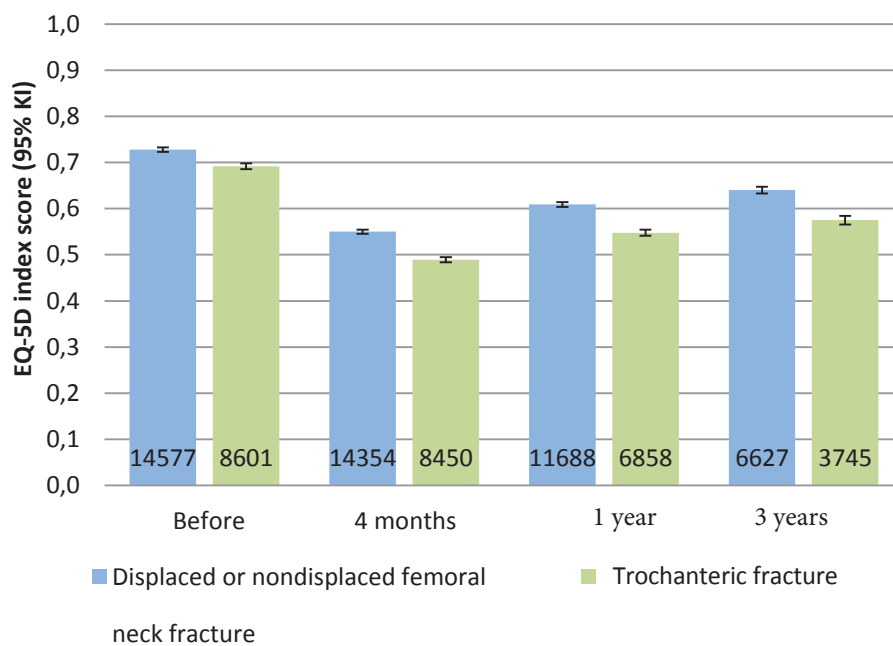
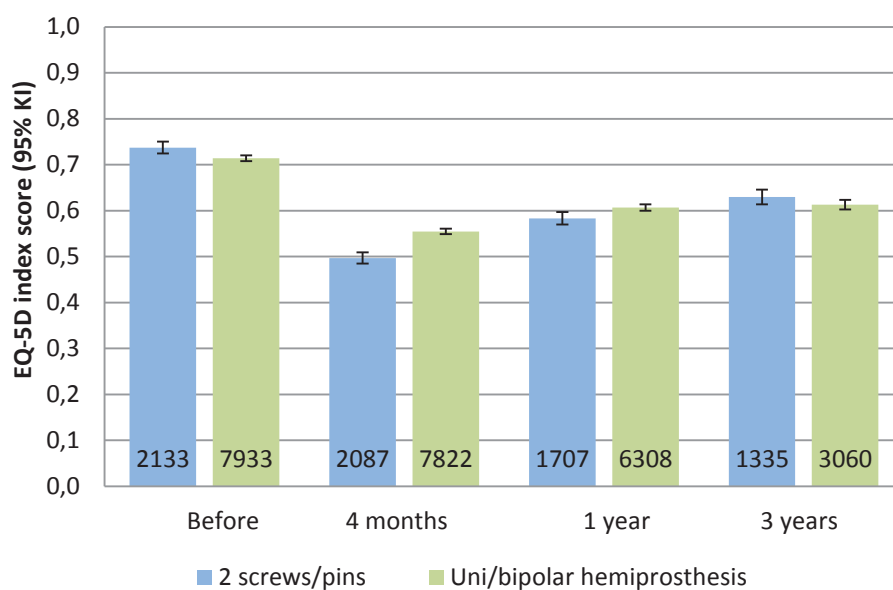


Figure 10b: Quality of life (EQ-5D) among patients with displaced femoral neck fracture



The numbers in each column indicate the numbers of patients who had answered the quality of life questionnaire at each follow up.

Reoperations

Table 9: Reasons for reoperation (more than one reason is possible)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	Total
2014	109	55	27	48	7	4	130	14	19	20	65	16	21	499	1034
	10,5%	5,3%	2,6%	4,6%	0,7%	0,4%	12,6%	1,4%	1,8%	1,9%	6,3%	1,5%	2,0%	48,3%	
2013	138	56	33	72	5	10	138	15	28	22	76	7	47	511	1158
	11,9%	4,8%	2,8%	6,2%	0,4%	0,9%	11,9%	1,3%	2,4%	1,9%	6,6%	0,6%	4,1%	44,1%	
2012	153	65	37	75	18	9	158	15	34	22	62	3	42	493	1186
	12,9%	5,5%	3,1%	6,3%	1,5%	0,8%	13,3%	1,3%	2,9%	1,9%	5,2%	0,3%	3,5%	41,6%	
2011	157	75	59	82	12	5	128	12	41	23	67	8	32	489	1190
	13,2%	6,3%	5,0%	6,9%	1,0%	0,4%	10,8%	1,0%	3,4%	1,9%	5,6%	0,7%	2,7%	41,1%	
2010	176	79	48	79	11	11	118	14	44	26	58	10	37	484	1195
	14,7%	6,6%	4,0%	6,6%	0,9%	0,9%	9,9%	1,2%	3,7%	2,2%	4,9%	0,8%	3,1%	40,5%	
2009	216	96	59	95	8	18	138	7	38	36	49	9	56	494	1319
	16,4%	7,3%	4,5%	7,2%	0,6%	1,4%	10,5%	0,5%	2,9%	2,7%	3,7%	0,7%	4,2%	37,5%	
2008	245	104	63	101	10	10	101	20	39	42	57	10	33	552	1387
	17,7%	7,5%	4,5%	7,3%	0,7%	0,7%	7,3%	1,4%	2,8%	3,0%	4,1%	0,7%	2,4%	39,8%	
2007	287	132	85	111	10	10	78	13	32	39	48	9	31	589	1474
	19,5%	9,0%	5,8%	7,5%	0,7%	0,7%	5,3%	0,9%	2,2%	2,6%	3,3%	0,6%	2,1%	40,0%	
2006	318	125	64	101	7	8	75	20	21	30	33	7	21	588	1418
	22,4%	8,8%	4,5%	7,1%	0,5%	0,6%	5,3%	1,4%	1,5%	2,1%	2,3%	0,5%	1,5%	41,5%	
2005	281	107	71	85	9	12	50	16	25	27	33	2	24	653	1395
	20,1%	7,7%	5,1%	6,1%	0,6%	0,9%	3,6%	1,1%	1,8%	1,9%	2,4%	0,1%	1,7%	46,8%	
Total	2080	894	546	849	97	97	1114	146	321	287	548	81	344	5352	12756
	16,3%	7,0%	4,3%	6,7%	0,8%	0,8%	8,7%	1,1%	2,5%	2,2%	4,3%	0,6%	2,7%	42,0%	

R1: Osteosynthesis failure

R2: Nonunion

R3: Avascular necrosis (segmental collapse)

R4: Local pain due to osteosynthesis material

R5: Malunion

R6: Infection - superficial

R7: Infection - deep

R8: Haematoma

R9: Dislocation of hemiprosthesis

R10: Penetration of osteosynthesis material through caput

R11: New fracture around implant

R12: Loosening of hemiprosthesis

R13: Other

R14: Reported reoperations to the Arthroplasty Register except "Deep infection" which is included in R7: Infection – deep.

Table 10: Numbers of reoperation for each type of primary fracture

In patients where both primary operation and the related reoperation are registered.
Multiple causes for each reoperation can be registered.

		Type of primary fracture								
		Intracapsular fracture, undischanced	Intracapsular fracture, displaced	Basocervical fracture	Trochanteric fracture (2 fragments)	Trochanteric fracture (multifragment)	Subtrochanteric fracture	Intertrochanteric fracture*	Other	Missing
Reasons for reoperation	Osteosynthesis failure	495	600	106	104	199	101	28	12	1
	Nonunion	211	235	46	35	84	50	7	5	1
	Avascular necrosis (segmental collaps)	161	150	23	15	17	2	2	2	0
	Local pain due to osteosynthesis material	199	227	46	49	69	37	9	2	0
	Malunion	20	22	7	12	10	1	1	1	0
	Infection - superficial	5	53	1	8	8	6	0	3	0
	Infection - deep	63	597	23	36	162	76	12	5	1
	Haematoma	12	85	2	12	18	7	2	2	0
	Dislocation of hemiprosthesis	18	254	9	4	8	2	0	2	0
	Penetration of osteosynthesis material through caput	39	48	27	38	56	12	7	4	0
	New fracture around implant	124	139	10	33	47	27	6	8	0
	Loosening of hemiprosthesis	5	46	2	0	3	2	0	1	0
	Other	66	71	16	38	47	33	4	11	0

* The registration started in 2008

Table 11: Type of reoperation (more than one reason is possible)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2014	55 5,7%	22 2,3%	149 15,4%	0 0,0%	84 8,7%	101 10,4%	6 0,6%	4 0,4%	94 9,7%	453 46,8%	968
2013	75 7,0%	30 2,8%	158 14,7%	0 0,0%	118 11,0%	105 9,8%	14 1,3%	7 0,7%	117 10,9%	452 42,0%	1076
2012	82 7,4%	36 3,3%	188 17,1%	0 0,0%	90 8,2%	129 11,7%	14 1,3%	9 0,8%	109 9,9%	445 40,4%	1102
2011	77 6,9%	31 2,8%	212 19,0%	0 0,0%	98 8,8%	93 8,3%	19 1,7%	13 1,2%	116 10,4%	456 40,9%	1115
2010	105 9,5%	35 3,2%	218 19,7%	2 0,2%	91 8,2%	93 8,4%	15 1,4%	11 1,0%	105 9,5%	433 39,1%	1108
2009	131 11,0%	36 3,0%	253 21,2%	0 0,0%	98 8,2%	108 9,0%	10 0,8%	11 0,9%	96 8,0%	453 37,9%	1196
2008	117 9,3%	38 3,0%	316 25,2%	1 0,1%	86 6,9%	72 5,7%	10 0,8%	15 1,2%	92 7,3%	508 40,5%	1255
2007	122 9,6%	28 2,2%	369 29,1%	1 0,1%	78 6,1%	58 4,6%	5 0,4%	11 0,9%	66 5,2%	532 41,9%	1270
2006	103 8,1%	37 2,9%	370 29,1%	6 0,5%	82 6,5%	59 4,6%	8 0,6%	5 0,4%	58 4,6%	543 42,7%	1271
2005	111 9,0%	25 2,0%	321 26,0%	36 2,9%	45 3,6%	36 2,9%	9 0,7%	7 0,6%	44 3,6%	600 48,6%	1234
Total	978 8,4%	318 2,7%	2554 22,0%	46 0,4%	870 7,5%	854 7,4%	110 0,9%	93 0,8%	897 7,7%	4875 42,0%	11595

R1: Removal of implant (when only procedure)
R2: Girdlestone (= Removal of implant/hemiprosthesis and caput)
R3: Bipolar hemiprosthesis
R4: Unipolar haemiprosthesis
R5: Re-osteosynthesis
R6: Drainage of haematoma or infection
R7: Closed reduction of dislocated hemiprosthesis
R8: Open reduction of dislocated hemiprosthesis
R9: Other
R10: Total hip prosthesis

Table 12: Reoperation with primary uni/bipolar hemiprosthesis (reasons are not mutually exclusive)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2014	3 1,9%	8 5,1%	18 11,4%	0 0,0%	2 1,3%	39 24,7%	4 2,5%	4 2,5%	56 35,4%	24 15,2%	158
2013	2 1,0%	10 5,0%	15 7,5%	0 0,0%	2 1,0%	59 29,4%	9 4,5%	4 2,0%	77 38,3%	23 11,4%	201
2012	4 2,2%	7 3,9%	23 12,8%	0 0,0%	0 0,0%	49 27,2%	10 5,6%	8 4,4%	56 31,1%	23 12,8%	180
2011	4 2,1%	7 3,7%	12 6,4%	0 0,0%	1 0,5%	49 26,2%	16 8,6%	8 4,3%	73 39,0%	17 9,1%	187
2010	6 3,4%	4 2,3%	15 8,6%	0 0,0%	3 1,7%	46 26,3%	10 5,7%	9 5,1%	70 40,0%	12 6,9%	175
2009	3 2,3%	6 4,6%	9 6,9%	0 0,0%	0 0,0%	30 23,1%	7 5,4%	9 6,9%	50 38,5%	16 12,3%	130
2008	2 1,5%	9 6,8%	7 5,3%	0 0,0%	2 1,5%	37 28,0%	5 3,8%	12 9,1%	45 34,1%	13 9,8%	132
2007	0 0,0%	5 5,7%	7 8,0%	0 0,0%	0 0,0%	21 23,9%	3 3,4%	10 11,4%	37 42,0%	5 5,7%	88
2006	0 0,0%	6 8,5%	2 2,8%	0 0,0%	0 0,0%	24 33,8%	4 5,6%	3 4,2%	29 40,8%	3 4,2%	71
2005	0 0,0%	1 2,9%	1 2,9%	0 0,0%	0 0,0%	11 32,4%	3 8,8%	3 8,8%	13 38,2%	2 5,9%	34
Total	24 1,8%	63 4,6%	109 8,0%	0 0,0%	10 0,7%	365 26,9%	71 5,2%	70 5,2%	506 37,3%	138 10,2%	1356

R1: Removal of implant (when only procedure)
R2: Girdlestone (= Removal of implant/hemiprosthesis and caput)
R3: Bipolar hemiprosthesis
R4: Unipolar hemiprosthesis
R5: Re-osteosynthesis
R6: Drainage of haematoma or infection
R7: Closed reduction of dislocated hemiprosthesis
R8: Open reduction of dislocated hemiprosthesis
R9: Other
R10: Total hip prosthesis

Table 13: Specification of R9 - Others

	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Attempt on closed reduction	1					1					
Cable Ready plate + cerclage	5		1	1					1		2
Cement spacer	10				1		1	2		2	3
Cerclage	12		1		2	1		2	1	3	2
Dall Miles plate + cerclage	13					1	3	4	1		4
Drainage of haematoma	25	3	7	3	5	1	3	2	1		
Exchange of caput/bipolar head	393	8	19	27	35	42	56	58	42	67	39
Exchange of caput/bipolar head + osteosynthesis with plate/cerclage	4						2			1	1
Exchange of femoral stem	9			2		1	2	2	1	1	
Extension of collum (BioBall)	1								1		
Fixation of trochanter (Dall Miles)	3			1				1	1		
LISS plate	2								1		1
Plate + cerclage	6	2			1				1	1	1
Reaming in acetabulum	1			1							
Removal of cement in acetabulum	2			1							1
Removal of drain	3		1			1				1	
Revision of prosthesis + osteosynthesis	2							1	1		
Suture of muscle/fascie	6				1	1	3		1		
Suture of skin + fascie	4			1		1			1		1
Unspecified plate + cerclage	5							1	2	1	1
Total	506	13	29	37	45	50	70	73	56	77	56

Table 14: Reoperation with primary screw osteosynthesis (reasons are not mutually exclusive)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2014	15 6,0%	0 0,0%	67 27,0%	0 0,0%	25 10,1%	3 1,2%	0 0,0%	0 0,0%	4 1,6%	134 54,0%	248
2013	33 11,7%	2 0,7%	72 25,4%	0 0,0%	35 12,4%	1 0,4%	0 0,0%	1 0,4%	2 0,7%	137 48,4%	283
2012	32 10,6%	10 3,3%	98 32,3%	0 0,0%	27 8,9%	4 1,3%	0 0,0%	0 0,0%	3 1,0%	129 42,6%	303
2011	36 11,0%	9 2,8%	113 34,6%	0 0,0%	23 7,0%	2 0,6%	0 0,0%	0 0,0%	7 2,1%	137 41,9%	327
2010	49 14,8%	11 3,3%	113 34,2%	1 0,3%	26 7,9%	2 0,6%	0 0,0%	0 0,0%	4 1,2%	124 37,6%	330
2009	70 19,2%	7 1,9%	126 34,6%	0 0,0%	15 4,1%	7 1,9%	0 0,0%	0 0,0%	4 1,1%	135 37,1%	364
2008	53 13,7%	12 3,1%	161 41,6%	0 0,0%	21 5,4%	3 0,8%	0 0,0%	0 0,0%	3 0,8%	134 34,6%	387
2007	64 14,8%	8 1,9%	198 45,9%	1 0,2%	15 3,5%	1 0,2%	0 0,0%	0 0,0%	5 1,2%	139 32,3%	431
2006	38 9,7%	5 1,3%	193 49,4%	5 1,3%	21 5,4%	2 0,5%	0 0,0%	0 0,0%	2 0,5%	125 32,0%	391
2005	10 4,7%	6 2,8%	124 58,2%	12 5,6%	6 2,8%	4 1,9%	0 0,0%	0 0,0%	4 1,9%	47 22,1%	213
Total	400 12,2%	70 2,1%	1265 38,6%	19 0,6%	214 6,5%	29 0,9%	0 0,0%	1 0,0%	38 1,2%	1241 37,9%	3277

R1: Removal of implant (when only procedure)
R2: Girdlestone (= Removal of implant/hemiprostheses and caput)
R3: Bipolar hemiprostheses
R4: Unipolar hemiprostheses
R5: Re-osteosynthesis
R6: Drainage of haematoma or infection
R7: Closed reduction of dislocated hemiprostheses
R8: Open reduction of dislocated hemiprostheses
R9: Other
R10: Total hip prostheses

Implants

Table 15: Cemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Charnley		Hastings bipolar head	2769	376	473	471	369	368	290	143	120	98	61
Charnley Modular	Elite	Hastings bipolar head	1278		23	144	221	227	208	142	160	152	1
Charnley Modular	Elite	Landos bipolar cup (DePuy)	24			15	5	4					
Charnley Modular	Elite	Self-centering bipolar (DePuy)	417				3	28	31	23	36	55	241
Charnley Modular	Unknown caput	Hastings bipolar head	12			5	2	1		2	1	1	
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	177					1	1	9	40	51	75
Corail	Articul/Eze CoCr	Vario-Cup (Link)	58						1	6	8	8	35
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	10								5	3	2
Corail	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	10	3	1	2	1	2	1				
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	78				1	14	31	22	10		
CPS-PLUS	Metal Ball Head	Bipolar Ball Head	23	1				1	19	2			
Elite	Elite	Hastings bipolar head	23	1	3	2	6	5	1	4		1	
ETS			298	23	31	48	71	79	23	16	3	2	2
Exeter/V40	Exeter/V40	Self-centering bipolar (DePuy)	425					1	7	42	31	94	250
Exeter/V40	Exeter/V40	UHR	8311	202	380	487	700	752	852	1139	1241	1262	1296
Exeter/V40	Exeter/V40	Unknown bipolar head	25		2	3		2	4	8	3	2	1
MS-30	Protasul/Metasul	UHR	22		11	10				1			
SP II (Link)	Articul/Eze CoCr	Self-centering bipolar (DePuy)	18								1		17
SP II (Link)	CoCrMo (Link)	Self-centering bipolar (DePuy)	54									7	47
SP II (Link)	CoCrMo (Link)	UHR	261									62	199
SP II (Link)	CoCrMo (Link)	Vario-Cup (Link)	1735	40	41	84	182	292	279	250	233	263	71
Spectron	Cobalt Chrom (S&N)	Biarticular cup (Permedica)	33			5	17	7	2	2			
Spectron	Cobalt Chrom (S&N)	HIP Bipolar Cup	85					8	12	19	9	16	21
Spectron	Cobalt Chrom (S&N)	Landos bipolar cup (DePuy)	112	38	30	31	12	1					
Spectron	Cobalt Chrom (S&N)	Self-centering bipolar (DePuy)	30				7	14	9				
Spectron	Cobalt Chrom (S&N)	Tandem	1090	62	137	171	204	182	70	104	95	65	
Spectron	Cobalt Chrom (S&N)	Universal bipolar	17	11	6								
Spectron	Cobalt Chrom (S&N)	Unknown bipolar head	11		1	3	3	1	3				
Spectron	Cobalt Chrom (S&N)	Vario-Cup (Link)	81		1	3	16	48	13				
Spectron	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	16	2	13	1							
Titan	Alumina Biolox (DePuy)	Landos bipolar cup (DePuy)	11	9	1	1							
Titan	Articul/Eze CoCr	Landos bipolar cup (DePuy)	15			15							
Titan	Articul/Eze CoCr	Self-centering bipolar (DePuy)	15						12	2	1		
Titan	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	672	108	165	211	168	19	1				
Titan	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	227				55	135	36	1			
Titan	Unknown caput	Landos bipolar cup (DePuy)	15	10	1	2	2						
Other*			235	13	25	46	26	25	24	24	10	23	19
Unknown			31	4	6	3	6	8	2	1			1
Total			18724	903	1351	1763	2077	2225	1932	1962	2007	2165	2339

*Other includes combinations of implants with less than 10 occurrences.

Table 16: Uncemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Accolade II	Exeter/V40	Vario-Cup (Link)	10									2	8
Corail	Alumina BioloX (DePuy)	Self-centering bipolar (DePuy)	11				1	1	6	3			
Corail	Alumina BioloX (DePuy)	Vario-Cup (Link)	10					1	9				
Corail	Articul/Eze BioloX Forte (DePuy)	Self-centering bipolar (DePuy)	14					3	1	3	7		
Corail	Articul/Eze CoCr	Bipolar Ball Head	64							17	39	8	
Corail	Articul/Eze CoCr	Landos bipolar cup (DePuy)	118			78	34		5	1			
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	2280				23	87	202	348	620	532	468
Corail	Articul/Eze CoCr	UHR	232						17	49	44	40	82
Corail	Articul/Eze CoCr	Vario-Cup (Link)	154						21	37	32	47	17
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	389							21	143	145	80
Corail	Cobalt Chrom (S&N)	Self-centering bipolar (DePuy)	37					14	23				
Corail	Cobalt Chrom (S&N)	Vario-Cup (Link)	13						13				
Corail	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	780	151	243	194	164	21	7				
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	1143			1	61	323	383	344	30	1	
Corail	Cobalt chrome (DePuy)	Tandem	11		2	2	1		4	2			
Corail	Cobalt chrome (DePuy)	UHR	20		7	1	1	3	3	5			
Corail	Metal Ball Head	Bipolar Ball Head	25					1	5	19			
Corail	Modular Cathcart (Fracture head hip ball)		14					3	8	3			
Corail	Unknown caput	Landos bipolar cup (DePuy)	10	4	4		2						
Corail	Unknown caput	Unknown bipolar head	15	1	2			5	4	1	1	1	
Filler	Biotechni fem. head	Biarticular cup (Permedica)	24	5	12	5	1	1					
Filler	Cobalt Chrom (S&N)	Biarticular cup (Permedica)	19			8	6	4			1		
Filler	Hipball Premium	Biarticular cup (Permedica)	197		6	63	71	50	7				
Filler	Hipball Premium	HIP Bipolar Cup	518					33	95	129	126	99	36
Filler	Hipball Premium	UHR	32									10	22
HACTIV	HACTIV head	Moonstone	22	17	4	1							
HACTIV	HACTIV head	Tandem	19	5	4		4	2		1	2	1	
HACTIV	HACTIV head	UHR	41										41
Polarstem	Cobalt Chrom (S&N)	Tandem	207						18	64	71	39	15
Polarstem	Cobalt Chrom (S&N)	UHR	16										16
SL-PLUS	HACTIV head	Bipolar Ball Head	16	13	3								
SL-PLUS	Metal Ball Head	Bipolar Ball Head	155	22	29	29	36	32	7				
Other*			200	14	11	18	26	26	41	13	18	13	20
Unknown			6	2			1	2					1
Total			6822	234	327	400	432	612	879	1060	1134	938	806

*Other includes combinations of implants with less than 10 occurrences.

Table 17: Cemented hemiprosthesis - reoperations

Femur	Caput	Bipolar head	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Charnley		Hastings bipolar head	489	131	95	73	65	50	39	22	8	3	3
Charnley Modular	Elite	Hastings bipolar head	82		3	16	13	17	12	11	2	8	
Charnley Modular	Elite	Landos bipolar cup (DePuy)	7			2	5						
Charnley Modular	Elite	Self-centering bipolar (DePuy)	25				2		1	3	7	1	11
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	18							4	8	1	5
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	11					2	5	4			
CPS-PLUS	Metal Ball Head	Bipolar Ball Head	8			1	3		4				
CPS-PLUS Rev. stem	Metal Ball Head	Bipolar Ball Head	7			5	1	1					
Elite	Elite	Hastings bipolar head	5		1	1			1		2		
ETS			23	10	4	1	4	3				1	
Exeter/V40	Exeter/V40	Self-centering bipolar (DePuy)	33						1	3	8	7	14
Exeter/V40	Exeter/V40	UHR	656	80	87	101	74	57	42	55	64	52	44
Fjord	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	6	1	3	1	1						
MS-30	Protasul/Metasul	UHR	5		4	1							
Restoration Modular (femur)	Exeter/V40	Self-centering bipolar (DePuy)	10					2	3	3	1	1	
Restoration Modular (femur)	Exeter/V40	UHR	6									4	2
SP II (Link)	CoCrMo (Link)	UHR	14									2	12
SP II (Link)	CoCrMo (Link)	Vario-Cup (Link)	140	10	12	13	14	11	18	24	19	12	7
Spectron	Cobalt Chrom (S&N)	Landos bipolar cup (DePuy)	11	1	2	3	5						
Spectron	Cobalt Chrom (S&N)	Tandem	128	22	20	20	22	18	3	5	11	6	1
Spectron	Cobalt Chrom (S&N)	Universal bipolar	9	9									
Titan	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	135	31	46	37	17	4					
Titan	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	19			1	5	9	3	1			
Other*			97	13	11	15	15	9	10	6	3	4	11
Unknown			5	1	2		1			1			
Total			1949	309	290	291	247	183	142	142	133	102	110

*Other includes combinations of implants with less than 5 occurrences.

Table 18: Uncemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Corail	Articul/Eze CoCr	Landos bipolar cup (DePuy)	22			11	11						
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	78				2	4	19	9	15	18	11
Corail	Articul/Eze CoCr	UHR	9						3	4			2
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	28							4	13	9	2
Corail	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	92	18	38	19	13	2	2				
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	74				4	28	25	16	1		
Corail	Cobalt chrome (DePuy)	UHR	6				1	2	1	1	1		
Filler	Biotechni fem. head	Biarticular cup (Permedica)	21	11	9		1						
Filler	Cobalt chrome (DePuy)	Biarticular cup (Permedica)	6		1	3	2						
Filler	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	5		5								
Filler	Hipball Premium	Biarticular cup (Permedica)	56		8	23	18	7					
Filler	Hipball Premium	HIP Bipolar Cup	63					4	8	21	7	13	10
HACTIV	HACTIV head	Moonstone	7	2	4	1							
KAR	Articul/Eze CoCr	Self-centering bipolar (DePuy)	6								2	3	1
KAR	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	7								4	3	
KAR	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	19	1	5	6	6			1			
KAR	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	12					5	4	2	1		
REEF	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	6				1	3	2				
Restoration -HA	C-Taper Head	Landos bipolar cup (DePuy)	7		1	5	1						
SL-PLUS	Metal Ball Head	Bipolar Ball Head	12	2	4	2	1	2	1				
TTHR	TETE Inox	Self-centering bipolar (DePuy)	5						4	1			
Other*			116	14	10	10	10	15	10	14	11	10	12
Unknown			3		2	1							
Total			660	48	87	81	71	72	79	73	55	56	38

*Other includes combinations of implants with less than 5 occurrences.

Table 19: Screws - primary operations

Product	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Asnis III	1124	96	121	98	75	49	126	177	156	105	121
Hansson pin system (LIH)	1953	352	332	287	253	235	212	112	69	60	41
Olmed	9519	1286	1445	1310	1230	1121	790	674	660	563	440
Richards CHP	5505	475	634	538	454	365	572	733	597	593	544
Other*	2							2			
Total	18103	2209	2532	2233	2012	1770	1700	1698	1482	1321	1146

Table 20: Hip compression screws - primary operations

Product	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
DHS	4212	593	982	1076	1009	337	108	58	28	8	13
LCP DHS	3276				34	705	476	485	458	467	651
Omega	111	53	35	10	3	1	2	3	2	2	
Richards CHS	16555	1315	1501	1426	1426	1510	2047	2021	1991	1765	1553
Other*	5	1			2					1	1
Total	24159	1962	2518	2512	2474	2553	2633	2567	2479	2243	2218

Table 21: Intramedullary nails - primary operations

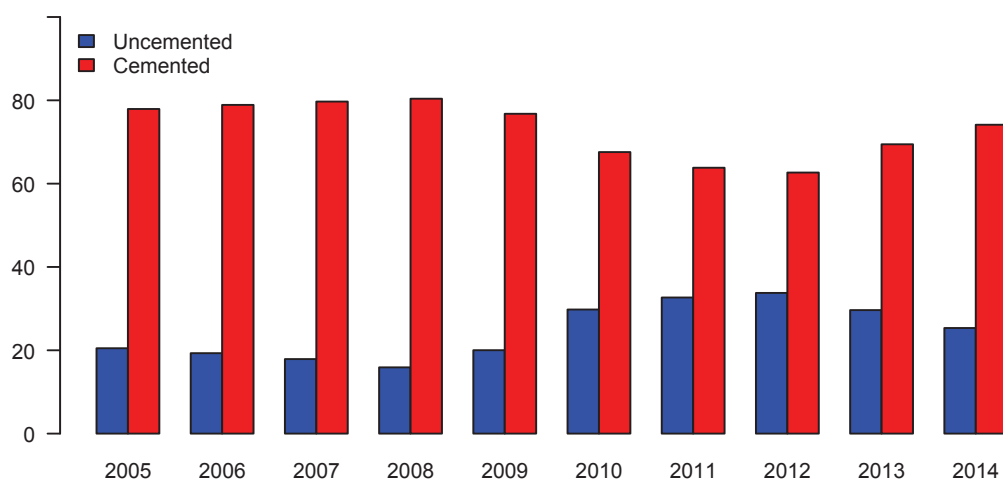
Product	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ACE	49	4	9	17	12	7					
Gamma 3	4983	46	193	284	502	505	656	672	657	764	704
IMHS	27	8	7	7	3	1	1				
IMHS CP	10	10									
LFN	62		1	5	3	10	12	8	8	8	7
PFN	26	19	5		2						
PFNA	566		28	44	39	41	30	40	91	136	117
T2	12	1	1	2		2	1	3	1		1
T2 recon	181			1		1	19	38	29	60	33
T-Gamma	507	191	166	91	34	22	3				
Trigen Intertan	1674		1	148	406	150	133	190	185	198	263
Trigen TAN/FAN	246	17	32	30	25	35	17	14	22	33	21
Other*	5	2	3								
Unknown	4					2			1		1
Total	8352	298	446	629	1026	776	872	965	994	1199	1147

Fixation of hemiprotheses

Table 22: Primary operations

	Uncemented	Cement with antibiotics	Cement without antibiotics	Missing	Total
2014	797 (25,3%)	2320 (73,8%)	12 (0,4%)	16 (0,5%)	3145
2013	920 (29,6%)	2153 (69,4%)	2 (0,1%)	28 (0,9%)	3103
2012	1060 (33,7%)	1956 (62,3%)	13 (0,4%)	112 (3,6%)	3141
2011	987 (32,7%)	1921 (63,6%)	8 (0,3%)	106 (3,5%)	3022
2010	837 (29,8%)	1883 (67,0%)	17 (0,6%)	74 (2,6%)	2811
2009	568 (20,0%)	2153 (75,9%)	25 (0,9%)	91 (3,2%)	2837
2008	399 (15,9%)	2001 (79,8%)	16 (0,6%)	93 (3,7%)	2509
2007	387 (17,9%)	1713 (79,2%)	11 (0,5%)	52 (2,4%)	2163
2006	324 (19,3%)	1315 (78,4%)	9 (0,5%)	30 (1,8%)	1678
2005	233 (20,5%)	882 (77,6%)	4 (0,4%)	18 (1,6%)	1137
Total	6512 (25,5%)	18297 (71,6%)	117 (0,5%)	620 (2,4%)	25546

*Other includes implants with less than 10 occurrences.

Figure 11: Time trend for fixation of primary hemiprostheses**Table 23: Type of cement - primary operations**

Product	Manufacturer	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Cemex System Genta FAST	Alere	612			22	60	101	102	83	74	84	86
Cemex w/gentamycin	Alere	71	5	16	24	4		1			11	10
Copal G+ V	Heraeus	1										1
Optipac Refobacin Bonecement R	Biomet	3901				41	219	518	717	790	725	891
Optipac Refobacin Revision	Biomet	128							2	1	58	67
Palacos R + G	Heraeus	8857	174	845	1078	1281	1363	983	712	690	868	863
Palacos w/gentamicin	Heraeus	353	351	2								
Refobacin Bone Cement R	Biomet	3705	61	424	538	547	395	246	356	367	394	377
Refobacin-Palacos	Biomet	314	287	20	7							
Simplex	Stryker	77		2	3	16	43	13				
SmartSet GHV	Ortomedic	65		1	32	27	4		1			
Missing information		213	4	5	9	25	28	20	50	34	13	25
Total		18297	882	1315	1713	2001	2153	1883	1921	1956	2153	2320

Table 24: Hydroxyapatite (HA) - uncemented prostheses

	With HA	Without HA	Missing	Total
2014	529 (66,4%)	9 (1,1%)	259 (32,5%)	797
2013	623 (67,7%)	0 (0,0%)	297 (32,3%)	920
2012	772 (72,8%)	2 (0,2%)	286 (27,0%)	1060
2011	785 (79,5%)	4 (0,4%)	198 (20,1%)	987
2010	666 (79,6%)	19 (2,3%)	152 (18,2%)	837
2009	440 (77,5%)	47 (8,3%)	81 (14,3%)	568
2008	300 (75,2%)	38 (9,5%)	61 (15,3%)	399
2007	294 (76,0%)	27 (7,0%)	66 (17,1%)	387
2006	213 (65,7%)	42 (13,0%)	69 (21,3%)	324
2005	143 (61,4%)	29 (12,4%)	61 (26,2%)	233
Total	4765 (73,2%)	217 (3,3%)	1530 (23,5%)	6512

Pathological fractures

Table 25: Pathological fracture (osteoporotic fracture not included) - primary operations *

	No	Yes	Missing	Total
2014	6835 (87,8%)	80 (1,0%)	872 (11,2%)	7787
2013	6986 (87,2%)	132 (1,6%)	890 (11,1%)	8008
2012	7186 (87,4%)	106 (1,3%)	928 (11,3%)	8220
2011	7483 (89,0%)	135 (1,6%)	787 (9,4%)	8405
2010	7610 (92,8%)	93 (1,1%)	496 (6,0%)	8199
2009	7305 (90,2%)	107 (1,3%)	686 (8,5%)	8098
2008	7388 (90,0%)	102 (1,2%)	721 (8,8%)	8211
2007	6958 (90,2%)	93 (1,2%)	660 (8,6%)	7711
2006	6656 (90,1%)	91 (1,2%)	637 (8,6%)	7384
2005	5138 (88,9%)	65 (1,1%)	574 (9,9%)	5777
Total	69545 (89,4%)	1004 (1,3%)	7251 (9,3%)	77800

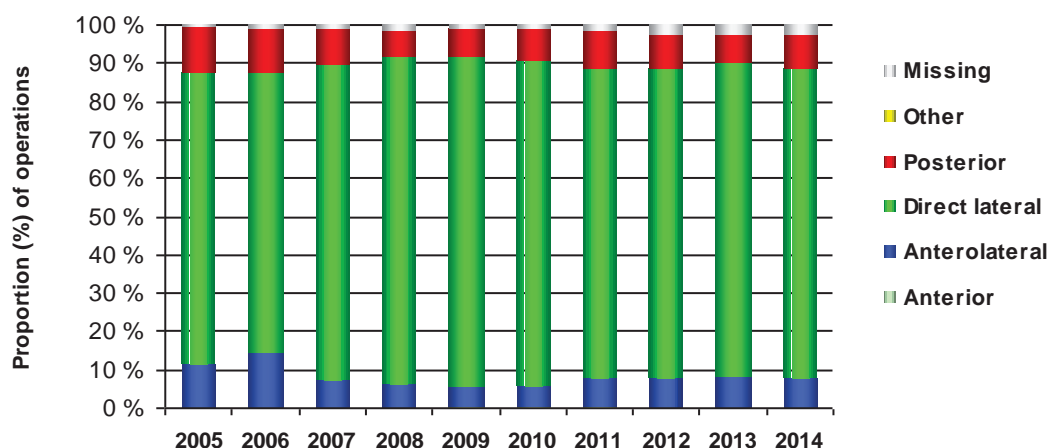
* Patients operated with total hip prostheses were excluded

Surgical approach used in hemiarthroplasty

Table 26: Surgical approach used in hemiarthroplasty

	Anterior	Anterolateral	Direct lateral	Posterior	Other	Missing	Total
2014	3 (0,1%)	248 (7,9%)	2531 (80,5%)	282 (9,0%)	1 (0,0%)	80 (2,5%)	3145
2013	8 (0,3%)	255 (8,2%)	2538 (81,8%)	224 (7,2%)	0 (0,0%)	78 (2,5%)	3103
2012	6 (0,2%)	237 (7,5%)	2535 (80,7%)	276 (8,8%)	1 (0,0%)	86 (2,7%)	3141
2011	11 (0,4%)	228 (7,5%)	2443 (80,8%)	289 (9,6%)	0 (0,0%)	51 (1,7%)	3022
2010	14 (0,5%)	142 (5,1%)	2391 (85,1%)	230 (8,2%)	0 (0,0%)	34 (1,2%)	2811
2009	14 (0,5%)	147 (5,2%)	2441 (86,0%)	200 (7,0%)	0 (0,0%)	35 (1,2%)	2837
2008	1 (0,0%)	155 (6,2%)	2143 (85,4%)	176 (7,0%)	0 (0,0%)	34 (1,4%)	2509
2007	0 (0,0%)	162 (7,5%)	1777 (82,2%)	201 (9,3%)	0 (0,0%)	23 (1,1%)	2163
2006	1 (0,1%)	245 (14,6%)	1224 (72,9%)	189 (11,3%)	0 (0,0%)	19 (1,1%)	1678
2005	0 (0,0%)	131 (11,5%)	865 (76,1%)	136 (12,0%)	0 (0,0%)	5 (0,4%)	1137
Total	58 (0,2%)	1950 (7,6%)	20888 (81,8%)	2203 (8,6%)	2 (0,0%)	445 (1,7%)	25546

Figure 12: Surgical approach used in hemiarthroplasty



Definition of operative approach:

- **Anterior** (between sartorius and tensor)
- **Anterolateral** (between gluteus medius and tensor)
- **Direct lateral** (transgluteal)
- **Posterior** (behind the gluteus medius)

Intraoperative complications

Table 27: Intraoperative complications - primary operations

	Yes	No	Missing	Total
2014	303 (3,8%)	7508 (92,9%)	272 (3,4%)	8083
2013	306 (3,7%)	7752 (93,2%)	256 (3,1%)	8314
2012	345 (4,1%)	7782 (92,1%)	324 (3,8%)	8451
2011	355 (4,1%)	7975 (92,6%)	287 (3,3%)	8617
2010	322 (3,9%)	7771 (92,8%)	279 (3,3%)	8372
2009	303 (3,7%)	7687 (93,1%)	271 (3,3%)	8261
2008	367 (4,4%)	7733 (92,4%)	271 (3,2%)	8371
2007	274 (3,5%)	7367 (93,5%)	238 (3,0%)	7879
2006	244 (3,2%)	7032 (93,4%)	253 (3,4%)	7529
2005	189 (3,2%)	5574 (94,5%)	135 (2,3%)	5898
Total	3008 (3,8%)	74181 (93,0%)	2586 (3,2%)	79775

Systemic antibiotic prophylaxis

Table 28: Antibiotic prophylaxis in primary screw operations

	Yes	No	Missing	Total
2014	980 (85,5%)	161 (14,0%)	5 (0,4%)	1146
2013	1008 (76,3%)	307 (23,2%)	6 (0,5%)	1321
2012	1016 (68,6%)	455 (30,7%)	11 (0,7%)	1482
2011	999 (58,8%)	682 (40,2%)	17 (1,0%)	1698
2010	952 (56,0%)	721 (42,4%)	26 (1,5%)	1699
2009	884 (50,0%)	858 (48,6%)	25 (1,4%)	1767
2008	930 (46,3%)	1050 (52,3%)	27 (1,3%)	2007
2007	905 (40,6%)	1300 (58,3%)	26 (1,2%)	2231
2006	814 (32,2%)	1663 (65,8%)	51 (2,0%)	2528
2005	533 (24,2%)	1627 (73,7%)	47 (2,1%)	2207
Total	9021 (49,9%)	8824 (48,8%)	241 (1,3%)	18086

Table 29: Antibiotic prophylaxis in primary hemiprosthesis

	Yes	No	Missing	Total
2014	3139 (99,8%)	0 (0,0%)	5 (0,2%)	3144
2013	3090 (99,6%)	4 (0,1%)	9 (0,3%)	3103
2012	3131 (99,7%)	6 (0,2%)	2 (0,1%)	3139
2011	3008 (99,6%)	4 (0,1%)	9 (0,3%)	3021
2010	2803 (99,8%)	4 (0,1%)	3 (0,1%)	2810
2009	2826 (99,6%)	8 (0,3%)	3 (0,1%)	2837
2008	2487 (99,1%)	13 (0,5%)	9 (0,4%)	2509
2007	2150 (99,4%)	7 (0,3%)	6 (0,3%)	2163
2006	1666 (99,3%)	9 (0,5%)	3 (0,2%)	1678
2005	1130 (99,4%)	2 (0,2%)	5 (0,4%)	1137
Total	25430 (99,6%)	57 (0,2%)	54 (0,2%)	25541

Table 30: Antibiotic prophylaxis in primary hip compression screw and plate (including angle plate)

	Yes	No	Missing	Total
2014	2208 (99,4%)	7 (0,3%)	7 (0,3%)	2222
2013	2238 (99,7%)	4 (0,2%)	2 (0,1%)	2244
2012	2461 (99,2%)	14 (0,6%)	5 (0,2%)	2480
2011	2527 (98,4%)	28 (1,1%)	12 (0,5%)	2567
2010	2584 (98,1%)	37 (1,4%)	12 (0,5%)	2633
2009	2490 (97,5%)	53 (2,1%)	10 (0,4%)	2553
2008	2377 (96,0%)	83 (3,4%)	16 (0,6%)	2476
2007	2361 (94,0%)	138 (5,5%)	13 (0,5%)	2512
2006	2342 (93,0%)	161 (6,4%)	16 (0,6%)	2519
2005	1824 (92,9%)	121 (6,2%)	18 (0,9%)	1963
Total	23412 (96,9%)	646 (2,7%)	111 (0,5%)	24169

Table 31: Antibiotic prophylaxis in primary intramedullary nail operations

	Yes	No	Missing	Total
2014	1132 (98,8%)	5 (0,4%)	9 (0,8%)	1146
2013	1179 (98,4%)	15 (1,3%)	4 (0,3%)	1198
2012	934 (94,1%)	53 (5,3%)	6 (0,6%)	993
2011	864 (89,5%)	96 (9,9%)	5 (0,5%)	965
2010	796 (91,3%)	68 (7,8%)	8 (0,9%)	872
2009	712 (91,9%)	58 (7,5%)	5 (0,6%)	775
2008	914 (89,1%)	105 (10,2%)	7 (0,7%)	1026
2007	573 (91,1%)	54 (8,6%)	2 (0,3%)	629
2006	397 (89,0%)	48 (10,8%)	1 (0,2%)	446
2005	236 (79,5%)	56 (18,9%)	5 (1,7%)	297
Total	7737 (92,7%)	558 (6,7%)	52 (0,6%)	8347

Table 32: Antibiotic prophylaxis in all reoperations

	Yes	No	Missing	Total
2014	828 (94,8%)	42 (4,8%)	3 (0,3%)	873
2013	895 (92,3%)	66 (6,8%)	9 (0,9%)	970
2012	916 (92,0%)	75 (7,5%)	5 (0,5%)	996
2011	910 (89,2%)	95 (9,3%)	15 (1,5%)	1020
2010	883 (87,9%)	109 (10,9%)	12 (1,2%)	1004
2009	953 (85,1%)	149 (13,3%)	18 (1,6%)	1120
2008	1036 (87,6%)	129 (10,9%)	18 (1,5%)	1183
2007	1091 (89,0%)	126 (10,3%)	9 (0,7%)	1226
2006	1089 (88,5%)	124 (10,1%)	17 (1,4%)	1230
2005	1064 (89,9%)	112 (9,5%)	8 (0,7%)	1184
Total	9665 (89,4%)	1027 (9,5%)	114 (1,1%)	10806

Table 33: Drugs in primary operations**(n=69919)**

Antibiotics (generic name)	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Ampicillin (Pentrexyl, Pondocillin, Doktacilin)	0,29%	0,31%	0,45%	0,27%	0,16%	0,25%	0,20%	0,17%	0,19%	0,22%
Benzylpenicillin (Penicillin G)	0,18%	0,10%	0,15%	0,12%	0,17%	0,05%	0,23%	0,28%	0,30%	0,28%
Cefaleksin (Keflex, Cefalexin)	0,27%	0,18%	0,08%	0,02%	0,01%	0,01%	0,03%	0,02%	0,02%	0,08%
Cefalotin (Keflin)	64,68%	69,99%	71,15%	73,04%	75,06%	76,03%	72,67%	72,41%	74,03%	76,88%
Cefotaksim (Claforan)	0,37%	0,15%	0,16%	0,13%	0,22%	0,20%	0,33%	0,31%	0,30%	0,25%
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	4,63%	4,89%	4,60%	4,40%	3,74%	3,54%	3,63%	4,25%	2,12%	0,98%
Ciprofloksasin (Ciproxin)	0,06%	0,04%	0,15%	0,05%	0,15%	0,15%	0,19%	0,19%	0,18%	0,07%
Dikloksacillin (Diclocil, Dicillin)	5,60%	4,41%	4,19%	4,76%	3,59%	1,56%	1,99%	2,23%	1,54%	0,20%
Gentamicin (Garamycin, Gensumycin)	0,08%	0,16%	0,29%	0,15%	0,06%	0,08%	0,12%	0,12%	0,04%	0,12%
Klindamycin (Dalacin, Clindamycin)	1,35%	1,57%	1,83%	2,15%	2,24%	2,46%	3,05%	3,20%	3,58%	3,78%
Kloksacillin (Ekvacillin)	0,49%	0,59%	0,62%	1,10%	2,09%	4,24%	5,65%	4,71%	5,65%	5,93%
Mecillinam (Selexid)	0,06%	0,03%	0,03%	0,02%	0,04%	0,02%	0,14%	0,09%	0,12%	0,12%
Metronidasol (Flagyl, Metronidazol, Elyzol)	0,04%	0,04%	0,03%	0,06%	0,06%	0,07%	0,10%	0,13%	0,09%	0,03%
Other	0,29%	0,16%	0,28%	0,13%	0,17%	0,20%	0,29%	0,35%	0,30%	0,31%
Missing	0,43%	0,43%	0,37%	0,33%	0,28%	0,31%	0,25%	0,21%	0,45%	0,43%

Pharmacological antithrombotic prophylaxis

Table 34: Primary operation

	Yes	No	Missing	Total
2014	7872 (97,4%)	193 (1,9%)	18 (0,7%)	8083
2013	8168 (98,2%)	139 (1,3%)	7 (0,4%)	8314
2012	8324 (98,5%)	125 (1,1%)	2 (0,4%)	8451
2011	8507 (98,7%)	92 (1,0%)	18 (0,3%)	8617
2010	8247 (98,5%)	94 (1,1%)	31 (0,4%)	8372
2009	8153 (98,7%)	78 (0,9%)	30 (0,4%)	8261
2008	8227 (98,3%)	112 (1,3%)	32 (0,4%)	8371
2007	7716 (97,9%)	135 (1,7%)	28 (0,4%)	7879
2006	7285 (96,8%)	198 (2,6%)	46 (0,6%)	7529
2005	5755 (97,6%)	117 (2,0%)	26 (0,4%)	5898
Total	78254 (98,1%)	1283 (1,6%)	238 (0,3%)	79775

Table 35: Number of drugs in antithrombotic prophylaxis

	One drug	Two drugs	Total
2014	7644 (97,1%)	228 (2,9%)	7872
2013	7908 (96,8%)	260 (3,2%)	8168
2012	8149 (97,9%)	175 (2,1%)	8324
2011	8420 (99,0%)	87 (1,0%)	8507
2010	8212 (99,6%)	35 (0,4%)	8247
2009	8135 (99,8%)	18 (0,2%)	8153
2008	8211 (99,8%)	16 (0,2%)	8227
2007	7701 (99,8%)	15 (0,2%)	7716
2006	7270 (99,8%)	15 (0,2%)	7285
2005	5734 (99,6%)	21 (0,4%)	5755
Total	77384 (98,9%)	870 (1,1%)	78254

Table 36: Antithrombotic prophylaxis - one drug - primary operation (n=77384)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Dalteparin (Fragmin)	54,71%	48,29%	53,06%	63,67%	51,91%	61,30%	63,00%	62,96%	53,38%	50,97%
Enoksaparin (Klexane)	44,89%	51,38%	46,83%	36,02%	47,72%	38,40%	36,59%	36,30%	45,65%	48,09%
Other	0,11%	0,08%	0,04%	0,13%	0,19%	0,18%	0,09%	0,05%	0,27%	0,38%
Missing	0,28%	0,21%	0,12%	0,18%	0,17%	0,12%	0,31%	0,70%	0,68%	0,55%

Table 37: Time of first dose in antithrombotic prophylaxis - primary operation

	Preoperatively	Postoperatively	Missing	Total
2014	2594 (33,0%)	4423 (56,2%)	855 (10,9%)	7872
2013	2817 (34,5%)	4361 (53,4%)	990 (12,1%)	8168
2012	3113 (37,4%)	4138 (49,7%)	1073 (12,9%)	8324
2011	3329 (39,2%)	4066 (47,8%)	1112 (9,8%)	8507
2010	3312 (40,2%)	3591 (43,5%)	1344 (10,5%)	8247
2009	3760 (46,2%)	3048 (37,4%)	1345 (12,1%)	8153
2008	3514 (42,7%)	2976 (36,2%)	1737 (16,3%)	8227
2007	2929 (38,0%)	2971 (38,5%)	1816 (17,7%)	7716
2006	2937 (40,4%)	2061 (28,3%)	2287 (19,6%)	7285
2005	2204 (38,8%)	46 (0,8%)	3505 (26,6%)	5755
Total	30509 (39,0%)	31681 (40,5%)	16064 (20,5%)	78254

DURATION OF SURGERY

Figure 13: Duration of surgery for the different types of operations

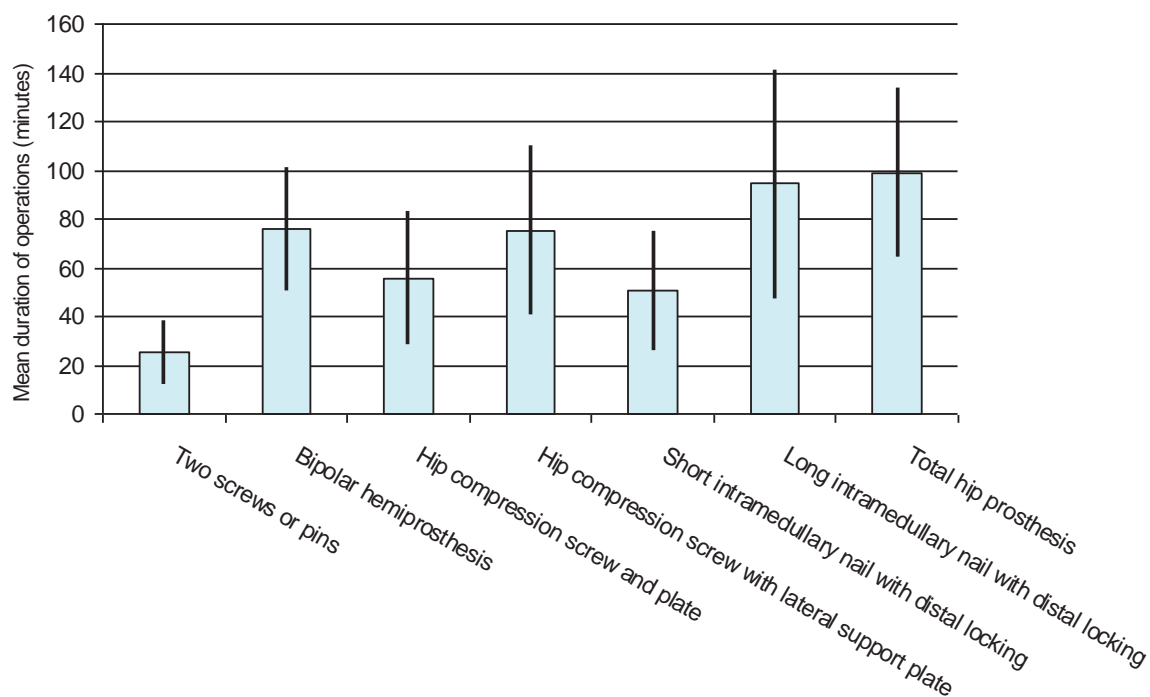


Table 38: Duration of surgery for the different types of operations

Type of operations	Total	Mean duration of operations (minutes)	Standard deviation
Two screws or pins	16732	25	13
Bipolar hemiprosthesis	24279	76	25
Hip compression screw and plate	16128	56	27
Hip compression screw with lateral support plate	6978	75	34
Short intramedullary nail with distal locking	5159	51	24
Long intramedullary nail with distal locking	2420	94	47
Total hip prosthesis	1917	99	35

Completeness analysis for the Norwegian Hip Fracture Register, 2008-2012

A completeness analysis for the Norwegian Hip Fracture Register (NHFR) has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the NHFR. A report on the analysis and results will be published on www.helsedirektoratet.no. There are separate statistics for primary hemiarthroplasty and osteosynthesis, and for the total number of revisions.

NCSP codes for combining data from NPR hospital stays and the Hip Fracture Register

Type	Code	Description
Primary hemi-arthroplasty	NFB 00	Primary partial prosthetic replacement of hip joint not using cement; all parts
	NFB 02	Primary partial prosthetic replacement of hip joint not using cement; single part - distal
	NFB 09	Primary partial prosthetic replacement of hip joint not using cement; other or unspecified
	NFB 10	Primary partial prosthetic replacement of hip joint using cement; all parts
	NFB 12	Primary partial prosthetic replacement of hip joint using cement; single part - distal
	NFB 19	Primary partial prosthetic replacement of hip joint using cement; other or unspecified
Osteosynthesis	NFJ0 (0,1,2,3)	Closed reduction of fracture of femur
	NFJ1 (0,1,2,3)	Open reduction of fracture of femur
	NFJ2 (0,1,2,3)	External fixation of fracture of femur
	NFJ3 (0,1,2,3)	Internal fixation of fracture of femur using bioimplant
	NFJ4 (0,1,2,3)	Internal fixation of fracture of femur using wire, rod, cerclage or pin
	NFJ5 (0,1,2,3)	Internal fixation of fracture of femur using intramedullary nail
	NFJ6 (0,1,2,3)	Internal fixation of fracture of femur using plate and screws
	NFJ7 (0,1,2,3)	Internal fixation of fracture of femur using screws alone
	NFJ8 (0,1,2,3)	Internal fixation of fracture of femur using other or combined methods
	NFJ9 (0,1,2,3)	Other fracture surgery of femur
Revision	NFC 0*	Secondary implantation of partial prosthesis in hip joint not using cement
	NFC 1*	Secondary implantation of partial prosthesis in hip joint using cement
	NFC 59	Secondary implantation of interposition prosthesis in hip joint
	NFG 09	Excision arthroplasty of hip joint
	NFH 4*	Removal of foreign or loose body from hip joint
	NFH 22	Open reduction of dislocation prosthesis of hip joint
	NFL 19	Suture or plastic repair of muscle of hip or thigh
	NFL 99	Other operation on muscle or tendon of hip or thigh
	NFN 09	Autograft of bone to femur
	NFN 19	Allograft of bone to femur
	NFN 29	Xenograft of bone to femur
	NFU 0*	Removal of partial prosthesis from hip joint
	NFU 49	Removal of internal fixation device from femur
	NFU 89	Removal of therapeutic implant in treatment of infection of hip or femur
	NFB 00	Primary partial prosthetic replacement of hip joint not using cement; all parts
	NFB 02	Primary partial prosthetic replacement of hip joint not using cement; single part - distal
	NFB 09	Primary partial prosthetic replacement of hip joint not using cement; other or unspecified
	NFB 10	Primary partial prosthetic replacement of hip joint using cement; all parts
	NFB 12	Primary partial prosthetic replacement of hip joint using cement; single part - distal
	NFB 19	Primary partial prosthetic replacement of hip joint using cement; other or unspecified
	NFJ0 (0,1,2,3)	Closed reduction of fracture of femur
	NFJ1 (0,1,2,3)	Open reduction of fracture of femur
	NFJ2 (0,1,2,3)	External fixation of fracture of femur
	NFJ3 (0,1,2,3)	Internal fixation of fracture of femur using bioimplant
	NFJ4 (0,1,2,3)	Internal fixation of fracture of femur using wire, rod, cerclage or pin
	NFJ5 (0,1,2,3)	Internal fixation of fracture of femur using intramedullary nail
	NFJ6 (0,1,2,3)	Internal fixation of fracture of femur using plate and screws
	NFJ7 (0,1,2,3)	Internal fixation of fracture of femur using screws alone
	NFJ8 (0,1,2,3)	Internal fixation of fracture of femur using other or combined methods
	NFJ9 (0,1,2,3)	Other fracture surgery of femur

* All codes beginning with this in the NCSP

The completeness rate for the Hip Fracture Register was calculated as follows:

$$\frac{(\text{Only NHFR} + \text{Inclusion in both registers})}{(\text{Only NPR} + \text{Only NHFR} + \text{Inclusion in both registers})}$$

Completeness for the NPR was calculated in a similar way:

$$\frac{(\text{Only NPR} + \text{Inclusion in both registers})}{(\text{Only NHFR} + \text{Only NPR} + \text{Inclusion in both registers})}$$

Primary operations

Primary hip fracture surgery should be reported to the NPR with the NCSP procedure codes shown in the table and the ICD-10 codes S72.0, S72.1, S72.2 or S72.3.

From 2008 to 2012, 16 154 hemiarthroplasties were reported to one or both of the registers. 94.2% of these were reported to the NHFR, while 81.8% of these were reported to the NPR. Reporting of hemiarthroplasties to the NHFR is over 80% from all hospitals except one, see Tables 38-41.

In the same period, there were 30 932 reports of internal fixation for hip fracture; 86.4% of these were to the NHFR and 92.3% to the NPR. Completeness by hospital is presented in Tables 38 to 42, divided into health regions; these show that reporting of internal fixation to the NHFR varies between hospitals from 54% to 98%. Almost a third of hospitals have a completeness rate of below 80%, which we find very low.

For hospitals with a low completeness rate for the NHFR, the form may not have been submitted to the Register, and one possible reason for this is that the patient has not given or been able to give consent. The difference in completeness between primary hemiarthroplasty and internal fixation shows that this cannot be the sole reason and that hospitals must be more aware of internal fixation and report it regularly to the NHFR. Another factor affecting the completeness rate is that other interventions than hip fracture surgery may have been incorrectly coded with the NCSP and ICD-10 codes mentioned above.

Revision operations

Revision surgery after hip fracture should be reported to the NPR with the NCSP procedure codes given in the table and one or more of the ICD-10 codes M84, M86, M87.2, T81.0, T81.3, T81.4, T81.5, T81.6, T81.7, T81.8, T81.9, T84.0, T84.1, T84.2, T84.5, T84.6, T84.7, T84.8, T84.9, T93.1.

From 2008 to 2012, 8426 revisions were reported to one or both of the registers. 62.8% of these were reported to the NHFR, while 52.9% were reported to the NPR. Completeness by hospital is presented in Tables 38 to 42, showing that the completeness rate for the NHFR for the various hospitals (with over ten revisions) ranged between 15% and 91%. The reoperation figures are uncertain, partly because some revision hemiarthroplasties are erroneously reported to the NPR as primary operations. If a hemiprosthesis is inserted after a failed internal fixation of a femoral neck fracture, this is a sequela after hip fracture, even though it is the first hemiprosthesis inserted. A low completeness rate may also mean that the revision form was not submitted to the NHFR, or that other interventions have been incorrectly coded with the codes in the table above.

Helse Sør-Øst

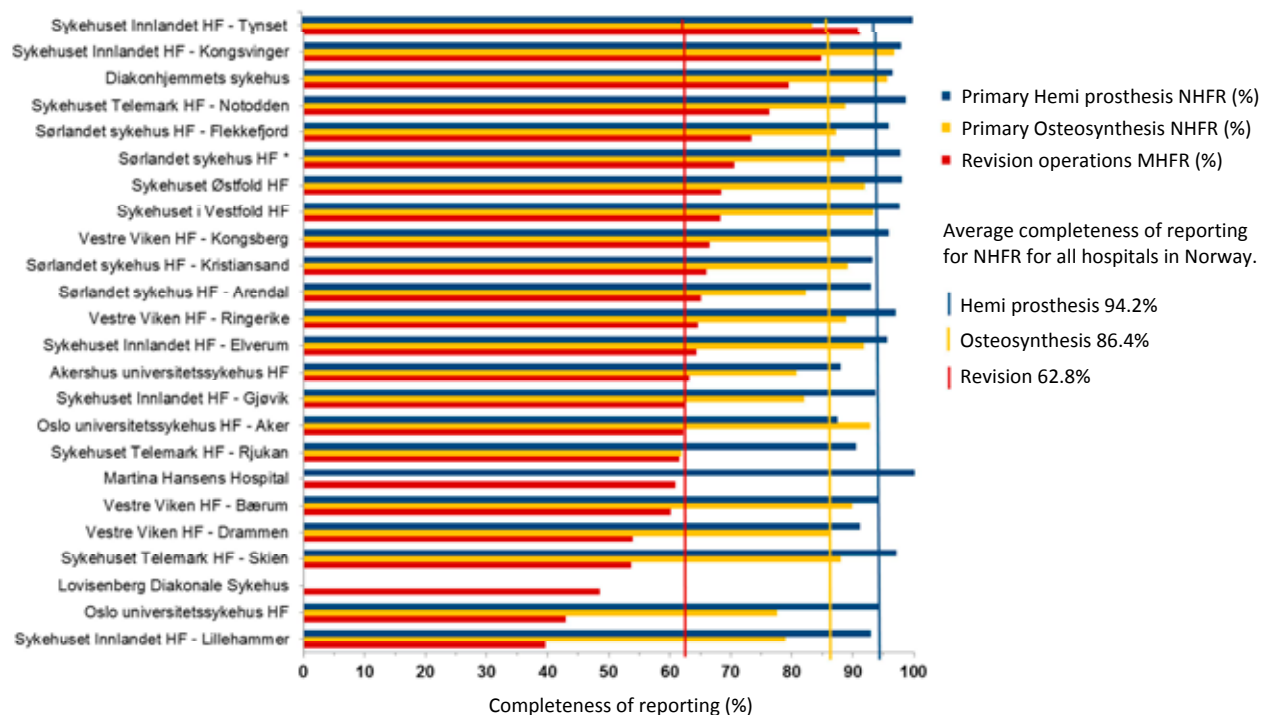
Table 38: Completeness of reporting for hip fracture operations, 2008-2012

Helse Sør-Øst	Primary operation Hemi prosthesis			Primary operation Osteosynthesis			Revision operations		
	Total number NHFR + NPR	NHFR (%)	NPR (%)	Total number NHFR + NPR	NHFR (%)	NPR (%)	Total number NHFR + NPR	NHFR (%)	NPR (%)
Sykehuset Innlandet HF - Tynset	55	100,0	47,3	189	83,6	96,3	45	91,1	28,9
Sykehuset Innlandet HF - Kongsvinger	323	97,8	91,6	451	96,7	94,9	118	84,7	39,0
Diakonhjemmets sykehus	967	96,5	89,8	1 569	95,5	96,0	374	79,4	48,1
Sykehuset Telemark HF - Notodden	73	98,6	57,5	159	88,7	96,9	42	76,2	35,7
Sørlandet sykehus HF - Flekkefjord	73	95,9	83,6	180	87,2	96,1	45	73,3	40,0
Sørlandet sykehus HF *	269	97,8	71,4	699	88,6	84,8	207	70,5	42,5
Sykehuset Østfold HF	1 314	97,9	78,5	1 570	91,9	92,7	392	68,4	43,9
Sykehuset i Vestfold HF	717	97,6	94,1	1 534	93,3	94,7	328	68,3	47,6
Vestre Viken HF - Kongsberg	240	95,8	83,8	394	85,8	94,9	128	66,4	57,0
Sørlandet sykehus HF - Kristiansand	337	93,2	82,2	488	89,1	95,9	94	66,0	48,9
Sørlandet sykehus HF - Arendal	168	92,9	83,3	360	82,2	94,7	86	65,1	43,0
Vestre Viken HF - Ringerike	299	97,0	73,9	616	88,8	94,6	141	64,5	52,5
Sykehuset Innlandet HF - Elverum	649	95,5	82,6	900	91,8	94,7	221	64,3	53,4
Akershus universitetssykehus HF	1 152	87,9	82,9	1 701	80,7	95,4	485	63,1	49,7
Sykehuset Innlandet HF - Gjøvik	430	93,7	78,1	827	82,0	95,8	202	62,4	54,0
Oslo universitetssykehus HF - Aker	56	87,5	83,9	1 105	92,8	92,0	264	62,1	75,8
Sykehuset Telemark HF - Rjukan	42	90,5	35,7	118	61,9	92,4	13	61,5	46,2
Martina Hansens Hospital	7	100,0	0,0				92	60,9	41,3
Vestre Viken HF - Bærum	619	94,0	88,5	941	89,8	89,9	276	60,1	63,0
Vestre Viken HF - Drammen	451	91,1	87,6	867	86,4	95,6	269	53,9	59,9
Sykehuset Telemark HF - Skien	582	97,1	90,4	980	88,0	95,8	222	53,6	55,0
Lovisenberg Diakonale Sykehus				2	0,0	100,0	165	48,5	53,3
Oslo universitetssykehus HF	543	94,5	76,6	742	77,5	88,9	350	42,9	69,1
Sykehuset Innlandet HF - Lillehammer	493	92,9	88,8	674	78,9	95,4	222	39,6	70,3
Betanien hospital Telemark ***							2	0,0	100,0
Sykehuset Telemark HF – Kragerø***				1	100,0	100,0			

* Reporting unit can not be given more accurate in NPR

** Not in figure

Figure 14: Completeness of reporting for NHFR Helse Sør-Øst, primary operations and revisions



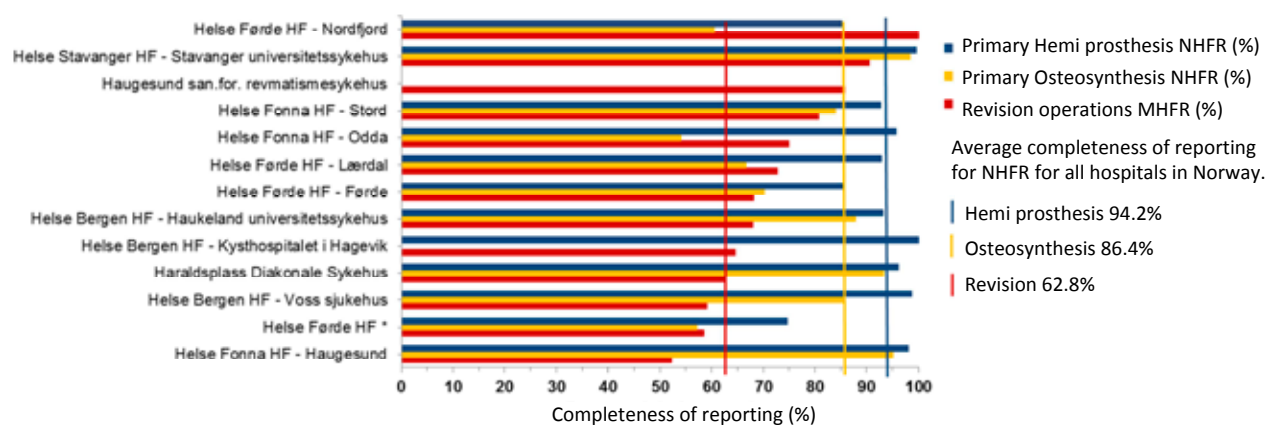
Helse Vest

Table 39: Completeness of reporting for hip fracture operations, 2008-2012

Helse Vest	Primary operation Hemi prosthesis			Primary operation Osteosynthesis			Revision operations		
	Total number NHFR + NPR	NHFR (%)	NPR (%)	Total number NHFR + NPR	NHFR (%)	NPR (%)	Total number NHFR + NPR	NHFR (%)	NPR (%)
Helse Førde HF - Nordfjord	27	85,2	85,2	38	60,5	100,0	2	100,0	0,0
Helse Stavanger HF - Stavanger	476	99,6	61,6	1 877	98,3	75,1	605	90,6	27,6
Haugesund san.for. revmatismesykehus							7	85,7	14,3
Helse Fonna HF - Stord	96	92,7	76,0	318	84,0	90,3	57	80,7	38,6
Helse Fonna HF - Odda	23	95,7	82,6	100	54,0	94,0	12	75,0	75,0
Helse Førde HF - Lærdal	14	92,9	85,7	18	66,7	100,0	11	72,7	27,3
Helse Førde HF - Førde	139	85,6	80,6	215	70,2	93,0	22	68,2	36,4
Helse Bergen HF - Haukeland	663	93,2	82,8	1 254	87,9	84,3	344	68,0	45,3
Helse Bergen HF - Kysthospitalet i Hagevik	3	100,0	0,0				65	64,6	36,9
Haraldsplass Diakonale Sykehus	366	96,2	84,2	722	93,4	93,1	165	62,4	46,7
Helse Bergen HF - Voss sjukehus	290	98,6	92,4	518	85,5	96,1	93	59,1	73,1
Helse Førde HF *	185	74,6	80,0	444	57,2	95,7	94	58,5	57,4
Helse Fonna HF - Haugesund	407	98,0	93,9	685	95,2	93,6	174	52,3	68,4

* Reporting unit can not be given more accurate in NPR

Figure 15: Completeness of reporting for NHFR Helse Vest, primary operations and revisions

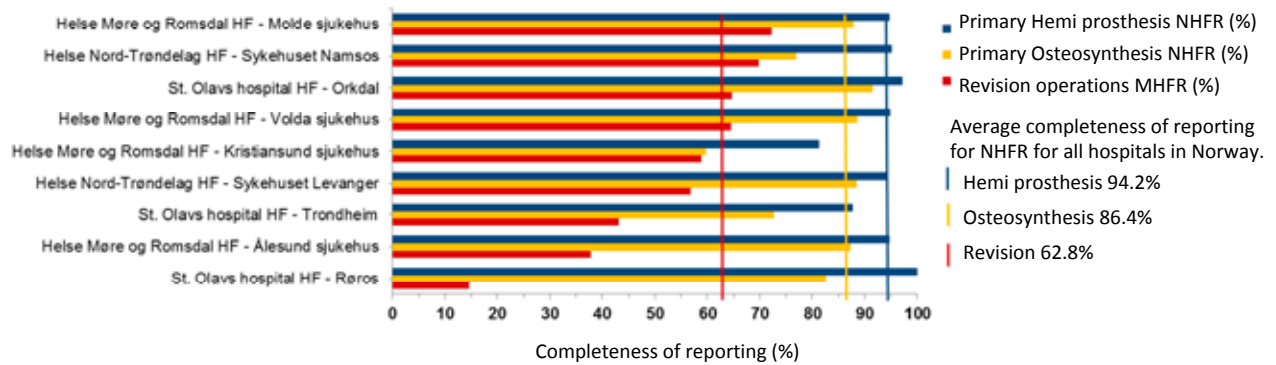


Helse Midt-Norge

Table 40: Completeness of reporting for hip fracture operations, 2008-2012

Helse Midt-Norge	Primary operation Hemi prosthesis			Primary operation Osteosynthesis			Revision operations		
	Total number NHFR + NPR	NHFR (%)	NPR (%)	Total number NHFR + NPR	NHFR (%)	NPR (%)	Total number NHFR + NPR	NHFR (%)	NPR (%)
Helse Møre og Romsdal HF - Molde sjukehus	228	94,7	88,6	460	87,8	96,1	97	72,2	55,7
Helse Nord-Trøndelag HF - Sykehuset Namsos	122	95,1	68,0	328	76,8	96,0	86	69,8	50,0
St. Olavs hospital HF - Orkdal	214	97,2	83,6	446	91,5	94,2	113	64,6	45,1
Helse Møre og Romsdal HF - Volda sjukehus	156	94,9	94,9	322	88,5	94,7	76	64,5	47,4
Helse Møre og Romsdal HF - Kristiansund	197	81,2	69,0	357	59,7	94,4	126	58,7	57,1
Helse Nord-Trøndelag HF - Sykehuset Levanger	288	94,4	81,6	589	88,5	95,2	155	56,8	60,0
St. Olavs hospital HF - Trondheim	751	87,6	79,4	1 305	72,6	95,9	337	43,0	66,8
Helse Møre og Romsdal HF - Ålesund sjukehus	317	94,6	80,4	668	87,3	91,6	220	37,7	75,0
St. Olavs hospital HF - Røros	6	100,0	66,7	23	82,6	95,7	96	14,6	88,5

Figure 16: Completeness of reporting for NHFR Helse Midt-Norge, primary operations and revisions



Helse Nord

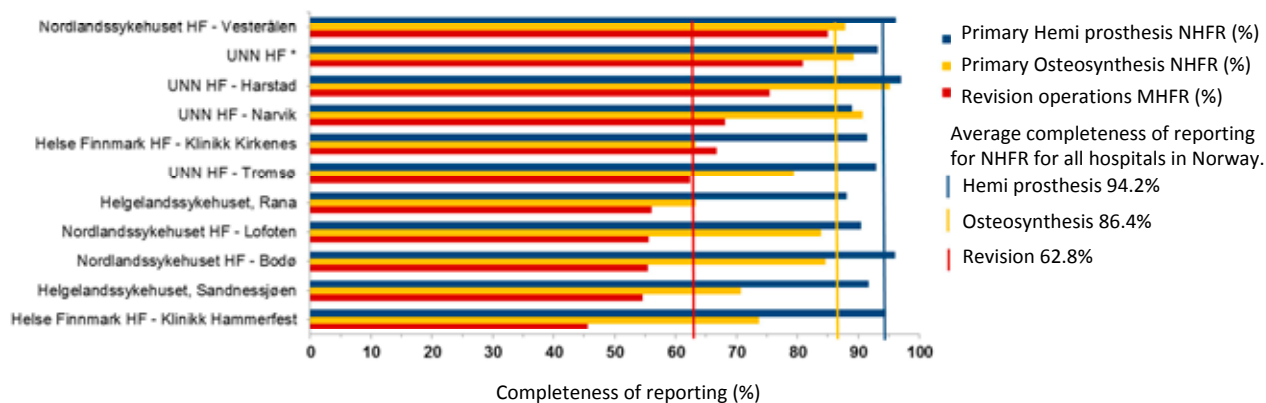
Table 41: Completeness of reporting for hip fracture operations, 2008-2012

Helse Nord	Primary operation Hemi prosthesis			Primary operation Osteosynthesis			Revision operations		
	Total number NHFR + NPR	NHFR (%)	NPR (%)	Total number NHFR + NPR	NHFR (%)	NPR (%)	Total number NHFR + NPR	NHFR (%)	NPR (%)
Nordlandssykehuset HF - Vesterålen	104	96,2	52,9	239	87,9	91,2	40	85,0	30,0
UNN HF *	88	93,2	65,9	251	89,2	86,1	47	80,9	38,3
UNN HF - Harstad	168	97,0	81,5	333	95,2	91,6	69	75,4	44,9
UNN HF - Narvik	36	88,9	80,6	225	90,7	85,3	25	68,0	56,0
Helse Finnmark HF - Klinikk Kirkenes	58	91,4	56,9	106	63,2	97,2	18	66,7	44,4
UNN HF - Tromsø	196	92,9	74,5	532	79,3	93,2	125	62,4	57,6
Helgelandssykehuset, Rana	151	88,1	57,6	448	63,2	97,1	116	56,0	52,6
Nordlandssykehuset HF - Lofoten	63	90,5	77,8	155	83,9	90,3	27	55,6	55,6
Nordlandssykehuset HF - Bodø	322	96,0	78,0	543	84,5	93,2	121	55,4	57,0
Helgelandssykehuset, Sandnessjøen	12	91,7	41,7	99	70,7	94,9	11	54,5	63,6
Helse Finnmark HF - Klinikk Hammerfest	129	94,6	72,1	247	73,7	94,7	68	45,6	66,2

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* Reporting unit can not be given more accurate in NPR

Figure 17: Completeness of reporting for NHFR Helse Nord, primary operations and revisions



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CRUCIATE LIGAMENT REGISTER 2015 ANNUAL REPORT

The past year has been marked by some “bureaucratic” innovations. SKDE (the Centre for Clinical Documentation and Evaluation) will now receive an annual report from the Cruciate Ligament Register, which was assessed as Stage 3 by the SKDE. This is the second highest stage; only eight registers were assessed as Stage 3, and none of the Norwegian quality registers achieved Stage 4.

One of the main reasons why we did not reach Stage 4 is the lack of electronic submission of the “ACL form” and the KOOS form that patients submit.

We have been working at creating electronic submission of forms for a long time. The main reason that this has taken time is the problem of authentication, i.e. the use of computers, to get a code via text message and mobile phone before the form can be registered and sent to the database. We have had demonstrations of other versions without authentication, but all feedback indicates that we cannot avoid authentication if we are to remain a national quality register.

MRS (Medical Registration System), developed by HEMIT, was validated during 2014, suggesting that it will be employed. It is almost complete regarding the “ACL form”, and will be adopted by Haukeland Hospital for a trial period beginning in early autumn 2015.

There is considerable research activity. The article “Increased risk of revision with hamstring tendon grafts compared with patellar tendon grafts after anterior cruciate ligament reconstruction” by Andreas Persson and colleagues was published in AJSM in February 2014. Also published was the article by Tone Gifstad and colleagues “Lower risk of revision with patellar tendon autografts compared with hamstring autografts”, which is based on Scandinavian cruciate ligament registers. This has led to a change in procedures, as more surgeons are now using patellar tendon autografts.

Tone Gifstad from St Olav’s Hospital defended her thesis entitled “Results after ACL reconstruction - Clinical and registry-based studies”, based on data from the Norwegian, Swedish and Danish cruciate ligament registers.

We have had excellent collaboration with Kaiser Permanente in the United States, and we have been cooperating on articles with the MOON group, also in the US. Cooperation with French, Norwegian and North American researchers has led to another article. The Scandinavian registers in Sweden, Denmark and Norway have joint articles and also articles based on cooperation between two of the countries. This cooperation is primarily thanks to the researchers at the Oslo Sports Trauma Research Centre. Many thanks go to Professor Lars Engebretsen and Lars-Petter Granan, the principal driving forces in this research environment.

In 2014, there were 1654 primary operations (a slight decrease from the previous year) and 247 revisions (up from 2013). For other procedures, the figure is very low (141) and, as in previous years, we believe this is considerably underreported. It is a big challenge to get people to send in the forms. This is also a problem in the corresponding registers in other countries.

SKDE requires results from the Register to be publicised. The various quality registers are now publicly available on the web site: kvalitetsregistre.no

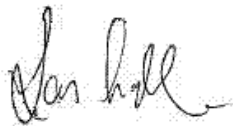
Håvard Moksnes, Lars Engebretsen and Romain Seil have started a project called “ESSKA - Pediatric ACL Monitoring Initiative (PAMI)”, based on Håvard Moksnes’ article “The current evidence for treatment of ACL injuries in children is low”.

The forms will probably have to be changed again soon. This is only natural, and may be easier when they are electronic.

We would like to thank all our colleagues who regularly send in the forms. Without them, it would be impossible to perform our work satisfactorily.

Our goal is to reach Stage 4, the highest ranking by SKDE, as soon as possible.

Bergen, 26.05.15



Lars Engebretsen
Head of Steering Committee



Knut Fjeldsgaard
Chief Physician



Lars-Petter Granan
Register Secretary

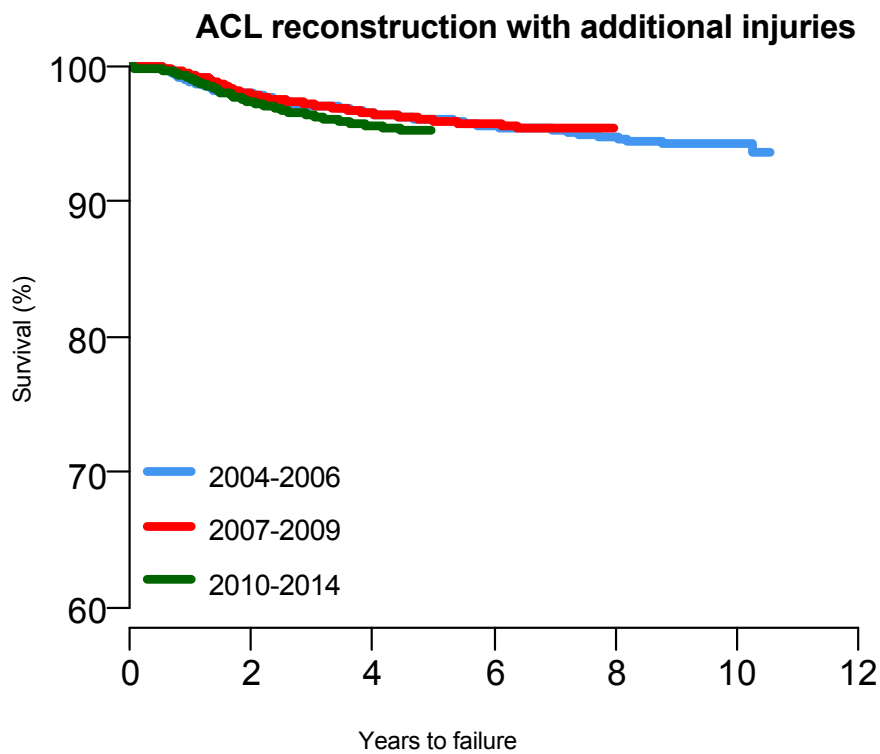
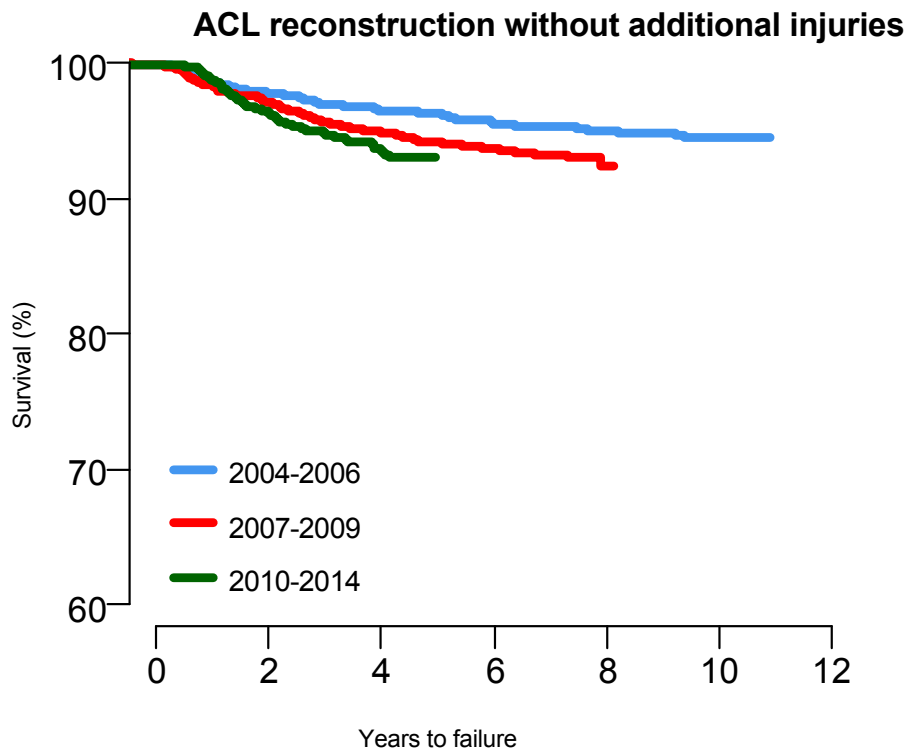


Irina Kvinnesland
IT Consultant



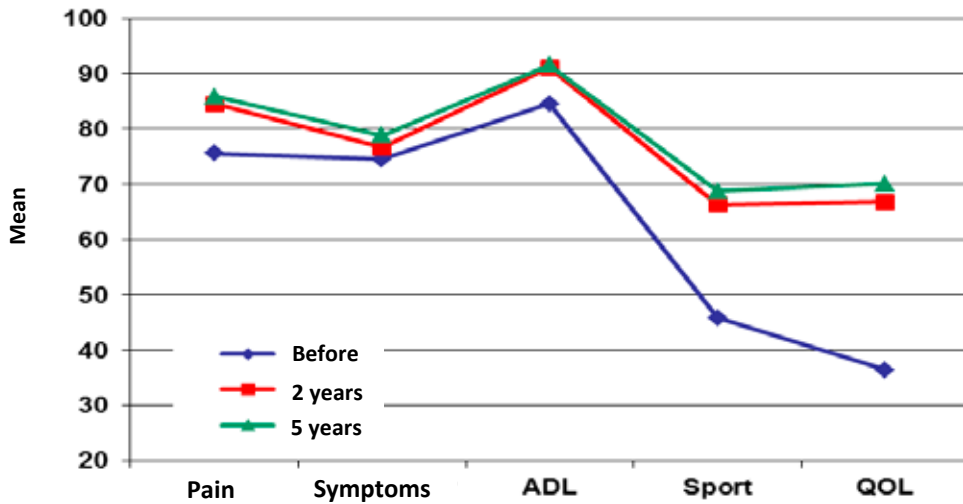
Birgitte Espehaug
Biostatistician

Survival for cruciate ligament operations

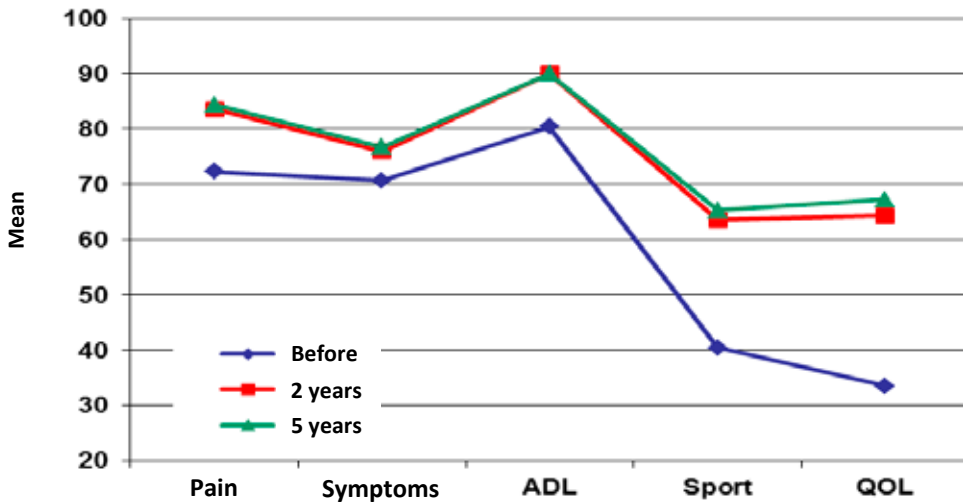


Survival estimate is given as long as >20 reconstructions remains at risk.

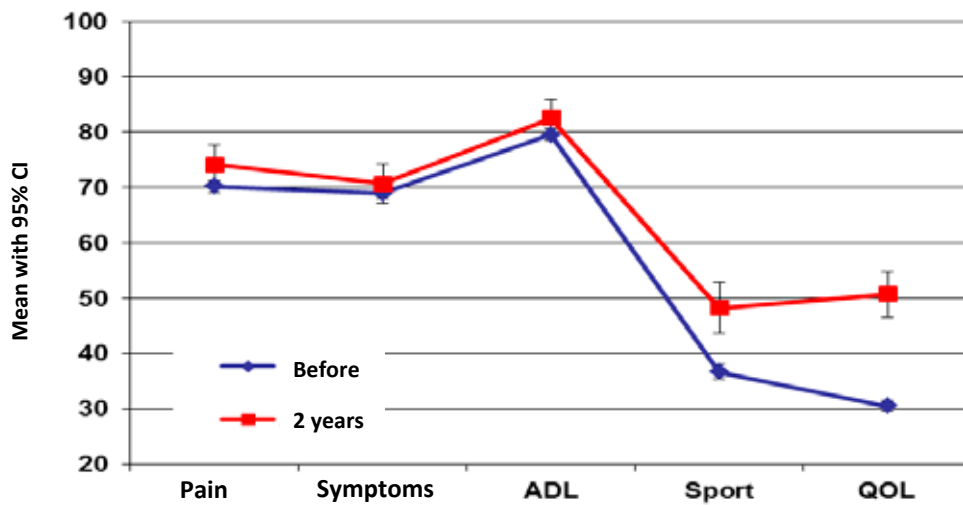
KOOS with primary ACL reconstruction without additional injury



KOOS with primary ACL reconstruction with additional injury



KOOS with revision reconstructions



KOOS = Knee Injury and Osteoarthritis Outcome Score. ADL = Function in daily living. QOL = Quality of life. Number of patients included in the calculations may vary over time. CI = confidence interval.

Cruciate Ligament

All categories of operations

Table 1: Annual numbers of operations

	Primary reconstruction	Revision reconstruction	Only other procedures	Total
2014	1654 (81,0%)	247 (12,1%)	141 (6,9%)	2042
2013	1754 (84,0%)	207 (9,9%)	128 (6,1%)	2089
2012	1771 (83,5%)	220 (10,4%)	130 (6,1%)	2121
2011	1858 (85,2%)	176 (8,1%)	148 (6,8%)	2182
2010	1748 (87,4%)	132 (6,6%)	119 (6,0%)	1999
2004-09	8948 (88,3%)	665 (6,6%)	516 (5,1%)	10129
Total	17733 (86,2%)	1647 (8,0%)	1182 (5,7%)	20562

Registration complete from 2005. 49,2% of the operations were performed on the right side. 43,6% of the operations were performed on females. 7,1% of the patients had a previous ACL/PCL-injury in the opposite knee. (13,4% was missing). Mean age was 28,7 years, 27,1 years for women and 29,8 years for men. Standard deviation of age was 10,5 years, 11,1 years for women and 9,9 years for men. Median value for duration of primary ACL reconstruction was 71 minutes.

Figure 1: Distribution of hospitals by surgery volume, primary ACL reconstructions

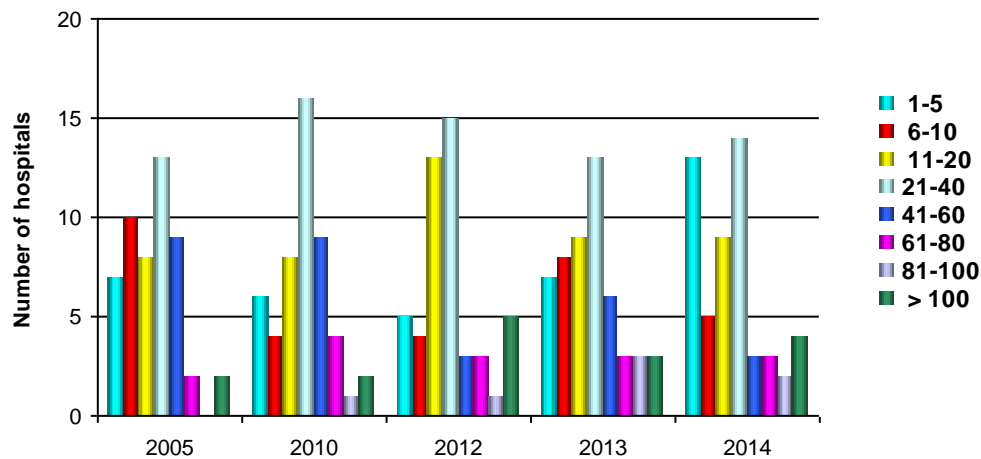


Figure 2: Distribution of hospitals by surgery volumes, revision reconstructions ACL

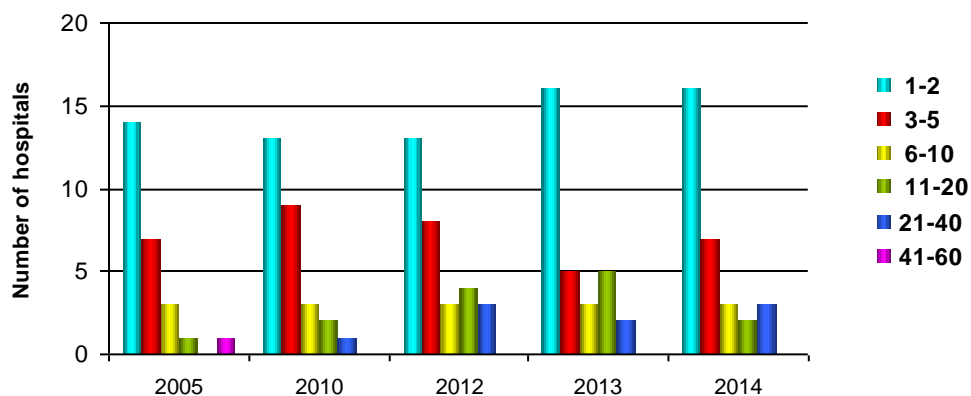
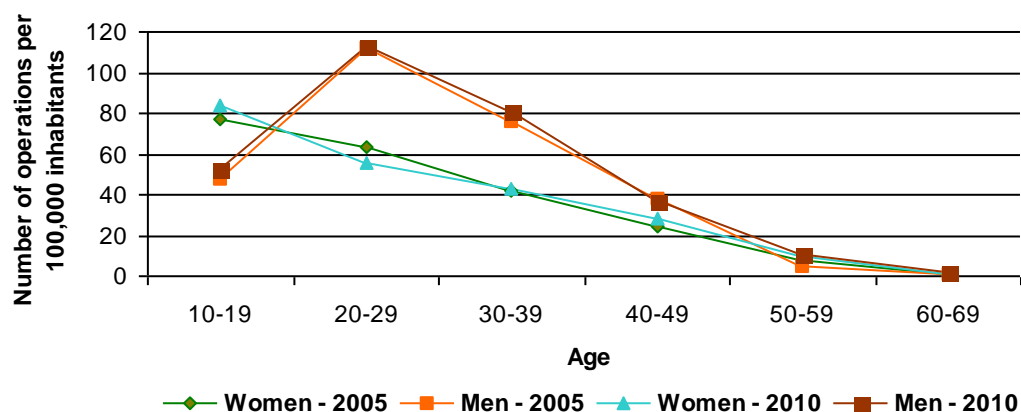


Figure 3: Incidence of primary reconstruction of cruciate ligament for 2005 and 2010



Distribution of other procedures

Table 2: The number of other procedures for all categories of surgeries

	Meniscus surgery	Cartilage surgery	Synovectomy	Arthroscopic debridement	Mobilizing in narcosis	Surgery due to infection	Removal of implants	Bone transplantation	Osteotomy	Bone resection (Notch plasty)	Osteosynthesis	Arthrodesis
2014	903	77	86	58	7	10	45	42	1	26	2	0
2013	869	101	44	66	6	10	40	31	2	16	4	0
2012	908	76	49	75	12	9	55	25	1	36	1	0
2011	920	77	41	69	10	10	43	24	0	40	0	0
2010	881	60	22	56	6	9	33	14	1	54	2	0
2004-09	4166	467	127	319	33	14	217	114	12	333	15	0
Total	8647	858	369	643	74	62	433	250	17	505	24	0

Table 3: Distribution of other procedures in combination with primary reconstruction of cruciate ligament

	Meniscus surgery	Cartilage surgery	Synovectomy	Arthroscopic debridement	Removal of implants	Bone resection (Notch plasty)
6954	x					
345	x	x				
216		x				
149						x
127	x					x
68				x		
67	x		x			
64			x			
44	x			x		
27	x	x		x		
21				x		x
19					x	
18	x			x		x
14		x		x		
12		x				x
10	x	x				x

X indicates applied procedure and each row gives the number of operations that is carried out with this combination of procedures. The table shows only combinations that have a number of ten or more.

Table 4: Distribution of other procedures in combination with primary reconstruction of cruciate ligament

	Meniscus surgery	Cartilage surgery	Removal of implants	Bone transplantation	Bone resection (Notch plasty)
334	x				
80			x		
41				x	
37		x			
32			x	x	
30	x		x		
25	x	x			
21	x			x	
16					x
13	x		x	x	
13			x	x	
10	x				
10			x		

X indicates applied procedure and each row gives the number of operations that is carried out with this combination of procedures. The table shows only combinations that have a number of ten or more.

Table 5: Distribution of other procedures when this is the only procedure

	Meniscus surgery	Cartilage surgery	Synovectomy	Arthroscopic debridement	Mobilizing in narcosis	Surgery due to infection	Removal of implants	Bone transplantation
385	x							
120				x				
61							x	
49		x						
36	x			x				
30						x		
29			x					
25				x	x			
22							x	x
17	x		x					
16				x			x	x
14	x	x						
14			x	x				
13	x		x	x				
12				x			x	
11								
10	x						x	x
10			x	x	x			

X indicates applied procedure and each row gives the number of operations that is carried out with this combination of procedures. The table shows only combinations that have a number of ten or more.

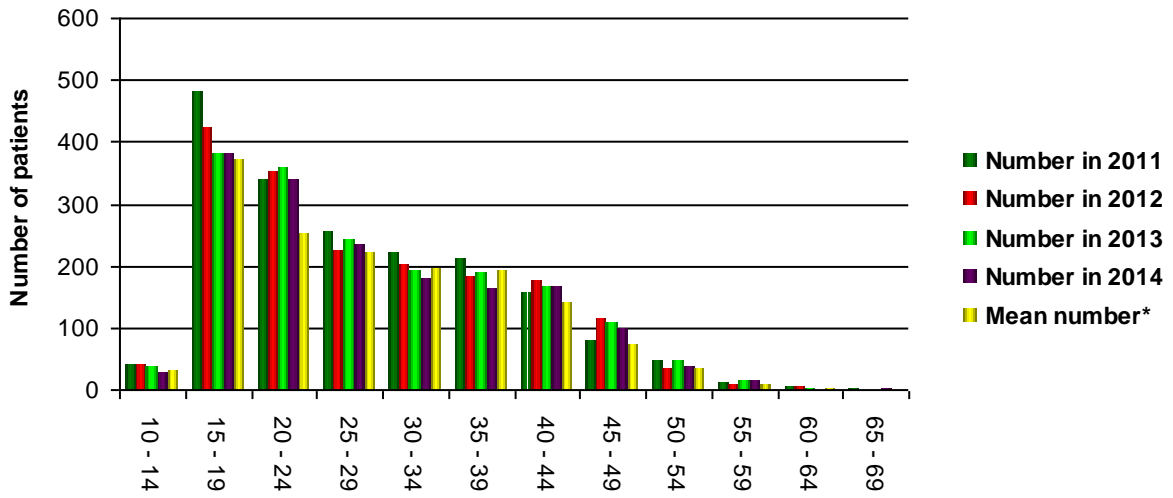
Intraoperative complications

Table 6: Intraoperative complications for all categories of surgeries

	Yes	No	Missing	Total
2014	54 (2,6%)	1906 (93,3%)	82 (4,0%)	2042
2013	59 (2,8%)	1946 (93,2%)	84 (4,0%)	2089
2012	43 (2,0%)	2036 (96,0%)	42 (2,0%)	2121
2011	63 (2,9%)	2081 (95,4%)	38 (1,7%)	2182
2010	55 (2,8%)	1928 (96,4%)	16 (,8%)	1999
2004-09	349 (3,4%)	9564 (94,4%)	216 (2,1%)	10129
Total	623 (3,0%)	19461 (94,6%)	478 (2,3%)	20562

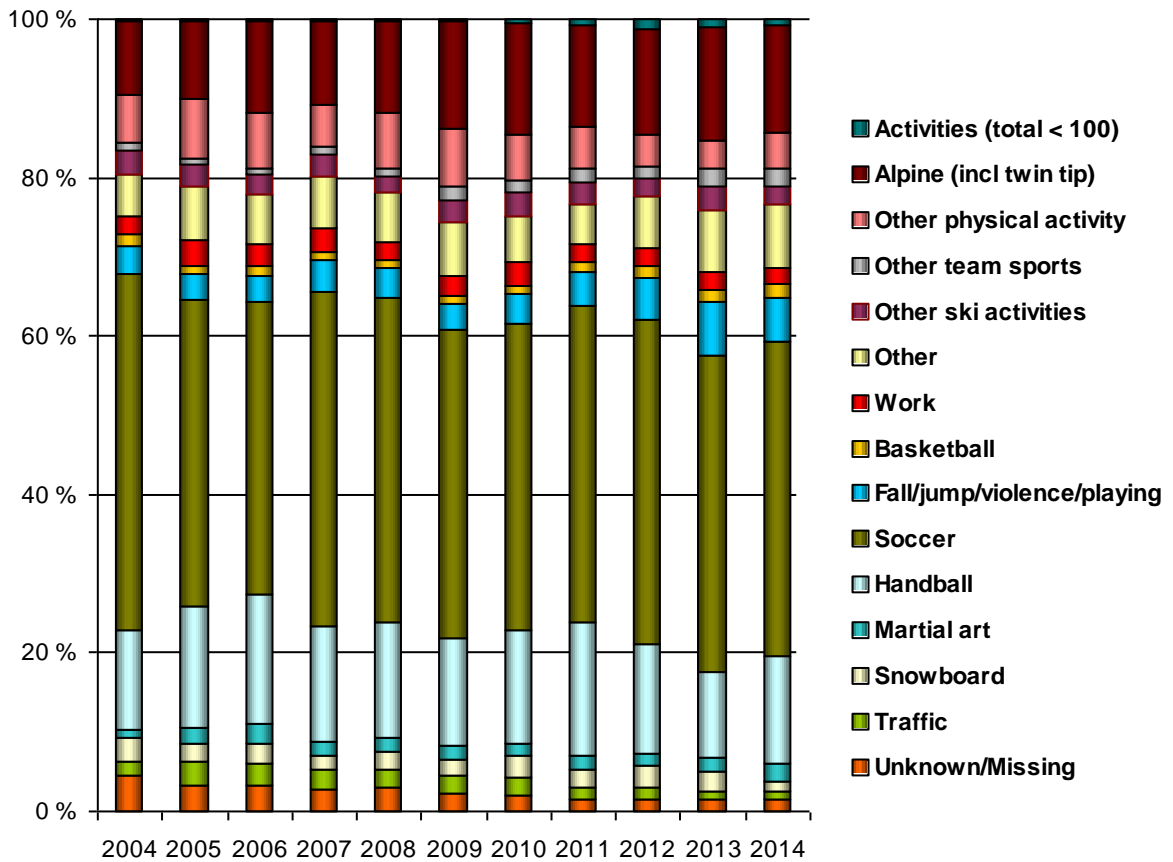
Primary reconstruction of cruciate ligament

Figure 4: Age by primary operation



* Mean number of primary operations for 2004 - 2010

Figure 5: Activity that lead to injury



Actual injury

Table 7: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2014	1633	50	156	34	19	348	884
2013	1736	38	167	54	23	375	858
2012	1750	36	152	32	14	378	934
2011	1844	41	136	24	18	436	965
2010	1720	67	110	46	37	440	885
2004-09	8871	228	552	109	88	2256	4272
Total	17554	460	1273	299	199	4233	8798

* More than one type of injury can be given for each form

Additional injuries

Table 8: ACL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
6589	x						
3676	x					x	
1619	x					x	x
1283	x						x
981	x					x	
743	x					x	
434	x		x				
402	x					x	x
306	x					x	
192	x					x	x
176	x					x	x
159	x		x			x	
132	x		x				x
111	x		x			x	x
76	x		x			x	
64	x			x			
59	x	x	x				
41	x		x			x	
38	x			x	x		
35	x	x	x				x
33	x		x			x	x
26	x		x			x	
24	x		x			x	x
23	x	x					
20	x		x			x	x
20	x			x			x

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where ACL where the only injury. The table shows only combinations that have a number of 20 or more.

Table 9: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
77		x					
59	x	x	x				
35	x	x	x				x
30		x					x
24	x	x	x			x	
23	x	x					
18	x	x	x			x	x
15	x	x		x	x		
12	x	x				x	x
11	x	x				x	
11		x	x				
10	x	x			x		

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where PCL where the only injury. The table shows only combinations that have a number of 10 or more.

Choice of graft for injuries registered in primary reconstructions

Table 10: BPTB

	ACL	PCL	MCL	LCL	PLC
2014	712	1	0	0	0
2013	565	2	0	0	0
2012	464	1	0	0	0
2011	378	2	0	0	0
2010	319	4	0	0	0
2004-09	2900	16	1	0	0
Total	5338	26	1	0	0

Table 11: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2014	896	17	15	7	4
2013	1154	21	14	8	7
2012	1266	24	14	3	3
2011	1452	23	21	2	4
2010	1391	34	19	5	4
2004-09	5918	153	64	4	1
Total	12077	272	147	29	23

Table 12: ALLOGRAFT

	ACL	PCL	MCL	LCL	PLC
2014	4	15	2	8	9
2013	7	8	1	8	5
2012	4	10	2	4	4
2011	5	3	0	5	5
2010	4	4	2	14	17
2004-09	15	17	4	18	24
Total	39	57	11	57	64

Table 13: Suture

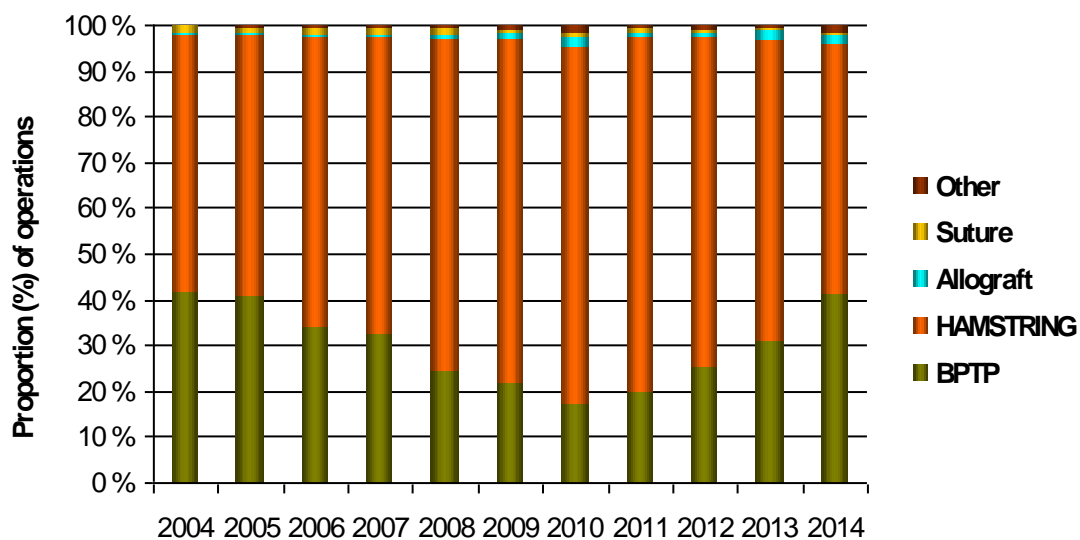
	ACL	PCL	MCL	LCL	PLC
2014	1	1	4	2	1
2013	0	0	8	7	3
2012	0	0	6	3	2
2011	2	2	9	5	4
2010	0	0	7	8	5
2004-09	1	5	52	34	32
Total	4	8	86	59	47

Table 14: Other

	ACL	PCL	MCL	LCL	PLC
2014	17	5	0	0	0
2013	3	2	0	0	0
2012	14	1	1	0	0
2011	6	4	0	1	1
2010	5	16	1	1	1
2004-09	30	7	5	6	3
Total	75	35	7	8	5

There are 19 forms where there are registered product for ACL and 22 forms for PCL but not checked for choice of graft.

Figure 6: Choice of graft for all injuries in primary reconstructions



Fixation

Table 15: Femur ACL (The 5 most common)

Product	Total	2004-09	2010	2011	2012	2013	2014
ToggleLoc	541	45	87	89	114	157	49
TunneLoc	852	516	78	67	44	77	70
EZLoc	1727	1404	160	95	39	13	16
SoftSilk	1792	1030	86	103	135	165	273
Endobutton CL Ultra	5515	904	931	1097	986	879	718

Table 16: Tibia ACL (The 5 most common)

Product	Total	2004-09	2010	2011	2012	2013	2014
Biosure PK	414	3	29	85	72	129	96
Intrafix Screw	1445	805	143	174	153	96	74
Biosure HA Interferenc	1581	101	235	382	341	288	234
SoftSilk	1918	1010	78	94	168	232	336
RCI Screw	3628	2048	405	345	277	278	275

Table 17: Femur PCL (The 5 most common)

Product	Total	2004-09	2010	2011	2012	2013	2014
Xtendobutton	7		2	3	1		1
Peek Interference Scre	10				3	5	2
SoftSilk	35	16	3	4	4	2	6
EndoButton CL	110	104	3	1	1		1
Endobutton CL Ultra	155	36	42	17	18	19	23

Table 18: Tibia PCL (The 5 most common)

Product	Total	2004-09	2010	2011	2012	2013	2014
Biosure HA Interferenc	14	1		2	2	4	5
BioRCI-HA	18	2	1	2	3	4	6
SoftSilk	21	12	2	2	2	2	1
AO Skrue	61	37	7	6	7	1	3
RCI Screw	205	122	39	15	11	9	9

Table 19: Femur and tibia ACL (The 5 most common)

Femur	Tibia	Total	2004-09	2010	2011	2012	2013	2014
Endobutton CL Ultra	BioRCI-HA	440	44	99	71	90	87	49
Endobutton CL Ultra	Intrafix Screw	556	108	106	117	111	68	46
Endobutton CL Ultra	Biosure HA Interference screw	1462	68	220	371	316	273	214
SoftSilk	SoftSilk	1617	947	76	89	116	147	242
Endobutton CL Ultra	RCI Screw	1718	365	328	305	241	240	239

Meniscal lesion

Table 20: Actual treatment of meniscal lesion

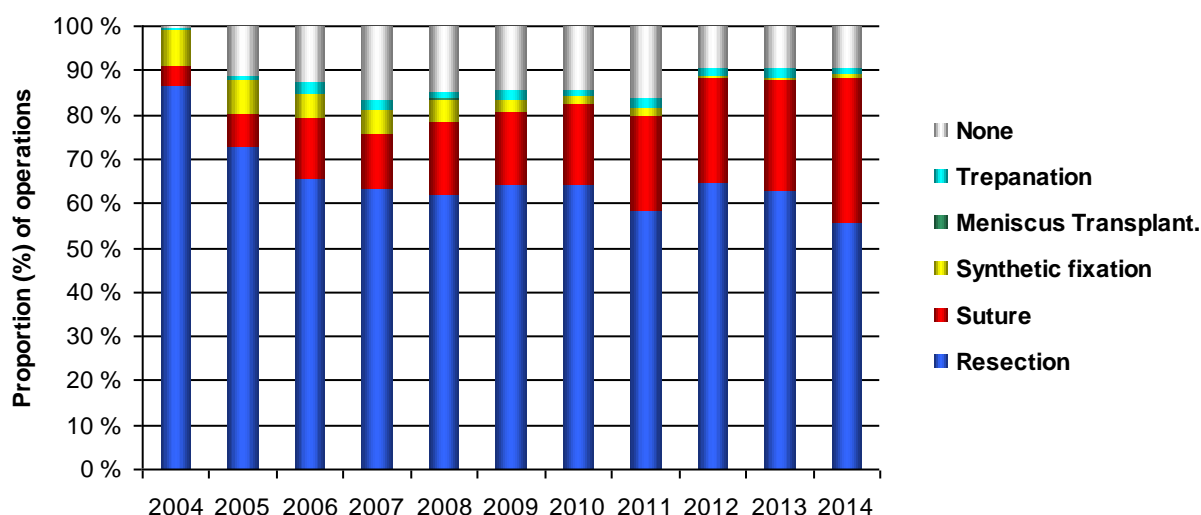
		Resection			Suture	Synthetic fixation	Meniscus Transplant.	Trepanation	None	Total
		OLD	Total	Partial						
2014	Lateral	0	2	280	124	4	1	7	64	482
2014	Medial	0	7	303	224	4	1	4	38	581
2013	Lateral	0	2	292	97	2		11	49	453
2013	Medial	0	7	344	163	3		8	50	575
2012	Lateral	21	2	326	88	3	1	10	57	508
2012	Medial	18	9	336	174	4		9	46	596
2011	Lateral	181	1	139	82	6		20	98	527
2011	Medial	235	2	164	188	16		9	101	715
2010	Lateral	316		5	59	6		6	77	469
2010	Medial	344		9	134	14	1	6	76	584
2004-09	Lateral	1522		1	215	51	1	42	333	2165
2004-09	Medial	1774		1	436	206	2	45	314	2778
Total		4411	32	2200	1984	319	7	177	1303	10433

It became possible to register "Trepanation" and "None" from 01.01.2005. There have been forms where this has been an additional information. This information have been registered, but the registration is not complete before 2005.

In table 7: Actual injury has less. The reason for this is that we distinguish between the lateral and medial injury and some injuries are registered in both groups.

The value in OLD Resection are the forms that are registered before the new forms were introduced in autumn 2011. Total and Partial Resection values are the new forms were introduced in autumn 2011.

Figure 7: Treatment of meniscal lesions in primary reconstructions



Fixation

Table 21: Synthetic

Product	Total	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Contour Meniscus arrow	143	7	40	24	38	25	8	1				
FAST-FIX	12							1	7	3		1
Meniscal Dart	19		3	8	6	2						
Meniscal Dart Stick	24		7	4	1	6	5		1			
Meniscus arrow	31	18	6	1			2	1	2		1	
Unknown	43	2	4	2	3	3	2		11	4	4	8
Total	272	27	60	39	48	36	17	3	21	7	5	9

Table 22: Suture

Product	Total	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
FAST-FIX	1343		28	45	61	99	118	126	192	207	199	268
Meniscal Dart Stick	1							1				
Meniscus arrow	7							3	4			
Rapidloc	74	9	10	19	24	8	2				2	
Unknown	187			2	1	1	3	3	48	39	42	48
Total	1612	9	38	66	86	108	123	133	244	246	243	316

Cartilage lesion all localizations

Table 23: ICRS Grade

Definition of ICRS Grade:

1. Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks.
2. Abnormal: Lesions extending down to <50% of cartilage depth.
3. Severely abnormal: Cartilage defects extending down >50% of cartilage depth as well as down to calcified layer.
4. Severely abnormal: Osteochondral injuries, lesions extending just through the subchondral boneplate or deeper defects down into trabecular bone.

	Code 1	Code 2	Code 3	Code 4	Missing
2014	30,1%	44,4%	18,5%	5,4%	1,6%
2013	25,3%	49,8%	20,1%	4,5%	0,3%
2012	26,2%	47,3%	20,8%	5,0%	0,6%
2011	30,1%	44,4%	18,5%	5,9%	1,0%
2010	25,2%	49,2%	21,0%	4,6%	
2004-09	41,6%	39,0%	13,6%	4,1%	1,8%

The complete overview of cartilage lesions with ICRS Grade and localization is located on The Norwegian Cruciate Ligament Registry's website.

Table 24: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2014	13,5%	4,1%	78,3%	1,0%	3,2%
2013	20,1%	3,8%	72,7%	0,2%	3,3%
2012	18,5%	5,0%	72,8%	0,6%	3,1%
2011	14,8%	5,2%	75,3%	0,4%	4,3%
2010	9,9%	3,9%	83,6%		2,6%
2004-09	9,6%	2,3%	50,9%	1,7%	35,5%

The complete overview of treatment codes and localization is located on The Norwegian Cruciate Ligament Registry's website.

Cartilage injuries registered in primary reconstructions

Figure 8: All Cartilage injuries (total)

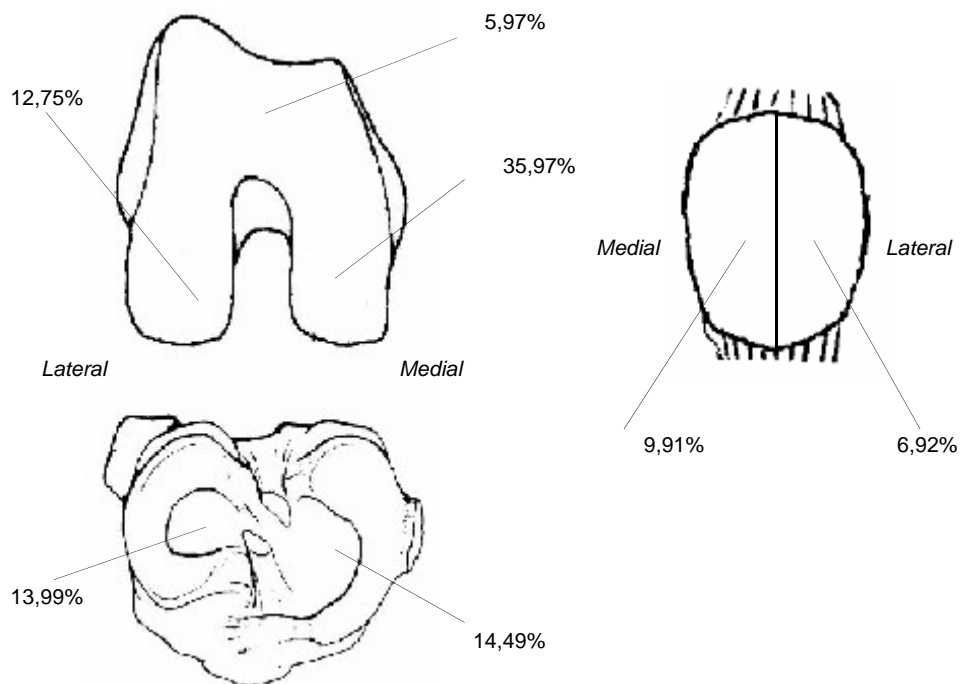
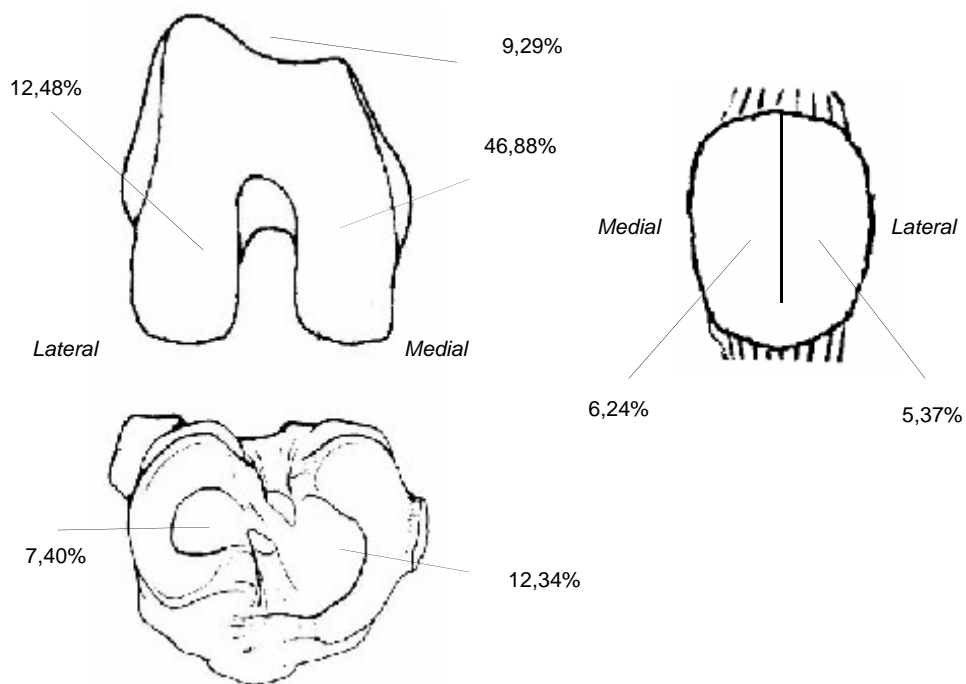


Figure 9: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 25: Outpatient surgery

	Yes		No		Missing		Total
2014	1154	(69,8%)	485	(29,3%)	15	(0,9%)	1654
2013	1136	(64,8%)	605	(34,5%)	13	(0,7%)	1754
2012	1226	(69,2%)	543	(30,7%)	2	(0,1%)	1771
2011	1183	(63,7%)	673	(36,2%)	2	(0,1%)	1858
2010	962	(55,0%)	782	(44,7%)	4	(0,2%)	1748
2004-09	3631	(40,6%)	5263	(58,8%)	54	(0,6%)	8948
Total	9292	(52,4%)	8351	(47,1%)	90	(0,5%)	17733

Intraoperative complications

Table 26: Intraoperative complications

	Yes		No		Missing		Total
2014	50	(3,0%)	1543	(93,3%)	61	(3,7%)	1654
2013	52	(3,0%)	1639	(93,4%)	63	(3,6%)	1754
2012	38	(2,1%)	1701	(96,0%)	32	(1,8%)	1771
2011	60	(3,2%)	1766	(95,0%)	32	(1,7%)	1858
2010	49	(2,8%)	1687	(96,5%)	12	(0,7%)	1748
2004-09	314	(3,5%)	8454	(94,5%)	180	(2,0%)	8948
Total	563	(3,2%)	16790	(94,7%)	380	(2,1%)	17733

Systemic antibiotic prophylaxis

Table 27: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2014	1651	(99,8%)	1	(0,1%)	2	(0,1%)	1654
2013	1743	(99,4%)	2	(0,1%)	9	(0,5%)	1754
2012	1765	(99,7%)	5	(0,3%)	1	(0,1%)	1771
2011	1846	(99,4%)	7	(0,4%)	5	(0,3%)	1858
2010	1740	(99,5%)	5	(0,3%)	3	(0,2%)	1748
2004-09	8841	(98,8%)	81	(0,9%)	26	(0,3%)	8948
Total	17586	(99,2%)	101	(0,6%)	46	(0,3%)	17733

Table 28: Drug

	2004-09	2010	2011	2012	2013	2014
Benzylpenicillin (Penicillin G)					0,11%	0,06%
Cefaleksin (Keflex, Cefalexin)	0,03%					
Cefalotin (Keflin)	89,29%	91,09%	92,36%	92,46%	93,12%	92,19%
Cefotaksim (Claforan)						0,18%
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	2,47%	1,03%	1,03%	0,57%	0,46%	0,24%
Ciprofloksasin (Ciproxin)	0,01%					
Dikloksacillin (Diclocil, Dicillin)	5,55%	0,46%	0,54%	0,91%	0,92%	0,79%
Doksisyklin (Vibramycin, Dumoxin, Doxylin)	0,01%					
Erytromycin (Ery-max, Abboticin)	0,02%					0,06%
Gentamicin (Garamycin, Gensumycin)	0,01%	0,06%				
Klindamycin (Dalacin, Clindamycin)	2,35%	3,97%	2,93%	1,98%	1,95%	2,12%
Kloksacillin (Ekvacillin)	0,10%	3,33%	3,03%	4,08%	2,70%	3,45%
Linkomycin (Lincocin)		0,06%				
Oxacillin (Unspecified)					0,17%	0,18%
Tobramycin (Nebcina, Nebcin, Tobi)					0,11%	
Missing	0,15%		0,11%		0,46%	0,73%

Thrombosis prophylaxis

Table 29: Thrombosis prophylaxis

	Yes	No	Missing	Total
2014	1355 (81,9%)	291 (17,6%)	8 (0,5%)	1654
2013	1476 (84,2%)	265 (15,1%)	13 (0,7%)	1754
2012	1461 (82,5%)	308 (17,4%)	2 (0,1%)	1771
2011	1510 (81,3%)	342 (18,4%)	6 (0,3%)	1858
2010	1442 (82,5%)	298 (17,0%)	8 (0,5%)	1748
2005-09	6481 (79,6%)	1489 (18,3%)	209 (2,6%)	8179
Total	13725 (80,9%)	2993 (17,6%)	246 (1,5%)	16964

There are 33 old forms that are filled out so that thrombosis prophylaxis can not be registered. These are added to missing.

Table 30: Use of drugs

	One drug	Two drugs	Total
2014	1343 (99,1%)	12 (0,9%)	1355
2013	1455 (98,6%)	21 (1,4%)	1476
2012	1458 (99,8%)	3 (0,2%)	1461
2011	1505 (99,7%)	5 (0,3%)	1510
2010	1441 (99,9%)	1 (0,1%)	1442
2005-09	6432 (99,2%)	49 (0,8%)	6481
Total	13634 (99,3%)	91 (0,7%)	13725

Table 31: Drug

	2005-09	2010	2011	2012	2013	2014
Dabigatranetixalat (Re-Novate, Pradaxa)		0,07%		0,07%		
Dalteparin (Fragmin)	58,42%	64,91%	62,45%	67,69%	64,91%	55,65%
Dekstran (Macrodex, Dextran)	0,02%	0,07%	0,07%	0,07%	0,27%	0,37%
Enoksaparin (Klexane)	35,52%	32,39%	35,56%	31,69%	32,18%	42,51%
Heparin (Heparin)			0,07%			
Rivaroksaban (Xarelto)			0,07%	0,14%	0,27%	
Warfarin (Marevan)	0,02%					0,15%
Ximelagatran (Exanta, Malagatran)	0,46%					
No drugs	4,60%	2,36%	1,46%		0,61%	
Missing	0,22%	0,14%		0,14%	0,34%	0,44%
Two drugs	0,76%	0,07%	0,33%	0,21%	1,42%	0,89%

NSAID's

Table 32: NSAID's

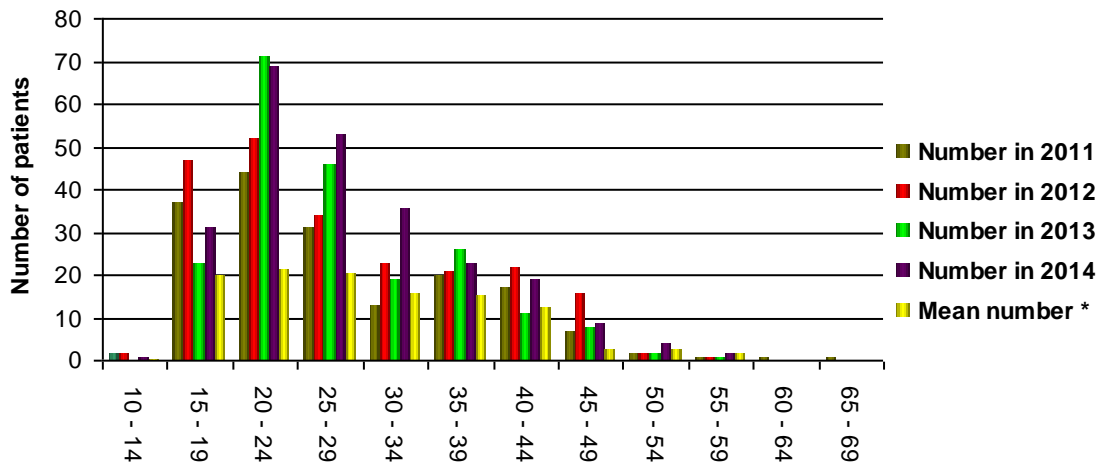
	Yes		No		Missing		Total
2014	695	(42,0%)	912	(55,1%)	47	(2,8%)	1654
2013	752	(42,9%)	942	(53,7%)	60	(3,4%)	1754
2012	804	(45,4%)	916	(51,7%)	51	(2,9%)	1771
2011	893	(48,1%)	878	(47,3%)	87	(4,7%)	1858
2010	763	(43,6%)	809	(46,3%)	176	(10,1%)	1748
2009	831	(44,7%)	639	(34,4%)	388	(20,9%)	1858
2008	572	(34,0%)	416	(24,7%)	696	(41,3%)	1684
2007	94	(5,8%)	76	(4,7%)	1463	(89,6%)	1633
Total	5404	(38,7%)	5588	(40,0%)	2968	(21,3%)	13960

Table 33: Drug

	2007-09	2010	2011	2012	2013	2014
Celecoxib (Celebra)	0,40%	4,33%	1,34%	1,87%	5,05%	3,02%
Diklofenak (Voltaren, Diclofenac, Cataflam)	94,12%	90,04%	91,94%	93,16%	86,70%	68,06%
Etoricoxib (Arcoxia)	0,13%		0,56%	0,37%	2,13%	22,01%
Ibuprofen (Ibux, Ibumetin)	0,33%	0,39%	2,80%	0,37%	0,80%	0,86%
Ketorolak (Toradol)	1,60%	4,85%	2,91%	3,73%	3,99%	4,46%
Parecoxib (Dynastat)					0,27%	0,29%
Piroxicam (Brexidol)	0,20%			0,12%		
Missing	3,21%	0,39%	0,45%	0,37%	1,06%	1,29%

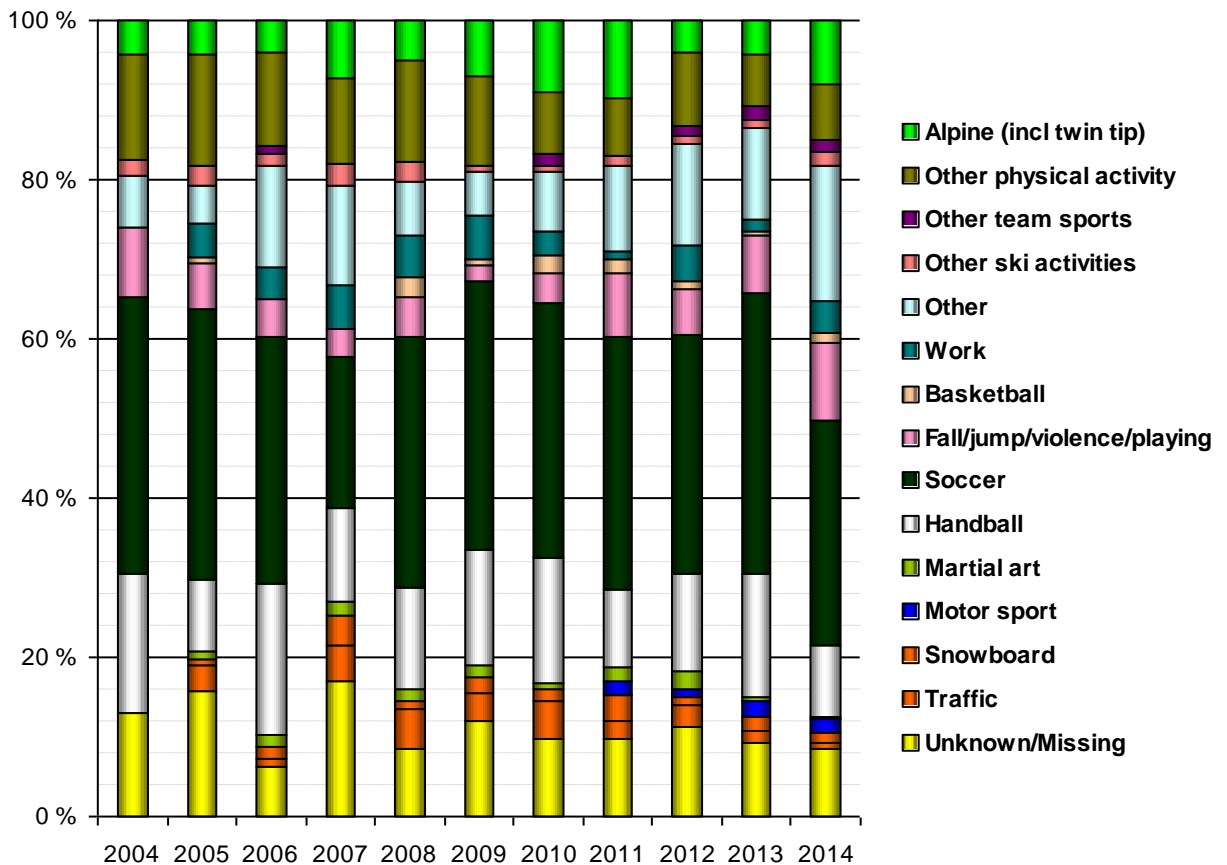
Revision reconstruction

Figure 10: Age by primary operation



* Mean number of primary operations for 2004 - 2010

Figure 11: Activity that lead to injury



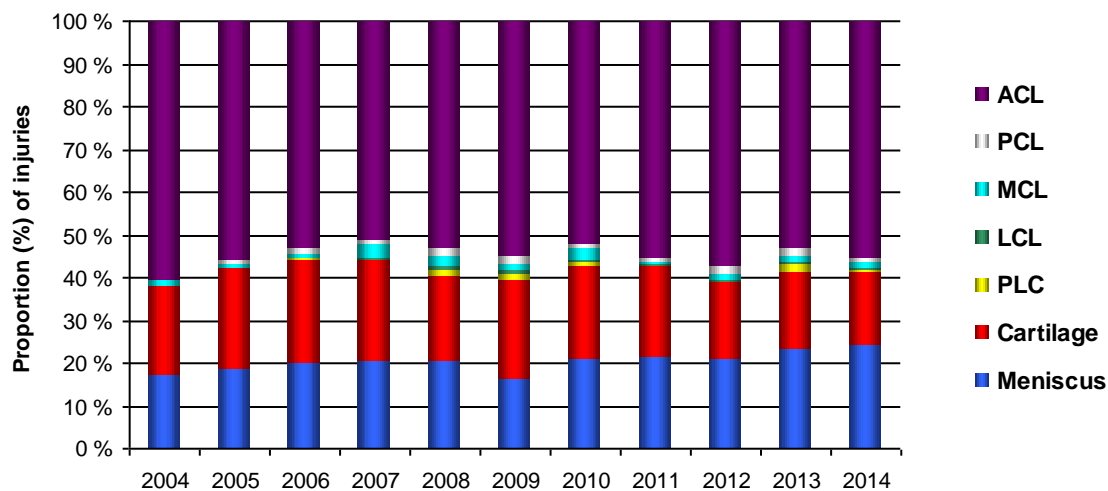
Actual injury

Table 34: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2014	190	4	4	2	1	59	84
2013	184	6	4	3	5	63	81
2012	195	6	4	2		62	71
2011	154	2	2	1		60	59
2010	127	2	7	2	2	54	52
2004-09	645	16	20	6	7	273	227
Total	1495	36	41	16	15	571	574

* More than one type of injury can be given for each form

Figure 12: Actual injury



Additional injuries

Table 35: ACL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
343	x						
215	x						
171	x						x
143	x					x	x
139	x					x	
94	x						
65	x					x	
58	x						x
42	x					x	x
31	x					x	
27	x						x
17	x					x	
17	x					x	x
17	x					x	x
15	x					x	
14	x					x	x
10	x					x	
8	x		x				
6	x		x				x
6	x					x	

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where ACL where the only injury. The total number will be identical to the total number of registered ACL injuries. The table shows only combinations that have a number of more than 5.

Table 36: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
5		x					
4		x					
3	x	x	x				x
3	x	x					x
3	x	x					
3		x					x

x indicates registered injury and each row tell the number of incidences of different combination of injuries. The first row gives the number of records where PCL where the only injury. The total number will be identical to the total number of registered PCL injuries. The table shows only combinations that have a number of more than 2.

Reason for revision reconstruction

Table 37: Reason for revision reconstruction

	Cause 1	Cause 2	Cause 3	Cause 4	Cause 5	Cause 6	Other	Total
2014	4	4	1	105	117	6		231
2013	1	11	1	123	74	5		210
2012	8	10	3	95	99	3	6	221
2011	4	12	1	81	80		5	183
2010	1	6	1	54	57	1	8	127
2004-09	4	14	5	103	110	5	14	250
Total	22	57	12	561	537	20	33	1242

Cause 1: Infection
Cause 2: Fixation failure

Cause 3: Untreated ligament injury
Cause 4: Graft failure

Cause 5: New trauma
Cause 6: Pain

Choice of graft for injuries registered in revision reconstructions

Table 38: BPTB

	ACL	PCL	MCL	LCL	PLC
2014	117	0	0	0	0
2013	91	0	0	0	0
2012	101	0	0	0	0
2011	90	1	0	0	0
2010	56	0	0	0	0
2004-09	207	1	0	0	0
Total	662	2	0	0	0

Table 39: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2014	48	1	1	0	0
2013	50	1	1	0	0
2012	53	0	2	1	0
2011	50	0	0	1	0
2010	65	0	4	0	0
2004-09	382	4	8	0	0
Total	648	6	16	2	0

Table 40: ALLOGRAFT

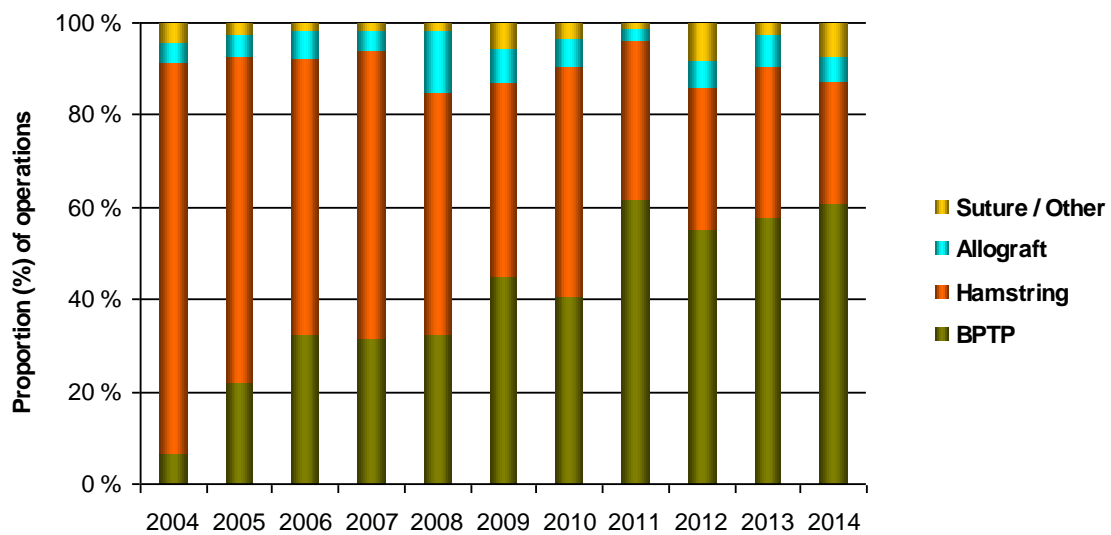
	ACL	PCL	MCL	LCL	PLC
2014	7	2	0	1	1
2013	4	3	1	1	2
2012	5	6	0	0	0
2011	2	1	1	0	0
2010	3	1	2	1	1
2004-09	25	8	2	5	7
Total	46	21	6	8	11

Table 41: Suture / Other

	ACL	PCL	MCL	LCL	PLC
2014	13	0	0	1	0
2013	3	0	0	0	1
2012	15	0	0	0	0
2011	2	0	0	0	0
2010	3	1	1	0	0
2004-09	14	3	2	0	0
Total	50	4	3	1	1

It was registered direct suture for two cases (PLC, MCL).

Figure 13: Choice of graft for all injuries in revision reconstruction



Fixation

Table 42: Femur ACL (The 5 most common)

Product	Total	2004-09	2010	2011	2012	2013	2014
Endobutton CL BTB	49				11	9	29
TunneLoc	84	4	7	6	7	2	4
EZLoc	102		12	3	3	2	2
Endobutton CL Ultra	283		45	46	46	48	49
SoftSilk	333	1	28	51	53	44	60

Table 43: Femur PCL (The 5 most common)

Product	Total	2004-09	2010	2011	2012	2013	2014
Propel Cannulated	2	1		1			
EndoButton CL	2	2					
SoftSilk	3	2				1	
RCI Screw	11	9	1		1		
Endobutton CL Ultra	12	1	1	1	4	3	2

Table 44: Tibia ACL (The 5 most common)

Product	Total	2004-09	2010	2011	2012	2013	2014
SoftSilk	301	81	19	47	52	44	58
Biosure HA Interferenc	127	6	19	14	29	30	29
RCI Screw	295	187	29	20	21	18	20
Propel Cannulated	74	27	4	7	8	10	18
BioRCI-HA	39	1	8	12	12		6

Table 45: Tibia PCL (The 5 most common)

Product	Total	2004-09	2010	2011	2012	2013	2014
Tightrope ABS	1						1
Intrafix Screw	1						1
Propel Cannulated	3	1		1	1		
AO Skrue	4	2	1		1		
RCI Screw	21	12	1	1	2	4	1

Table 46: Femur and tibia ACL (The 5 most common)

Femur	Tibia	Total	2004-09	2010	2011	2012	2013	2014
Endobutton CL Ultra	Intrafix Screw	28	3	4	8	2	4	7
Endobutton CL Ultra	BioRCI-HA	33	1	5	12	12		3
Endobutton CL Ultra	Biosure HA Interference screw	85	3	10	7	15	27	23
Endobutton CL Ultra	RCI Screw	102	36	22	13	10	10	11
SoftSilk	SoftSilk	276	77	19	45	47	36	52

Meniscal lesion

Table 47: Actual treatment of meniscal lesion

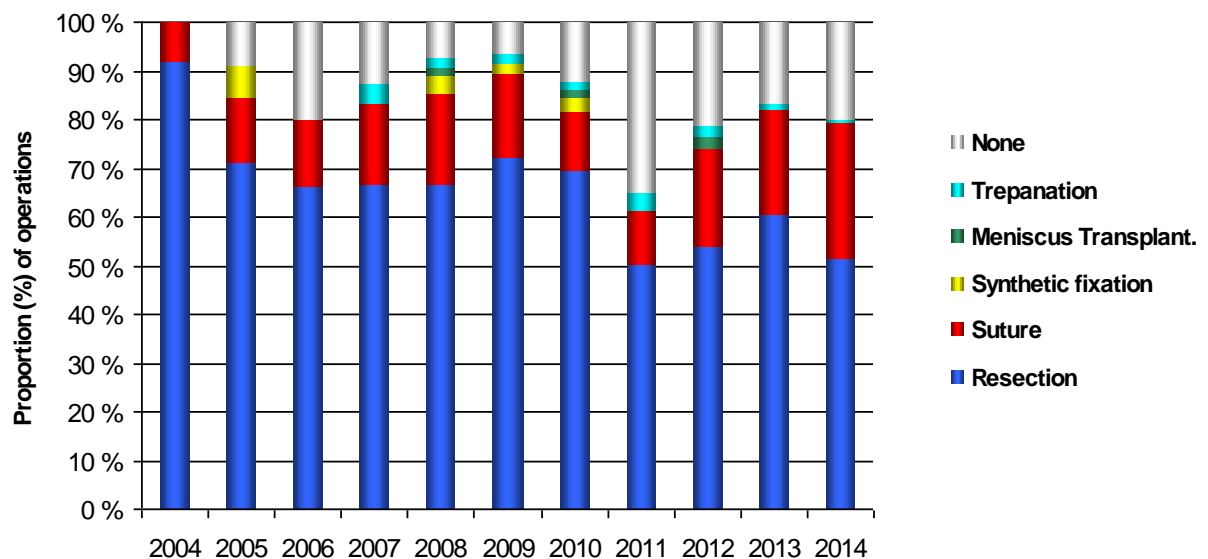
		Resection		Suture	Synthetic fixation	Meniscus Transplant.	Trepanation	None	Total
		OLD	Total						
2014	Lateral		24	12				4	40
2014	Medial		28	16			1	16	61
2013	Lateral		29	4			1	7	41
2013	Medial		32	18				10	60
2012	Lateral		14	6		2	2	4	28
2012	Medial	1	28	10				13	52
2011	Lateral	2	1	7	2		2	18	32
2011	Medial	11	3	16	7		1	10	48
2010	Lateral	19			2	1		3	25
2010	Medial	26			6	1	1	5	40
2004-09	Lateral	64			11	3		2	95
2004-09	Medial	112		2	29	3		1	161
Total		234	5	180	123	8	4	117	683

It became possible to register "Trepanation" and "None" from 01.01.2005. There have been forms where this has been an additional information. This information have been registered, but the registration is not complete before 2005.

In table 36: Actual injury has less. The reason for this is that we distinguish between the lateral and medial injury and some injuries are registered in both groups.

The value in OLD Resection are the forms that are registered before the new forms were introduced in autumn 2011. Total and Partial Resection values are the new forms were introduced in autumn 2011.

Figure 14: Treatment of meniscal lesions in revision reconstructions



Fixation

Table 48: Synthetic

Product	Total	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Contour Meniscus arrow	3		2			1						
Meniscus arrow	1		1									
Unknown	1						1					
Total	5		3			1	1					

Table 49: Suture

Product	Total	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
FAST-FIX	82	3	4	6	6	5	4	5	14	16	19	
Meniscus arrow	1						1					
Rapidloc	4	1	2	1								
Unknown	16						1	4	1	5	5	
Total	103	4	6	7	6	6	5	9	15	21	24	

Cartilage lesion all localizations

Table 50: ICRS Grade

Definition av ICRS Grade:

1. Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks.
2. Abnormal: Lesions extending down to <50% of cartilage depth.
3. Severely abnormal: Cartilage defects extending down >50% of cartilage depth as well as down to calcified layer.
4. Severely abnormal: Osteochondral injuries, lesions extending just through the subchondral boneplate or deeper defects down into trabecular bone.

	Code 1	Code 2	Code 3	Code 4	Missing
2014	10,6%	60,2%	23,9%	3,5%	1,8%
2013	24,6%	47,0%	23,1%	3,7%	1,5%
2012	14,3%	45,2%	31,7%	7,1%	1,6%
2011	34,4%	39,3%	18,9%	7,4%	
2010	6,0%	67,8%	22,8%	3,4%	
2004-09	21,9%	51,1%	21,0%	4,2%	1,7%

The complete overview of cartilage lesions with ICRS Grade and localization is located on The Norwegian Cruciate Ligament Registry's website.

Table 51: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2014	3,5%	4,4%	83,3%	1,8%	7,0%
2013	18,7%	2,2%	71,6%		7,5%
2012	18,3%	3,2%	74,6%		4,0%
2011	10,7%	3,3%	82,8%		3,3%
2010	9,4%	2,7%	86,6%		1,3%
2004-09	4,1%	1,9%	60,9%	2,0%	31,1%

The complete overview of treatment codes and localization is located on The Norwegian Cruciate Ligament Registry's website.

Cartilage injuries registered in revision reconstructions

Figure 15: All Cartilage injuries (total)

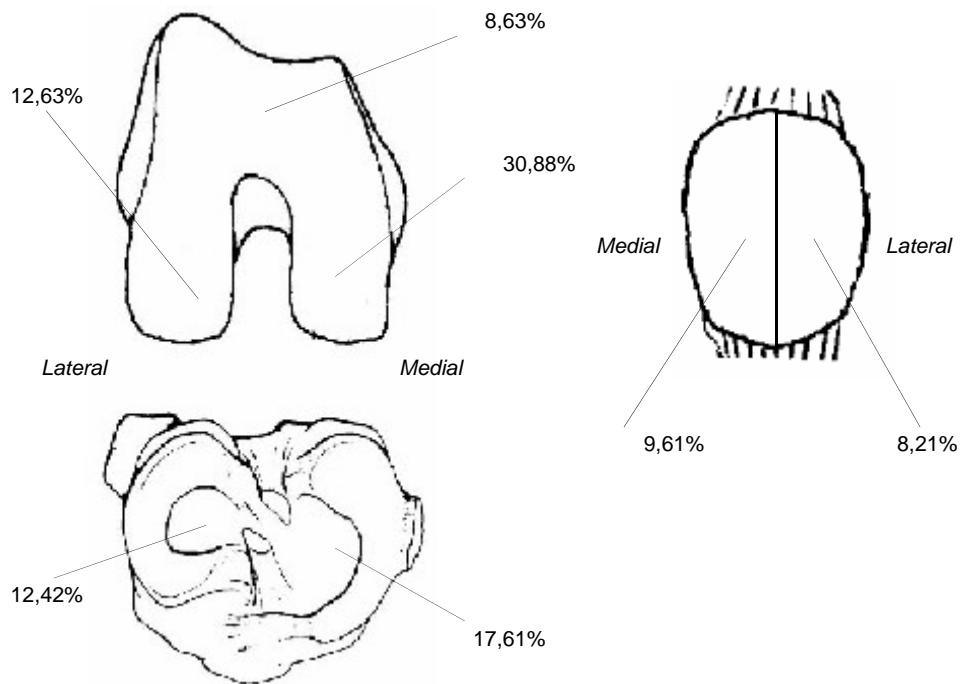


Figure 16: All Cartilage injuries with area greater than 2 cm² (total)

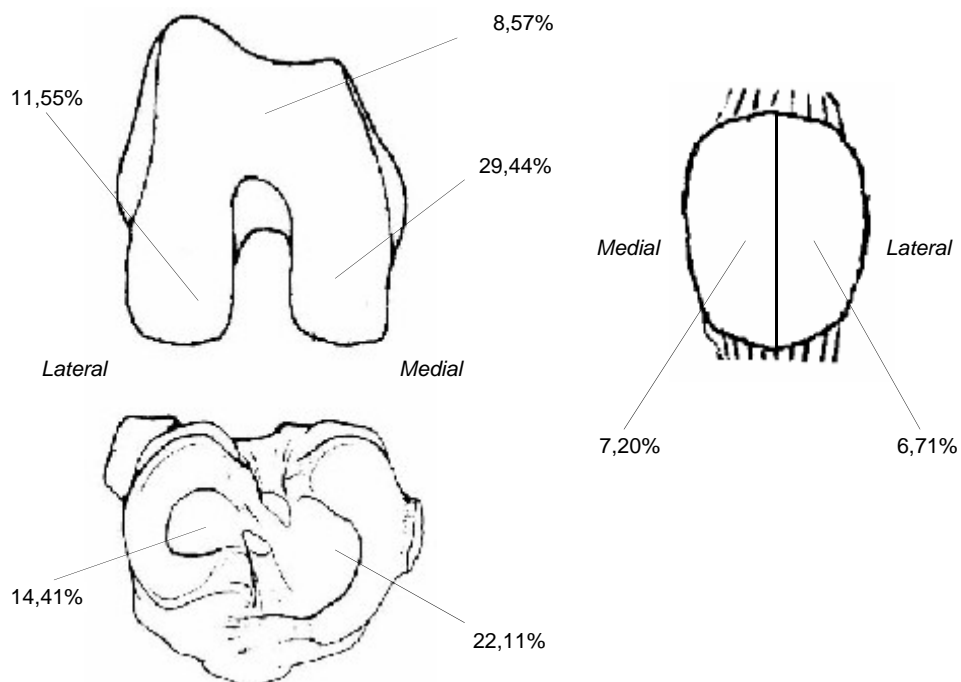
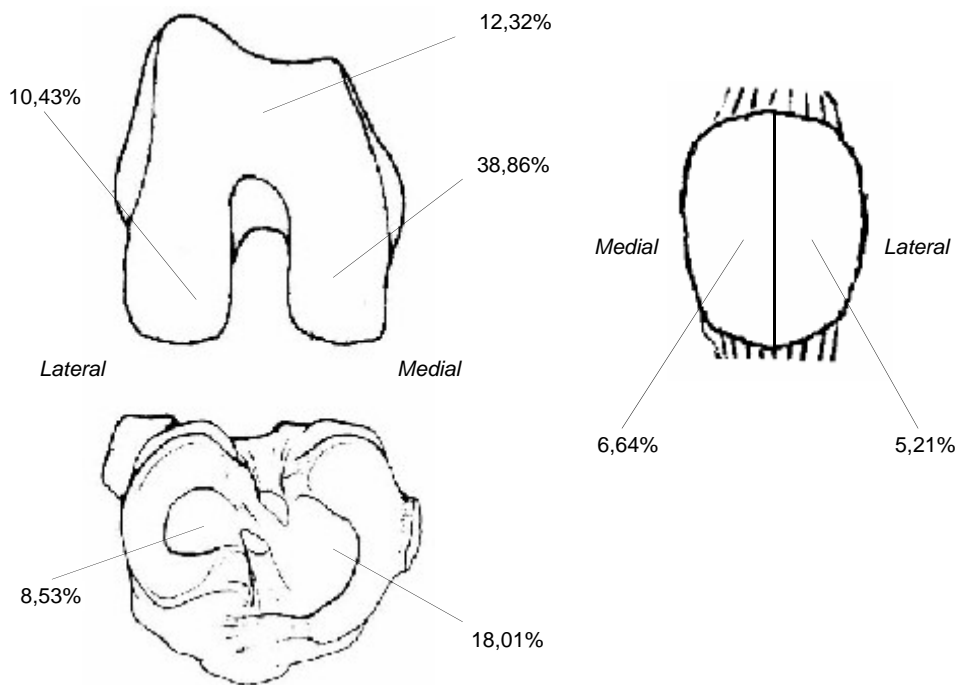


Figure 17: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 52: Outpatient surgery

	Yes	No	Missing	Total
2014	124 (50,2%)	121 (49,0%)	2 (0,8%)	247
2013	96 (46,4%)	106 (51,2%)	5 (2,4%)	207
2012	120 (54,5%)	99 (45,0%)	1 (0,5%)	220
2011	81 (46,0%)	95 (54,0%)		176
2010	67 (50,8%)	65 (49,2%)		132
2004-09	207 (31,1%)	454 (68,3%)	4 (0,6%)	665
Total	695 (42,2%)	940 (57,1%)	12 (0,7%)	1647

Intraoperative complications

Table 53 : Intraoperative complications

	Yes	No	Missing	Total
2014	3 (1,2%)	231 (93,5%)	13 (5,3%)	247
2013	7 (3,4%)	189 (91,3%)	11 (5,3%)	207
2012	5 (2,3%)	208 (94,5%)	7 (3,2%)	220
2011	3 (1,7%)	171 (97,2%)	2 (1,1%)	176
2010	6 (4,5%)	126 (95,5%)		132
2004-09	31 (4,7%)	614 (92,3%)	20 (3,0%)	665
Total	55 (3,3%)	1539 (93,4%)	53 (3,2%)	1647

Systemic antibiotic prophylaxis

Table 54: Systemic antibiotic prophylaxis

	Yes	No	Missing	Total
2014	245 (99,2%)	2 (0,8%)		247
2013	204 (98,6%)	2 (1,0%)	1 (0,5%)	207
2012	216 (98,2%)	3 (1,4%)	1 (0,5%)	220
2011	175 (99,4%)	1 (0,6%)		176
2010	132 (100,0%)			132
2004-09	652 (98,0%)	10 (1,5%)	3 (0,5%)	665
Total	1624 (98,6%)	18 (1,1%)	5 (0,3%)	1647

Table 55: Drug

	2004-09	2010	2011	2012	2013	2014
Benzympenicillin (Penicillin G)				0,46%		
Cefalotin (Keflin)	92,64%	90,91%	96,00%	88,43%	91,67%	90,61%
Ceftriakson (Rocefalin)						0,41%
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	1,07%	0,76%		0,46%		
Ciprofloksasin (Ciproxin)						0,41%
Dikloksacillin (Diclocil, Dicillin)	3,22%	0,76%	0,57%	0,93%	1,47%	0,41%
Gentamicin (Garamycin, Gensumycin)				0,46%		
Klindamycin (Dalacin, Clindamycin)	2,45%	3,03%	0,57%	4,17%	3,43%	3,27%
Kloksacillin (Ekvacillin)	0,15%	4,55%	2,29%	4,63%	2,45%	4,08%
Oxacillin (Unspecified)						0,41%
Vankomycin (Vancomycin, Vancocin)			0,57%			
Missing	0,46%			0,46%	0,98%	0,41%

Thrombosis prophylaxis

Table 56: Thrombosis prophylaxis

	Yes	No	Missing	Total
2014	197 (79,8%)	49 (19,8%)	1 (0,4%)	247
2013	173 (83,6%)	32 (15,5%)	2 (1,0%)	207
2012	183 (83,2%)	36 (16,4%)	1 (0,5%)	220
2011	145 (82,4%)	31 (17,6%)		176
2010	106 (80,3%)	25 (18,9%)	1 (0,8%)	132
2005-09	490 (79,4%)	115 (18,6%)	14 (2,3%)	619
Total	1294 (80,8%)	288 (18,0%)	19 (1,2%)	1601

There are 2 old forms that are filled out so that thrombosis prophylaxis can not be registered. These are added to missing.

There are 5 forms with two drugs and 1289 forms with one drug.

Table 57: Drug

	2005-09	2010	2011	2012	2013	2014
Apixiban (Eliquis)						0,51%
Dalteparin (Fragmin)	66,53%	58,49%	64,83%	67,21%	73,41%	57,87%
Dekstran (Macrodex, Dextran)			0,69%		0,58%	
Enoksaparin (Klexane)	29,59%	39,62%	34,48%	32,79%	25,43%	39,59%
Rivaroksaban (Xarelto)						0,51%
Ximelagatran (Exanta, Malagatran)	0,61%					
No drugs	2,65%	0,94%				
Missing	0,20%					1,02%
Two drugs	0,41%	0,94%			0,58%	0,51%

NSAID's

Table 58: NSAID's

	Yes	No	Missing	Total
2014	80 (32,4%)	162 (65,6%)	5 (2,0%)	247
2013	84 (40,6%)	119 (57,5%)	4 (1,9%)	207
2012	84 (38,2%)	130 (59,1%)	6 (2,7%)	220
2011	63 (35,8%)	103 (58,5%)	10 (5,7%)	176
2010	42 (31,8%)	79 (59,8%)	11 (8,3%)	132
2007-09	82 (22,0%)	148 (39,8%)	142 (38,2%)	372
Total	435 (32,1%)	741 (54,7%)	178 (13,1%)	1354

Table 59: Drug

	2007-09	2010	2011	2012	2013	2014
Celecoksib (Celebra)	1,22%				2,38%	
Diklofenak (Voltaren, Diclofenac, Cataflam)	92,68%	88,10%	95,24%	90,48%	73,81%	68,75%
Etoricoksib (Arcoxia)	1,22%		3,17%		1,19%	17,50%
Ketorolak (Toradol)	2,44%	11,90%	1,59%	9,52%	19,05%	10,00%
Parecoksib (Dynastat)					1,19%	
Piroxicam (Brexidol)	1,22%					
Missing	1,22%				2,38%	3,75%

Completeness analysis for the Cruciate Ligament Register, 2008-2012

A completeness analysis for the Cruciate Ligament Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Cruciate Ligament Register. Both primary and revision ACL surgery are reported to the Cruciate Ligament Register, but in the NPR it is not possible to separate the types of operation using NCSP codes. The completeness rate in this year's report therefore only applies to cruciate ligament surgery in general. A supplementary report on the analytical procedure and results contains a more detailed analysis of primary and revision surgeries, and will be published on www.helsedirektoratet.no.

NCSP codes for combining data from NPR hospital stays and the Cruciate Ligament Register

Code	Description
NGE 11	Transcision or excision of ligament of knee; anterior cruciate, open
NGE 12	Transcision or excision of ligament of knee; posterior cruciate, open
NGE 15	Transcision or excision of ligament of knee; anterior cruciate, arthroscopic
NGE 16	Transcision or excision of ligament of knee; posterior cruciate, arthroscopic
NGE 21	Fixation of fragment of surface of knee; anterior cruciate, open
NGE 22	Fixation of fragment of surface of knee; posterior cruciate, open
NGE 25	Fixation of fragment of surface of knee; anterior cruciate, arthroscopic
NGE 26	Fixation of fragment of surface of knee; posterior cruciate, arthroscopic
NGE 31	Transposition of ligament of knee; anterior cruciate, open
NGE 32	Transposition of ligament of knee; posterior cruciate, open
NGE 35	Transposition of ligament of knee; anterior cruciate, arthroscopic
NGE 36	Transposition of ligament of knee; posterior cruciate, arthroscopic
NGE 41	Plastic repair of ligament of knee not using prosthetic material; anterior cruciate, open
NGE 42	Plastic repair of ligament of knee not using prosthetic material; posterior cruciate, open
NGE 45	Plastic repair of ligament of knee not using prosthetic material; anterior cruciate, arthroscopic
NGE 46	Plastic repair of ligament of knee not using prosthetic material; posterior cruciate, arthroscopic
NGE 51	Plastic repair of ligament of knee using prosthetic material; anterior cruciate, open
NGE 52	Plastic repair of ligament of knee using prosthetic material; posterior cruciate, open
NGE 55	Plastic repair of ligament of knee using prosthetic material; anterior cruciate, arthroscopic
NGE 56	Plastic repair of ligament of knee using prosthetic material; posterior cruciate, arthroscopic
NGE 91	Other operation on capsule or ligament of knee; anterior cruciate, open
NGE 92	Other operation on capsule or ligament of knee; posterior cruciate, open
NGE 95	Other operation on capsule or ligament of knee; anterior cruciate, arthroscopic
NGE 96	Other operation on capsule or ligament of knee; posterior cruciate, arthroscopic
NGT 19	Forcible manipulation of knee joint
NGU 69	Removal of prosthetic ligament from knee or lower leg

The completeness rate for the Cruciate Ligament Register was calculated as follows:

$$\frac{\text{(Only Cruc. Lig. Reg. + Inclusion in both registers)}}{\text{(Only NPR + Only Cruc. Lig. Reg. + Inclusion in both registers)}}$$

Completeness for the NPR was calculated in a similar way:

$$\frac{\text{(Only NPR + Inclusion in both registers)}}{\text{(Only Cruc. Lig. Reg. + Only NPR + Inclusion in both registers)}}$$

From 2008 to 2012, 12 431 cruciate ligament operations were reported to one or both of the registers. 78.1% of these were reported to the Cruciate Ligament Register, while 83.5% were reported to the NPR. The completeness by hospital is presented in Tables 76 to 80, divided into health regions, and shows considerable variation between hospitals. The Cruciate Ligament Register is based on consent, and a low completeness rate may be connected to patients refusing consent. But also erroneous use of the NCSP codes for other conditions than cruciate ligament surgery affects the completeness for the Cruciate Ligament Register. NGT19 "Forcible manipulation of knee joint" is also used for other conditions than cruciate ligament surgery, resulting in lower coverage, and it is impossible for us to check the numbers involved. Conversely, the Cruciate Ligament Register will get higher completeness if hospitals do not report to the NPR, and this probably applies to private hospitals to some extent. In order to get good data, it is important that everyone submits the registration forms to the Cruciate Ligament Register and chooses carefully the correct procedure code for the NPR.

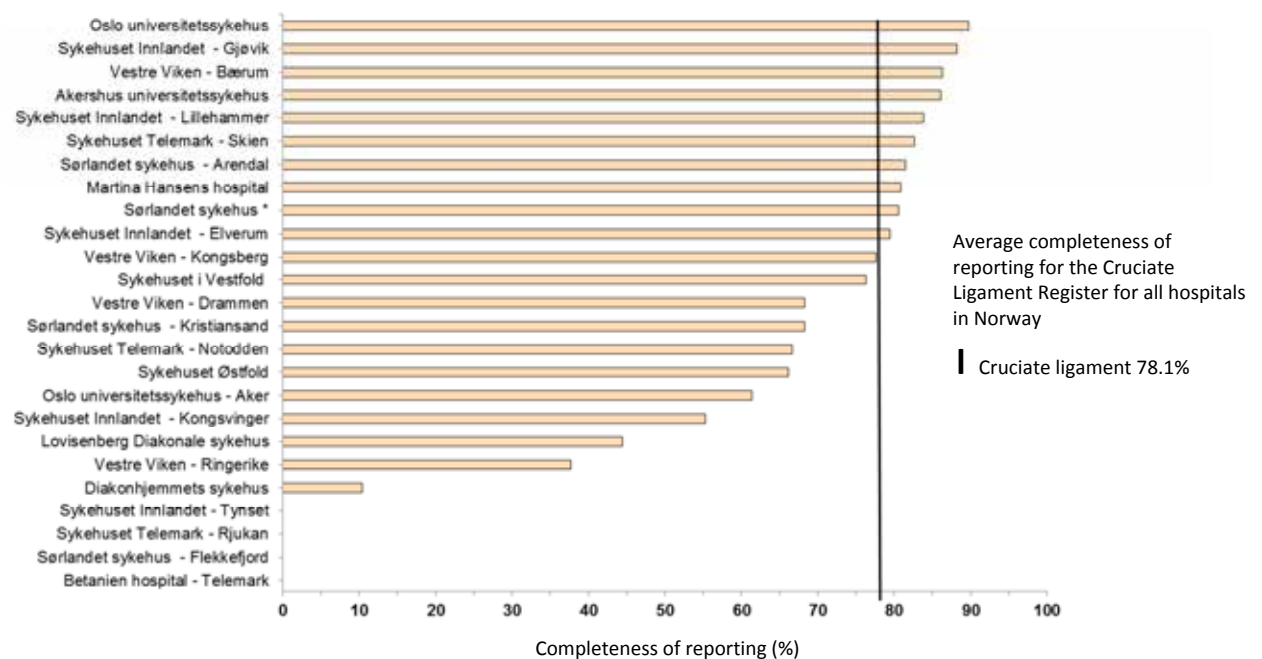
Helse Sør-Øst

Table 76: Completeness of reporting for cruciate ligament operations, 2008-2012

Helse Sør-Øst	Total number Cruciate Ligament Register + NPR	Cruciate Ligament Register (%)	NPR (%)
Oslo universitetssykehus	1 186	89,7	98,2
Sykehuset Innlandet - Gjøvik	153	88,2	98,0
Vestre Viken - Bærum	240	86,3	88,8
Akershus universitetssykehus	381	86,1	93,7
Sykehuset Innlandet - Lillehammer	99	83,8	98,0
Sykehuset Telemark - Skien	230	82,6	95,7
Sørlandet sykehus - Arendal	130	81,5	98,5
Martina Hansens hospital	445	80,9	97,5
Sørlandet sykehus *	201	80,6	98,5
Sykehuset Innlandet - Elverum	200	79,5	99,0
Vestre Viken - Kongsberg	67	77,6	97,0
Sykehuset i Vestfold	299	76,3	99,7
Vestre Viken - Drammen	221	68,3	99,5
Sørlandet sykehus - Kristiansand	126	68,3	97,6
Sykehuset Telemark - Notodden	15	66,7	100,0
Sykehuset Østfold	195	66,2	98,5
Oslo universitetssykehus - Aker	57	61,4	96,5
Sykehuset Innlandet - Kongsvinger	94	55,3	100,0
Lovisenberg Diakonale sykehus	293	44,4	71,0
Vestre Viken - Ringerike	77	37,7	98,7
Diakonhjemmets sykehus	67	10,4	100,0
Sykehuset Innlandet - Tynset	68	0,0	100,0
Sørlandet sykehus - Flekkefjord	18	0,0	100,0
Sykehuset Telemark - Rjukan	18	0,0	100,0
Betanien hospital - Telemark	6	0,0	100,0

* Reporting unit can not be given more accurate in NPR

Figure 24: Completeness of reporting for the Cruciate Ligament Register Helse Sør-Øst



Helse Vest

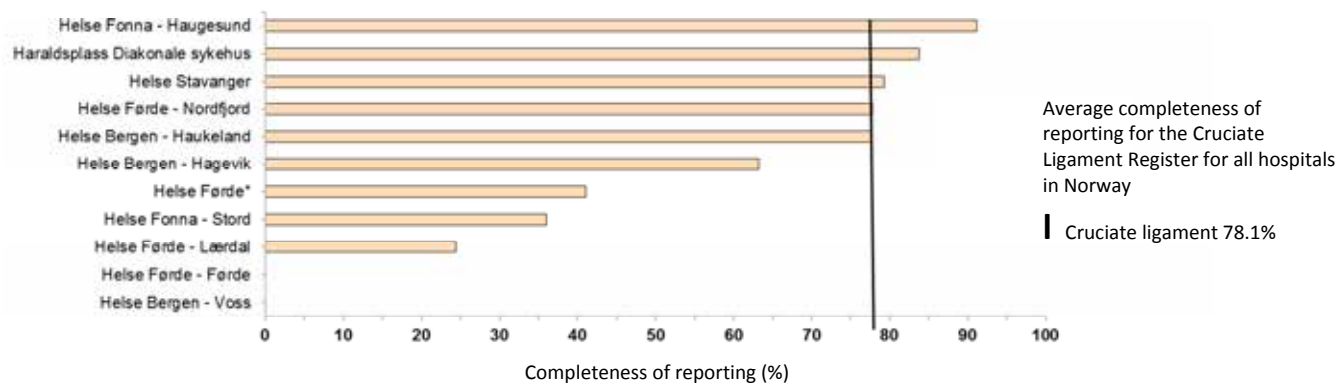
Table 77: Completeness of reporting for cruciate ligament operations, 2008-2012

Helse Vest	Total number Cruciate Ligament Register + NPR	Cruciate Ligament Register (%)	NPR (%)
Helse Fonna - Haugesund	179	91,1	98,9
Haraldsplass Diakonale sykehus	699	83,8	99,0
Helse Stavanger	305	79,3	98,7
Helse Førde - Nordfjord	9	77,8	100,0
Helse Bergen - Haukeland	380	77,6	97,4
Helse Bergen - Hagevik	87	63,2	100,0
Helse Førde (kan ikke splittes)	246	41,1	100,0
Helse Fonna - Stord	25	36,0	100,0
Helse Førde - Lærdal	127	24,4	100,0
Helse Førde - Førde	41	0,0	100,0
Helse Bergen - Voss	37	0,0	100,0
Haugesund san.for. revmatismesykehus**	4	0,0	100,0
Helse Fonna – Odda**	1	0,0	100,0

* Reporting unit can not be given more accurate in NPR

** Total number under 5 are not in the figure

Figure 25: Completeness of reporting for the Cruciate Ligament Register Helse Vest



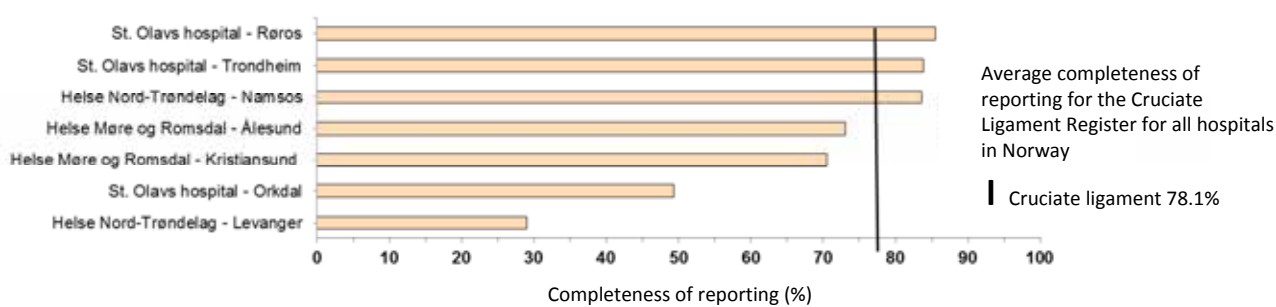
Helse Midt-Norge

Table 78: Completeness of reporting for cruciate ligament operations, 2008-2012

Helse Midt-Norge	Total number Cruciate Ligament Register + NPR	Cruciate Ligament Register (%)	NPR (%)
St. Olavs hospital - Røros	110	85,5	99,1
St. Olavs hospital - Trondheim	420	83,8	99,0
Helse Nord-Trøndelag - Namsos	67	83,6	98,5
Helse Møre og Romsdal - Ålesund	238	73,1	97,5
Helse Møre og Romsdal - Kristiansund	129	70,5	96,9
St. Olavs hospital - Orkdal	67	49,3	100
Helse Nord-Trøndelag - Levanger	124	29,0	100
Helse Møre og Romsdal - Molde*	5	0,0	100
Helse Møre og Romsdal - Volda*	1	0,0	100

* Total number under 5 are not in the figure

Figure 26: Completeness of reporting for the Cruciate Ligament Register Helse Midt-Norge



Helse Nord

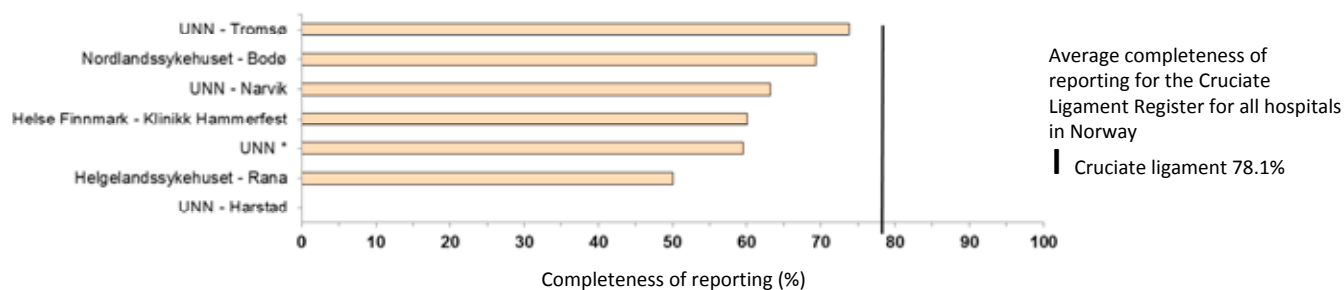
Table 79: Completeness of reporting for cruciate ligament operations, 2008-2012

Helse Nord	Total number Cruciate Ligament Register + NPR	Cruciate Ligament Register (%)	NPR (%)
UNN - Tromsø	226	73,9	98,2
Nordlandssykehuset - Bodø	179	69,3	97,2
UNN - Narvik	19	63,2	94,7
Helse Finnmark - Klinikk Hammerfest	153	60,1	98,0
UNN *	42	59,5	100,0
Helgelandssykehuset - Rana	26	50,0	96,2
UNN - Harstad	32	0,0	100,0
Nordlandssykehuset – Vesterålen**	3	0,0	100,0
Helse Finnmark - Klinikk Kirkenes**	2	0,0	100,0
Helgelandssykehuset - Sandnessjøen**	1	0,0	100,0

* Reporting unit can not be given more accurate in NPR

** Total number under 5 are not in the figure

Figure 27: Completeness of reporting for the Cruciate Ligament Register Helse Nord



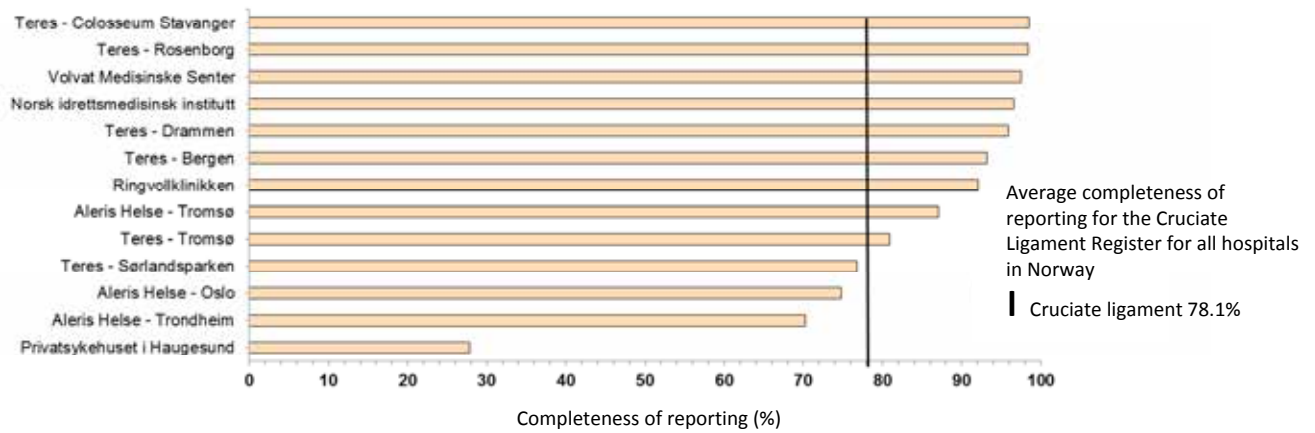
Private hospitals med avtale med RHF

Table 80: Completeness of reporting for cruciate ligament operations, 2008-2012

Private hospitals	Total number Cruciate Ligament Register + NPR	Cruciate Ligament Register (%)	NPR (%)
Oslofjordklinikken*	2	100,0	0,0
Teres - Colosseum Stavanger	130	98,5	26,9
Teres - Rosenborg	579	98,4	39,0
Volvat Medisinske Senter	516	97,5	64,3
Norsk idrettsmedisinsk institutt	443	96,6	50,1
Teres - Drammen	344	95,9	41,0
Teres - Bergen	308	93,2	11,7
Ringvollklinikken	482	92,1	42,7
Aleris Helse - Tromsø	62	87,1	90,3
Teres - Tromsø	47	80,9	31,9
Teres - Sørlandsparken	99	76,8	23,2
Aleris Helse - Oslo	242	74,8	85,1
Aleris Helse - Trondheim	283	70,3	86,6
Privatsykehuset i Haugesund	18	27,8	83,3
Medi3 - Ålesund*	2	0,0	100,0
Mjøskirurgene*	2	0,0	100,0
Teres - Bodø*	2	0,0	100,0

* Total number under 5 are not in the figure

Figure 28: Completeness of reporting for the Cruciate Ligament Register private hospitals



CRUSIATE LIGAMENT SURVIVAL RATES IN NORWEGIAN HOSPITALS

For the first time, we present eight-year survival rates for primary ACL reconstructions (with additional injuries) performed at hospitals in Norway. We have included operations from 2004-2014 from hospitals with more than 50 operations during this period. The Kaplan-Meier method with a 95% confidence interval was used. We provide the unadjusted rate for all primary ACL reconstructions. The endpoint is the first revision reconstruction. Only hospitals that performed reconstructions in 2014 are included.

The results must be interpreted with caution, because differences in reoperation rates may be due to a number of factors:

1. Hospitals that are more rigorous in reporting their complications and reoperations to the Register could have unfairly negative results in the analysis.
2. If surgeons at one hospital are more diligent in facilitating check-ups for patients than at other hospitals, and thus discover more complications, this could lead to unfortunate results despite the fact that this hospital in reality is doing a better job than other hospitals.
3. If the waiting time for reoperations is longer in some hospitals than others, the longer wait could erroneously lead to better results than those of hospitals with a short waiting time.
4. If the surgeons at one hospital have a higher threshold for recommending reoperation than at other hospitals and thus prolong patients' problems, this will also give skewed results in the statistics.
5. Poor hospital results from an earlier period will remain with the hospital, even though the hospital may have acted upon previous problems by switching to better prostheses and improving procedures and surgical skills.

The completeness analysis shows the proportion of primary reconstructions each hospital has reported to NPR. Because there are not any specific codes for revision reconstruction of cruciate ligaments in NPR it is not possible to perform the completeness analysis for revision reconstructions in the Cruciate Ligament register.

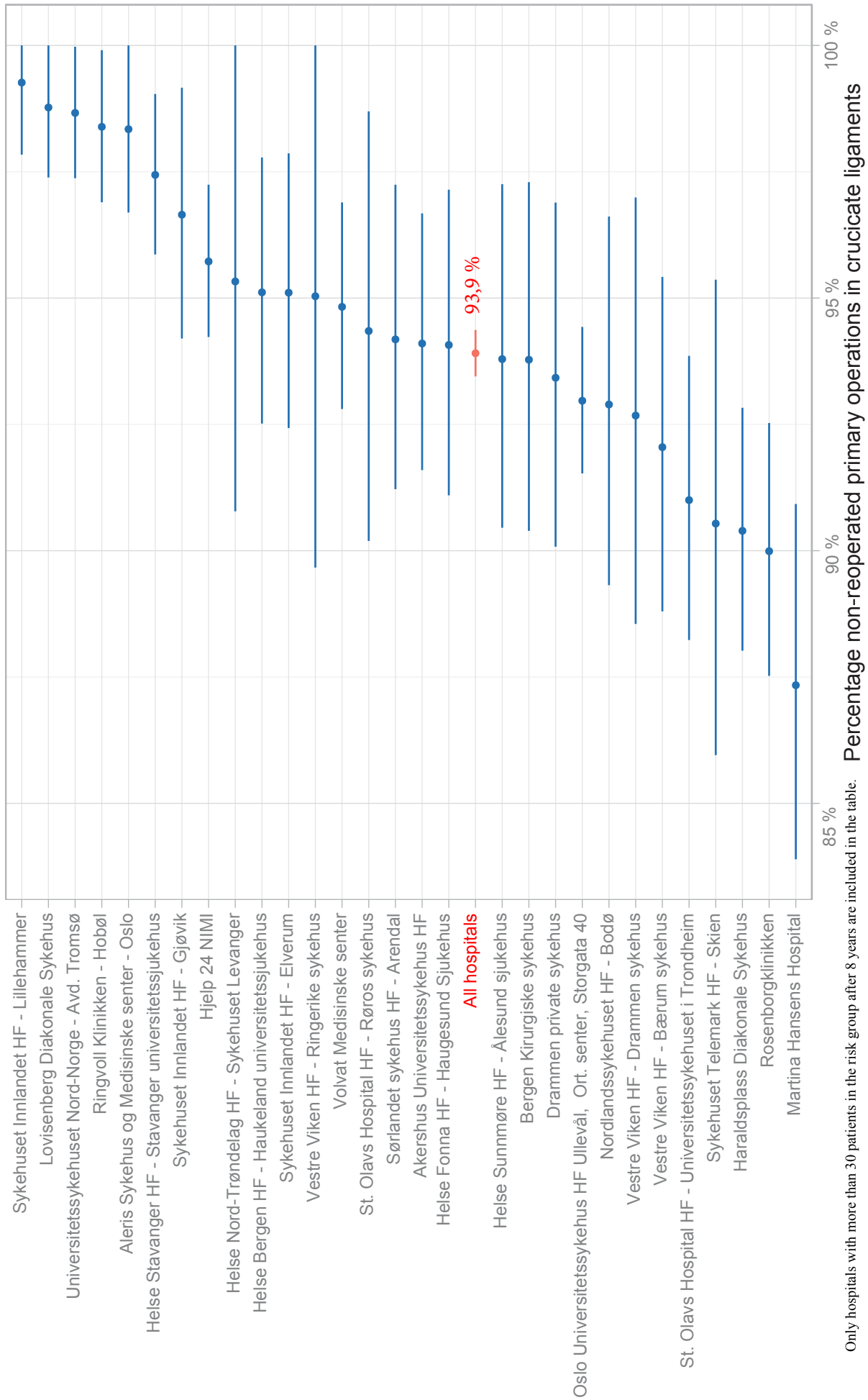
Ranking of hospitals

There is statistical uncertainty in the ranking lists because the data from the Cruciate Ligament register are poorly suited for such calculations. The register was designed to compare the results of implants and surgical procedures nationwide. To compare quality in hospitals is a complex matter, because some hospitals operate on more patients with poor prognosis than other hospitals, and because many hospitals, especially the small ones, have so few reoperations that the statistics are too weak, and are further weakened by the fact that the hospitals' completeness (reporting rate) of reoperations varies from 16.7% to 100%. This

issue is explained in detail in the following articles: Ranstam J, Wagner P, Robertsson O, Lidgren L. Health-care quality registers: outcome-orientated ranking of hospitals is unreliable. *J Bone Joint Surg Br.* 2008 and Ranstam J, Wagner P, Robertsson O, Lidgren L. [Ranking in health care results in wrong conclusions]. *Läkartidningen.* 2008 Aug 27-Sep 2;105(35):2313-4.

Moreover, it is a well-known phenomenon in quality assurance that if those who report their complications and errors receive bad publicity, the reporting deteriorates. If league tables of hospitals are publicised, there is thus a danger that hospitals' reporting of reoperations may become less reliable, leading to inferior quality of the registers.

In order to achieve complete reporting of reoperations (revisions), reporting to the Register should be linked to performance-based financing, reporting should be made mandatory, and the requirement for the patient's written consent to reporting of the operation to the Register should be waived and replaced by presumed consent.



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**THE NORWEGIAN PAEDIATRIC
HIP REGISTER
2015 ANNUAL REPORT**

The Paediatric Hip Register is now in its fifth year of operation. Our experience so far has been good, although in the first year of the Register we had to work to increase compliance. This was expected and must continue to be addressed. The registration form has been revised following feedback from users, and we hope that it is now set out in a more logical and user-friendly manner.

There is rightly a major focus on Patient-Recorded Outcome Measures (PROM) as the endpoint for treatment in orthopaedic surgery. For open and arthroscopic hip replacements in young adults, we plan to use IHOT 12, a questionnaire with 12 questions, which is a simplified version of IHOT 33. IHOT 12 has now been translated, ready for use. In the past year, we have been cooperating with Swedish paediatric orthopaedists who are in the process of establishing their own paediatric orthopaedic register. We aim to use as similar parameters as possible in the two national registers, and we are close to agreement on a common PROM system to be used in both registers. During the past year, open and arthroscopic hip replacements have also been registered, but there is a need for further revision of this part of the form, with help from arthroscopy surgeons.

The collecting of radiographs of children in the Register has functioned satisfactorily, and we now have over 4000 images in our database. We have developed a computer programme that combines the data from the Register with the radiographs and this will be a useful tool in the analysis of data and images.

A PhD candidate, Anne Kristin Reve, is now attached to the Register. She is an assistant physician in the Orthopaedic Department of Stavanger University Hospital. She is currently working on the compliance study, which will soon be completed. She plans to start epidemiological studies of paediatric hip diseases in Norway. At the autumn meeting of the Norwegian Orthopaedic Association in 2014, she presented the status of the Paediatric Hip Register after three years of operation.

In 2014, we applied to the National Service Centre for Medical Quality Registers for status as a national quality register. In all probability, our Register will be approved, which will ensure future funding.

Bergen, 29 May 2015



Ola Wiig
Leader
Paediatric Hip Register



Irina Kvinnesland
IT Consultant

PEADIATRIC HIP DISEASE

Hip Dysplasia

Table 1: HD - New cases per year

Year diagnosed	Unilateral	Bilateral	Missing	Total
2014	41	17	1	59
2013	44	13	0	57
2012	71	31	0	102
2011	66	17	0	83
2010	88	17	0	105
2009	20	6	0	26
2008	6	2	0	8
2007	3	2	0	5
2006	1	0	0	1
2004	2	0	0	2
2001	2	0	0	2
2000	1	0	0	1
Ukjent	19	4	0	23
Total	364	109	1	474

Table 2: HD - Hip status

Year treated	Located	Partially dislocated	Luksert	Missing	Total
2014	56	11	31	2	100
2013	46	15	17	7	85
2012	71	18	34	11	134
2011	54	14	23	8	99
2010	62	23	28	7	120
Ukjent	10	3	5	4	22
Total	299	84	138	39	560

More than one form for patient per side is possible

Table 3: HD - Acetabular index

Year diagnosed	< 15°	< 20°	< 25°	< 30°	< 35°	< 40°	< 45°	>= 45°	Missing	Total
2014	0	0	2	5	17	4	5	18	8	59
2013	0	0	0	4	13	10	9	8	13	57
2012	0	0	4	12	25	10	10	29	12	102
2011	0	1	3	12	24	11	6	18	8	83
2010	0	3	5	24	24	12	12	13	12	106
2009	0	0	1	2	4	6	3	4	6	26
2008	0	0	0	1	4	0	0	1	2	8
2007	0	0	0	1	1	2	0	1	0	5
2006	0	0	0	0	1	0	0	0	0	1
2004	0	0	0	1	0	1	0	0	0	2
2001	0	0	0	0	0	0	0	0	2	2
2000	0	0	0	0	0	0	1	0	0	1
Ukjent	0	0	0	4	4	0	3	2	10	23
Total	0	4	15	66	117	56	49	94	73	474

Mean number used for both hips for bilateral HD,

Table 4: HD - Non-operative treatment

Treatment year	Pillow	Plaster	Abduction orthosis	Closed reduction	No treatment/obs.	Missing	Total
2014	0	0	7	1	0	0	8
2013	9	6	17	2	2	0	36
2012	36	29	42	6	8	4	125
2011	23	12	43	5	6	1	90
2010	32	20	52	9	5	3	121
2009	1	1	3	1	2	0	8
2007	3	1	1	0	0	0	5
2005	1	0	1	0	0	0	2
Ukjent	3	1	4	1	1	1	11
Total	108	70	170	25	24	9	406

Table 5: HD - Reduction - Surgical

Treatment year	Yes
2014	10
2013	9
2012	5
2011	12
2010	14
Ukjent	3
Total	53

Table 6: HD - Femoral osteotomy

Treatment year	Varising	Rotation	Shortening	Total
2014	1	0	0	1
2013	5	4	3	12
2012	2	2	0	4
2011	3	2	1	6
2010	1	3	1	5
Total	12	11	5	28

Table 7: HD - Pelvic osteotomy

Treatment year	Salter	Dega	Triple	Periacetabular	Other	Total
2014	8	2	0	0	0	10
2013	8	0	0	0	0	8
2012	3	0	0	0	0	3
2011	3	1	0	2	0	6
2010	1	1	0	0	0	2
Total	23	4	0	2	0	29

Table 8: HD - Tenotomi

Treatment year	Psoas tenotomy	Adductor tenotomy	Total
2014	8	14	22
2013	7	1	8
2012	4	5	9
2011	3	0	3
2010	8	5	13
Missing	2	1	3
Total	32	26	58

Epifysiolsis Capitis Femoris

Table 9: ECF - New cases per year

Year diagnosed	Unilateral	Bilateral	Total
2014	17	3	20
2013	22	11	33
2012	17	4	21
2011	24	8	32
2010	21	6	27
2009	4	0	4
2008	2	0	2
2007	1	2	3
2006	1	1	2
2005	1	0	1
2004	1	0	1
Unknown	8	7	15
Total	119	42	161

Table 10: ECF - Classification

Year diagnosed	Acute	Chronic	Acute on chronic	Stable (Able to bear weight)	Unstable (Unable to ambulate)
2014	1	14	5	13	7
2013	3	20	5	24	5
2012	2	10	5	11	5
2011	6	14	7	20	4
2010	4	14	3	17	7
2009	0	1	0	1	0
2008	0	0	0	1	0
2006	0	0	0	1	0
2005	1	0	0	0	1
Unknown	2	3	0	5	1
Total	19	76	25	93	30

Table 11: ECF - Symptoms duration

Year diagnosed	< 4 weeks	4 - 8 weeks	9 - 26 weeks	27-52 weeks	> 52 weeks	Total
2014	0	1	1	0	0	2
2013	1	4	3	5	0	13
2012	3	5	3	1	0	12
2011	5	3	6	4	3	21
2010	3	8	8	2	0	21
2007	0	0	0	0	1	1
Unknown	2	0	0	0	0	2
Total	14	21	21	12	4	72

Table 12: ECF - Degree of slippage

Year diagnosed	< 30°	30 - 50°	> 50°	Total
2014	10	2	8	20
2013	15	12	4	31
2012	8	3	5	16
2011	11	7	6	24
2010	15	4	7	26
2005	1	0	0	1
Unknown	4	1	0	5
Total	64	29	30	123

Table 13: ECF - Type of primary operation

Year treated	Screw osteosynthesis	Femoral osteotomy	Pin osteosynthesis	Total
2014	25	0	4	30
2013	35	0	11	46
2012	15	0	7	22
2011	24	1	15	40
2010	23	1	13	37
2009	1	0	0	1
Unknown	0	0	2	2
Total	124	2	52	178

Table 14: ECF - Primary operation - Osteosynthesis with screws

Year treated	----- Number of screws -----			----- Brand -----		
	1 screw	2 screws	> 2 screws	Olmed	Richards	Smith+N.
2014	22	4	0	10	6	3
2013	31	1	1	13	8	1
2012	11	3	0	8	0	0
2011	20	4	0	15	3	1
2010	20	3	0	13	4	0
2009	1	0	0	1	0	0
Total	105	15	1	60	21	5

Smith+N. = Smith and Nephew

Table 15: ECF - Primay operation - Osteosynthesis with pins

Year treated	----- Number of pins -----				----- Diameter -----				
	1	2	3	> 3	2,3	2,5	2,8	3,0	3,2
2014	1	2	1	0	2	0	0	1	0
2013	0	10	0	0	8	0	0	0	1
2012	0	5	1	0	5	1	0	0	0
2011	0	12	3	0	5	1	1	0	1
2010	0	12	1	0	9	1	0	1	2
Unknown	0	2	0	0	0	0	0	0	0
Total	1	43	6	0	29	3	1	2	4

Calvè-Legg-Perthes

Table 16: CLP - Number of new cases per year

Year diagnosed	Unilateral	Bilateral	Total
2014	23	1	24
2013	39	1	40
2012	34	4	38
2011	25	3	28
2010	58	12	70
2009	4	1	5
2008	1	2	3
2007	4	0	4
2006	1	0	1
2005	2	0	2
2003	3	0	3
2002	4	0	4
2001	1	0	1
2000	1	0	1
1993	1	0	1
Unknown	21	2	23
Total	222	26	248

Table 17: CLP - Catterall

Year diagnosed	I/II	III/IV	Missing	Total
2014	7	16	1	24
2013	12	22	6	40
2012	13	22	3	38
2011	11	17	0	28
2010	21	42	7	70
2009	0	5	0	5
2008	0	2	1	3
2007	0	2	2	4
2006	0	0	1	1
2005	0	1	1	2
2003	0	1	2	3
2002	0	1	3	4
2001	0	0	1	1
2000	1	0	0	1
1993	0	0	1	1
Unknown	0	6	17	23
Total	65	137	46	248

I/II = < 50 % caput necrosis

III/IV = < 50 % caput necrosis

Table 18: CLP - Treatment

Year treated	None/ physiotherapy	Abduction orthosis	Femoral osteotomy	Salter	Dega	Periacetabular	Other pelvic osteotomy	Total
2014	24	2	9	0	0	0	0	35
2013	34	0	13	0	0	0	0	47
2012	32	0	4	0	0	0	0	36
2011	29	0	15	0	0	0	0	44
2010	41	0	10	0	0	0	0	51
2009	1	0	0	0	0	0	0	1
2008	1	0	0	0	0	0	0	1
2007	1	0	0	0	0	0	0	1
Unknown	10	0	0	0	0	0	0	10
Total	173	2	51	0	0	0	0	226

Table 19: CLP - Plates and screws

Year treated	Prebent plate	Angel plate	Special plate	Normal screws	Angle-stable screws
2014	0	0	8	2	5
2013	2	1	9	3	12
2012	1	0	8	2	2
2011	0	0	20	5	9
2010	1	7	3	5	3
Total	4	8	48	17	31

LIST OF PUBLICATIONS

Doctoral thesis

Norwegian Arthroplasty Register

1. Havelin LI. Hip arthroplasty in Norway 1987–1994. The Norwegian Arthroplasty Register [dissertation]. Bergen, Norway: University of Bergen, 1995.
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Scientific exhibitions

Nasjonalt Register for Leddproteser

1. Havelin LI, Espehaug B, Lie SA, Engesæter LB, Furnes O, Vollset SE. Prospective studies of hip prostheses and cements. A presentation of the Norwegian Arthroplasty Register 1987–1999. Scientific exhibition presented at the 67th Annual Meeting of the American Academy of Orthopaedic Surgeons, March 15–19, 2000, Orlando, USA.
2. Furnes O, Espehaug B, Lie SA, Engesæter LB, Vollset SE, Hallan G, Fenstad AM, Havelin LI. Prospective studies of hip and knee prostheses. The Norwegian Arthroplasty Register 1987-2004. Scientific exhibition presented at the 72nd Annual Meeting of the American Academy of Orthopaedic Surgeons, February 23–27, 2005, Washington DC, USA.

Oral presentations/Abstracts/Posters 2014 - May 2015.

Norwegian Arthroplasty Register

3. Furnes O, Cafri G, Paxton L, Graves S, Bordini B, Comfort T, Banerjee S, Marinac-Dabic D, Sedrakyan A. Distributed analysis of hip implants using five International registries: pioneering study of bearing surfaces. The annual AAOS meeting. 2014 March 11–15; New Orleans, USA.
4. Furnes O. The Norwegian Shoulder Register. The annual AAOS meeting. 2014 March 11–15; New Orleans, USA.
5. Havelin LI, Fenstad AM, Baste V, Furnes O, Engesæter LB. Nasjonal kompetansetjeneste for leddproteser og hoftebrudd. Poster presentert på Helse- og kvalitetsregisterkonferansen 2014; 2014 13.–14. mars; Radisson BLU Hotel Plaza, Oslo.
6. MacInnes SJ, Fenstad AM, Michael A, Buckle C, Furnes O, Hallan G, Havelin LI, Fevang B, Dale H, Høl PJ, Wilkinson JM. Using a National Joint Register Dataset and Postal Methodology to develop a large DNA archive for musculoskeletal disease. ORS 60th annual meeting; 2014 March 16; New Orleans, USA.

7. Dybvik E, Furnes O, Havelin LI, Fosså SD, Trovik C, Lie SA. Does total hip arthroplasty increase the cancer risk? A linkage study between an arthroplasty register and a cancer register. Poster presented at the 3rd Congress of International Society of Arthroplasty Registries (ISAR); 2014 May 31–June 2; Boston, USA.
8. Badawy M, Espehaug B, Indrekvam K, Havelin LI, Furnes O. Higher revision risk for unicompartmental knee arthroplasty in low-volume hospitals. Data from 5,791 cases in the Norwegian Arthroplasty Register. Presented at the 3rd Congress of International Society of Arthroplasty Registries (ISAR); 2014 May 31–June 2; Boston, USA.
9. Furnes O. The NARA experience. Presented at the 3rd Congress of International Society of Arthroplasty Registries (ISAR); 2014 May 31–June 2; Boston, USA.
10. Leta TH, Lygre SHL, Skredderstuen A, Hallan G, Furnes O. Failure of aseptic revision total knee arthroplasties in Norway (1994–2011). Poster presented at the 3rd Congress of International Society of Arthroplasty Registries (ISAR); 2014 May 31– June 2; Boston, USA.
11. Mäkelä KT, Matilainen M, Pulkkinen P, Fenstad AM, Havelin L, Engesæter LB, Furnes O, Pedersen AB, Overgaard S, Kärrholm J, Malchau H, Garellick G, Ranstam J, Eskelinen A. Failure rate of cemented and uncemented total hip replacements: register study of combined Nordic database of four nations. Poster presented at the 3rd Congress of International Society of Arthroplasty Registries (ISAR); 2014 May 31–June 2; Boston, USA.
12. Mäkelä K, Matilainen M, Pulkkinen P, Fenstad AM, Havelin LI, Engesæter L, Furnes O, Overgaard S, Pedersen AB, Kärrholm J, Malchau H, Garellick G, Ranstam J, Eskelinen A. Countrywise results of total hip replacement. An analysis of 438,733 hips based on the Nordic Arthroplasty register Association database. Presented at the 3rd Congress of International Society of Arthroplasty Registries (ISAR); 2014 May 31–June 2; Boston, USA.
13. Jonsson B. What is the outcome of acetabular revisions with bone impaction grafting in Norway. Presented at the 15th EFORT Congress; 2014 June 4–6; London, United Kingdom.
14. Varnum C. Risk for revision of metal-on-metal cementless stemmed total hip arthroplasty – data from the Nordic Arthroplasty Registry Association. Presented at the 15th EFORT Congress; 2014 June 4–6; London, United Kingdom.
15. Nystad TW, Fenstad AM, Furnes O, Havelin Li, Skredderstuen A, Fevang BT. Reduction in orthopaedic surgery in patients with rheumatoid arthritis. Poster presented at the EULAR Annual European Congress of Rheumatology; 2014 June 11–14; Paris, France.
16. Schrama JC. Increased risk of revision for infection in total hip prosthesis in patients with rheumatoid arthritis. 33rd Annual meeting European Bone and Joint Infection Society; 2014 Sept 13; Utrecht, The Netherlands.
17. Furnes O. Bruk av PROMSIl medisinske kvalitetsregistre. Regionalt seminar, pasientrapporterte data i forskning og klinisk praksis; 2014 18. september; HUS, Bergen.
18. Furnes O. Implant selection based on revision rates in registers – the way to do it? 11th Congress EHS; 2014 Oct 9–11; Stockholm, Sweden.
19. Furnes O. The Influence of learning curve on clinical outcome. Honorary lecture. Dansk Ortopædisk Selskab Kongress; 2014 23. oktober; København, Danmark.

20. Havelin LI. Praksisendringer i hofteprotesekirurgien i Norge. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
21. Furnes O. Protesefiksjon i relasjon til alder. Resultat fra NARA-studier. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
22. Furnes O, Hallan G. Resultater fra andre registre. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
23. Talsnes O. Patofysiologiske reaksjoner ved sementering. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
24. Dale H. Revisjonsrisiko og mortalitet i relasjon til fiksasjon og alder. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
25. Dale H. Organisering. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
26. Baste V, Wiik R, Walnum A, Havelin LI, Furnes O. Validering av leddproteseregisteret mot norsk pasientregister. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
27. Baste V, Havelin LI, Wiik R, Walnum A, Furnes O. Prosedyrekoder brukt i validering av Leddproteseregisteret. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
28. Petursson G, Gøthesen Ø, Fenstad AM, Dyrhovden GS, Haugan K, Havelin LI, Hallan G, Röhrli SM, Aamodt A, Nilsson KG, Furnes O. Computernavigasjon vs. konvensjonell teknikk ved kneprotesekirurgi. En prospektiv, randomisert, blindet RSA-studie. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
29. Badawy M, Fenstad AM, Espehaug B, Havelin LI, Furnes O. Totalprotese kne etter høy tibiaosteotomi – høyere risiko for revisjon? Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
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31. Skredderstuen A, Furnes O, Fevang BTS. Albueproteser i Norge, trender og resultater. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
32. Engesæter LB, Gjertsen JE, Dybvik E. Varighet av tromboseprofylakse ved primære totalproteser i hofteleddet. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
33. Børsheim S, Dale H, Hallan G, Furnes O, Havelin LI, Fenstad AM. Høgare risiko for revisjon av usementerte og omvendt hybride hofteproteser samanlikna med sementerte hofteproteser for kvinner eldre enn 75 år. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
34. Skredderstuen A, Furnes O, Fevang BTS. Elbow arthroplasty in Norway, trends and results, the Norway register. 5emes Rencontres de l'IMM; Palavas les flots; 2014 Oct 31; Montpellier, France.

35. Engesæter LB. Hvordan monitorere datakvalitet i praksis? Erfaringer fra Nasjonalt hoftebruddregister. Konferanse for Nasjonale Medisinske Kvalitetsregistre; 2015 15. januar; Oslo.
36. Havelin LI. Hva kan dekningsgradanalysene brukes til? Erfaringer fra Nasjonalt register for leddproteser. Konferanse for Nasjonale Medisinske Kvalitetsregistre; 2015 15. januar; Oslo.
37. Furnes O. The Norwegian Arthroplasty Register. Update. International Society of Arthroplasty Registries (ISAR) meeting during AAOS. 2015 March 26; Las Vegas, USA.
38. Furnes O. Highlights of the Scandinavian Registry Knees. ICJR, World arthroplasty congress; 2015 April 17; Paris, France.
39. Lie SA, Furnes O, Havelin LI. Co-occurring competing risk for 92 160 primary hip prostheses with 12 843 revisions and 52 380 deaths. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.
40. Furnes O, Baste V, Fenstad AM, Wiik R, Walnum A, Havelin LI. Validation of reporting of primary and revision hip and knee replacements to the Norwegian Arthroplasty Register and Norwegian Patient Register, 2008-2012. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.
41. Furnes O. Knee revisions in Norway. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23 -25; Gothenburg, Sweden.
42. Glassou EN, Hansen TB, Mäkelä K, Havelin LI, Furnes O, Badawy M, Kärrholm J, Garellick G, Pedersen AB. Association between hospital procedure volume and risk of revision after total hip arthroplasty: A population-based study within the Nordic Arthroplasty Register Association database. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.
43. Varnum C, Pedersen AB, Mäkelä K, Eskelinen A, Havelin LI, Furnes O, Kärrholm J, Garellick G, Overgaard S. Revision risk of cementless metal-on-metal total hip arthroplasty is influenced by component design. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.
44. Leta TH, Lygre SHL, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. Addition of patella component in painful non-resurfaced total knee arthroplasties; does it help? Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.
45. Badawy M, Fenstad AM, Indrekvam K, Havelin LI, Furnes O. The risk of revision in total knee arthroplasty is not affected by previous high tibial osteotomy: A 15 year followup of 32,476 total knee arthroplasties in the NAR. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.
46. MacInnes SJ, Fenstad AM, Panoutsopoulou K, Southam L, Hallan G, Dale H, Furnes O, Zeggini E, Wilkinson M. A genome-wide association study of osteolysis after hip replacement. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.

47. Tsukanaka M, Röhrli S, Engesæter IØ, Engesæter LB, Nordsletten L, Halvorsen V. Outcome of total hip replacement in young patients under 20 years of age. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.
48. Rasmussen JV, Brorson S, Hallan G, Dale H, Fenstad AM, Ääräma V, Mokka J, Jensen SL, Salomonsson B. Is it feasible to pool data from national shoulder registers with comparable healthcare structures? A new collaboration within the Nordic Arthroplasty Register Association (NARA). Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.

Norwegian Cruciate Ligament Register

1. Persson A, Fjeldsgaard K, Gjertsen JE, Kjellsen A, Engebretsen L, Hole R, Fevang JM. Increased risk of revision with hamstring graft compared to patellar graft after anterior cruciate ligament reconstruction: A study of 12 643 cases from the Norwegian cruciate ligament registry 2004–2012. 16th ESSKA Congress; 2014 May 14–17; Amsterdam.
2. Engebretsen L. Hva er det med bakre korsbånd? Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
3. Granan LP. Registerrapport. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
4. Engebretsen L. Hvem skal opereres? Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
5. Owesen C. Gir KOOS gevinst? Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
6. Årøen A. Single eller double bundle kirurgi? Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
7. Persson A, Kjellsen AB, Engebretsen L, Fjeldsgaard K, Fevang JM. Revisjonsrisiko for de vanligste fiksasjonskombinasjonene etter fremre korsbåndskonstruksjon rapportert til Nasjonalt Korsbåndregister 2004–2013. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
8. Sivertsen EA, Wagner LR, Lind M, Granan LP, Skråmm I, Årøen A. Infeksjon etter ACL rekonstruksjon. Data fra de norske og danske korsbåndregistre. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
9. Ulstein S, Bredland K, Årøen A, Engebretsen L, Røtterud JH. Ingen negativ effekt av fulltykkelse bruskskade hos fremre korsbånd rekonstruerte pasienter ved 5–9 års oppfølging. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
10. Grindem H, Granan LP, Risberg MA, Engebretsen L, Snyder-Mackler L, Eitzen I. Store forskjeller i knefunksjon 2 år etter korsbåndrekonstruksjon: Progresseiv rehabilitering versus standard behandling i Norge. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.

11. Fjeldsgaard K, Persson A, Kjellsen AB, Engebretsen L, Espehaug B, Fevang JM. Increased risk of revision for femoral fixation endobutton combined with tibial fixation biosureHA after ACL reconstruction – A prospective cohort study from the Norwegian Knee Ligament registry 2004–2013. 10th Biennial ISAKOS Congress • Lyon, France • June 7–11, 2015; Lyon, France.

Norwegian Hip Fracture Register

1. Vinje T, Gjertsen JE, Baste V, Engesæter LB. Surgical delay and mortality in patients with hip fractures. A nationwide cohort study with 7,292 propensity score exact matched pairs. Presented at the 15th EFORT Congress; 2014 June 4–6; London, United Kingdom.
2. Matre K. Extracapsular fractures:Plates or nails – who is the winner? Presented at the 15th EFORT Congress; 2014 June 4–6; London, United Kingdom.
3. Engesæter LB. Hoftebruddregisterets synspunkt. VOF; 2014 11.–12. september; Clarion Admiral, Bergen.
4. Engesæter LB. Thromboprophylaxis in patients with hip fractures. 52nd annual academic meeting. The Girdlestone Orthopaedic Society; 2014 sept 24-28; Corfu, Greece.
5. Gjertsen JE. Innledning og presentasjon. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
6. Fevang JM. Pro glideskrue. Presentert på Symposium på Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
7. Arnason O, Matre K, Engesæter, Fevang JM. Validering av registrerte hoftebrudd i Hoftebruddregisteret, Norsk Pasientregister og i ulike datakilder ved Haukeland universitetssjukehus. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
8. Arnason O, Matre K, Engesæter LB, Kjærner-Semb Ø, Fevang JM. Forenklet metode for å finne antall primæroperasjoner for hoftebrudd på Haukeland universitetssjukehus og Haraldsplass Diakonale Sykehus. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
9. Baste V, Wiik R, Walnum A, Gjertsen JE, Engesæter LB. Validering av rapporteringen til Nasjonalt Hoftebruddregister og Norsk Pasientregister. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
10. Formanek E, Gjertsen JE, Meling T. Intertrokantære femurfrakturer; insidens, behandling og reoperasjonsrate. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
11. Gjertsen JE, Baste V, Furnes O, Fevang JM, Engesæter LB. Pasientrapportert helseutfall etter hoftebrudd. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
12. Bartels S, Gjertsen JE, Frihagen F, Utvåg SE. Behandling og funksjonelle resultater hos pasienter under 55 år med disloerte lårhalsbrudd; en studie fra Nasjonalt Hoftebruddregister 2005-2012. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.

13. Kristensen TB, Vinje T, Havelin LI, Engesæter LB, Gjertsen JE. Sementerte hemiproteser ved lårhalsbrudd: bakre eller direkte lateral tilgang? Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.
14. Gjertsen JE. Decision algorithm for internal fixation or arthroplasty in femoral neck fractures – the Norwegian experience. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); Gothenburg, Sweden.

Norwegian Paediatric Hip Register

1. Reve AK, Lehmann TG, Engesæter LB, Wensaas A, Wiig O. Nasjonalt Barnehofteregister - status nå. Høstmøtet i Norsk Ortopedisk Forening; 2014 22.–24. oktober; Oslo.

Clinical trials

1. Jonsson BA, Kadar T, Hallan G, Havelin LI, Haugan K, Espehaug B, Stokke T, Indrekvam K, Furnes O. Oxidized zirconium femoral heads in total hip arthroplasty: A 5-year follow-up using radiostereometric analysis. The annual AAOS meeting. 2014 March 11–15; New Orleans, USA.
2. Strand LI, AL Olsen, Nygard H, Furnes O, Magnussen LH, Lygren H, Sundal MS, Skjærven LH. Patient education and basic body awareness therapy in hip osteoarthritis: a multiple case study of treatment responses. Poster presented at WCPT (World Congress Physiotherapy) Congress; 2015 May 1–4; Singapore.
3. Kutzner I. Early aseptic loosening of a mobile-bearing knee replacement - a retrieval analysis. Presented at the 15th EFORT Congress; 2014 June 4–6; London, United Kingdom.
4. Furnes O. Randomized study on highly crosslinked poly- and oxinium versus cobalt chrome using radiostereometric analysis (RSA). ICJR, World arthroplasty congress; 2015 April 18; Paris, France.

**Operation forms (in Norwegian only)
Data from these forms is the basis of this report.**



Nasjonalt Register for Leddproteser

Ortopedisk klinikk, Helse Bergen HF
Haukeland universitetssjukehus
Møllendalsbakken 11, 5021 BERGEN
Tlf 55973742/55973743

F.nr. (11 sifre).....

Navn:.....

(Skriv tydelig ev. pasient klistrelapp – spesifiser sykehus.)

Sykehus:.....

HOFTEPROTESER

ALLE TOTALPROTESER I HOFTELEDD REGISTRERES. Innsetting, skifting og fjerning av totalproteser i hofteledd, samt kantplastikk, bløtdelsrevisjon for infisert protese og hemiprotoser på annen indikasjon enn fraktur/fraktursekvele. Hemiprotese for fraktur/fraktursekvele registreres på Hoftebruddskjema.

TIDLIGERE OPERASJON I AKTUELLE HOFTE (ev. flere kryss)

- ⁰ Nei
- ¹ Osteosyntese for fraktur i prox. femurende
- ² Hemiprotese pga. fraktur
- ³ Osteotomi
- ⁴ Artrodese
- ⁵ Totalprotese(r)
- ⁶ Annen operasjon

OPERASJONSDATO (dd.mm.åå)

AKTUELLE OPERASJON (ett kryss)

- ¹ Primæroperasjon (også hvis hemiprotese tidligere)
- ² Reoperasjon (totalprotese tidligere)
- ³ Primær hemiprotese for annen indikasjon enn fraktur/fraktursekvele

AKTUELLE SIDE (ett kryss) (Bilateral opr. = 2 skjema)

- ¹ Høyre ² Venstre

ÅRSAK TIL AKTUELLE OPERASJON (KRYSS AV ENTEN I A ELLER B)

A Primæroperasjon pga. (evt. flere kryss)

- ¹ Idiopatisk coxartrose
 - ² Rheumatoid artritt
 - ³ Sekvele etter frakt. colli. fem.
 - ⁴ Sekv. dysplasi
 - ⁵ Sekv. dysplasi med total luksasjon
 - ⁶ Sekv. Perthes
 - ⁷ Sekv. Epifysiolyse
 - ⁸ Mb. Bechterew
 - ⁹ Akutt fraktura colli femoris
 - Annet
- (f.eks caputnekrose, tidl. artrodese o.l.)

B Årsak til reoperasjon (evt. flere kryss)

- ¹ Løs acetabularkomponent
 - ² Løs femurkomponent
 - ³ Luksasjon
 - ⁴ Dyp infeksjon
 - ⁵ Fraktur (i acetabulum)
 - ⁶ Fraktur (av femur)
 - ⁷ Smerter
 - ⁸ Osteolyse i acetab. uten løsning
 - ⁹ Osteolyse i femur uten løsning
 - Annet
- (f.eks Girdlestonesituasjon etter tidl. infisert protese)
- ¹⁰ Implantatfraktur femurdell
 - ¹¹ Implantatfraktur caput
 - ¹² Implantatfraktur kopp
 - ¹³ Implantatfraktur liner
 - ¹⁴ Implantatfraktur annet:

REOPERASJONSType (ev. flere kryss)

- ¹ Bytte av femurkomponent
- ² Bytte av acetabularkomponent
- ³ Bytte av hele protesen
- ⁴ Fjernet protese og satt inn sementspacer
- ⁵ Fjernet sementspacer og satt inn ny protese
- ⁶ Fjernet protese (Girdlestone eller fjerning av sementspacer)
Angi hvilke deler som ble fjernet
- ⁷ Bytte av plastforing
- ⁸ Bytte av caput
- ⁹ Bløtdelsdebridement for infisert protese
- Andre operasjoner

TILGANG (ett kryss)

- ¹ Fremre (Mellom sartorius og tensor)
- ² Anterolateral (Mellom glut. medius og tensor)
- ³ Direkte lateral (Transgluteal)
- ⁴ Bakre (Bak gluteus medius)
- ⁵ Annen

MINIINVASIV KIRURGI (MIS) ⁰ Nei ¹ Ja

LEIE ⁰ Sideleie ¹ Rygg

TROKANTEROSTEOTOMI ⁰ Nei ¹ Ja

BENTRANSPLANTASJON (ev. flere kryss)

Acetabulum ⁰ Nei ¹ Ja ² Benpakking
Femur ⁰ Nei ¹ Ja ² Benpakking a.m. Ling/Gie

BENTAP VED REVISJON (Paprosky's klassifikasjon se baksiden)

Acetabulum ¹ I ² IIA ³ IIB ⁴ IIC ⁵ IIIA ⁶ IIIB
Femur ¹ I ² II ³ IIIA ⁴ IIIB ⁵ IV

PROTESEKOMPONENTER

(Bruk klistrelapp på baksiden, eller spesifiser nøyaktig)

Acetabulum

Navn/Type

ev. katalognummer

Med hydroksylapatitt Uten hydroksylapatitt

¹ Sement med antibiotika – Navn

² Sement uten antibiotika – Navn

³ Usementert

Femur

Navn/Type

ev. katalognummer

Med hydroksylapatitt Uten hydroksylapatitt

¹ Sement med antibiotika – Navn

² Sement uten antibiotika – Navn

³ Usementert

⁴ Resurfacing

Caput

¹ Fastsittende caput

² Separat caput - Navn/Type

ev. katalognummer

Diameter

SYSTEMISK ANTIBIOTIKA

⁰ Nei ¹ Ja: ¹ Profylakse ² Behandling

Navn	Dosering	Varighet i timer (døgn)
Medikament 1timer (.....døgn)
Medikament 2timer (.....døgn)
Medikament 3timer (.....døgn)

TROMBOSEPROFYLAKSE

⁰ Nei ¹ Ja: Første dose ¹ Preoperativt ² Postoperativt

Medikament 1	Dosering opr.dag.....
.....	Dosering videre	Varighet døgn
Medikament 2	Dosering	Varighet døgn

Fast antikoagulasjon

⁰ Nei ¹ Ja, type

FIBRINOLYSEHEMMER

⁰ Nei ¹ Ja, medikament:

OPERASJONSSTUE

- ¹ "Green house"
- ² Operasjonsstue med laminær luftstrøm
- ³ Vanlig operasjonsstue

OPERASJONSTID (hud til hud)

PEROPERATIV KOMPLIKASJON

⁰ Nei ¹ Ja, hvilke(n)

ASA KLASSE (se baksiden for definisjon)

- ¹ Frisk
- ² Asymptomatisk tilstand som gir økt risiko
- ³ Symptomatisk sykdom
- ⁴ Livstruende sykdom
- ⁵ Moribund

Lege

Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

RETTLEDNING TIL HOFTEPROTESER

Registreringen gjelder innsetting, skifting og fjerning av totalproteser i hofteledd, samt kantplastikk, bløtdelsrevisjon for infisert protese og hemiprotoser på annen indikasjon enn fraktur/fraktursekvele. Hemiprotese for fraktur/ fraktursekvele registreres på Hoftebruddskjema. Ett skjema fylles ut for hver operasjon. Fødselsnummer (11sifre) og sykehusnavn må påføres. Aktuelle ruter markeres med kryss. På eget Samtykkeskjema skal pasienten gi samtykke til rapportering til Leddregisteret. Samtykkeskjema skal lagres i pasientjournal.

AKTUELLE OPERASJON

Primæroparasjoner: Dette er første totalproteseoperasjon.

Reoperasjon (totalprotese tidligere): Fjerning av protesedeler (f.eks. Girdlestone) må registreres. Kantplastikk (f. eks. PLAD) og bløtdelsrevisjoner for infeksjon registreres selv om protesedeler ikke skiftes.

Primær hemiprotese for annen indikasjon enn fraktur/fraktursekvele: Hemiprotese for fraktur/fraktursekvele registreres på Hoftebruddskjema.

ÅRSÅK TIL AKTUELLE OPERASJON

Kryss av under A ved primæroparasjoner og under B ved reoperasjoner. I B må du krysse av for alle årsakene til reoperasjon, eller forklare med fritekst.

REOPERASJONSTYPE

Fjerning av protesedeler (f.eks. Girdlestone) må registreres. Kantplastikk (f. eks. PLAD) og bløtdelsrevisjoner for infeksjon registreres selv om protesedeler ikke skiftes.

TILGANG

Det vises til artikkel: Reigstad A, Blom Hagen T. Snittføring ved totalplastikk i hofteleddet. Tidsskr Nor Lægeforen. 1985 Mar 30;105(9-10):677-9.

BENTRANSPLANTASJON Benpropp som sementstopper regnes ikke som bentransplantat.

PROTESEKOMPONENTER: Acetabulum - Femur - Caput - Trokanterdel og hals hvis disse er separate deler

Bruk helst klistrelappene som følger med protesen. Lim disse på baksiden av skjema. Alternativt, skriv inn protesenavn + katalognummer eller protesenavn + størrelse, materiale, overflatebelegg og design. Sementnavn må anføres.

KOMPLIKASJONER Også operasjoner hvor pasienter dør på operasjonsbordet eller rett etter operasjon skal meldes. Ved stor stor blødning, angi mengde.

ASA-KLASSE (ASA=American Society of Anesthesiologists)

ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.

ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks hypertensjon)

eller med kost (f.eks diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.

ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt

(f.eks moderat angina pectoris og mild astma).

ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks hjertesvikt og astma).

ASA-klasse 5: Moribund/døende pasient

MINIINVASIV KIRURGI (MIS = Minimally Invasive Surgery)

Med MIS menes her at kirurgen har brukt kort snitt og at det er brukt spesialinstrument laget for MIS

SYSTEMISK ANTIBIOTIKA

Her føres det på hvilket antibiotikum som er blitt benyttet i forbindelse med operasjonen, f.eks.: Medkament 1: Keflin 2g x 4, med varighet 12 timer.

TROMBOSEPROFYLAKSE

Medikament, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere. Det skal også oppgis om pasienten står fast på antikoagulantia (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER

Her føres det på om en benytter blødningsreducerende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

BEINTAP VED REVISJON

Femur (Paprosky's klassifikasjon)

Type I: Minimalt tap av metafysært ben og intakt diafyse.

Type II: Stort tap av metafysært ben, men intakt diafyse.

Type IIIA: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Over 4 cm intakt corticalis i isthmusområdet.

Type IIIB: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Under 4 cm intakt corticalis i isthmusområdet.

Type IV: Betydelig tap av metafysært ben uten mulighet for proximal mekanisk støtte. Bred isthmus med liten mulighet for cortical støtte.

Acetabulum (Paprosky's klassifikasjon)

Type I: Hemisfærisk acetabulum uten kantdefekter. Intakt bakre og fremre kolonne. Defekter i forankringshull som ikke ødelegger subchondral benplate.

Type IIA: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kolonne, men med lite metafysært ben igjen.

Type IIB: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kolonne, men med lite metafysært ben igjen og noe manglende støtte superior.

Type IIC: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kolonne, men med defekt i medial vegg.

Type IIIA: Betydelig komponentvandring, osteolyse og bentap. Bentap fra kl. 10 til 2.

Type IIIB: Betydelig komponentvandring, osteolyse og bentap. Bentap fra kl. 9 til 5.

Kopi beholdes til pasientjournalen, originalen sendes Haukeland universitetssjukehus.

Kontaktpersoner vedrørende registreringskjema er

Overlege Leif Ivar Havelin, tlf.: 55 97 56 87 og klinikkoverlege Ove Furnes, tlf.: 55 97 56 80

Ortopedisk klinikk, Haukeland universitetssjukehus. Besøksadresse: Møllendalsbakken 11.

Sekretærer i Nasjonalt Register for Leddproteser, Ortopedisk klinikk, Helse Bergen:

Ingunn Vindenes, tlf.: 55 97 37 43 og Ruth Wasmuth, tlf.: 55 97 37 42

Epost nrl@helse-bergen.no

Internet: <http://www.haukeland.no/nrl/>



Nasjonalt Register for Leddproteser
 Ortopedisk klinikk, Helse Bergen HF
 Haukeland universitetssjukehus
 Møllendalsbakken 11, 5021 BERGEN
 Tlf 55973742/55973743

F.nr. (11 sifre).....

Navn:.....

(Skriv tydelig ev. pasient klistrelapp – spesifiser sykehus.)

Sykehus:.....

KNEPROTESER og andre leddproteser

Innsetting, skifting eller fjerning av protese eller protesedeler, samt bløtdelsrevisjoner for infisert protese.

LOKALISASJON, AKTUELL OPERASJON

- ¹ Kne ⁶ Håndledd
² Ankel ⁷ Fingre (angi ledd)
³ Tær (angi ledd) ⁸ Annet
⁴ Skulder ⁹ Rygg (angi nivå).....
⁵ Albue

AKTUELLE SIDE (ett kryss) (Bilateral opr. = 2 skjema)

- ¹ Høyre ² Venstre

TIDLIGERE OPERASJON I AKTUELLE LEDD (ev. flere kryss)

- ⁰ Nei
¹ Osteosyntese for intraartikulær/leddnær fraktur
² Osteotomi
³ Artrodese
⁴ Protese
⁵ Synovectomi
⁶ Annet (f.eks menisk og leddbåndsp.).....

OPERASJONSDATO (dd.mm.åå) | | | | | | | | | |

AKTUELLE OPERASJON (ett kryss)

- ¹ Primæroperasjon ² Reoperasjon (protese tidligere)

ÅRSÅK TIL AKTUELLE OPERASJON (KRYSS AV ENTEN I A ELLER B)

A . Primæroper. pga (ev. flere kryss)

- ¹ Idiopatisk artrose ¹ Løs prox.protesedel
² Rheumatoid artritt ² Løs distal protesedel
³ Fraktursequele ³ Løs patellaprotese
⁴ Mb. Bechterew ⁴ Luksasjon av patella
⁵ Sequele ligamentskade ⁵ Luksasjon (ikke patella)
⁶ Sequele meniskskade ⁶ Instabilitet
⁷ Akutt fraktur ⁷ Aksefeil
⁸ Infeksjonssequele ⁸ Dyp infeksjon
⁹ Spondylose ⁹ Fraktur av bein (nær protesen)
¹⁰ Sequele prolaps kirurgi ¹⁰ Smerter
¹¹ Degenerativ skivesykdom ¹¹ Slitt eller defekt plastforing
¹² Annet
 Hvilken.....

B . Reoper. pga (ev. flere kryss)

- ¹² Progresjon av artrose
¹³ Annet (f.eks tidl fjernet protese)

REOPERASJONSTYPE (ev. flere kryss)

- ¹ Bytte el. innsetting av distal komponent ⁹ Fjernet protesedeler (inkl. sementspacer)
² Bytte el. innsetting av proximal protesedel
³ Bytte el. innsetting av hele protesen
⁴ Insetting av patellakomp.
⁵ Bytte av patellaprotese ¹⁰ Bløtdelsdebridement for infisert protese
⁶ Bytte av plastforing ¹¹ Annet
⁷ Artrodese
⁸ Amputasjon

BENTRANSPLANTASJON (evt. flere kryss)

- Proximalt ⁰ Nei ¹ Ja ² Benpakking
 Distalt ⁰ Nei ¹ Ja ² Benpakking

SYSTEMISK ANTIBIOTIKA

- ⁰ Nei ¹ Ja: ¹ Profylakse ² Behandling
 Navn Dosering Varighet i timer (døgn)

Medikament 1..... timer (...døgn)

Medikament 2..... timer (...døgn)

Medikament 3..... timer (...døgn)

TROMBOSEPROFYLAKSE

- ⁰ Nei ¹ Ja: Første dose ¹ Preoperativt ² Postoperativt

Medikament 1 Dosering opr.dag
 Dosering videre Varighet døgn

Medikament 2 Dosering Varighet døgn

FAST ANTIKOAGULASJON

- ⁰ Nei ¹ Ja, type:

FIBRINOLYSEHEMMER

- ⁰ Nei ¹ Ja, medikament : Dosering

DREN ⁰ Nei ¹ Ja. Antatt varighet døgn

OPERASJONSTID (hud til hud) minutter

PEROPERATIV KOMPLIKASJON

- ⁰ Nei ¹ Ja, hvilke(n):

MINIINVASIV KIRURGI (MIS) ⁰ Nei ¹ Ja

COMPUTERNAVIGERING (CAOS) ⁰ Nei ¹ Ja Type:.....

PASIENTTILPASSEDE INSTRUMENTER ⁰ Nei ¹ Ja Type:.....

ASA KLASSE (se baksiden for definisjon)

- ¹ Frisk
² Asymptomatisk tilstand som gir økt risiko
³ Symptomatisk sykdom
⁴ Livstruende sykdom
⁵ Moribund

PROTESE KNE (Bruk klistrelapper på baksiden, eller spesifiser nøyaktig)

PROTESETYPE

- ¹ Totalprot. m/patella ⁴ Patellofemoralledd prot.
² Totalprot. u/patella ⁵ Bi-compartmental ⁶ Hengslet protese
³ Unicondylær prot. Medial Lateral

FEMUR KOMPONENT

Navn/Type/Str
 ev. katalognummer
 Sentral stamme ⁰ Nei ¹ Ja, ev. lengdemm
 Metallforing ⁰ Nei ¹ Ja
 Stabilisering ⁰ Nei ¹ Ja, bakre ² Ja, annen

- ¹ Sement med antibiotika – Navn
² Sement uten antibiotika – Navn
³ Usementert

TIBIAKOMPONENT (metallplata)

Navn/Type/Str
 ev. katalognummer
 Stabiliseringsplugg ⁰ Nei ¹ Ja, plast ² Ja, metall ³ Ja, 1 + 2
 Forlenget sentral stamme ⁰ Nei ¹ Ja, ev. lengdemm
 Metallforing ⁰ Nei ¹ Ja

- ¹ Sement med antibiotika – Navn
² Sement uten antibiotika – Navn
³ Usementert

TIBIA KOMPONENT (plastkomponent)

Navn/Type/Str
 ev. katalognummer
 Tykkelse mm
 Stabilisering ⁰ Nei ¹ Ja, bakre ² Ja, annen

PATELLA KOMPONENT

Navn/Type/Str
 ev. katalognummer
 Metallrygg ⁰ Nei ¹ Ja
¹ Sement med antibiotika – Navn
² Sement uten antibiotika – Navn
³ Usementert

KORSBÅND

- Intakt fremre korsbånd før operasjon ⁰ Nei ¹ Ja
 Intakt fremre korsbånd etter operasjon ⁰ Nei ¹ Ja
 Intakt bakre korsbånd før operasjon ⁰ Nei ¹ Ja
 Intakt bakre korsbånd etter operasjon ⁰ Nei ¹ Ja

PROTESE ANDRE LEDD (Bruk klistrelapper på baksiden, eller spesifiser nøyaktig)

PROTESETYPE

- ¹ Totalprotese ² Hemiprotese ³ Enkomponentprotese

PROKSIMAL KOMPONENT

Navn/Type/Str
 ev. katalognummer
¹ Sement med antibiotika – Navn
² Sement uten antibiotika – Navn
³ Usementert

DISTAL KOMPONENT

Navn/Type/Str
 ev. katalognummer
¹ Sement med antibiotika – Navn
² Sement uten antibiotika – Navn
³ Usementert

INTERMEDIÆR KOMPONENT (f.eks. caput humeri)

Navn/Type/Str/Diameter.....
 ev. katalognummer

Lege
 Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

RETTLEDNING KNEPROTESER og andre leddproteser

Registreringen gjelder innsetting, skifting eller fjerning av protese i kne, skuldre og andre ledd med unntak av hofter som har eget skjema. Ett skjema fylles ut for hver operasjon. Pasientens fødselsnummer (11 sifre) og sykehus må være påført. Aktuelle ruter markeres med kryss.

Pasienten skal på eget skjema gi samtykke til registrering, samtykkeskjemaet skal lagres i pasientjournalen.

Kommentarer til de enkelte punktene

AKTUELLE OPERASJON

Primæroperasjon: Dette er første totalproteseoperasjon.

Kryss av enten i A eller i B. Kryss av for alle årsakene til operasjonen. Bløtdelsrevisjon for infeksjon skal registreres selv om protesedeler ikke skiftes.

REOPERASJONSTYPER

Fjerning av protesedeler må spesifiseres og føres opp, også fjerning ved infeksjon.

BENTRANSPANTASJON

Påsmøring av benvev rundt protesen regnes ikke som bentransplantat.

SYSTEMISK ANTIBIOTIKA

Medikament, dose og varighet av profylaksen skal angis f.eks. slik: Medikament: Keflin, Dosering: 2g x 4, Varighet: 12 timer, altså 4 doser i løpet av 12 timer.

TROMBOSEPROFYLAKSE

Medikament, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere. Det skal også oppgis om pasienten står fast på antikoagulantia (AlbyE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER

Her føres det på om en benytter blødningsreducerende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

PEROPERATIV KOMPLIKASJON

Dersom det foreligger komplikasjon i form av stor blødning, må mengden angis.

Dersom pasienten dør under eller like etter operasjonen, ønsker vi likevel melding om operasjonen.

ASA-KLASSE (ASA=American Society of Anesthesiologists)

ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.

ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks hypertensjon) eller med kost (f.eks diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.

ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt (f.eks moderat angina pectoris og mild astma).

ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks hjertesvikt og astma).

ASA-klasse 5: Moribund/døende pasient

PROTESETYPE

Dersom det er gjort revisjon av totalprotese uten patellakomponent og REOPERASJONSTYPER er **innsetting av patellakomponent**, skal det krysses av for pkt. 1: Totalprotese med patellakomponent (dvs. protesen har nå blitt en totalprotese med patellakomponent). Ved revisjon av unicondylær protese til totalprotese brukes enten pkt. 1 eller 2.

PROTESEKOMPONENTER

Her anføres kommersielle navn, materiale, størrelse og design. Alternativt kan en føre opp protesenavn og katalognummer eller benytte klistrelapp som følger med de fleste protesene. **Denne kan limes på baksiden av skjemaet (vennligst ikke plasser klistrelapper på markeringskryss, som brukes ved scanning av skjema).**

Navnet på sementen som evt. brukes må anføres, f.eks. Palacos R+G. (Bruk helst klistrelapp)

Under femurkomponent skal evt. påsatt **femurstamme** anføres med lengde.

Med **metallforing** under femur og tibia komponent menes bruk av en eller flere separate metallkiler (wedges) som erstatning for manglende benstøtte. Stabilisering er bruk av proteser med stabilisering som kompensasjon for sviktende båndapparat.

Forlenget sentral stamme under tibia komponent (metallplata) skal bare anføres ved bruk av en lengre påsatt stamme enn standardkomponenten.

ANDRE LEDD. PROTESETYPE

Ved bruk av hemiprotese med bare en komponent, f.eks. resurfacing i skulder, skrives dette på DISTAL KOMPONENT. Enkomponent-protese i finger/tå, skrives på PROKSIMAL KOMPONENT.

COMPUTERNAVIGERING (CAOS = Computer Aided Orthopaedic Surgery)

Angi firmanavn på computersystem.

MINIINVASIV KIRURGI (MIS = Minimally Invasive Surgery)

Her menes at kirurgen har brukt kort snitt og at det er brukt spesialinstrument laget for MIS.

PASIENTTILPASSEDE INSTRUMENTER

Her menes kutteblokker eller instrumenter som lages etter MR eller CT bilder tatt av pasienten før operasjonen. Oppgi navn på systemet.

Kopi beholdes til pasientjournalen, originalen sendes Haukeland universitetssjukehus.

Kontaktpersoner vedrørende registreringsskjema er

Klinikkoverlege Ove Furnes, tlf. 55 97 56 80 og overlege Leif Ivar Havelin, tlf.: 55 97 56 87.

Ortopedisk klinikk, Haukeland universitetssjukehus. Besøksadresse: Møllendalsbakken 11.

Sekretærer i Nasjonalt Register for Leddproteser, Ortopedisk klinikk, Helse Bergen:

Ruth Wasmuth, tlf.: 55 97 37 42 og Ingunn Vindenes, tlf.: 55 97 37 43.

Epost: nrl@helse-bergen.no

Internet: <http://www.haukeland.no/nrl/>

**NASJONALT HOFTEBRUDDREGISTER**

Nasjonalt Register for Leddproteser
 Helse Bergen HF, Ortopedisk klinikk
 Haukeland universitetssjukehus
 Møllendalsbakken 11
 5021 BERGEN
 Tlf: 55976452

F.nr. (11 sifre).....

Navn:.....

(Skriv tydelig ev. pasientklirelapp – spesifiser sykehus.)

Sykehus:.....

HOFTEBRUDD

PRIMÆRE OPERASJONER PÅ BRUDD I PROKSIMALE FEMURENDE og ALLE REOPERASJONER, inkludert lukket reponering av hemiprotoser. Ved primæroperasjon med totalprotese og ved reoperasjon til totalprotese brukes kun hofteproteseskjema. Alle produktklirelapper settes i merket felt på baksiden av skjemaet.

AKTUELLE OPERASJON¹ Primæroperasjon ² Reoperasjon**SIDE (ett kryss)** (Bilateral opr.= 2 skjema)¹ Høyre ² Venstre**OPR TIDSPUNKT** (dd.mm.åå) | | | | | | | | | | kl | | |**BRUDD TIDSPUNKT** (dd.mm.åå) | | | | | | | | | | kl | | |

Dersom det er usikkerhet om bruddtidspunkt, fyll ut neste punkt.

TID FRA BRUDD TIL OPERASJON I TIMER¹ 0-6 ² >6-12 ³ >12-24 ⁴ >24-48 ⁵ >48**DEMENS**⁰ Nei ¹ Ja (Se test på baksiden) ² Usikker**ASA-KLASSE** (se bakside av skjema for definisjon)

- ¹ Frisk
- ² Asymptomatisk tilstand som gir økt risiko
- ³ Symptomatisk sykdom
- ⁴ Livstruende sykdom
- ⁵ Moribund

TYPE PRIMÆRBRUDD (ÅRSÅK TIL PRIMÆROPERASJON) (Kun ett kryss)

Se baksiden for klassifikasjon

- ¹ Lårhalsbrudd udislokert (Garden 1 og 2)
- ² Lårhalsbrudd dislokert (Garden 3 og 4)
- ³ Lateralt lårhalsbrudd
- ⁴ Pertrokantært tofragment (AO klassifikasjon A1)
- ⁵ Pertrokantært flerfragment (AO klassifikasjon A2)
- ⁶ Intertrokantært (AO klassifikasjon A3)
- ⁷ Subtrokantært
- ⁸ Annet, spesifiser.....

TYPE PRIMÆROPERASJON (Kun ett kryss)

(Fyll ut bare ved primæroperasjon - eget skjema for totalproteser)

(Fest produktklirelapp på baksiden eller spesifiser nøyaktig produkt)

- ¹ To skruer eller pinner
- ² Tre skruer eller pinner
- ³ Bipolar hemiprotese
- ⁴ Unipolar hemiprotese
- ⁵ Glideskrue og plate
- ⁶ Glideskrue og plate med trokantær støtteplate
- ⁷ Vinkelplate
- ⁸ Kort margnagle uten distal sperre
- ⁹ Kort margnagle med distal sperre
- ¹⁰ Lang margnagle uten distal sperre
- ¹¹ Lang margnagle med distal sperre
- ¹² Annet, spesifiser.....

Navn / størrelse og katalognummer.....

ÅRSÅK TIL REOPERASJON (Flere enn ett kryss kan brukes)

- ¹ Osteosyntesesvikt/havari
- ² Ikke tilhelet brudd (non-union/pseudartrose)
- ³ Caputnekrose (segmentalt kollaps)
- ⁴ Lokal smerte pga prominierende osteosyntesemateriale
- ⁵ Brudd tilhelet med feilstilling
- ⁶ Sårinfeksjon – overfladisk
- ⁷ Sårinfeksjon – dyp
- ⁸ Hematom
- ⁹ Luksasjon av hemiprotese
- ¹⁰ Osteosyntesematerialet skåret gjennom caput
- ¹¹ Nytt brudd rundt implantat
- ¹² Løsning av hemiprotese
- ¹³ Annet, spesifiser.....

TYPE REOPERASJON (Flere enn ett kryss kan brukes)

(Fest produktklirelapp på baksiden eller spesifiser nøyaktig produkt)

- ¹ Fjerning av implantat (Brukes når dette er eneste prosedyre)
- ² Girdlestone (= fjerning av implantat og caput)
- ³ Bipolar hemiprotese
- ⁴ Unipolar hemiprotese
- ⁵ Re-osteosyntese
- ⁶ Debridement for infeksjon
- ⁷ Lukket reposisjon av luksert hemiprotese
- ⁸ Åpen reposisjon av luksert hemiprotese
- ⁹ Annet, spesifiser.....

Navn / størrelse og katalognummer.....

FIKSASJON AV HEMIPROTESE

(For totalprotese sendes eget skjema til hofteproteseregisteret)

- ¹ Usementert ¹ med HA ² uten HA
- ² Sement med antibiotika Navn.....
- ³ Sement uten antibiotika Navn.....

PATOLOGISK BRUDD (Annen patologi enn osteoporose)⁰ Nei ¹ Ja, type.....**TILGANG TIL HOFTELEDDET VED HEMIPROTESE** (Kun ett kryss)

- ¹ Fremre (mellom sartorius og tensor)
- ² Anterolateral (mellom gluteus medius og tensor)
- ³ Direkte lateral (transgluteal)
- ⁴ Bakre (bak gluteus medius)
- ⁵ Annet, spesifiser.....

ANESTESITYPE¹ Narkose ² Spinal ³ Annet, spesifiser.....**PEROPERATIVE KOMPLIKASJONER**⁰ Nei ¹ Ja, hvilke(n).....**OPERASJONSTID** (hud til hud).....minutter.**SYSTEMISK ANTIBIOTIKA**⁰ Nei ¹ Ja: ¹ Profylakse ² Behandling

Navn	Dosering	Varighet i timer (døgn)
Medikament 1.....timer (.....døgn)
Medikament 2.....timer (.....døgn)
Medikament 3.....timer (.....døgn)

TROMBOSEPROFYLAKSE⁰ Nei ¹ Ja: Første dose ¹ Preoperativt ² Postoperativt

Medikament 1.....	Dosering opr.dag.....
	Dosering videre.....	Varighet..... døgn
Medikament 2.....	Dosering.....	Varighet..... døgn

FAST ANTIKOAGULASJON⁰ Nei ¹ Ja, type:.....**FIBRINOLYSEHEMMER**⁰ Nei ¹ Ja, medikament :..... Dosering.....**OPERATØRERFARING**Har en av operatørene mer enn 3 års erfaring i bruddbehandling? ⁰ Nei ¹ Ja

Lege.....
 Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

RETTLEDNING

Registreringen gjelder alle operasjoner for hoftebrudd (lårhals, pertrokantære og subtrokantære) og alle reoperasjoner, også reoperasjoner, på pasienter som er primæroperert og reoperert for hoftebrudd. **Ved primæroperasjon med totalprotese og ved reoperasjon til totalprotese sendes bare skjema til hofteproteseregisteret.**

Ett skjema fylles ut for hver operasjon. Originalen sendes Haukeland universitetssjukehus og kopien lagres i pasientens journal. Pasientens fødselsnummer (11 sifre) og sykehuset må være påført. Aktuelle ruter markeres med kryss. Pasienten skal på eget skjema gi samtykke til registrering i Nasjonalt hoftebruddregister og samtykkeerklæringen lagres i pasientens journal på sykehuset.

Kommentarer til enkelte punkt:

OPERASJONS- OG BRUDDTIDSPUNKT

Operasjonstidspunkt (dato og klokkeslett) må føres opp på alle primæroperasjoner. Det er også sterkt ønskelig at dato og klokkeslett for *bruddtidspunkt* føres opp. Dette bl.a. for å se om tid til operasjon har effekt på prognose. (Hvis en ikke kjenner klokkeslettet for bruddtidspunkt lar en feltet stå åpent. En må da prøve å angi omtrentlig tidsrom fra brudd til operasjon på neste punkt).

Ved reoperasjon er ikke klokkeslett nødvendig.

DEMENS

Demens kan eventuelt testes ved å be pasienten tegne klokken når den er 10 over 11. En dement pasient vil ha problemer med denne oppgaven.

ASA-KLASSE (ASA=American Society of Anesthesiologists)

ASA-klasse 1: Friske pasienter som røyker mindre enn 5 sigaretter daglig.

ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks hypertensjon) eller med kost (f.eks diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.

ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under kontroll medikamentelt (f.eks moderat angina pectoris og mild astma).

ASA-klasse 4: Pasienter med en tilstand som ikke er under kontroll (f.eks hjertesvikt og astma).

ASA-klasse 5: Moribund/døende pasient

GARDENS KLASSIFISERING AV LÅRHALSBRUDD

Garden 1: Ikke komplett brudd av lårhalsen (såkalt innkilt)

Garden 2: Komplet lårhalsbrudd uten dislokasjon

Garden 3: Komplet lårhalsbrudd med delvis dislokasjon. Fragmentene er fortsatt i kontakt, men det er feilstilling av lårhalsens trabekler. Caputfragmentet ligger uanatomisk i acetabulum.

Garden 4: Komplet lårhalsbrudd med full dislokasjon. Caputfragmentet er fritt og ligger korrekt i acetabulum slik at trabeklene er normalt orientert.

AO KLASSEKASJON AV TROKANTÆRE BRUDD



A1: Pertrokantært tofragment brudd



A2: Pertrokantært flerfragment brudd



A3: Intertrokantært brudd



Subtrokantært brudd*

*Subtrokantært brudd: Bruddsentrum er mellom nedre kant av trokanter minor og 5 cm distalt for denne.

REOPERASJONSÅRSÅK

Dyp infeksjon defineres som infeksjon som involverer fascie, protese, ledd eller periprotetisk vev.

IMPLANTAT

Implantattype må angis entydig. Produktklistrelapp er ønskelig for å angi katalognummer for osteosyntesematerialet eller protesen som er brukt.

PEROPERATIVE KOMPLIKASJONER

Vi ønsker også å få meldt dødsfall på operasjonsbordet og peroperativ transfusjonstrengende blødning.

SYSTEMISK ANTIBIOTIKA

Her føres det på hvilket antibiotikum som er blitt benyttet i forbindelse med operasjonen. Det anføres dose, antall doser og profylaksens varighet. F.eks. Medkament 1: Keflin 2g x 4, med varighet 12 timer.

TROMBOSEPROFYLAKSE

Medikament, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere. Det skal også oppgis om pasienten står fast på antikoagulantia (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER

Her føres det på om en benytter blødningsreducerende legemidler i forbindelse med operasjonen (f.eks. Cyklokapron).

Kontaktpersoner vedrørende registreringsskjema er:

Overlege Jan-Erik Gjertsen, Ortopedisk klinikk, Haukeland universitetssjukehus. Tlf. 55 97 56 72 (email: jan-erik.gjertsen@helse-bergen.no)

Professor Lasse Engesæter, Ortopedisk klinikk, Haukeland universitetssjukehus. Tlf. 55 97 56 84

Prosjektkoordinator Nasjonalt Hoftebruddregister: Lise B. Kvamsdal. Tlf. 55 97 64 52 (email: nrl@helse-bergen.no)

Internett: <http://www.haukeland.no/nrl/>

PRODUKTKLISTRELAPPER:

NASJONALT KORSBÅNDSREGISTER

Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland universitetssjukehus
Møllendalsbakken 11, 5021 BERGEN
Tlf: 55976450



F.nr. (11 sifre).....

Navn.....

Sykehus.....

(Skriv tydelig evt. pasientklirelapp – spesifiser sykehus.)

KORSBÅND

KORSBÅNDSOPERASJONER OG ALLE REOPERASJONER på pasienter som tidligere er korsbåndoperert.

Alle klirelapper (med unntak av pasientklirelapp) settes i merket felt på baksiden av skjemaet.

(Bilateral operasjon = 2 skjema)

AKTUELLE SIDE (ett kryss) 0 Høyre 1 Venstre

MOTSATT KNE 0 Normalt 1 Tidligere ACL/PCL-skade

TIDLIGERE OPERASJON I SAMME KNE

0 Nei 1 Ja

SKAEDATO FOR AKTUELL SKADE (mm.åå) |__| |__| |__|

AKTIVITET SOM FØRTE TIL AKTUELLE SKADE

- | | |
|--|---|
| <input type="checkbox"/> 0 Fotball | <input type="checkbox"/> 7 Annen lagidrett |
| <input type="checkbox"/> 1 Håndball | <input type="checkbox"/> 8 Motor- og bilsport |
| <input type="checkbox"/> 2 Snowboard | <input type="checkbox"/> 9 Annen fysisk aktivitet |
| <input type="checkbox"/> 3 Alpint (inkl. twin tip) | <input type="checkbox"/> 10 Arbeid |
| <input type="checkbox"/> 4 Annen skiaktivitet | <input type="checkbox"/> 11 Trafikk |
| <input type="checkbox"/> 5 Kampsport | <input type="checkbox"/> 12 Fall/hopp/vold/lek |
| <input type="checkbox"/> 6 Basketball | |
| <input type="checkbox"/> 98 Annet..... | |

AKTUELLE SKADE (Registrer alle skader – også de som ikke opereres)

- | | | | |
|-------------------------------------|------------------------------|--------------------------------|--------------------------------------|
| <input type="checkbox"/> ACL | <input type="checkbox"/> MCL | <input type="checkbox"/> PLC | <input type="checkbox"/> Med. menisk |
| <input type="checkbox"/> PCL | <input type="checkbox"/> LCL | <input type="checkbox"/> Brusk | <input type="checkbox"/> Lat. menisk |
| <input type="checkbox"/> Annet..... | | | |

YTTERLIGERE SKADER (evt. flere kryss) Nei, hvis ja spesifiser under

- | | |
|--|--|
| <input type="checkbox"/> Karskade | Hvilken: |
| <input type="checkbox"/> Nerveskade | <input type="checkbox"/> 0 N. tibialis <input type="checkbox"/> 1 N. peroneus |
| <input type="checkbox"/> Fraktur | <input type="checkbox"/> 0 Femur <input type="checkbox"/> 1 Tibia <input type="checkbox"/> 2 Fibula
<input type="checkbox"/> 3 Patella <input type="checkbox"/> 4 Usikker |
| <input type="checkbox"/> Ruptur i ekstensorapparatet | <input type="checkbox"/> 0 Quadricepsenen
<input type="checkbox"/> 1 Patellarsenen |

OPERASJONSDATO (dd.mm.åå) |__| |__| |__|

AKTUELLE OPERASJON (ett kryss)

- 0 Primær rekonstruksjon av korsbånd
 1 Revisjonskirurgi, 1. seanse
 2 Revisjonskirurgi, 2. seanse
 3 Annen knekirurgi (Ved kryss her skal andre prosedyrer fylles ut)

ÅRSAK TIL REVISJONSREKONSTRUKSJON (evt. flere kryss)

- | | |
|---|--------------------------------------|
| <input type="checkbox"/> Infeksjon | <input type="checkbox"/> Graftsvikt |
| <input type="checkbox"/> Fiksasjonssvikt | <input type="checkbox"/> Nytt traume |
| <input type="checkbox"/> Ubehandlede andre ligamentskader | <input type="checkbox"/> Smerte |
| <input type="checkbox"/> Annet | |

ANDRE PROSEDYRER (evt. flere kryss) Nei, hvis ja spesifiser under

- | | |
|--|---|
| <input type="checkbox"/> Meniskoperasjon | <input type="checkbox"/> Osteosyntese |
| <input type="checkbox"/> Synovektomi | <input type="checkbox"/> Bruskoperasjon |
| <input type="checkbox"/> Mobilisering i narkose | <input type="checkbox"/> Artroskopisk debridement |
| <input type="checkbox"/> Fjerning av implantat | <input type="checkbox"/> Operasjon pga infeksjon |
| <input type="checkbox"/> Benreseksjon (Notch plastikk) | <input type="checkbox"/> Bentransplantasjon |
| <input type="checkbox"/> Osteotomi | <input type="checkbox"/> Artrodese |
| <input type="checkbox"/> Annet | |

GRAFTVALG

	ACL	PCL	MCL	LCL	PLC
<input type="checkbox"/> BPTB					
<input type="checkbox"/> Hamstring					
<input type="checkbox"/> Allograft					
<input type="checkbox"/> Direkte sutur					
<input type="checkbox"/> Annet					

GRAFTDIAMETER (oppgi største diameter på graftet) .. mm

Ved bruk av double bundle-teknikk: AM:.....mm PL:.....mm

TILGANG FOR FEMURKANAL

- 1 Anteromedial 2 Transtibial 3 Annet

FIKSASJON

Sett klirelapp på merket felt på baksiden av skjemaet
Skill mellom femur og tibia

AKTUELL BEHANDLING AV MENISKLESJON

	Partiell reseksjon	Total reseksjon	Sutur	Syntetisk fiksasjon*	Menisk-transpl.	Trepanering	Ingen
Medial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lateral	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

* Sett klirelapp på merket felt på baksiden

BRUSKLESJON (evt. flere kryss)

	Areal (cm ²)		ICRS Grade*				Artrose		Behandlings-kode**				
	≤2	>2	1	2	3	4	Ja	Nei	1	2	3	4	Spesifiser annet
Patella MF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Patella LF	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trochlea fem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Med.fem. cond.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Med. tib. plat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lat.fem. cond.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lat. tib. plat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

***ICRS Grade:** 1 Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks; 2 Abnormal: Lesions extending down to <50% of cartilage depth; 3 Severely abnormal: Cartilage defects extending down >50% of cartilage depth as well as down to calcified layer; 4 Severely abnormal: Osteochondral injuries, lesions extending just through the subchondral boneplate or deeper defects down into trabecular bone.

****Behandlingskoder:** 1 Debridement; 2 Mikrofraktur; 3 Ingen behandling; 4 Annet.

DAGKIRURGISK OPERASJON 0 Nei 1 Ja

PEROPERATIVE KOMPLIKASJONER 0 Nei 1 Ja, hvilke(n)

OPERASJONSTID (hud til hud).....min

SYSTEMISK ANTIBIOTIKA

0 Nei 1 Ja 1 Profylakse 2 Behandling

Medikament 1 Dosering Varighettimer

Eventuelt i kombinasjon med medikament 2

TROMBOSEPROFYLAKSE

0 Nei 1 Ja: Første dose 1 Preoperativt 2 Postoperativt

Medikament 1 Dosering opr.dag.....

Dosering videre Varighet døgn

Medikament 2

Anbefalt total varighet av tromboseprofylakse.....

NSAIDs

0 Nei 1 Ja, hvilken type.....

Anbefalt total varighet av NSAIDs-behandling.....

HØYDEcm

VEKTkg

RØYK 0 Nei 1 Av og til 2 Daglig

SNUS 0 Nei 1 Av og til 2 Daglig

Lege:.....
Legen som har fylt ut skjemaet (navnet registreres ikke i databasen).

RETTLEDNING

- Registreringen gjelder ALLE fremre og bakre korsbåndoperasjoner.
- Registreringen gjelder ALLE kneoperasjoner på pasienter som tidligere er korsbåndoperert.
- Ett skjema fylles ut for hvert kne som blir operert.
- Aktuelle ruter markeres med kryss. Stiplet linje fylles ut der dette er aktuelt.
- Pasienten skal på eget skjema gi samtykke til registrering.

KOMMENTARER TIL DE ENKELTE PUNKTENE

FORKORTELSER SOM ER BRUKT PÅ SKJEMAET

- ACL: Fremre korsbånd
- PCL: Bakre korsbånd
- MCL: Mediale kollateralligament
- LCL: Laterale kollateralligament
- PLC: Popliteus kompleks/bicepssene kompleks
- BPTB; Patellarsene autograft
- AM: Anteromediale bunt av ACL
- PL: Posterolaterale bunt av ACL

SKADEDATO Skriv inn skadedatoen så eksakt som mulig.
Ved ny skade av tidligere operert korsbånd, skriv inn den nye skadedatoen.

FIKSASJON Angi hvilken fiksasjonstype som er brukt ved å feste kiistrelapp på baksiden.
Husk å skille mellom femur og tibia for graffiksasjon, og mellom medial og lateral side for meniskfiksasjon.

PEROPERATIVE KOMPLIKASJONER
Ved en ruptur/kontaminering av høstet graft e.l. skal det opprinnelige graftet anføres her.
Andre peroperative komplikasjoner skal også fylles inn her.

SYSTEMISK ANTIBIOTIKA
Her føres det på hvilket antibiotikum som er blitt benyttet i forbindelse med operasjonen. Det anføres dose, antall doser og profylaksens varighet. F.eks. Medikament 1: Keflin 2g x 4, med varighet 12 timer.

TROMBOSEPROFYLAKSE
Type, dose og antatt varighet av profylaksen skal angis separat for operasjonsdagen og senere.

Kopi beholdes i pasientjournalen, originalen sendes til Nasjonalt Korsbåndregister.

Kontaktpersoner vedrørende registreringskjema er
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Universitetssykehus e-post: lars.engebretsen@medisin.uio.no
Overlege Knut Andreas Fjeldsgaard, Haukeland universitetssykehus
e-post: knut.andreas.fjeldsgaard@helse-bergen.no
Sekretær i Nasjonalt Korsbåndregister, Ortopedisk avd., Helse Bergen
Merete Husøy, tlf.: 55 97 64 50, faks: 55 97 37 49
e-post: korsband@helse-bergen.no

GRAFFIKSASJON		MENISKFIKSASJON	
FEMUR	TIBIA	MEDIAL	LATERAL

KOOS – Spørreskjema for knepasienter.

**NASJONALT
KORSBÅNDSREGISTER**
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk
klinikk
Haukeland universitetssjukehus
Møllendalsbakken 11
5021 BERGEN Tlf: 55976450

DATO: _____ **OPERASJONSDATO:** _____

FØDSELSNR (11 siffer): _____

NAVN: _____

SYKEHUS: _____

Veiledning: Dette spørreskjemaet inneholder spørsmål om hvordan du opplever kneet ditt før operasjonen. Informasjonen vil hjelpe oss til å følge med i hvordan du har det og fungerer i ditt daglige liv. Besvar spørsmålene ved å krysse av for det alternativ du synes stemmer best for deg (kun ett kryss ved hvert spørsmål). Hvis du er usikker, kryss likevel av for det alternativet som føles mest riktig.

KRYSS AV FOR RIKTIG KNE (NB: Ett skjema for hvert kne): ¹ **VENSTRE** ⁰ **HØYRE**

Røyker du? ⁰ Nei ¹ Av og til ² Daglig
Hvis du røyker daglig –
hvor mange sigaretter per dag: _____

Vekt: _____ kg

Høyde : _____ cm

Symptom

Tenk på **symptomene** du har hatt fra kneet ditt den **siste uken** når du besvarer disse spørsmålene.

S1. Har kneet vært hovent?

Aldri	Sjelden	I blant	Ofte	Alltid
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

S2. Har du følt knirking, hørt klikking eller andre lyder fra kneet?

Aldri	Sjelden	I blant	Ofte	Alltid
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

S3. Har kneet haket seg opp eller låst seg?

Aldri	Sjelden	I blant	Ofte	Alltid
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

S4. Har du kunnet rette kneet helt ut?

Alltid	Ofte	I blant	Sjelden	Aldri
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

S5. Har du kunnet bøye kneet helt?

Alltid	Ofte	I blant	Sjelden	Aldri
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Stivhet

De neste spørsmålene handler om **leddstivhet**. Leddstivhet innebærer vanskeligheter med å komme i gang eller økt motstand når du bøyer eller strekker kneet. Marker graden av leddstivhet du har opplevd i kneet ditt den **siste uken**.

S6. Hvor stivt er kneet ditt når du nettopp har våknet om morgenen?

Ikke noe	Litt	Moderat	Betydelig	Ekstremt
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

S7. Hvor stivt er kneet ditt senere på dagen etter å ha sittet, ligget eller hvilt?

Ikke noe	Litt	Moderat	Betydelig	Ekstremt
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Smerte

P1. Hvor ofte har du vondt i kneet?

Aldri	Månedlig	Ukentlig	Daglig	Hele tiden
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Hvilken grad av smerte har du hatt i kneet ditt den **siste uken** ved følgende aktiviteter?

P2. Snu/vende på belastet kne

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

P3. Rette kneet helt ut

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

P4. Bøye kneet helt

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

P5. Gå på flatt underlag

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

P6. Gå opp eller ned trapper

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

P7. Om natten (smerter som forstyrrer søvnen)

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

P8. Sittende eller liggende

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

P9. Stående

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Funksjon i hverdagen

De neste spørsmålene handler om din fysiske funksjon. **Angi graden av vanskeligheter du har opplevd den siste uken ved følgende aktiviteter på grunn av dine kneproblemer.**

A1. Gå ned trapper

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A2. Gå opp trapper

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A3. Reise deg fra sittende stilling

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Angi graden av **vanskeligheter** du har opplevd ved hver aktivitet den **siste uken**.

A4. Stå stille

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A5. Bøye deg, f.eks. for å plukke opp en gjenstand fra gulvet

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A6. Gå på flatt underlag

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A7. Gå inn/ut av bil

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A8. Handle/gjøre innkjøp

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A9. Ta på sokker/strømper

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A10. Stå opp fra sengen

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A11. Ta av sokker/strømper

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A12. Ligge i sengen (snu deg, holde kneet i samme stilling i lengre tid)

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A13. Gå inn/ut av badekar/dusj

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A14. Sitte

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A15. Sette deg og reise deg fra toalettet

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A16. Gjøre tungt husarbeid (måke snø, vaske gulv, støvsuge osv.)

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

A17. Gjør lett husarbeid (lage mat, tørke støv osv.)

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Funksjon, sport og fritid

De neste spørsmålene handler om din fysiske funksjon. **Angi graden av vanskeligheter du har opplevd den siste uken ved følgende aktiviteter på grunn av dine kneproblemer.**

SP1. Sitte på huk

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

SP2. Løpe

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

SP3. Hoppe

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

SP4. Snu/vende på belastet kne

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

SP5. Stå på kne

Ingen	Lett	Moderat	Betydelig	Svært stor
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Livskvalitet

Q1. Hvor ofte gjør ditt kneproblem seg bemerket?

Aldri	Månedlig	Ukentlig	Daglig	Alltid
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Q2. Har du forandret levesett for å unngå å overbelaste kneet?

Ingenting	Noe	Moderat	Betydelig	Fullstendig
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Q3. I hvor stor grad kan du stole på kneet ditt?

Fullstendig	I stor grad	Moderat	Til en viss grad	Ikke i det hele tatt
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Q4. Generelt sett, hvor store problemer har du med kneet ditt?

Ingen	Lette	Moderate	Betydelige	Svært store
<input type="checkbox"/> ⁰	<input type="checkbox"/> ¹	<input type="checkbox"/> ²	<input type="checkbox"/> ³	<input type="checkbox"/> ⁴

Takk for at du tok deg tid og besvarte samtlige spørsmål!



BARNEHOFTEREGISTERET
Nasjonalt Register for Leddproteser
 Helse Bergen HF, Ortopedisk klinikk
 Haukeland universitetssjukehus
 Møllendalsbakken 11, 5021 Bergen

BARNEHOFTESYKDOM

HOFTEDYSPLASI

(Dysplasi på rtg bekken hos barn eldre enn 3 mnd)

BEHANDLINGSDATO/..... 20..... SIDE Ho Ve (Ett kryss. Bilateral = 2 skjema)

FØRSTE GANG DIAGNOSTISERT/..... 20..... (Fylles ut første gang det sendes inn skjema)

TIDLIGERE BEHANDLING Ingen Pute/abduksjonsortose

Annen, spesifiser:

BEHANDLINGSTRENGENDE DYSPLASI I FAMILIE N J

SYMPTOMVARIGHET (>12 år) mnd

IMPINGEMENT TEST (>12 år) Høyre: Neg. Pos. Venstre: Neg. Pos.

RØNTGEN FØR BEHANDLING

Acetabular indeks (<=12 år) Hø Ve CE vinkel (>12 år) Hø Ve

Cross-over tegn (>12 år) Hø: Neg. Pos. Ve: Neg. Pos.

Spina ischiadica projisert medialt for linea terminales? (>12 år) Hø: N J Ve: N J

Bruskhøyde (>12 år) (mm i øvre vektbærende del av leddet i AP projeksjon): <2 2-3 >3

HOFTEN I ledd Subluksert Luksert

LATERALE HJØRNE Normalt Avrundet/ defekt

CAPUTKJERNE Normal Forsinket Ikke tilstede Caputnekrose

BEHANDLING Ingen (obs.) Pute Abduksjonsortose Lukket repos. Hoftegips

ÅPEN REPOSISJON N J

TENOTOMI Psoastenotomi Adduktortentotomi

FEMUROSTEOTOMI Varisering Rotasjon Forkortning

PLATE Forbøyd plate Vinkelplate Spesialplate, fabrikkat:

SKRUER Vanlige skruer Vinkelstabile skruer

BEKKENOSTEOTOMI Salter Dega Trippel Takplastikk

Periacetabular osteotomi Annen:

TILGANG Fremre Lateral Annen:

POSTOPERATIV HOFTEGIPS N J Antall uker

POSTOPERATIV RØNTGEN (ETTER BEKKENOSTEOTOMI)

Acetabular indeks (<=12 år) Hø Ve CE vinkel (>12 år) Hø Ve

REOPERASJONSTYPER Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.

Annen:

REOPERASJONSÅRSÅK Osteosyntesvikt Infeksjon Pseudartrose

Blødning Annen:

ANNEN OPERASJON N J Spesifiser:

KNIVTID FOR OPERATIV BEHANDLING: min.

EPIFYSIOLYSIS CAPITIS FEMORIS

OPERASJONSDATO/..... 20..... SIDE Ho Ve (Ett kryss. Bilateral 2 skjema)

FØRSTE GANG DIAGNOSTISERT/..... 20..... (Fylles ut første gang det sendes inn skjema)

HØYDE OG VEKT Høyde: cm Vekt: kg

SYMPTOMVARIGHET Kronisk (> 3 uker) Akutt (< 3 uker) Akutt på kronisk

STABILITET Stabil (klarer belaste) Ustabil (klarer ikke belaste)

RØNTGEN < 30° 30-50° > 50° (Glidningsvinkel i sideplan)

OPERASJON Primæroperasjon Reoperasjon Profylaktisk

PRIMÆROPERASJONSTYPER Fiksasjon in-situ: N J Peroperativ reposisjon: N J

Kirurgisk hofte-dislokasjon: N J Collumosteotomi: N J

Femurosteotomi: N J Spesifiser:

Skruosteosyntese: N J Antall skruer: Fabrikat:

Pinnfiksasjon: N J Antall pinner: Diameter: mm

Platéfiksasjon: N J Spesifiser:

Annen operasjon: N J Spesifiser:

REOPERASJONSTYPER Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.

Annen, spesifiser:

REOPERASJONSÅRSÅK Feilplass. av osteosynt. Osteosyntesvikt Infeksjon

Blødning Annen:

KNIVTID FOR OPERATIV BEHANDLING: min.

Ved operativ behandling (artroskopisk eller åpen) for impingement etter SCFE:

fill ut rubrikken ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

Dato: Lege:

Legen som har fylt ut skjemaet (Navnet registreres ikke i databasen)

F.nr. (11 sifre):

Navn:

Sykehus:

(Skriv tydelig eller bruk pasientklistrelapp. Husk sykehus!)

CALVÉ-LEGG-PERTHES

BEHANDLINGSDATO/..... 20..... SIDE Ho Ve (Ett kryss. Bilateral = 2 skjema)

FØRSTE GANG DIAGNOSTISERT/..... 20..... (Fylles ut første gang det sendes inn skjema)

SYMPTOMVARIGHET mnd HALTING N J

SMERTE Ingen Lett Betydelig CATTERALL I / II III / IV

BEHANDLING Ingen (fysioterapi) Abduksjonsortose

FEMUROSTEOTOMI Varisering Valgisering Rotasjon

PLATE Forbøyd plate Vinkelplate Spesialplate, fabrikkat:

SKRUER Vanlige skruer Vinkelstabile skruer

BEKKENOSTEOTOMI Salter Dega Takplastikk

Annen, spesifiser:

ANNEN OPERATIV BEHANDLING Trochanter transposisjon Trochanter apofysiodese

Annen, spesifiser:

REOPERASJONSTYPER Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.

Annen:

REOPERASJONSÅRSÅK Osteosyntesvikt Blødning Infeksjon

Pseudartrose Annen:

KNIVTID FOR OPERATIV BEHANDLING: min.

Ved artroskopi eller hofte-dislokasjon for sequele etter CLP: fill ut rubrikken ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

BEHANDLINGSDATO/..... 20..... SIDE Ho Ve (Ett kryss. Bilateral = 2 skjema)

OPERASJON Primæroperasjon Reoperasjon Kun diagnostisk uten intervensjon

SYMPTOMVARIGHET mnd

TIDLIGERE HOFTELIDELSE N J SCFE CLP DDH

Andre:

DIAGNOSE Cam impingement Pincer impingement Kombinert impingement

Annen:

PREOPERATIVE FUNN Impingement test Høyre: Neg. Pos. Venstre: Neg. Pos.

Halting: N J Rtg Alfavinkel sideplan: Hø Ve frontplan: Hø Ve

CE-vinkel Hø Ve Cross-over tegn Hø: Neg. Pos. Ve: Neg. Pos.

Spina ischiadica projisert medialt for linea terminales? Hø: N J Ve: N J

Bruskhøyde (mm i øvre vektbærende del av leddet i AP projeksjon): <2 2-3 >3

MR funn: Labrumskade Paralabral cyste Subchondral cyste

Effekt av lokalbedøvelse i leddet: N J Ikke aktuelt

KIRURGISK TILGANG Artroskopisk Kirurgisk dislokasjon Konvertering til åpen tilgang

Tilgang ved åpen kirurgi: Lateral Annen:

Fiksasjonsmetode ved trochanter osteotomi:

Portaler: Anterior Anterolateral Posterolateral Distal anterior Proximal anterior

Perifere kompartiment først Sentrale kompartiment først

PEROPERATIVE FUNN

Labrum: Normal Degen. forandret Forbetet Partiell ruptur Gjennomgående ruptur

Bruskskade acetabulum: N J Grad: 0 1 2 3 4 Lokalisasjon: 1 2 3 4 5 6

Bruskskade caput femoris: N J Areal: mm² Dybde (ICRS): 1 2 3 4 Lokalisasjon: 1 2 3 4 5 6

Ligamentum teres skade: N J Partiell ruptur Total ruptur

Frie legemer: N J Perifert Sentralt

Os acetabuli: N J Som forbenning av labrum Som del av leddflaten Synovitt: N J

KIRURGISK BEHANDLING Labrumruptur: Debridement Sutur. Antall ankre:

Type ankre: Labrumrekonstruksjon, spesifiser:

Bruskskade: Ingen beha. Debridement Mikrofraktur Annen:

Pincerlesjon: Ingen beha. Reseksjon. Dybde max mm Lengde mm

Camlesjon: Ingen beha. Reseksjon

Ligamentum teres: Ingen beha. Debridement Annen:

Os acetabuli: Ingen beha. Fjerning Fiksasjon Annen:

Frie legemer fjernet: N J Synovectomi: N J Knivtid min.

Reoperasjonsårsak, spesifiser:

RETTLEDNING

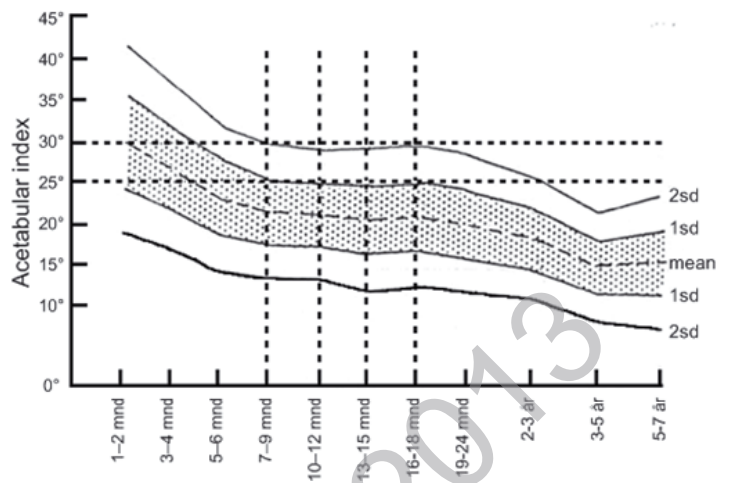
1. HOFTEDYSPLASI

Kriterier: AI > mean + 2SD for aktuell alder (Se figur)

Alle barn som på røntgen bekken får påvist hoftedysplasi etter 3 måneders alder skal registreres. Barn som er diagnostisert før 3 måneders alder (putebehandling) registreres hvis de fortsatt har dysplasi på røntgen bekken på kontroll etter 3 måneders alder. Barn med neuroortopediske lidelser skal ikke registreres.

- Registreres første gang ved diagnose (røntgen bekken)/primærbehandling
- Registreres ved senere behandling som krever anestesi/ sedasjon Lukket reposisjon/ hoftegips, åpen reposisjon, tenotomier, femur-/bekkenosteotomier, reoperasjoner. Operativ behandling (periacetabulære osteotomier, takplastikk og lignende) hos ungdommer og voksne skal også registreres.

CAPUTKJERNE: Ved unilateral – sammenlign med frisk side.



2. CALVÉ-LEGG-PERTHES

- Registreres første gang ved diagnose/primærbehandling
- Registreres ved senere behandling som krever anestesi (Femur-/bekkenosteotomier, reoperasjoner)

CATTERALL: VII = <50 % caputnekrose. III/IV = >50 % caputnekrose

3. EPIFYSIOLYSIS CAPITIS FEMORIS

- Registreres første gang ved diagnose/primærbehandling
- Registreres ved senere behandling som krever anestesi Osteosyntese, femurosteotomier, reoperasjoner.

4. ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

Alle pasienter (uavhengig av alder) som gjennomgår åpen eller artroskopisk hofteoperasjon, unntatt fraktur-, protese- og tumor-operasjoner, skal registreres.

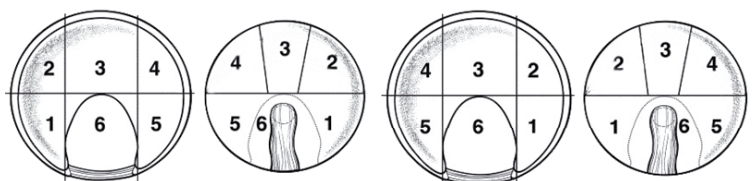
Bruskskade i acetabulum – Grade:

0=Normal.

- 1=Loss of fixation to the subchondral bone resulting in a wave sign, defined as occurring when the capsular side of the labrum is pushed inwards with the probe resulting in bulging of the adjacent articular cartilage.
- 2=Presence of cleavage tear with obvious separation at the chondrolabral junction.
- 3=Delamination of the articular cartilage.
- 4=Presence of exposed bone in the acetabulum.

Bruskskade i acetabulum og på caput femoris – Lokalisasjon:

1-2: Fortil, 4-5: Baktill



Venstre hofte

Høyre hofte

Bruskskade på caput femoris – Dybde (ICRS):

- 1=Nearly normal: Superficial lesions, soft indentation and/or superficial fissures and cracks.
- 2=Abnormal: Lesions extending down to <50% of cartilage depth.
- 3=Severely abnormal: Cartilage defects extending down to >50% of cartilage depth as well as down to calcified layer.
- 4=Severely abnormal: Osteochondral injuries, lesions extending just through the sub chondral boneplate or deeper defects down into trabecular bone.

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Ass.lege Trude Gundersen Lehmann, Ortopedisk klinikk, Haukeland universitetssjukehus,

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Sekretær Marianne Wiese, Barnehofteregisteret,

Tlf. 55 97 64 54, e-post: marianne.wiese@helse-bergen.no

Internett: <http://nrlweb.ihelse.net>



F.nr. (11 sifre):

Navn:

Sykehus:

(Skriv tydelig eller bruk pasientklistrelapp. Husk sykehus!)

BARNEHOFTESYKDOM

HOFTEDYSPLASI (Dysplasi på rtg bekken hos barn eldre enn 3 mnd)

FØRSTE GANG DIAGNOSTISERT:/..... 20.....

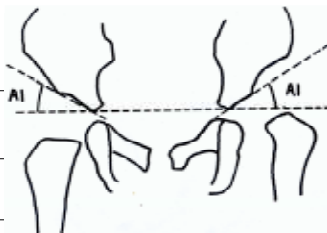
SIDE: Høyre Venstre (Ett kryss. Bilateral = to skjema)

BEHANDLINGSDATO:/..... 20.....

BEHANDLING Konservativ Primæroperasjon Reoperasjon

KNIVTID FOR OPERATIV BEHANDLING: min.

HOFTEN I ledd
 Subluksert
 Luksert



ACETABULAR INDEX

Hø Ve

LATERALE HJØRNE

Normalt Avrundet/ defekt

CAPUTKJERNE

Normal
 Forsinket
 Ikke tilstede
 Caputnekrose

(Ved unilateral - sammenlign med frisk side)

BEHANDLINGSTRENGENDE DYSPLASI I FAMILIE Nei Ja

KONSERVATIV BEHANDLING

Pute Hoftegips Abduksjonsortose
 Lukket reposisjon Ingen behandling/observasjon

ÅPEN REPOSISJON Nei Ja

FEMUROSTEOTOMI

Varisering Rotasjon Forkortning

BEKKENOSTEOTOMI

Salter Dega Trippel Takplastikk

Annen. Spesifiser:

TENOTOMI Psoastenotomi Adduktortentotomi

ANNEN OPERASJON Spesifiser:

PLATE Forbøyd plate Vinkelplate

Spesialplate. Fabrikat:

SKRUER Vanlige skruer Vinkelstabile skruer

POSTOPERATIV HOFTEGIPS Nei Ja. Antall uker

TILGANG Fremre Lateral

Annen. Spesifiser:

REOPERASJONSTYPE

Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.

Annen. Spesifiser:

REOPERASJONSÅRSÅK

Osteosyntesesvikt Infeksjon Pseudartrose Blødning

Annen. Spesifiser:

Lege:

Legen som har fylt ut skjemaet (Navnet registreres ikke i databasen)

EPIFYSIOLYSIS CAPITIS FEMORIS

FØRSTE GANG DIAGNOSTISERT:/..... 20.....

SIDE Høyre Venstre (Ett kryss. Bilateral = to skjema)

OPERASJONSDATO:/..... 20.....

OPERASJON Primæroperasjon Reoperasjon Profylaktisk

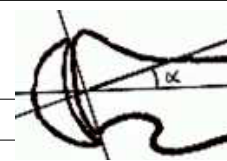
KNIVTID FOR OPERATIV BEHANDLING: min.

SYMPTOMER Varighet: uker Akutt (symptomer < 3 uker)
 Kronisk (symptomer > 3 uker) Akutt på kronisk

HØYDE OG VEKT Høyde: cm Vekt: kg

STABILITET Stabil (klarer belast) Ustabil (klarer ikke belast)

RØNTGEN < 30°
 30-50°
 > 50° (Glidningsvinkel i sideplan α)



PEROPERATIV REPOSISJON Nei Ja

PRIMÆROPERASJONSTYPE

Skruosteosyntese. Antall skruer: Fabrikat:

Femurosteotomi

Pinneosteosyntese. Antall pinner: Diameter: mm

REOPERASJONSTYPE

Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.

Annen. Spesifiser:

REOPERASJONSÅRSÅK

Feilplassering av osteosyntese Osteosyntesesvikt Infeksjon

Blødning Annen. Spesifiser:

CALVÉ-LEGG-PERTHES

FØRSTE GANG DIAGNOSTISERT:/..... 20.....

SIDE Høyre Venstre (Ett kryss. Bilateral = to skjema)

BEHANDLINGSDATO:/..... 20.....

BEHANDLING Konservativ Primæroperasjon Reoperasjon

KNIVTID FOR OPERATIV BEHANDLING: min.

SYMPTOMER Varighet: måneder

HALTING Nei Ja

SMERTE Ingen Lett Betydelig

CATTERALL I / II (< 50 % caputnekrose) III / IV (> 50 % caputnekrose)

KONSERVATIV BEHANDLING Ingen (fysioterapi) Abduksjonsortose

FEMUROSTEOTOMI Varisering Valgisering Rotasjon

NIVÅ Intertrochantær Subtrochantær

BEKKENOSTEOTOMI Salter Dega Takplastikk

Annen. Spesifiser:

PLATE Forbøyd plate Vinkelplate

Spesialplate. Fabrikat:

SKRUER Vanlige skruer Vinkelstabile skruer

REOPERASJONSTYPE Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.

Annen. Spesifiser:

REOPERASJONSÅRSÅK

Osteosyntesesvikt Blødning Infeksjon Pseudartrose

Annen. Spesifiser:

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