Nasjonalt Register for Leddproteser

REPORT

June 2016

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
2016 ANNUAL REPORT

This annual report presents results and descriptive statistics from our five registers.
The Paediatric Hip Register has now received 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 and Trude Gundersen is the general manager of the Paediatric Hip Register.

As required by the Interregional Steering Committee for the National Service Centre for Medical Quality Registers, the results at hospital level must be published. These will be published on the website of the National Service Centre this autumn and in next year's report. http://www.kvalitetsregistre.no/resultater/

Norwegian orthopaedic surgeons have long been requesting a system of electronic reporting to the registers. The National Service Centre 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 the catalogue number level. The Cruciate Ligament Register has tried out this system (MRS, a medical registration system) at Haukeland University Hospital (HUS), and is now ready to test it at other hospitals. 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. We are currently testing reporting of hip arthroplasty at HUS. It remains uncertain when these tools will be ready for use nationwide.

This 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. Since we mainly publish results on implants and surgical methods in scientific journals where we can account for materials and methods and discuss strengths and weaknesses and the significance of the findings, these are to be found in the reference lists at the end of this annual report.

The Nordic Arthroplasty Register Association (NARA) has published a report, which is available on our website.

Hospital-based annual reports, with data from each hospital, will as before be sent to our contact persons at the hospitals and to the general manager of the hospital. We encourage our contacts to pass on the reports to the hospital administration and their colleagues, and to check that the figures recorded from the hospital are correct. The reports should be used for local improvement work.

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

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 prostheses suppliers, the University of Bergen, the Norwegian Patient Register, 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, 17.06.2016.

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Chief Physician, Orthopaedic Department

Trude Gundersen
Chief Physician

The National Advisory Unit now has its own **Facebook page**, which we hope you will visit. You can find us at www.facebook.com/leddregisteret/ or by using the QR code below.

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THE HIP ARTHROPLASTY REGISTER
2016 ANNUAL REPORT

This year's annual report contains data from 200 796 hip arthroplasty operations. In 2015, there were 8402 primary operations and 1376 revisions. This represented a slight increase from 2014.

TRENDS AND RISK OF REVISION

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

In recent years, uncemented implants have been far more frequently used in elderly patients than previously. This change in practice is not supported by the literature, since the annual reports from the registers and many publications show that uncemented prostheses may be detrimental in elderly patients, especially women (Dale et al. 2012; Mäkelä et al. 2014; Jämsen et al. 2014; Thien et al. 2014). In Figure 8c in this year's report, we see that the use of uncemented femoral stems in elderly patients has not increased in the past two years, but the use of this fixation method in elderly patients has not declined either.

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 femoral heads, and increased use of 32 mm. This is probably highly beneficial, since 32 mm heads give a lower risk of dislocation than the smaller heads. The reduction seen in the use of >36 mm heads is probably also beneficial, since prostheses with such a large head diameter are liable to increased risk of corrosion in the artificial joint.

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 considerably in recent years and increased further in 2015, to a number of about 1000 operations. The use of direct lateral approaches decreased accordingly. This change is probably beneficial, since Amlie et al. (2014) showed that with a direct lateral approach about 25% of patients experienced limping and pain after surgery, about twice as many as for patients who underwent surgery with other surgical approaches. To gain a better overview of the problem of limping and post-operative muscle rupture, we ask all surgeons to report all reoperations involving muscle transposition or sewing of the gluteus medius to the Hip Arthroplasty Register (see the relevant column in the form).

METAL ON METAL (MoM) PROSTHESES

Please remember that hospitals have a duty to 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 2015 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:

Johnsen MB et al. showed in a study (HUNT) that increased recreational activity was associated with a greater risk of hip arthroplasty in women and men aged 45-59. The risk of knee arthroplasty was greater for young women with considerable leisure-time activity, but not for men.

Busch VJ et al. found that bone packing with cement was more cost-effective than the use of an uncemented cup in primary surgery on young patients with bone defects in the acetabulum.

Blågestad T et al. documented that the post-operative use of analgesics, hypnotics and anxiolytics showed a significant decrease in patients undergoing total hip arthroplasty.

Langvatn H et al. showed that coagulase-negative staphylococci are the most common bacteria in prosthetic infections and that there had been only minor changes in the bacteriology over time.

Glassou EN et al. found a relationship between low hospital procedure volume of hip replacements and increased risk of revision.

Nystad TW et al. demonstrated a reduction in orthopaedic surgical treatment of patients with arthritis, and that this may be related to the improved effects of modern pharmaceutical treatment of arthritis.

Schrama JC et al. showed that rheumatoid arthritis patients had a slightly higher risk of prosthetic infection than patients with osteoarthritis.

Varnum C et al. found a higher risk of revision of uncemented prostheses with metal-on-metal articulation than alternative types of hip prostheses.

Løwer HL et al. showed that most SSIs (surgical site infections) are detected within 90 days and that passive PDS (post-discharge surveillance) after 30 days seems to be able to replace active PDS (patient questionnaire).

Bergen, 18.06.2016

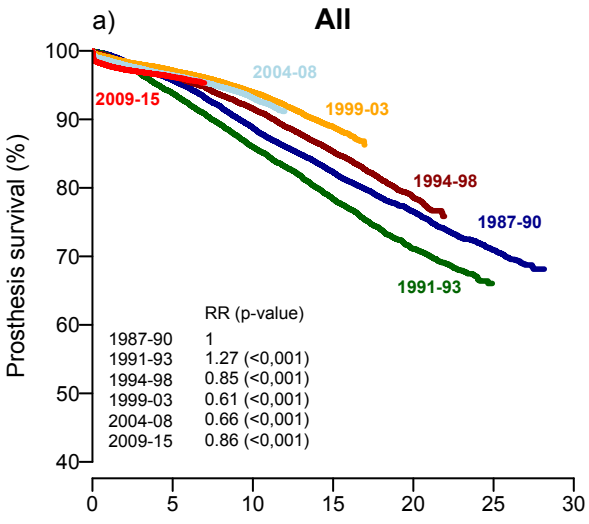
Leif I. Havelin
Chief Physician/Professor

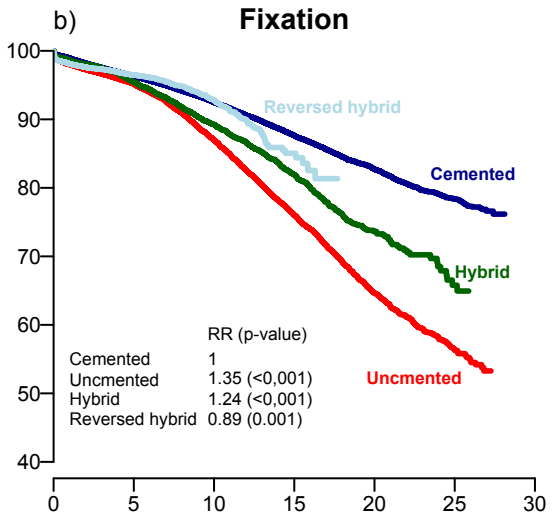
Anne Marie Fenstad
Biostatistician/researcher

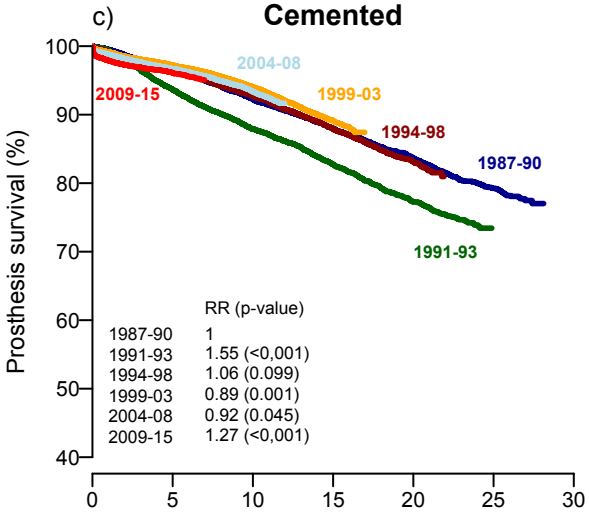
Irina Kvinnesland
IT Consultant

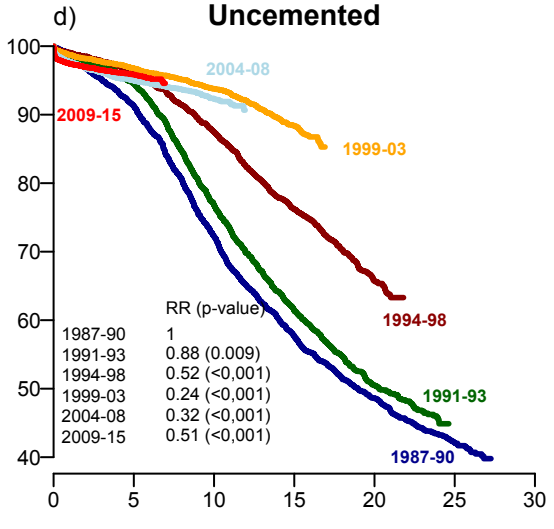
Christoffer Bartz-Johannessen
Biostatistician/researcher

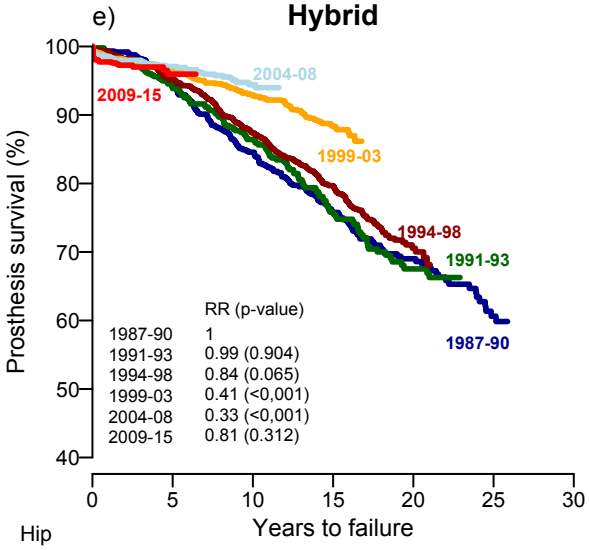
Survival of total hip prostheses 1987-2015

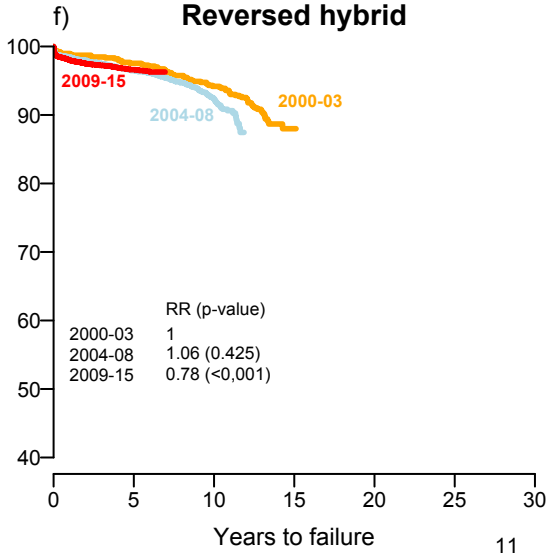










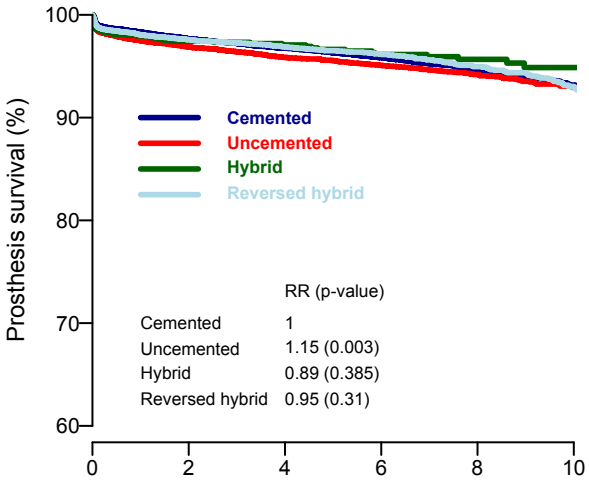


Kaplan-Meier survival curves. Rate ratio (RR) is adjusted for age, gender and diagnosis.

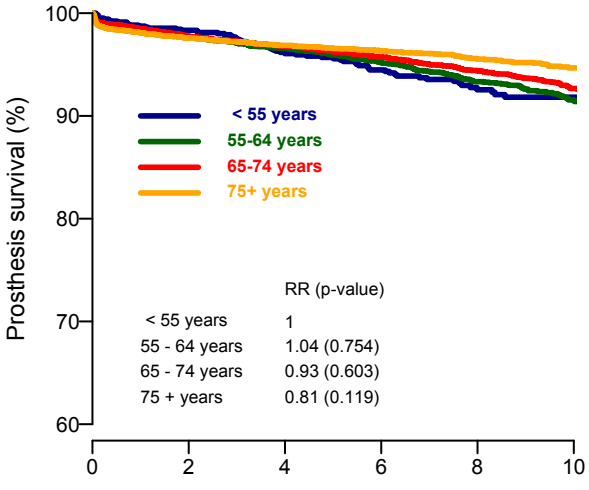
Survival estimate is given as long as more than 50 prostheses remains in the risk set.

Survival of total hip prostheses 2005-2015

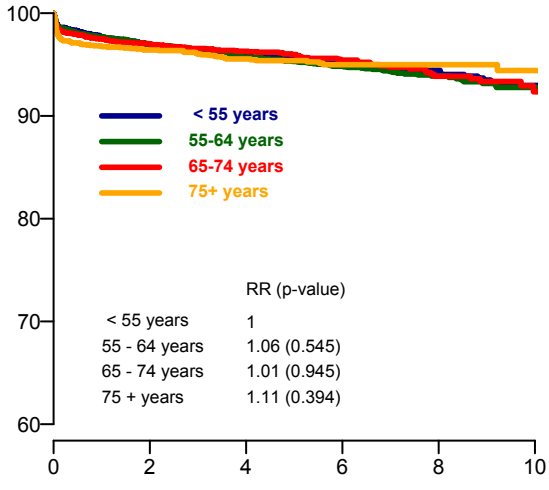
g) Fixation



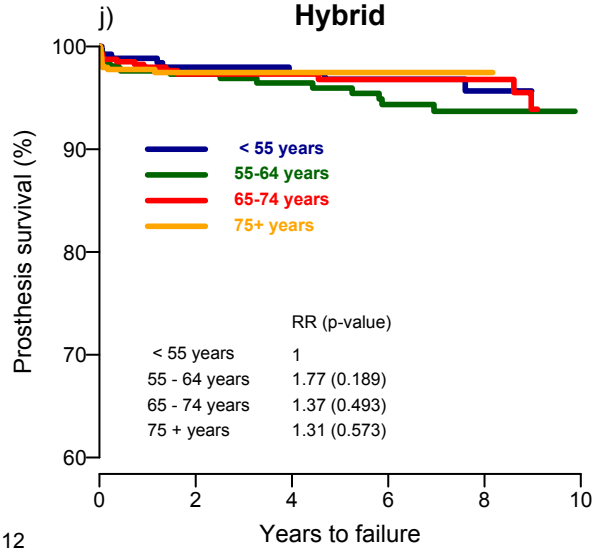
h) Cemented



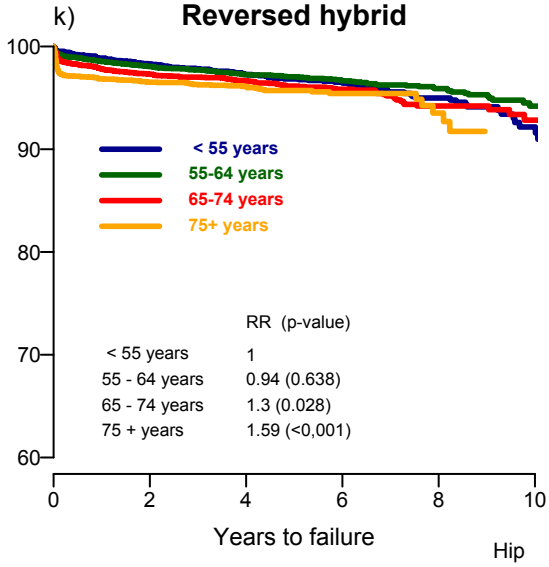
i) Uncemented



j) Hybrid



k) Reversed hybrid

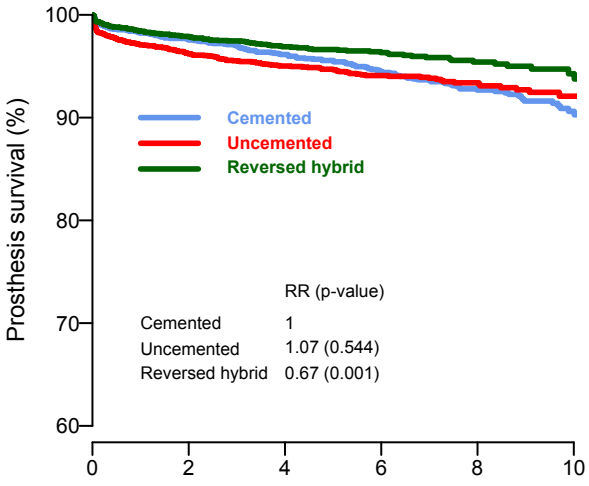


Kaplan-Meier survival curves. Rate ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheses remains in the risk set.

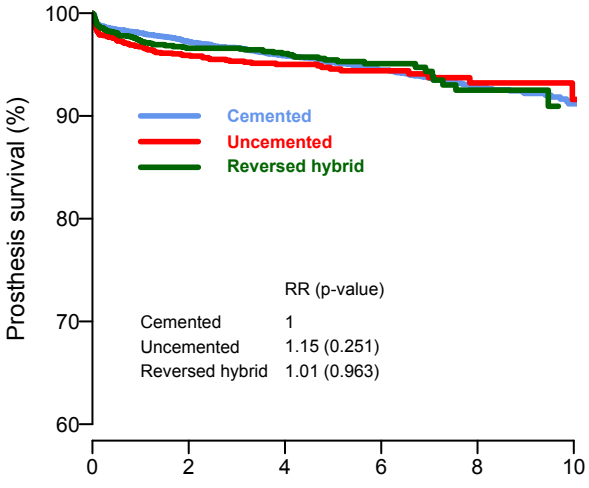
Survival of total hip prostheses 2005-2015

Different fixations men

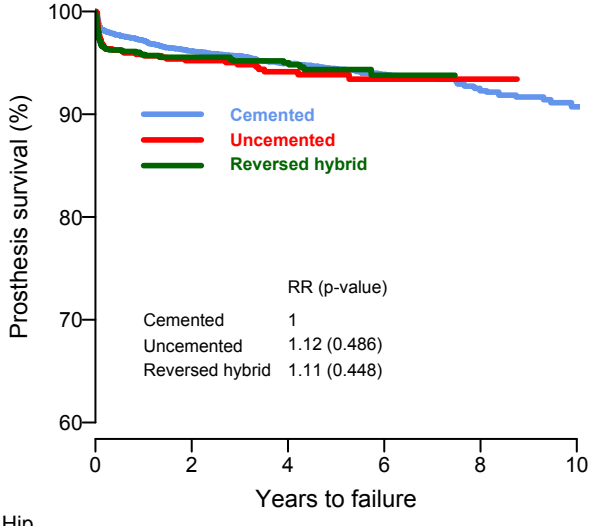
l) Under 65 years



n) 65 - 74 years

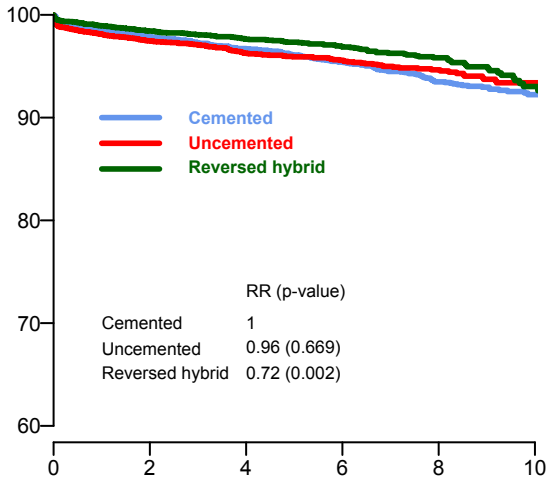


p) Over 75 years

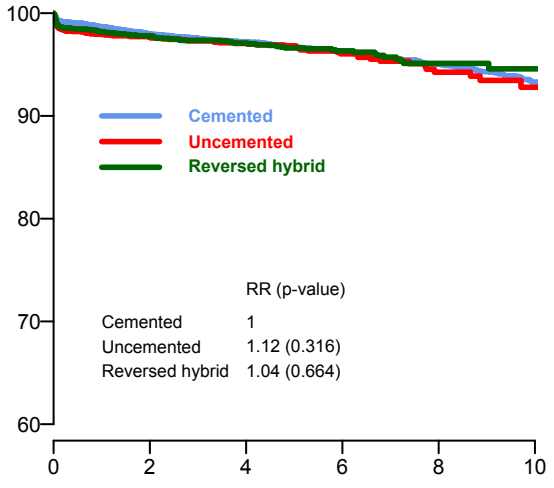


Different fixations women

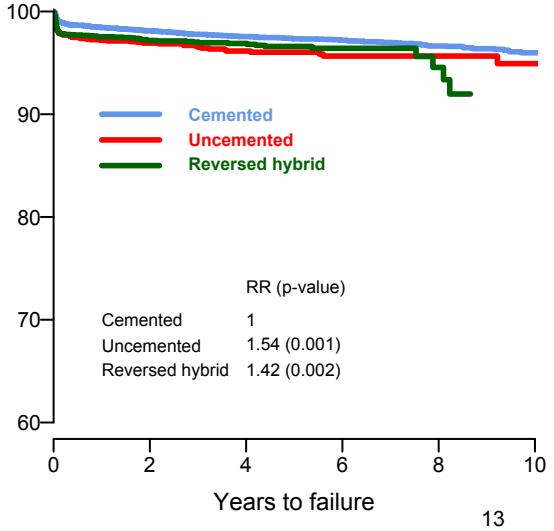
m) Under 65 years



o) 65 - 74 years

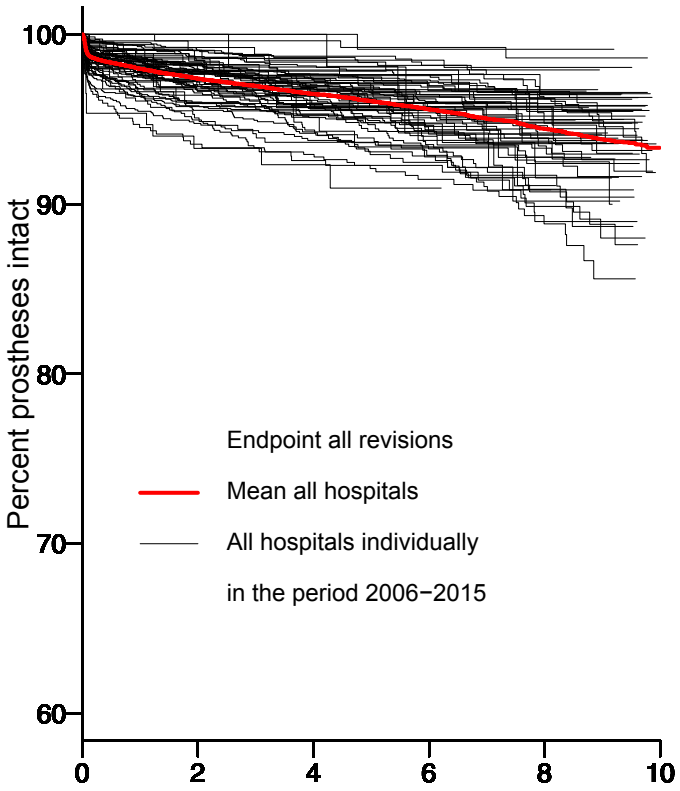


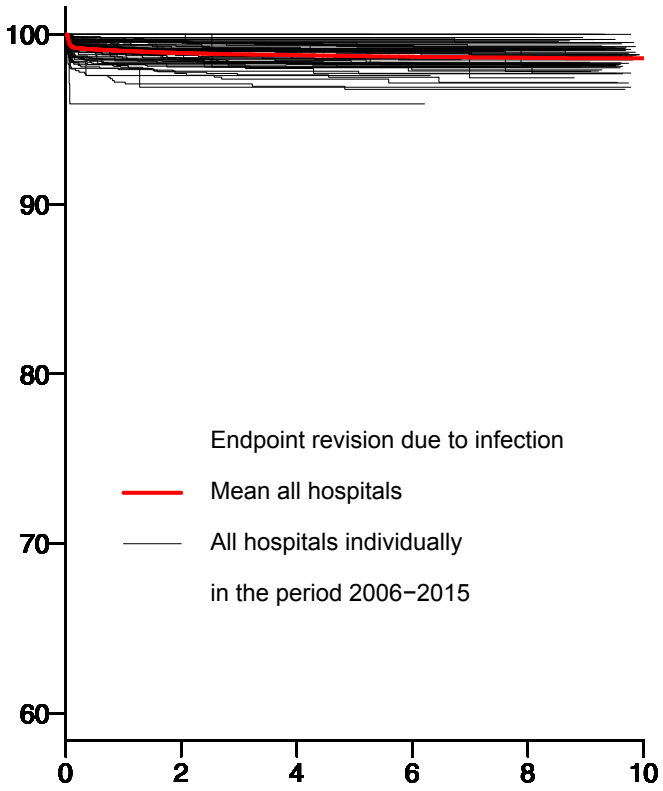
q) Over 75 years

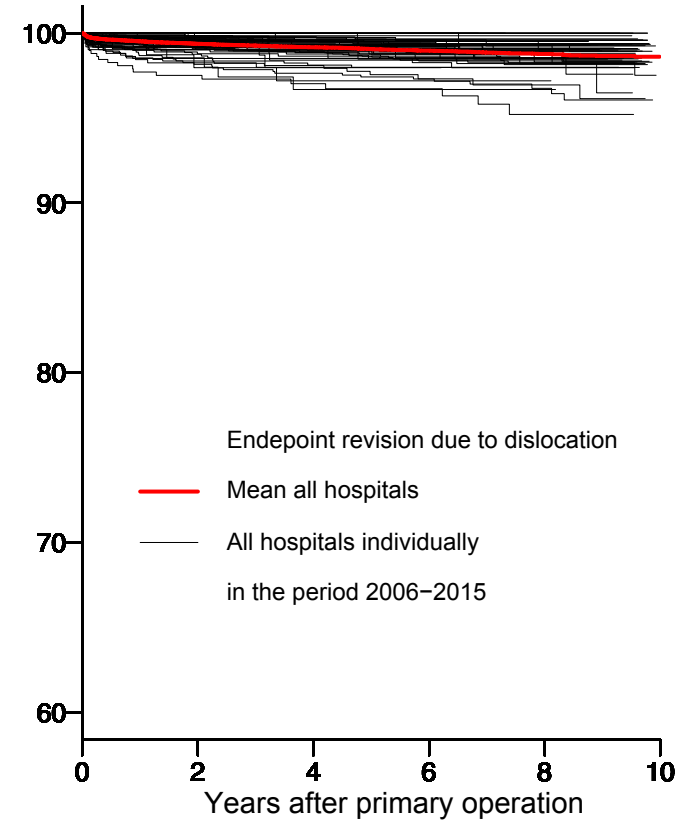


Hip Kaplan-Meier survival curves. Rate ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheses remains in the risk set.

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	2015	Sum:
Number of patients	136	12	12	15	13	19	15	15	18	26	23	22	27	353

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 ARTHROPLASTY

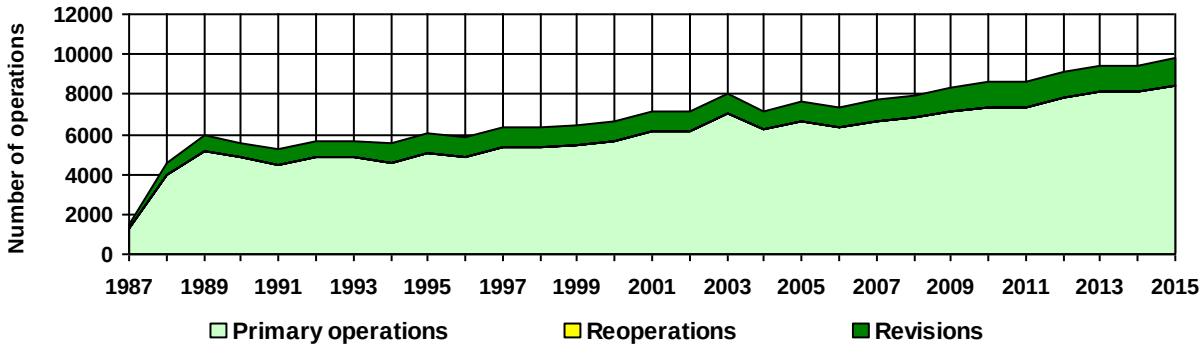
Table 1: Annual numbers of operations (Hemi prosthesis operations for hip fracture are not included here. These are found in tables of The Norwegian Hip Fracture Register)

Year	Primary operations *		Reoperations **		Revisions		Total
2015	8 402	(85,8%)	16	(0,2%)	1 376	(14,0%)	9 794
2014	8 128	(86,3%)	23	(0,2%)	1 269	(13,5%)	9 420
2013	8 092	(86,1%)	15	(0,2%)	1 290	(13,7%)	9 397
2012	7 843	(85,7%)	24	(0,3%)	1 282	(14,0%)	9 149
2011	7 359	(85,1%)	13	(0,2%)	1 271	(14,7%)	8 643
2010	7 330	(85,4%)	1	(0,0%)	1 257	(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	(0,0%)	1 057	(13,8%)	7 655
2004	6 218	(86,9%)			940	(13,1%)	7 158
2003	7 040	(87,7%)			990	(12,3%)	8 030
2002	6 174	(86,6%)			956	(13,4%)	7 130
1997-01	27 985	(85,1%)	1	(0,0%)	4 899	(14,9%)	32 885
1992-96	24 231	(84,3%)	1	(0,0%)	4 512	(15,7%)	28 744
1987-91	19 784	(86,5%)			3 086	(13,5%)	22 870
Totalt	**172 126**	**(85,7%)**	**28 575**	**(0,0%)**	**28 575**	**(14,2%)**	**200 796**

* In addition, there were reports' & [Antall1] & ' primary hemi prostheses done for other reasons than hip fractures.

** Reoperations where prosthetic parts are not changed or removed (soft tissue debridements for infected prosthesis, soft tissue procedures for gluteal insufficiency etc.)

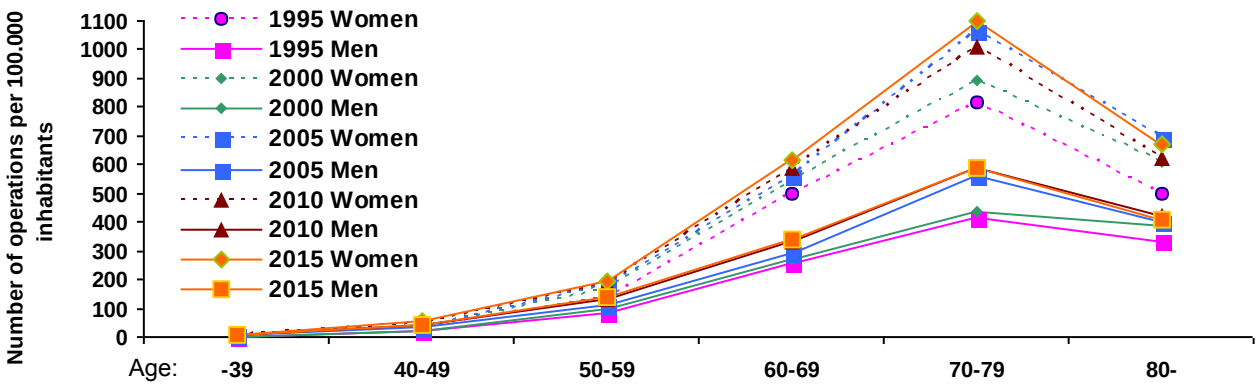
Figure 1: Annual numbers of operations



55 % of all operations were performed on the right side. 67,3 % 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



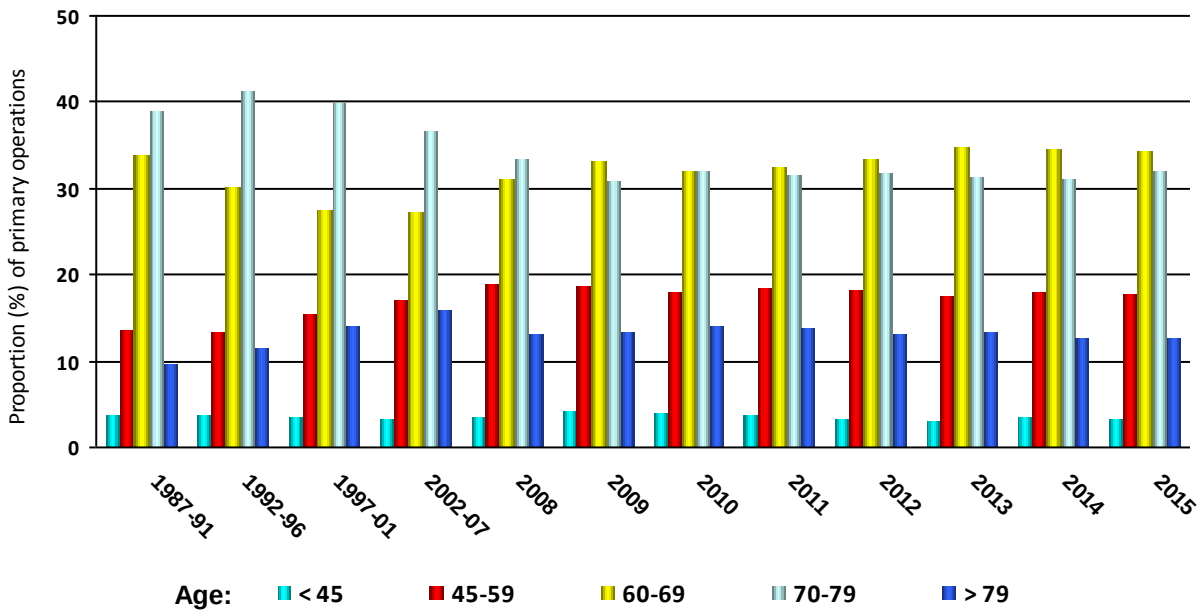
Reasons for primary operations

Table 2:

Year	Primary osteoarthritis	Rheumatoid arthritis	Sequelae after femoral neck fracture	Congenital dysplasia	Cong. dysplasia with dislocation	Epiphysiol./Perthes' disease	Bechterew	Acute fracture of the femoral neck	Avascular necrosis of the femoral head	Sequelae after acetabular fracture	Other	Missing information
2015	6737	107	325	585	10	104	21	320	181	26	189	47
2014	6395	115	354	647	18	86	28	290	252	22	170	30
2013	6400	125	350	609	10	115	31	290	173	29	193	36
2012	6218	157	365	615	12	92	44	205	186	15	203	14
2011	5787	132	372	573	24	96	26	188	138	21	188	30
2010	5734	130	355	594	36	88	20	162	151	16	192	50
2009	5515	131	390	560	26	127	24	152	174	11	164	33
2008	5359	144	443	498	25	99	21	148	145	19	146	6
2007	5166	146	475	457	21	80	22	159	174	22	111	15
2006	4819	147	486	445	17	83	24	131	172	19	126	13
2005	5097	166	550	437	29	87	22	102	143	13	109	14
2004	4680	141	531	414	17	85	20	94	117	13	113	3
2003	5304	171	584	511	26	69	25	86	35	9	61	11
2002	4621	168	534	433	29	82	37	56	68	12	83	16
1997	20078	877	3025	1952	143	380	128	218	328	55	540	291
1992	16739	918	3050	1870	238	330	121	83	146	90	499	145
1987	13300	732	2713	1615	359	246	80	47	51	64	354	224
Total	**127949**	**4507**	**14902**	**12815**	**1040**	**2249**	**694**	**2731**	**2634**	**456**	**3441**	**978**

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

Figure 3: Age by year of operation



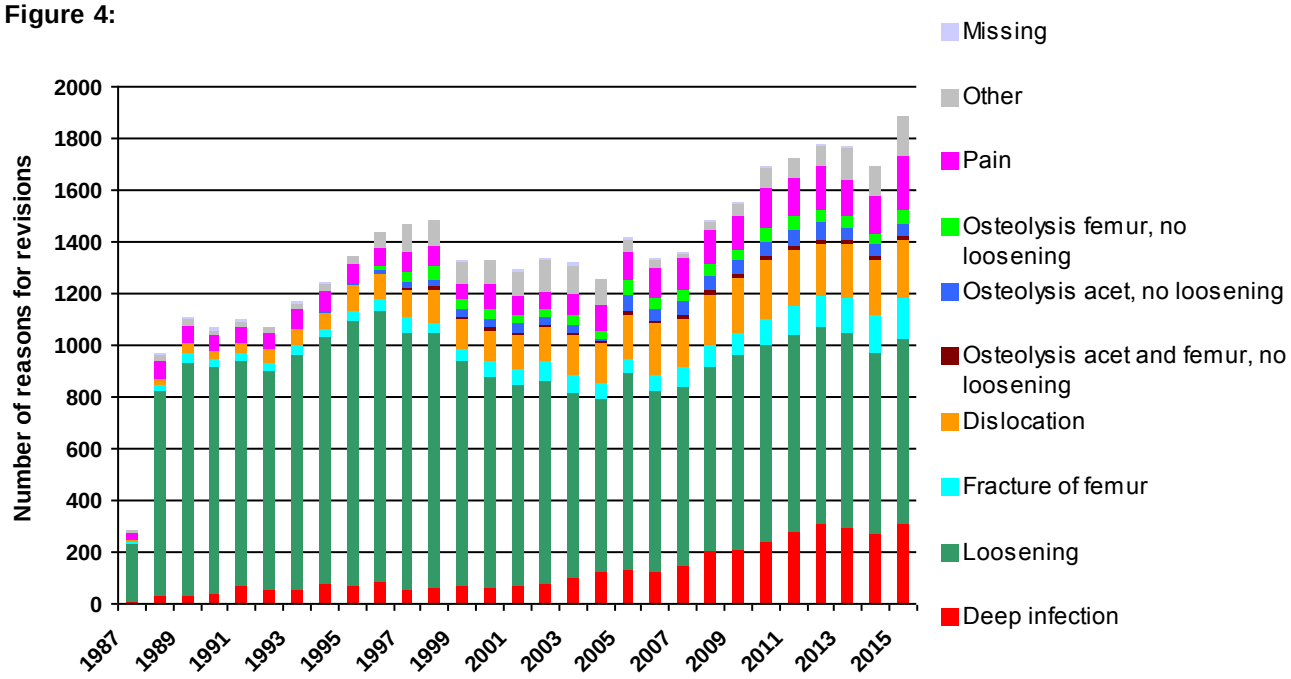
Reasons for revisions

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
2015	425	289	227	309	151	208	46	54	49	10	161	5
2014	424	281	216	267	140	148	49	36	48	18	114	5
2013	441	318	209	289	132	142	53	43	55	12	125	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
1997-01	2138	2302	607	317	253	383	137	212	345	181	478	20
1992-96	2184	2587	376	344	181	367	14	25	42	147	164	14
1987-91	1714	1948	127	175	125	304	0	0	18	31	98	34
Total	**11899**	**11218**	**3808**	**3642**	**1857**	**2883**	**827**	**862**	**1255**	**746**	**1912**	**145**

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

Figure 4:



The graph is hierarchical, i.e. if a revision is marked both "Deep infection" and "Loosening", only "Deep infection" is counted.

Type of revision

Table 4a: Age 75 years old or younger

Year	Exchange of femoral stem and head	Exchange of stem, PE liner, head	Exchange of acetabular cup	Exchange of femoral head	Exchange of femoral head and acetabular cup	Exchange of all components	Exchange of PE liner only	Exchange of PE liner and femoral head	Exchange of PE liner and femoral stem	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
2015	91	13	110	33	160	137	3	58	5	20	65	4	55	39	4	**797**
2014	68	20	114	34	140	122	3	49	6	14	74	1	42	19	3	**709**
2013	77	8	90	42	166	138	2	43	5	15	73	2	46	14	4	**725**
2012	88	8	89	29	156	162	6	38	5	17	70	1	43	13	5	**733**
2011	83	6	102	47	157	162	3	48	9	29	25	1	36	19	2	**734**
2010	89	8	114	60	173	178	1	37	4	32	15	8	5	4	11	**742**
2009	85	6	46	58	239	176	6	54	5	30	10	7		2	2	**726**
2008	83	6	53	35	188	160	1	37	5	33	18	6	1	5	4	**635**
2002-07	439	55	554	131	811	902	40	262	28	196	17	57		20	25	**3537**
1997-01	530	56	317	51	610	1003	24	219	10	122	0	119	1	9	9	**3080**
1992-96	747	6	464	21	170	1322	10	28	3	132	0	73	1	12	2	**2991**
1987-91	509		267	4	12	1220	1		2	80	0	12		6	28	**2141**
Total	**2889**	**192**	**2320**	**545**	**2982**	**5682**	**100**	**873**	**87**	**720**	**367**	**291**	**230**	**162**	**99**	**17550**

Figure 5a: Age 75 years old or younger

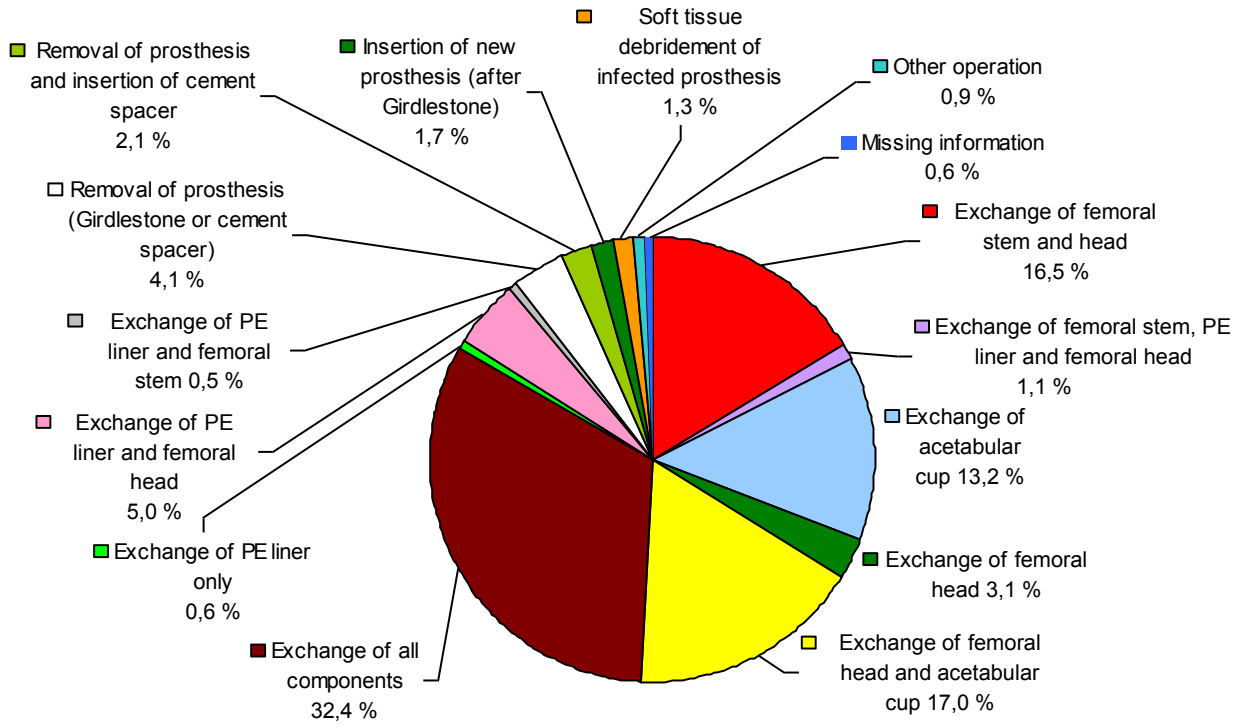
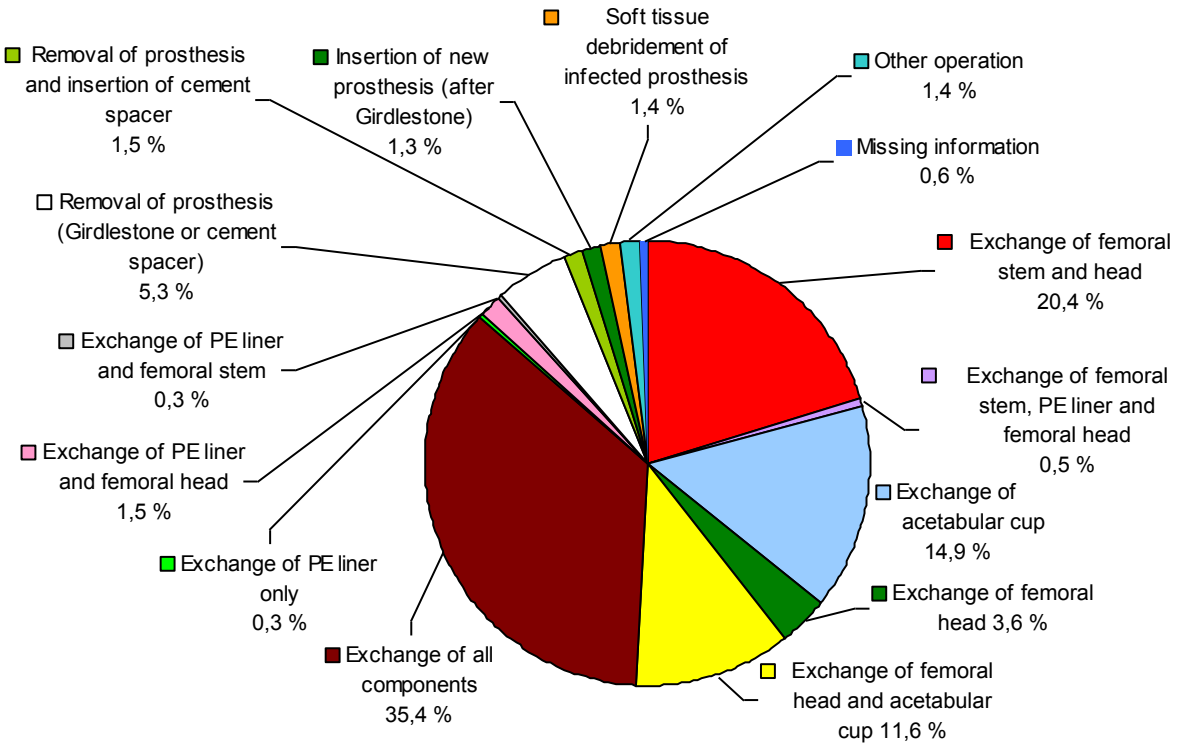


Table 4b: Age over 75 years old

Year	Exchange of femoral stem and head	Exchange of stem, PE liner, head	Exchange of acetabular cup	Exchange of femoral head	Exchange of femoral head and acetabular cup	Exchange of all components	Exchange of PE liner only	Exchange of PE liner and femoral head	Exchange of PE liner and femoral stem	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
2015	82	10	96	28	92	150	6	17	4	24	28	2	30	23	3	**595**
2014	87	4	90	27	100	149	5	14	2	25	18		31	26	5	**583**
2013	94	3	80	15	88	167	2	14	4	14	29	3	35	29	3	**580**
2012	81	3	99	30	72	156		19	2	20	38	1	32	15	5	**573**
2011	94	1	96	32	90	143	3	12	5	23	14	2	22	7	4	**550**
2010	94		87	44	77	143	1	12	1	27	6	5	4	9	6	**516**
2009	69	3	59	50	99	140	3	12	2	35	6	3		4		**485**
2008	69	3	61	43	94	153		6	1	33	11	5		8		**487**
2002-07	459	20	412	92	327	828	10	43	6	175	14	37	1	22	20	**2466**
1997-01	503	6	196	37	175	730	7	17	4	91	0	49		3	2	**1820**
1992-96	417	2	218	3	66	671		4		95	0	35		9	2	**1522**
1987-91	215		162		8	512				30	0	3		2	13	**945**
Total	**2264**	**55**	**1656**	**401**	**1288**	**3942**	**37**	**170**	**31**	**592**	**164**	**145**	**155**	**157**	**63**	**11122**

Figure 5b: Age over 75 years old



Bone transplant in revisions

Table 5: Acetabular cup

Year	Yes	No	Bone impaction[1]	Missing	Total
2015	101 (7,3 %)	959 (68,9 %)	91 (6,5 %)	241 (17,3 %)	**1 392**
2014	112 (8,7 %)	856 (66,3 %)	94 (7,3 %)	230 (17,8 %)	**1 292**
2013	87 (6,7 %)	838 (64,2 %)	131 (10 %)	249 (19,1 %)	**1 305**
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**
1997-01	1 033 (21,1 %)	3 049 (62,2 %)	703 (14,3 %)	115 (2,3 %)	**4 900**
1992-96	1 326 (29,4 %)	2 986 (66,2 %)	86 (1,9 %)	115 (2,5 %)	**4 513**
1987-91	820 (26,6 %)	2 217 (71,8 %)	0 (0 %)	49 (1,6 %)	**3 086**
Total	**4 986 (17,4 %)**	**18 222 (63,6 %)**	**3 093 (10,8 %)**	**2 369 (8,3 %)**	**28 670**

Table 6: Femoral stem

Year	Yes	No	Bone impaction[1]	Missing	Total
2015	69 (5 %)	972 (69,8 %)	11 (0,8 %)	340 (24,4 %)	**1 392**
2014	63 (4,9 %)	880 (68,1 %)	3 (0,2 %)	346 (26,8 %)	**1 292**
2013	83 (6,4 %)	869 (66,6 %)	8 (0,6 %)	345 (26,4 %)	**1 305**
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**
1997-01	1 015 (20,7 %)	2 872 (58,6 %)	898 (18,3 %)	115 (2,3 %)	**4 900**
1992-96	1 234 (27,3 %)	3 035 (67,3 %)	129 (2,9 %)	115 (2,5 %)	**4 513**
1987-91	470 (15,2 %)	2 567 (83,2 %)	0 (0 %)	49 (1,6 %)	**3 086**
Total	**4 407 (15,4 %)**	**18 858 (65,8 %)**	**1 809 (6,3 %)**	**3 596 (12,5 %)**	**28 670**

1 Registration of "Bone impaction" started in 1996.

Bone loss in revisions

Table 7: Acetabular cup

Year	Type I	Type IIA	Type IIB	Type IIC	Type IIIA	Type IIIB	Missing	Total
2015	241	178	106	49	58	20	740	**1 392**
2014	197	171	93	69	41	31	690	**1 292**
2013	246	184	84	77	58	25	631	**1 305**
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 superiort.
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: Femoral stem

Year	Type I	Type II	Type IIIA	Type IIIB	Type IV	Missisng	Total
2015	197	133	86	17	10	949	**1 392**
2014	162	148	67	13	3	899	**1 292**
2013	226	151	66	24	4	834	**1 305**
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 superiort.
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

Surgical approach

Table 9: In primary operations *

Year	Anterior		Anterolateral		Direct lateral		Posterior		Other		Missing information		Total
2015	516	(6,1 %)	1 145	(13,6 %)	2 222	(26,4 %)	4 062	(48,3 %)	3	(0 %)	454	(5,4 %)	**8 402**
2014	337	(4,1 %)	1 056	(13 %)	3 172	(39 %)	3 016	(37,1 %)	18	(0,2 %)	529	(6,5 %)	**8 128**
2013	342	(4,2 %)	1 080	(13,3 %)	3 622	(44,8 %)	2 471	(30,5 %)	25	(0,3 %)	552	(6,8 %)	**8 092**
2012	438	(5,6 %)	1 023	(13 %)	3 916	(49,9 %)	2 191	(27,9 %)	12	(0,2 %)	263	(3,4 %)	**7 843**
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 %)	462	(7,4 %)	4 286	(68,9 %)	1 437	(23,1 %)	5	(0,1 %)	20	(0,3 %)	**6 218**
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**
1997-01	42	(0,2 %)	2 068	(7,4 %)	9 182	(68,5 %)	6 585	(23,5 %)	19	(0,1 %)	89	(0,3 %)	**27 985**
1992-96	93	(0,4 %)	1 374	(5,7 %)	6 534	(68,2 %)	6 079	(25,1 %)	34	(0,1 %)	117	(0,5 %)	**24 231**
1987-91	28	(0,1 %)	1 344	(6,8 %)	2 821	(64,8 %)	5 422	(27,4 %)	4	(0 %)	165	(0,8 %)	**19 784**
Total	**3 302**	**(1,9 %)**	**13 879**	**(8,1 %)**	**04 522**	**(60,7 %)**	**47 074**	**(27,3 %)**	**262**	**(0,2 %)**	**3 087**	**(1,8 %)**	**172 126**

Figure 6: In primary operations *

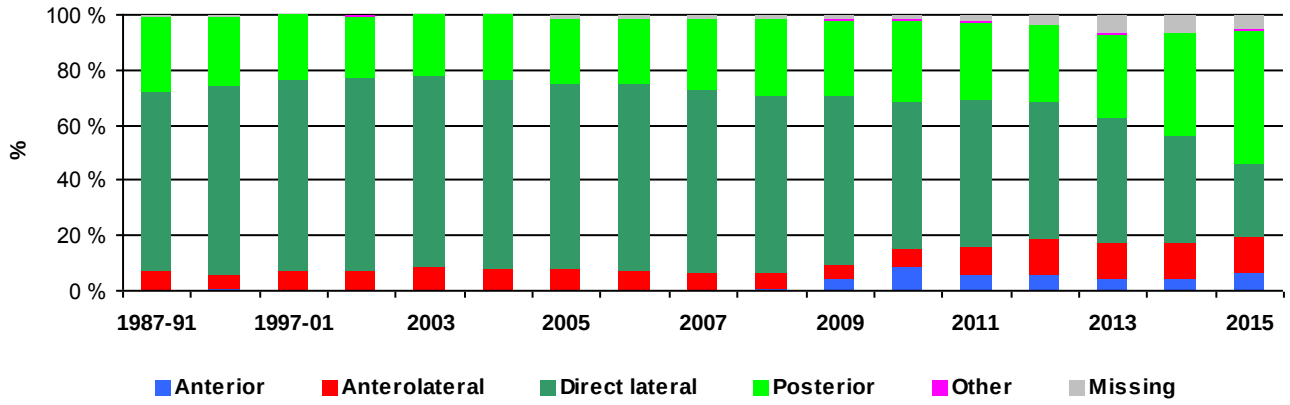


Table 10: Mini invasive surgery in primary surgery

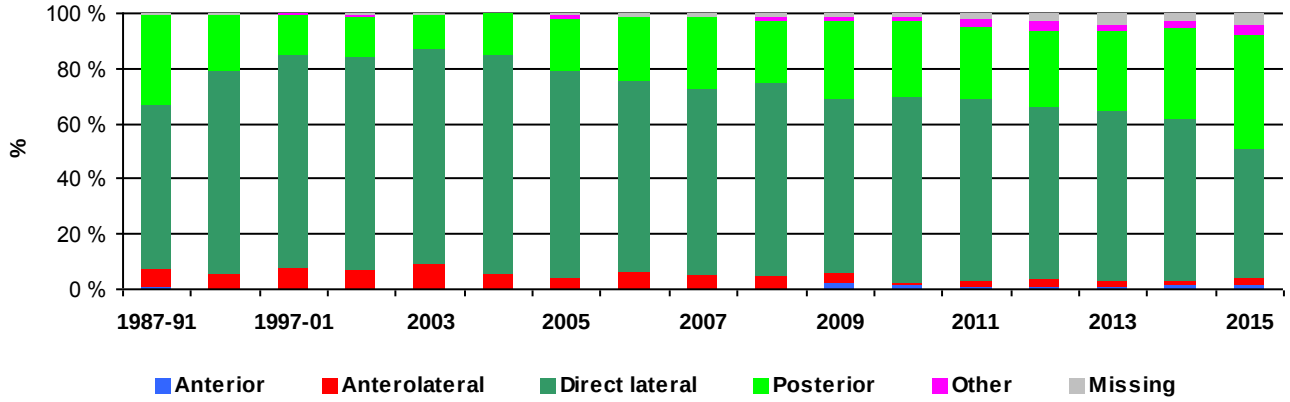
Year	Yes		No		Missing		Total
2015	1 587	(18,9%)	6 507	(77,4%)	308	(3,7%)	**8 402**
2014	1 336	(16,4%)	6 523	(80,3%)	269	(3,3%)	**8 128**
2013	1 407	(17,4%)	6 313	(78,0%)	372	(4,6%)	**8 092**
2012	1 327	(16,9%)	5 858	(74,7%)	658	(8,4%)	**7 843**
2011	1 000	(13,6%)	6 004	(81,6%)	355	(4,8%)	**7 359**
2010	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**

* 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

Table 11: In revisions *

Year	Anterior		Anterolateral		Direct lateral		Posterior		Other		Missing information		Total
2015	24	(1,7 %)	34	(2,4 %)	650	(46,7 %)	572	(41,1 %)	49	(3,5 %)	63	(4,5 %)	**1 392**
2014	16	(1,2 %)	25	(1,9 %)	762	(59 %)	427	(33 %)	23	(1,8 %)	39	(3 %)	**1 292**
2013	7	(0,5 %)	31	(2,4 %)	804	(61,6 %)	378	(29 %)	33	(2,5 %)	52	(4 %)	**1 305**
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**
1997-01	15	(0,3 %)	384	(7,8 %)	3 742	(76,4 %)	678	(13,8 %)	39	(0,8 %)	42	(0,9 %)	**4 900**
1992-96	6	(0,1 %)	259	(5,7 %)	3 295	(73 %)	906	(20,1 %)	20	(0,4 %)	27	(0,6 %)	**4 513**
1987-91	12	(0,4 %)	204	(6,6 %)	1 850	(59,9 %)	1 000	(32,4 %)	2	(0,1 %)	18	(0,6 %)	**3 086**
Total	**151**	**(0,5 %)**	**1 474**	**(5,1 %)**	**19 557**	**(68,2 %)**	**6 676**	**(23,3 %)**	**316**	**(1,1 %)**	**496**	**(1,7 %)**	**28 670**

Figure 7: In revisions *



* 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:

	Primary operations						Revisions						
Year	No		Yes		Missing		No		Yes		Missing		Total
2015	7 562	(90 %)	29	(0,3 %)	811	(9,7 %)	1 190	(85,5 %)	95	(6,8 %)	107	(7,7 %)	**9 794**
2014	7 390	(90,9 %)	21	(0,3 %)	717	(8,8 %)	1 112	(86,1 %)	66	(5,1 %)	114	(8,8 %)	**9 420**
2013	7 222	(89,2 %)	58	(0,7 %)	812	(10 %)	1 144	(87,7 %)	65	(5 %)	96	(7,4 %)	**9 397**
2012	7 040	(89,8 %)	37	(0,5 %)	766	(9,8 %)	1 073	(82,2 %)	110	(8,4 %)	123	(9,4 %)	**9 149**
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	5 998	(96,5 %)	130	(2,1 %)	90	(1,4 %)	808	(86 %)	99	(10,5 %)	33	(3,5 %)	**7 158**
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**
1997-01	26 707	(95,4 %)	1 038	(3,7 %)	240	(0,9 %)	4 214	(86 %)	604	(12,3 %)	82	(1,7 %)	**32 885**
1992-96	21 512	(88,8 %)	2 520	(10,4 %)	199	(0,8 %)	3 869	(85,7 %)	588	(13 %)	56	(1,2 %)	**28 744**
1987-91	15 171	(76,7 %)	4 356	(22 %)	257	(1,3 %)	2 278	(73,8 %)	770	(25 %)	38	(1,2 %)	**22 870**
Total	**155 154**	**(90,1 %)**	**9 055**	**(5,3 %)**	**7 917**	**(4,6 %)**	**24 031**	**(83,8 %)**	**3 371**	**(11,8 %)**	**1 268**	**(4,4 %)**	**200 796**

Antibiotic prophylaxis

Table 13:

	Primary operations						Revisions						
Year	No		Yes		Missing		No		Yes		Missing		Total
2015	0	(0 %)	8 363	(99,5 %)	39	(0,5 %)	9	(0,6 %)	1 364	(98 %)	19	(1,4 %)	**9 794**
2014	1	(0 %)	8 089	(99,5 %)	38	(0,5 %)	8	(0,6 %)	1 276	(98,8 %)	8	(0,6 %)	**9 420**
2013	2	(0 %)	8 053	(99,5 %)	37	(0,5 %)	7	(0,5 %)	1 280	(98,1 %)	18	(1,4 %)	**9 397**
2012	2	(0 %)	7 807	(99,5 %)	34	(0,4 %)	11	(0,8 %)	1 282	(98,2 %)	13	(1 %)	**9 149**
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 %)	6 217	(100 %)	0	(0 %)	6	(0,6 %)	929	(98,8 %)	5	(0,5 %)	**7 158**
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**
1997-01	43	(0,2 %)	27 937	(99,8 %)	5	(0 %)	24	(0,5 %)	4 870	(99,4 %)	6	(0,1 %)	**32 885**
1992-96	209	(0,9 %)	24 012	(99,1 %)	10	(0 %)	53	(1,2 %)	4 451	(98,6 %)	9	(0,2 %)	**28 744**
1987-91	1 599	(8,1 %)	18 148	(91,7 %)	37	(0,2 %)	136	(4,4 %)	2 935	(95,1 %)	15	(0,5 %)	**22 870**
Total	**2 036**	**(1,2 %)**	**169 825**	**(98,7 %)**	**265**	**(0,2 %)**	**511**	**(1,8 %)**	**28 021**	**(97,7 %)**	**138**	**(0,5 %)**	**200 796**

Fixation in primary operations

Figure 8a: Patients under 65 years old

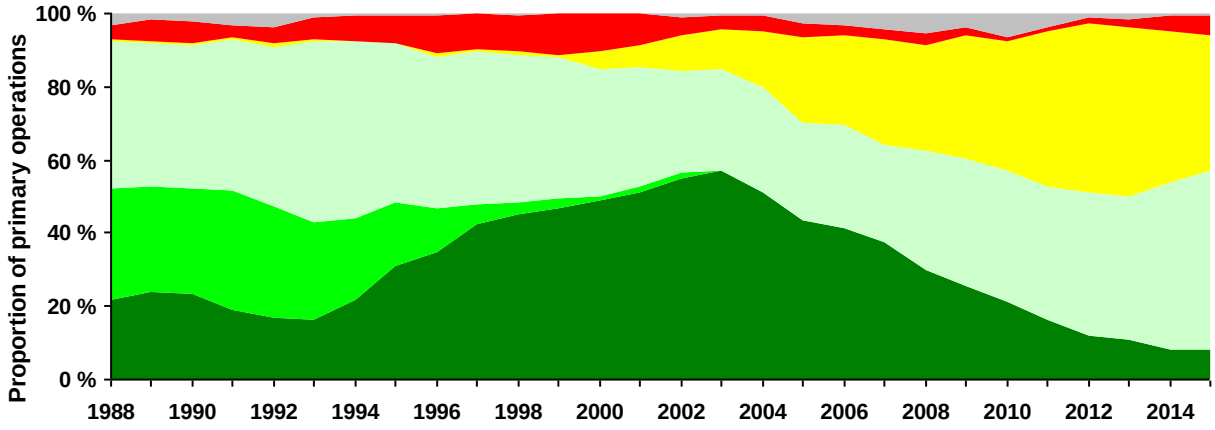


Figure 8b: Patients 65 years or older and under 75 years old

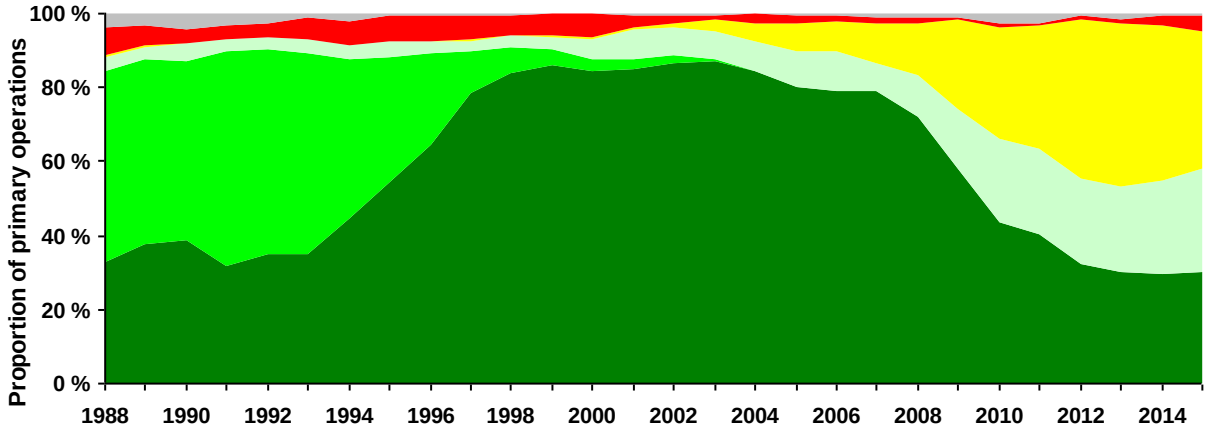
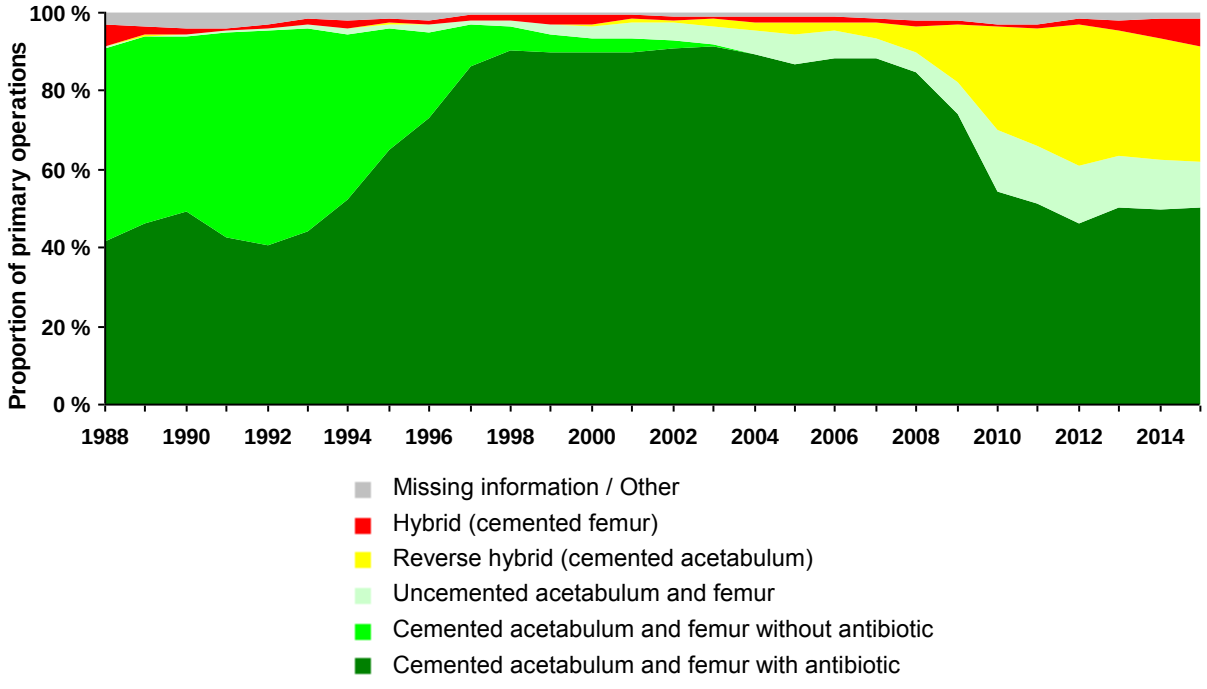


Figure 8c: Patients over 75 years old



Fixation in revisions

Figure 9: Acetabular cup - All patients

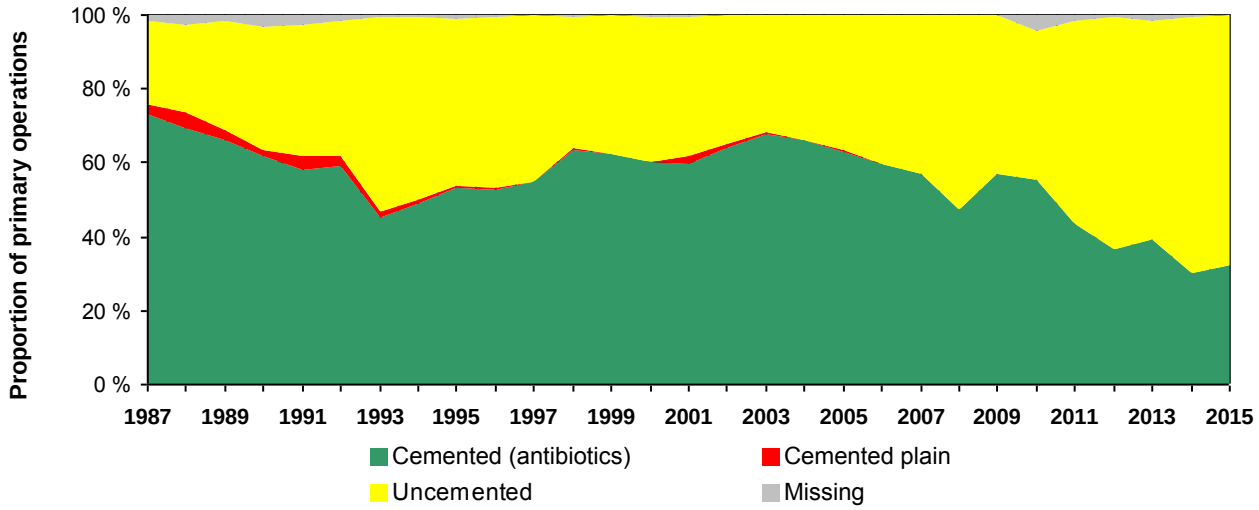
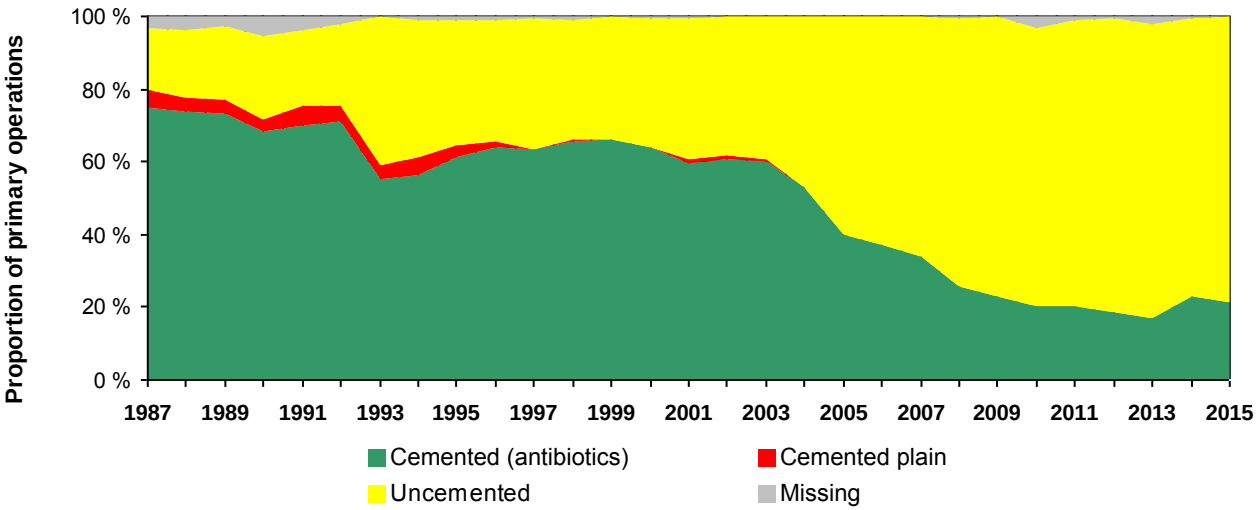


Figure 10: Femoral stem - All patients



Type of fixation and bone transplantation in revisions

Table 14: Acetabular cup

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2015	21%	9%	63%	8%	302	4%	12%	68%	15%	625
2014	26%	10%	56%	8%	259	4%	14%	67%	14%	592
2013	31%	7%	50%	12%	347	4%	11%	71%	13%	521
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
2002-07	36%	15%	45%	3%	2 562	5%	32%	58%	5%	1 491
1997-01	30%	21%	49%	0%	1 961	9%	47%	44%	1%	1 249
1992-96	4%	29%	65%	2%	1 611	2%	60%	37%	2%	1 403
1987-91	0%	22%	77%	1%	1 522	0%	67%	32%	1%	679
Total	**25%**	**17%**	**54%**	**3%**	**10 551**	**5%**	**34%**	**55%**	**6%**	**8 671**

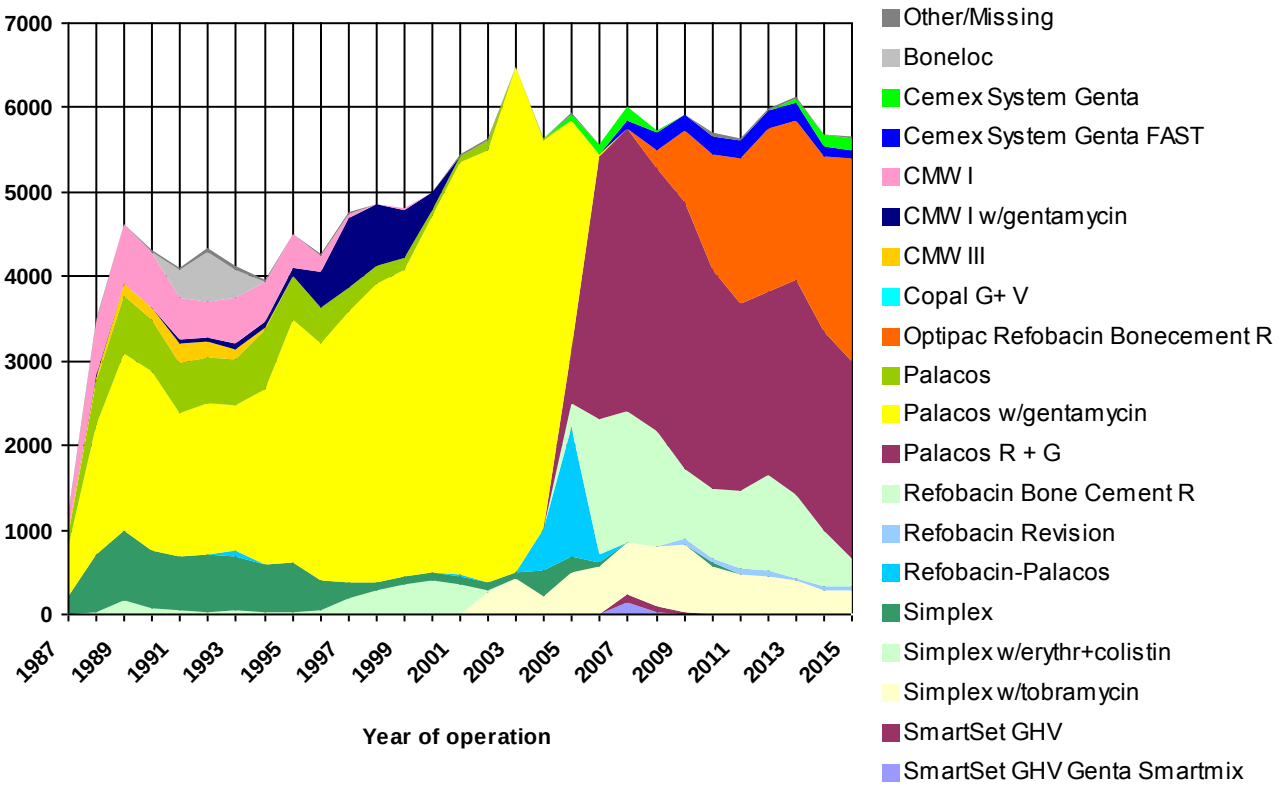
Table 15: Femoral stem

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2015	2%	4%	81%	13%	116	2%	9%	76%	14%	425
2014	3%	3%	63%	32%	114	0%	13%	74%	14%	376
2013	6%	4%	62%	28%	94	0%	14%	71%	14%	455
2012	13%	4%	60%	23%	100	1%	15%	71%	13%	428
2011	20%	4%	56%	20%	100	2%	22%	65%	11%	388
2010	29%	5%	58%	8%	106	2%	24%	66%	8%	398
2009	28%	5%	50%	17%	113	1%	25%	64%	10%	375
2008	40%	3%	49%	8%	126	4%	30%	59%	8%	362
2002-07	33%	10%	55%	3%	1 364	5%	39%	52%	5%	1 465
1997-01	36%	16%	48%	1%	1 931	17%	53%	29%	1%	1 060
1992-96	5%	22%	71%	2%	2 132	2%	65%	31%	2%	1 121
1987-91	0%	6%	93%	2%	1 924	0%	65%	34%	1%	518
Total	**17%**	**13%**	**67%**	**3%**	**8 220**	**4%**	**38%**	**51%**	**6%**	**7 371**

Registration of "Bone impaction" started in 1996

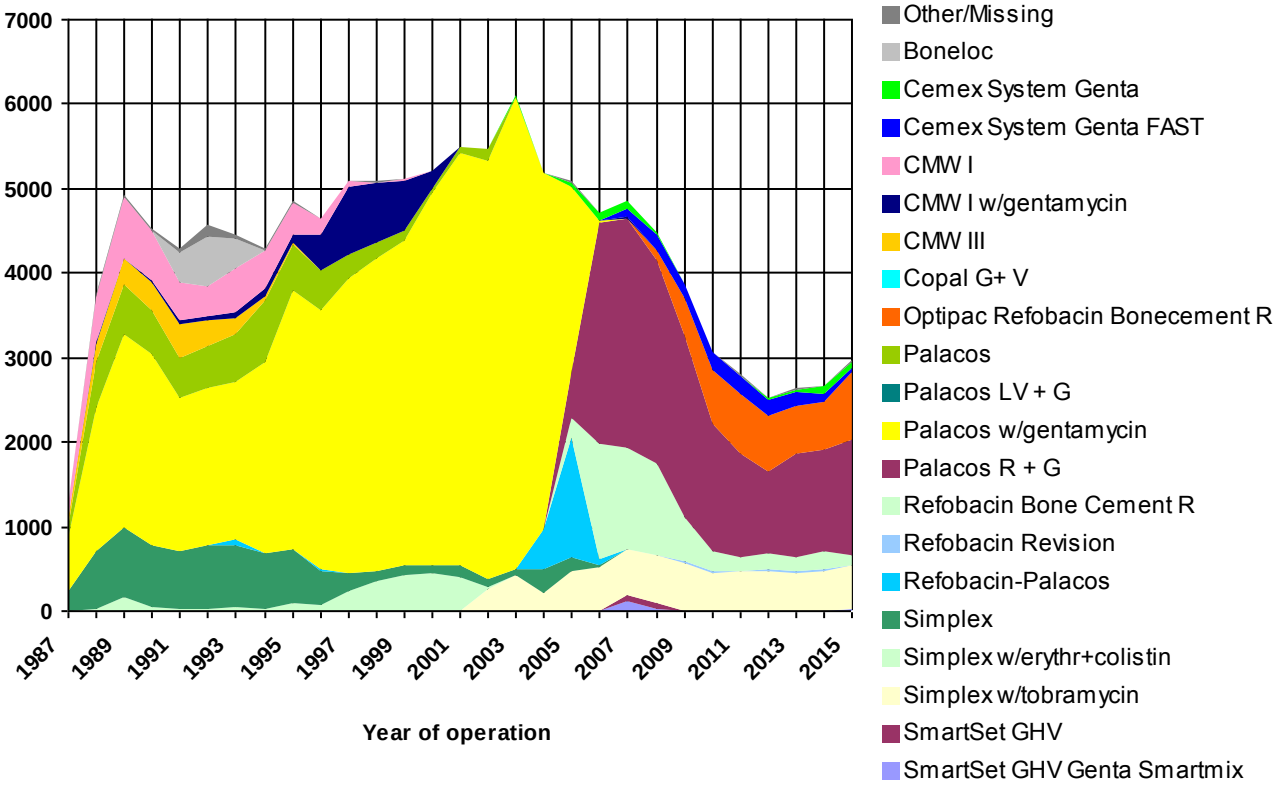
Cements used in the acetabulum

Figure 11: In primary- and revision surgeries



Cements used in the femur

Figure 12: In primary- and revision surgeries



Cemented primary prostheses

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

Cup	Stem	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
CHARNLEY	CHARNLEY	39109	368	345	223	115	112	65	39		**40376**
EXETER	EXETER	10919	689	577	496	155	80	25			**12941**
REFLECTION CEM. ALL POLY	SPECTRON-EF	7945	876	546	134	112	85	33	1		**9732**
TITAN	TITAN	6574	222	152	7						**6955**
IP	LUBINUS SP II	1875	505	569	627	524	471	415	279	304	**5569**
EXETER X3 RIMFIT	EXETER				54	604	982	1171	1156	1346	**5313**
CONTEMPORARY	EXETER	1616	695	701	734	627	188	104	54	14	**4733**
SPECTRON	ITH	2405									**2405**
MARATHON	CHARNLEY MODULAR		8	182	323	282	202	196	225	134	**1552**
KRONOS	TITAN	1348	65	54	16						**1483**
ELITE	TITAN	1037	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	811	2								**813**
ELITE	EXETER	530	147	69	31		1				**778**
ZCA	CPT	756									**756**
CHARNLEY	CHARNLEY MODULAR	243	285	129		1	1		1		**660**
IP	LUBINUS	587									**587**
ELITE	ELITE	577		1	1						**579**
CHARNLEY	EXETER	564	7								**571**
LUBINUS	LUBINUS SP II	13						125	167	250	**555**
TITAN	FJORD	523									**523**
ELITE	CHARNLEY MODULAR	74	120	111	53	57	48	30	21		**514**
SPECTRON	SP I	432									**432**
MODULAR HIP SYSTEM	BIO-FIT	430									**430**
MARATHON	EXETER		4	18	17	18	69	82	90	118	**416**
SPECTRON	TITAN	411									**411**
CHARNLEY	C-STEM	378									**378**
CHARNLEY	ELITE	375									**375**
OPERA	SPECTRON-EF	353	2	1							**356**
ELITE	MS-30	330	1								**331**
PEARL	TITAN	285									**285**
MODULAR HIP SYSTEM	ITH	277									**277**
AVANTAGE	EXETER	3		18	29	37	41	47	61	35	**271**
SPECTRON	BIO-FIT	226									**226**
IP	SP I	213									**213**
LMT	LMT	191									**191**
ELITE	CPT	128	13	24	16	1					**182**
ZCA	CPS-PLUS	168									**168**
MÜLLER TYPE	MÜLLER TYPE	168									**168**
PE-PLUS	CPS-PLUS	159		5							**164**
MARATHON	LUBINUS SP II			1	11	8	11	20	43	64	**158**
ELITE	C-STEM	120	1								**121**
MODULAR HIP SYSTEM	LUBINUS SP II	120									**120**

Uncemented primary prostheses

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

Cup	Stem	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
REFLECTION UNCEMENTED	CORAIL	350	144	209	520	529	674	746	823	541	**4536**
IGLOO	FILLER	1691	166	144	208	228	249	210	171	123	**3190**
TROPIC	CORAIL	2659									**2659**
TRILOGY	CORAIL	711	155	306	182	128	182	216	273	243	**2396**
PINNACLE	CORAIL	118	119	91	117	296	456	357	319	387	**2260**
ATOLL	CORAIL	1280									**1280**
DURALOC	CORAIL	391	28	84	188	239	72	62			**1064**
BICON-PLUS	ZWEYMÜLLER	511	59	16							**586**
REFLECTION UNCEMENTED	SECURFIT		33	83	128	146	91	32			**513**
TRILOGY	SCP/UNIQUE	496	6	3	3			1			**509**
Continuum Acetabular System	CORAIL								187	303	**490**
TRILOGY	HACTIV	266	64	57	38	4	12	7			**448**
GEMINI	PROFILE	407									**407**
BICON-PLUS	HACTIV	386									**386**
DURALOC	PROFILE	332									**332**
R3	POLARSTEM				21	68	56	79	49	47	**320**
REFLECTION UNCEMENTED	OMNIFIT	51	102	72	47	22	6				**300**
TRIDENT	ACCOLADE II							42	75	173	**290**
TRIDENT	CORAIL	1	12	8	24	3	17	26	71	114	**276**
TRILOGY	FILLER	44	41	33	45	40	38	18		1	**260**
DURALOC	SCP/UNIQUE	254									**254**
ENDLER	ZWEYMÜLLER	247									**247**
EUROPEAN CUP SYSTEM	TAPERLOC	240									**240**
PLASMACUP	BICONTACT	232									**232**
REFLECTION UNCEMENTED	SCP/UNIQUE	66	53	36	13	6	1	14	25	13	**227**
LMT	TAPERLOC	224									**224**
TRIDENT	ABG II				6	22	29	52	81	22	**212**
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**
ABG II	ABG II	155									**155**
COXA	FEMORA	155									**155**
PARHOFER	PARHOFER	152									**152**
BICON-PLUS	CORAIL	134	3	9		2			1	1	**150**
REFLECTION UNCEMENTED	PROFEMUR GLADIATOR				3	37	60	37	1		**138**
TRILOGY	OMNIFIT	72	30	23	9						**134**
REFLECTION UNCEMENTED	HACTIV	1						9	3	117	**130**
R3	CORAIL					1	1			121	**123**
R3	FILLER								30	88	**118**
TITAN	CORAIL	116									**116**
AVANTAGE	CORAIL	11	17	25	19	12	16	4	2	4	**110**
REFLECTION UNCEMENTED	BICONTACT	101									**101**
TRIDENT	POLARSTEM								43	58	**101**

Hybrid primary prostheses

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

Cup (uncemented)	Stem (cemented)	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
TRILOGY	EXETER	286	21	20	29	53	44	88	201	231	**973**
TROPIC	TITAN	869									**869**
MORSCHER	MS-30	569	43	30	25						**667**
TRILOGY	CHARNLEY	382									**382**
ENDLER	TITAN	336									**336**
REFLECTION UNCEMENTED	LUBINUS SP II	3	1			1	2	32	62	78	**179**
DURALOC	CHARNLEY	153									**153**
REFLECTION UNCEMENTED	BIO-FIT	142									**142**
REFLECTION UNCEMENTED	SPECTRON-EF	107	2	11			1	1			**122**
TRIDENT	EXETER	47	22	17	1	1		1	10	22	**121**
ATOLL	TITAN	105									**105**
IP	SP I	101									**101**
TRILOGY	CPT	88									**88**
AVANTAGE	EXETER		17	2	2	8	20	7	10	15	**81**
HG II	ANATOMIC CC	80									**80**
GEMINI	CHARNLEY	77									**77**
TI-FIT	BIO-FIT	53									**53**
TROPIC	EXETER	47									**47**
AVANTAGE	SPECTRON-EF	26	16	3							**45**
R3	LUBINUS SP II									41	**41**
TRILOGY	CENTRALIGN	41									**41**

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

Cup (cemented)	Stem (uncemened)	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
MARATHON	CORAIL		7	390	1127	1759	2734	2936	2767	2600	**14320**
ELITE	CORAIL	1088	363	334	249	227	205	86	70	3	**2625**
REFLECTION CEM. ALL POLY	CORAIL	470	204	268	193	15	25	21	22	30	**1248**
TITAN	CORAIL	454	114	181	132	48	1				**930**
CONTEMPORARY	CORAIL	6	45	183	202	236	6	2	1		**681**
KRONOS	CORAIL	250	157	121	98	7					**633**
REFLECTION CEM. ALL POLY	HACTIV	147	78	63	26	49	91	20	1		**475**
EXETER X3 RIMFIT	CORAIL	1			2	59	42	70	89	46	**309**
REFLECTION CEM. ALL POLY	FILLER	77	41	24	10	12	23	26	19	1	**233**
EXETER X3 RIMFIT	ACCOLADE II							59	49	119	**227**
IP	CORAIL	35	40	47	43	16	4	11	3	3	**202**
EXETER	CORAIL	72	28	45	26		2				**173**
EXETER	ABG II	172									**172**
REFLECTION CEM. ALL POLY	TAPERLOC	155									**155**
EXETER X3 RIMFIT	ABG II				10	69	60	8			**147**
CHARNLEY	CORAIL	89	13	12	2			1			**117**
AVANTAGE	CORAIL	6		5	15	23	11	15	19	17	**111**
ELITE	SCP/UNIQUE	70	10	8	2	3	2	2	1		**98**
EXETER X3 RIMFIT	FILLER					1		22	35	32	**90**
OPERA	CORAIL	79	5	5							**89**

Acetabular cups in primary operations

Table 20: (The 45 most common)

Cup	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
CHARNLEY	41475	679	489	230	117	114	66	40		**43210**
MARATHON		32	659	1556	2139	3084	3316	3186	3028	**17000**
REFLECTION CEM. ALL POLY	10956	1215	926	387	193	234	108	53	36	**14108**
EXETER	11388	718	625	522	156	84	26	1		**13520**
TITAN	7924	342	340	161	48	1				**8816**
ELITE	5228	837	615	391	304	261	118	94	4	**7852**
REFLECTION UNCEMENTED	1161	376	511	907	767	848	933	970	798	**7271**
IP	2858	552	634	715	558	488	441	286	313	**6845**
EXETER X3 RIMFIT	1			71	745	1103	1367	1359	1560	**6206**
TRILOGY	2913	347	455	340	243	292	349	509	510	**5958**
CONTEMPORARY	1649	748	891	957	889	195	110	56	14	**5509**
TROPIC	3823									**3823**
SPECTRON	3652									**3652**
IGLOO	1907	171	145	211	230	249	211	174	123	**3421**
PINNACLE	144	133	110	158	326	468	385	330	397	**2451**
KRONOS	1650	233	184	119	7					**2193**
DURALOC	1284	28	85	207	245	72	62			**1983**
ATOLL	1491									**1491**
TRIDENT	65	57	40	36	33	53	161	345	442	**1232**
BICON-PLUS	1121	63	25		2			1	1	**1213**
ZCA	1037	10	9	6						**1062**
AVANTAGE	175	65	97	104	109	119	102	118	93	**982**
MODULAR HIP SYSTEM	878									**878**
MORSCHER	687	65	48	37	6					**843**
WEBER ALLO PRO	828	2								**830**
ENDLER	662									**662**
R3				22	75	57	79	81	305	**619**
LUBINUS	31					1	125	168	251	**576**
BIRMINGHAM HIP RESURFACING	169	105	103	78	42	21	2			**520**
GEMINI	510									**510**
Continuum Acetabular System								191	319	**510**
OPERA	444	7	6							**457**
EUROPEAN CUP SYSTEM	332									**332**
POLARCUP			3	5	46	58	79	64	61	**316**
TI-FIT	312									**312**
PEARL	287									**287**
PLASMACUP	283									**283**
LMT (Uncemented)	275									**275**
HARRIS/GALANTE	252									**252**
PE-PLUS	237	4	6							**247**
MÜLLER TYPE	244									**244**
ABG II	236									**236**
COXA	220									**220**
LMT (Cemented)	208									**208**
EXCEED ABT RINGLOC-X			43	7	7	8	20	39	66	**190**

Acetabular cups in revisions

Table 21: (The 45 most common)

Cup	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
CHARNLEY	2782	23	25	17	9	5	3			**2864**
TROPIC	1882	2	1							**1885**
ELITE	1291	118	66	55	33	19	12	6		**1600**
TRILOGY	889	91	94	83	70	50	51	56	64	**1448**
AVANTAGE	424	135	151	169	149	126	105	86	86	**1431**
EXETER	871	38	18	12	1	3				**943**
REFLECTION CEM. ALL POLY	731	67	54	32	11	7	4	3	4	**913**
PINNACLE	152	70	83	93	86	97	82	117	96	**876**
TRABECULAR METAL	8	14	36	50	97	118	161	214	150	**848**
MARATHON		6	63	135	130	164	138	65	94	**795**
POLARCUP			12	41	50	84	121	116	135	**559**
REFLECTION UNCEMENTED	57	16	44	48	62	78	94	83	74	**556**
TITAN	470	20	26	11						**527**
IGLOO	321	39	22	22	28	24	17	15	15	**503**
ATOLL	396									**396**
TRIDENT	27	5	11	9	22	38	40	44	93	**289**
IP	198	9	16	10	7	10	4	3	3	**260**
CONTEMPORARY	48	34	57	42	45	9	3			**238**
KRONOS	190	16	13	6						**225**
CHRISTIANSEN	197									**197**
SPECTRON	189									**189**
DURALOC	75		11	8	16	10	5	11	9	**145**
EXETER X3 RIMFIT				2	23	24	30	25	29	**133**
OPERA	84	10	7							**101**
HARRIS/GALANTE	99									**99**
ZCA	95		1							**96**
MODULAR HIP SYSTEM	95									**95**
EUROPEAN CUP SYSTEM	73									**73**
CAPTIV	70	1								**71**
LMT (Uncemented)	67									**67**
ENDLER	66									**66**
Continuum Acetabular System								13	51	**64**
BICON-PLUS	46		2		1	2	3		2	**56**
HG II	53									**53**
MORSCHER	32	8	4	4	3					**51**
GEMINI	47									**47**
SECURFIT	45									**45**
OCTOPUS	35	2	3							**40**
R3						7	6	6	20	**39**
REGENEREX RINGLOC		2	6	9	13	7	2			**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 stems in primary operations

Table 22: (The 45 most common)

Stem	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
CHARNLEY	41245	369	359	233	117	116	67	43		**42549**
CORAIL	8843	1506	2429	3258	3685	4492	4633	4714	4461	**38021**
EXETER	14228	1614	1441	1455	1558	1460	1567	1648	1839	**26810**
TITAN	11444	449	256	36	3					**12188**
SPECTRON-EF	8771	903	574	145	119	92	37	10	4	**10655**
LUBINUS SP II	2129	515	590	658	557	519	621	584	773	**6946**
FILLER	1906	255	212	295	295	321	373	329	256	**4242**
ITH	3723									**3723**
CHARNLEY MODULAR	325	422	435	394	352	257	237	261	153	**2836**
BIO-FIT	1993									**1993**
MS-30	1764	50	35	27	1				17	**1894**
HACTIV	865	149	126	79	58	108	38	10	150	**1583**
SCP/UNIQUE	1017	96	85	47	23	15	33	36	27	**1379**
CPT	1046	13	30	21	2		1	2	1	**1116**
ZWEYMÜLLER	901	102	94	5						**1102**
ELITE	1019		4	1	2	3	1			**1030**
PROFILE	890									**890**
OMNIFIT	501	172	113	70	28	6				**890**
ABG II	399		6	62	105	94	78	81	23	**848**
SP I	779		1							**780**
TAPERLOC (Uncemented)	768		3							**771**
FJORD	651		1							**652**
LUBINUS	624									**624**
C-STEM	504	8	19	9			1	2	75	**618**
ACCOLADE II							110	137	313	**560**
SECURFIT		35	91	136	167	94	32			**555**
POLARSTEM				23	101	83	105	102	106	**520**
CPS-PLUS	481	1	7	7						**496**
TAPERLOC (Cemented)	456									**456**
BICONTACT	443									**443**
ABG I	304									**304**
TI-FIT	221									**221**
MÜLLER TYPE	217									**217**
KAR	99	13	11	14	8	19	29	8	1	**202**
FEMORA	182									**182**
SL-PLUS MIA			12	165						**177**
HARRIS/GALANTE	169									**169**
PROFEMUR GLADIATOR				4	48	71	38	4		**165**
BI-METRIC	58	2	35	33	15	5	2	3	6	**159**
PARHOFER	159									**159**
KAREY	136									**136**
MÜLLER TYPE V	132									**132**
ECHELON	113	2	4	2						**121**
ANATOMIC CC	113									**113**
CENTRALIGN	111									**111**

Femoral stems in revisions

Table 23: (The 45 most common)

Stem	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
CHARNLEY	2941	8	11	12	6	1	1	2	1	**2983**
KAR	1626	165	175	112	116	114	135	44	2	**2489**
EXETER	1434	72	61	64	70	72	61	62	76	**1972**
CORAIL	1175	27	43	70	84	86	77	117	187	**1866**
TITAN	527	4	5	1	1					**538**
CPT	447	7	7	7	6	7	2	5	6	**494**
FJORD	474	1	1							**476**
RESTORATION	59	36	42	42	39	57	67	63	70	**475**
SPECTRON-EF	289	23	16	13	14	4	8	3	3	**373**
FILLER	236	27	17	19	18	13	13	16	10	**369**
ELITE	342	4	3	2			1	1		**353**
TTHR	31	8	28	40	61	71	52	36	19	**346**
REEF	228	37	30	21	3	5	2			**326**
LUBINUS SP II	156	2	3	3	2	9	8	30	15	**228**
ANATOMIC BR	192									**192**
ITH	192									**192**
BIO-FIT	167									**167**
MP RECONSTRUCTION	32	2	2	12	21	24	26	18	17	**154**
BI-METRIC	48	7	10	21	15	16	16	1		**134**
HACTIV	66	15	7	14		4	4		13	**123**
TAPERLOC (Uncemented)	115									**115**
REACTIV	4	23	9	9	6	3	6	19	13	**92**
REVITAN				1		7	27	20	35	**90**
ZWEYMÜLLER	82			1						**83**
Profemur	1		4	26	16	11	14	5		**77**
ECHELON	49	8	5	5	1					**68**
SP I	66									**66**
ARCOS					1	3	11	17	27	**59**
SCAN HIP	59									**59**
LUBINUS	51									**51**
HARRIS/GALANTE	44									**44**
FEMORA	43									**43**
PARHOFER	43									**43**
AURA	12	8	7	11						**38**
PROFEMUR GLADIATOR				1	6	19	9	3		**38**
CHARNLEY MODULAR	11	4	3	4	3	3	3	3	3	**37**
RECLAIM						1	13	9	12	**35**
MS-30	30		3	1						**34**
MÜLLER TYPE	34									**34**
LANDOS (Reconstruction)	33									**33**
OMNIFIT	29	2			1					**32**
Securus							6	15	11	**32**
CPS-PLUS	25	1								**26**
CENTRALIGN	22									**22**
TAPERLOC (Cemented)	22									**22**

Monoblock and modular femoral head

Table 24: Primary operations and revisions - Cemented stem

Caput	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
Monoblock	46447	382	368	236	113	116	67	41	1	**47771**
Modular	52383	4086	3493	2823	2676	2409	2565	2628	2959	**76022**
Missing	141	1	1	6	13	1	3	3	3	**172**
Total	**98971**	**4469**	**3862**	**3065**	**2802**	**2526**	**2635**	**2672**	**2963**	**123965**

Table 25: Primary operations and revisions - Uncemented stem

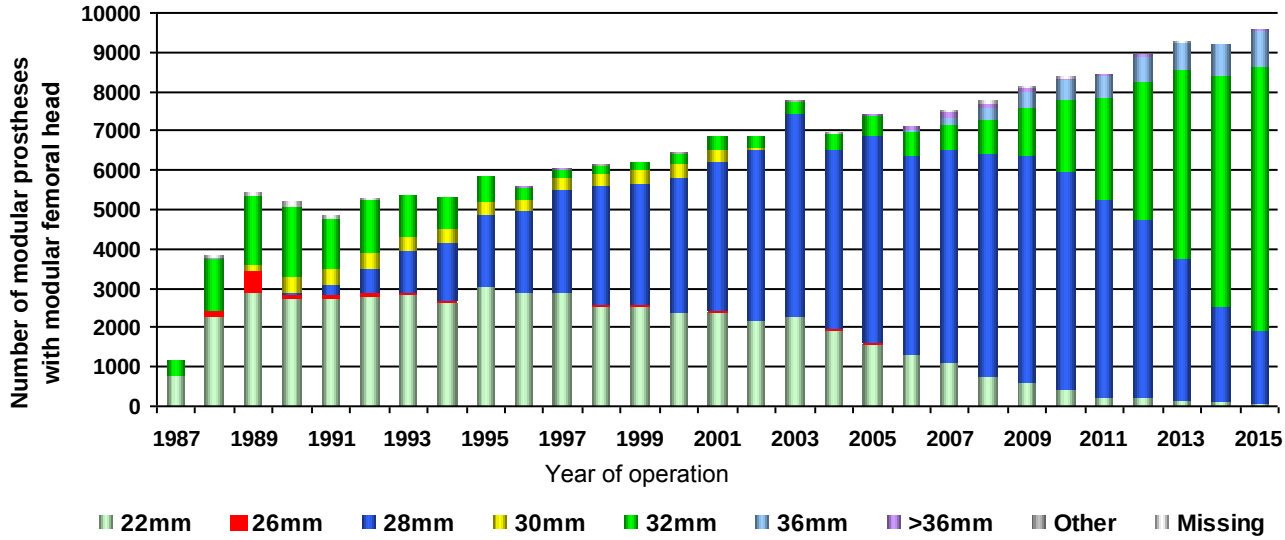
Caput	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
Monoblock	66		2	3			2		1	**74**
Modular	22434	2710	3607	4587	4913	5789	5949	5906	5937	**61832**
Missing	88	6	1	10	3	4	3	6	3	**124**
Total	**22588**	**2716**	**3610**	**4600**	**4916**	**5793**	**5954**	**5912**	**5941**	**62030**

Femoral head 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
2015	66		1 869		6 697	935	5	3	31	**9 606**
2014	97		2 427	1	5 842	801	5	5	39	**9 217**
2013	154	2	3 567	1	4 835	673	3	7	36	**9 278**
2012	213		4 517	3	3 500	671	25	8	27	**8 964**
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	26	4 546	7	393		6	3	27	**6 951**
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	**51 040**	**1 364**	**87 412**	**4 416**	**42 141**	**4 958**	**767**	**93**	**1 081**	**193 272**

Figure 13: In primary operations and revisions



Femoral head prostheses

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

Prosthesis	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
EXETER	15928	1777	1588	1471	1140	867	743	651	788	**24953**
LANDOS	17703	917	1199	1157	671	72	7	15		**21741**
UNIVERSAL	14766	975	658	198	176	149	108	50	38	**17118**
CERAMTEC	1360	375	688	1013	1797	2688	2577	2439	2193	**15130**
CORAIL	2	5	152	650	1253	2023	2400	2708	2874	**12067**
FJORD	8396	998	1028	768	510	62	6	2	3	**11773**
SP II	2317	530	617	695	605	566	680	643	817	**7470**
LFIT ANATOMIC	8	25	56	225	677	877	1242	1427	1634	**6171**
ELITE	2232	387	355	296	191	158	194	184	136	**4133**
IGLOO	1509	196	173	228	252	254	207	207	168	**3194**
PROTEK	1852	52	44	32	4	1				**1985**
SCANOS	997	193	185	124	63	102	28	30	211	**1933**
CPT	1507	27	41	32	11	7	9	2	1	**1637**
PLUS ENDO	1107	132	142	103	38	29	34	30	13	**1628**
PINNACLE	2	12	83	187	150	306	340	248	157	**1485**
PROFILE	1309	95	1	9	14	1				**1429**
TAPERLOC	1088									**1088**
BIOTECHNI	767	57	40	57	56	44	29	4	2	**1056**
OXINIUM	240	123	207	172	73	68	68	47	5	**1003**
HIPBALL PREMIUM	14	21	23	75	143	188	235	164	130	**993**
MALLORY-HEAD	545	19	55	60	43	34	42	65	106	**969**
HARRIS/GALANTE	838	6	4	6	9	7	6		6	**882**
OMNIFIT	532	99	73	65	36	19	20	1	2	**847**
" OSTEONICS Heads" , C-taper head	58	139	154	168	182	94	20			**815**
ZIRCONIA	762	1								**763**
BICONTACT	478	4	1		3	1	3	6	2	**498**
BIRMINGHAM HIP RESURFACING	162	92	77	73	39	20	2			**465**
ABG I	359	2	8	11	9	7	3	7	6	**412**
SURGIVAL	372									**372**
ZWEYMÜLLER	342									**342**
BIOBALL	4	5	19	25	49	66	42	62	61	**333**
VERSYS	22	8	12	21	45	41	38	29	77	**293**
CERAMIC OSTEO	220									**220**
FEMORA	213									**213**
PARHOFER	181		1	1			1			**184**
STRYKER Heads		3	2	18	44	22	15	23	41	**168**
FURLONG							7	71	80	**158**
TI-FIT	129	2	7	3						**141**
SMITH & NEPHEW CERAMIC HEADS			2	126						**128**
CHRISTIANSEN	126									**126**
PCA	99	1	1	3	2	1	1		2	**110**
BIOLOX DELTA						16	42	5	2	**65**
BIRMINGHAM HIP MODULAR	7	13	25	9	3	1				**58**
ABG II	48									**48**
ASR MODULAR	28	14	3							**45**
LINK Rippensystem	38									**38**
HASTINGS HIP	29									**29**
AURA II	16	5	2	4		2				**29**
WEBER	28									**28**
MUTARS	12		2			1	1	1	10	**27**

Dual Mobility articulation

Table 28 In primary operation

Prosthesis	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
AVANTAGE	168	65	95	100	109	118	100	109	84	**948**
POLARCUP			3	5	46	58	76	57	53	**298**
TRIDENT						2	6	1	4	**13**
Restoration ADM					1	1	2	1		**5**
GYROS	2									**2**

Table 29 In revisions

Prosthesis	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
AVANTAGE	576	199	244	269	258	245	205	198	172	**2366**
POLARCUP			15	46	96	140	198	176	195	**866**
Restoration ADM					2	11	10	7	12	**42**
TRIDENT						6	9	8	12	**35**
GYROS	12									**12**

ASA classification

Figure 14: Primary operations

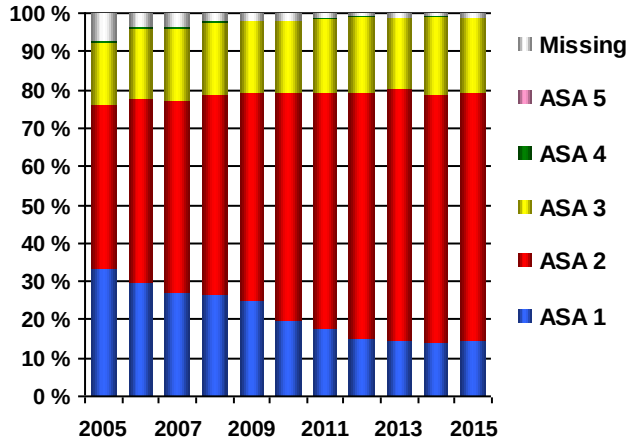
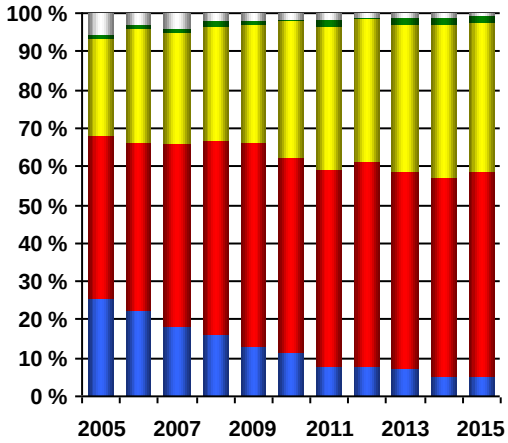


Figure 15: Revisions



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
2015	1058 (13%)	6244 (74%)	954 (11%)	56 (1%)	90 (1%)	**8402**
2014	1113 (14%)	5946 (73%)	962 (12%)	31 (0%)	76 (1%)	**8128**
2013	1340 (17%)	5632 (70%)	1047 (13%)	10 (0%)	63 (1%)	**8092**
2012	1579 (20%)	4851 (62%)	1322 (17%)	9 (0%)	82 (1%)	**7843**
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
2015	217 (16%)	1010 (73%)	131 (9%)	10 (1%)	24 (2%)	**1392**
2014	225 (17%)	921 (71%)	117 (9%)	9 (1%)	20 (2%)	**1292**
2013	221 (17%)	901 (69%)	151 (12%)	6 (0%)	26 (2%)	**1305**
2012	240 (18%)	815 (62%)	215 (16%)	10 (1%)	26 (2%)	**1306**
2011	317 (25%)	755 (59%)	184 (14%)	8 (1%)	20 (2%)	**1284**
2010	438 (35%)	683 (54%)	125 (10%)	2 (0%)	10 (1%)	**1258**
2009	421 (35%)	650 (54%)	126 (10%)	5 (0%)	8 (1%)	**1210**
2008	477 (43%)	531 (47%)	94 (8%)	5 (0%)	15 (1%)	**1122**
2007	501 (48%)	408 (39%)	106 (10%)	1 (0%)	35 (3%)	**1051**
2006	587 (58%)	273 (27%)	122 (12%)	4 (0%)	21 (2%)	**1007**
2005	706 (67%)	122 (12%)	162 (15%)	4 (0%)	64 (6%)	**1058**

Figure 16: Primary operations

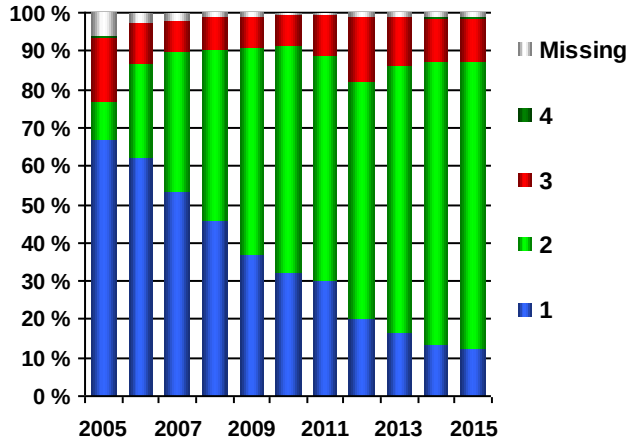
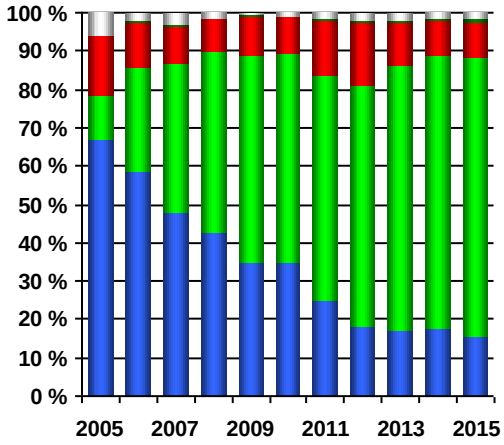


Figure 17: Revisions



*

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	2005-06	2007	2008	2009	2010	2011	2012	2013	2014	2015
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)		0,1 %	0,1 %	0,1 %				0,1 %	0,4 %	0,6 %
Apixiban (Eliquis)							0,1 %	1,2 %	1,5 %	1,5 %
Dabigatranetixalat (Re-Novate, Pradaxa)	1,4 %		0,2 %	0,2 %					0,1 %	0,1 %
Dalteparin (Fragmin)	47,0 %	54,9 %	61,0 %	50,7 %	63,2 %	65,1 %	63,1 %	56,1 %	51,6 %	58,4 %
Dekstran (Macrodex, Dextran)		0,1 %	0,1 %		0,1 %	0,3 %	0,1 %	0,1 %	0,1 %	
Enoksaparin (Klexane)	43,1 %	41,2 %	35,1 %	44,0 %	31,5 %	25,5 %	24,6 %	27,9 %	31,4 %	24,1 %
Rivaroksaban (Xarelto)					0,3 %	2,9 %	2,0 %	2,3 %	2,2 %	1,5 %
Warfarin (Marevan)	0,1 %	0,1 %	0,1 %	0,1 %	0,1 %		0,1 %			0,1 %
Ximelagatran (Exanta, Malagatran)	1,1 %		0,1 %	0,1 %	0,1 %					
Other			0,1 %	0,1 %					0,1 %	
Combination of 2 drugs	1,2 %	1,0 %	1,2 %	3,3 %	3,9 %	5,2 %	8,4 %	10,8 %	10,6 %	11,5 %
Clinical study	1,1 %	0,3 %	1,1 %	0,7 %	0,1 %					
Unknown							0,1 %		0,1 %	
No drugs		0,1 %	0,1 %	0,1 %						
Missing	5,0 %	2,2 %	0,9 %	0,7 %	0,7 %	0,9 %	1,5 %	1,4 %	2,0 %	2,2 %
Total	**14981**	**7711**	**7971**	**8325**	**8591**	**8660**	**9177**	**9448**	**9442**	**9809**

Figure 18: Drugs - All operations

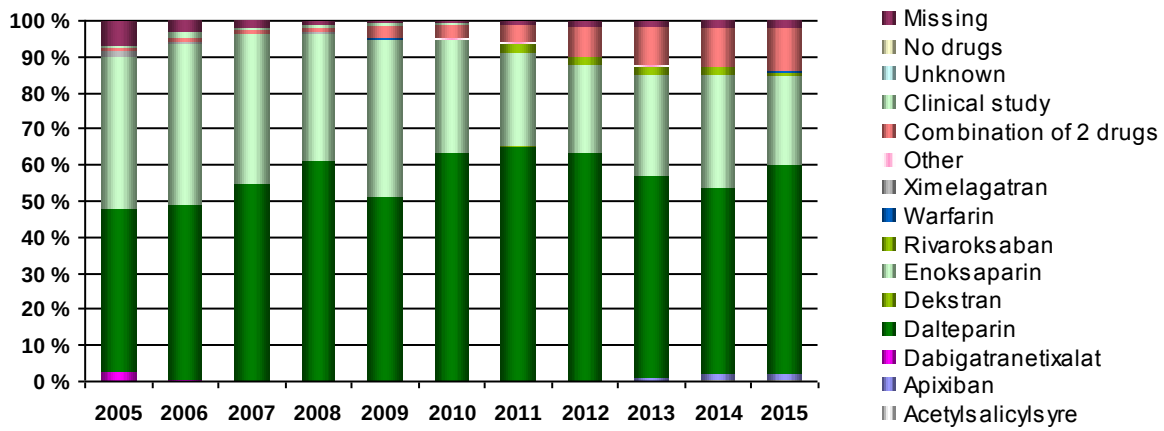


Table 33: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2015	1425	2864	720	937	2325	26	0	1512	9809
2014	1396	2276	576	903	2943	45	0	1303	9442
2013	1428	1402	597	1480	3228	63	0	1250	9448
2012	1163	1595	702	1496	3091	34	0	1096	9177
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

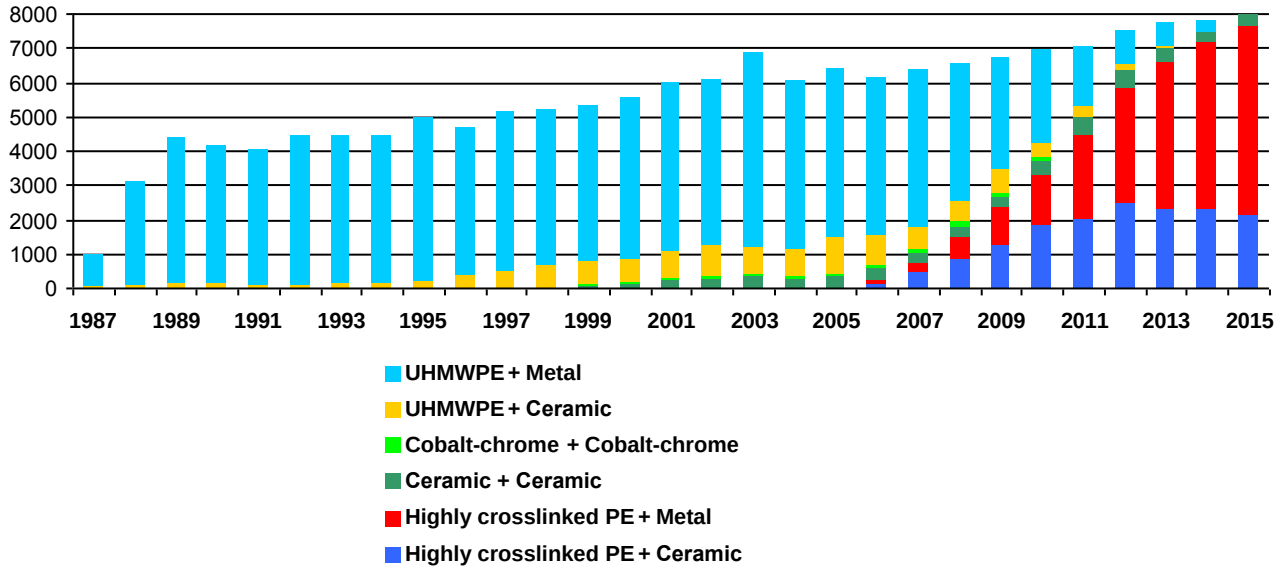
Registration of thrombosis prophylaxis started in 2005

Articulations

Table 34: In primary operations - All patients

Cup + Femoral head	1987-07	2008	2009	2010	2011	2012	2013	2014	2015	Total
UHMWPE + Steel	64316	2256	1909	1450	747	341	153	69	5	71246
UHMWPE + Cobalt-chrome	26628	1741	1356	1267	1013	638	526	236	108	33513
Highly crosslinked PE + Cobalt-chrome	383	595	905	1157	1886	2741	3556	4151	4740	20114
Highly crosslinked PE + Alumina	572	855	1000	1508	1511	2010	1916	1768	1508	12648
UHMWPE + Alumina	8947	516	602	354	293	146	44	8	4	10914
Highly crosslinked PE + Steel	15	13	157	278	532	651	726	713	800	3885
Alumina + Alumina	2107	202	227	322	368	246	201	108	7	3788
Highly crosslinked PE + Alumina/Zirconium[1]	48	34	292	368	512	478	419	549	627	3327
UHMWPE + Titanium	1945	15	19	4	1	2	4	1	0	1991
UHMWPE + Missing	1693	23	8	1	2	1	0	1	0	1729
Alumina/Zirconium + Alumina/Zirconium[1]	112	95	70	92	145	226	196	189	318	1443
UHMWPE + Zirconium	1401	1	0	0	0	0	0	0	0	1402
Cobalt-chrome + Cobalt-chrome	593	159	127	98	46	37	17	15	14	1106
Steel + Cobalt-Chrome	126	34	44	58	90	95	106	127	99	779
Highly crosslinked PE + Oxinium	124	101	185	149	56	61	51	39	3	769
Missing + Cobalt-chrome	492	18	10	24	50	39	41	30	35	739
Missing + Missing	542	19	9	10	8	9	15	15	10	637
Missing + Steel	277	9	11	10	6	5	3	4	7	332
UHMWPE + Alumina/Zirconium[1]	59	78	81	40	18	0	3	1	0	280
Steel + Steel	26	23	37	39	30	37	24	20	34	270
Missing + Alumina	151	31	9	19	8	13	12	7	4	254
Missing + Titanium	160	1	2	3	1	2	1	7	0	177
Missing + Alumina/Zirconium[1]	16	5	10	17	3	19	28	15	25	138
Highly crosslinked PE + Titanium	6	6	13	18	2	17	20	19	15	116
Highly crosslinked PE + Missing	17	4	10	19	8	7	3	3	6	77
UHMWPE + Oxinium	74	1	1	0	0	0	0	0	0	76
Other (n<50)	178	14	21	25	23	22	27	33	28	371
Total	**111008**	**6849**	**7115**	**7330**	**7359**	**7843**	**8092**	**8128**	**8397**	**172121**

Figure 19: In primary operations



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

Completeness analysis for the Norwegian Arthroplasty Register, 2013-2014

A completeness analysis for the Norwegian Arthroplasty Register (NAR) 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 NAR. A report on the implementation and results will be published on www.helsedirektoratet.no. There are separate statistics on primary operations and revisions. Here we only present the completeness analysis for primary operations, as the compilation work on revisions has not been completed.

NCSP 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

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

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

Completeness for the NPR was calculated in a similar way:

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

Primary operations. From 2013 to 2014, 16 681 primary hip replacements were reported to one or both of the registers. 96.7% of these were reported to the NAR while 97.2% were reported to the NPR. Completeness by hospital is divided into health regions; these show a completeness rate for the Norwegian Arthroplasty Register ranging from 79.1% to 100% between the different hospitals. For hospitals with a low completeness rate for the Norwegian Arthroplasty Register, either the form was not sent to the NAR or other interventions than hip arthroplasties were incorrectly coded with NFB 20/30/40/99 (There were only 7 operations in the category NFB 99 during the period).

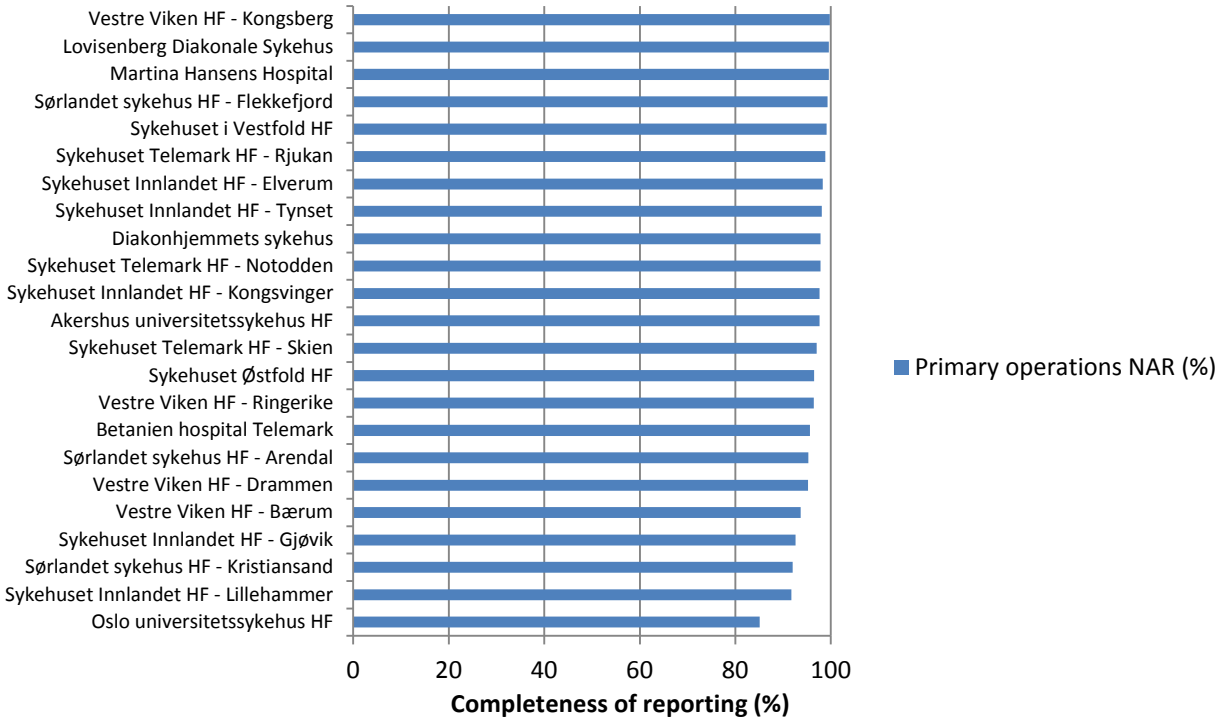
Procedure codes to be used for primary operations: NFB 20 - NFB 30 - NFB 40 - NFB 99

Helse Sør-Øst

Table: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Helse Sør-Øst:	Total number NAR+NPR	NAR(%)	NPR(%)
Vestre Viken HF - Kongsberg	472	99,8	100
Martina Hansens Hospital	1 115	99,6	98,7
Lovisenberg Diakonale Sykehus	1 236	99,6	98,5
Sørlandet sykehus HF - Flekkefjord	143	99,3	99,3
Sykehuset i Vestfold HF	682	99,1	99,3
Sykehuset Telemark HF - Rjukan	86	98,8	100
Sykehuset Innlandet HF - Elverum	473	98,3	98,5
Sykehuset Innlandet HF - Tynset	413	98,1	98,8
Sykehuset Telemark HF - Notodden	46	97,8	100
Diakonhjemmets sykehus	643	97,8	99,1
Akershus universitetssykehus HF	497	97,6	97,4
Sykehuset Innlandet HF - Kongsvinger	287	97,6	97,9
Sykehuset Telemark HF - Skien	203	97	98,5
Sykehuset Østfold HF	460	96,5	99,1
Vestre Viken HF - Ringerike	223	96,4	99,1
Betanien hospital Telemark	45	95,6	97,8
Sørlandet sykehus HF - Arendal	468	95,3	98,9
Vestre Viken HF - Drammen	686	95,2	97,4
Vestre Viken HF - Bærum	238	93,7	95,8
Sykehuset Innlandet HF - Gjøvik	309	92,6	98,1
Sørlandet sykehus HF - Kristiansand	286	92	97,9
Sykehuset Innlandet HF - Lillehammer	265	91,7	98,9
Oslo universitetssykehus HF	362	85,1	94,5

Figure: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

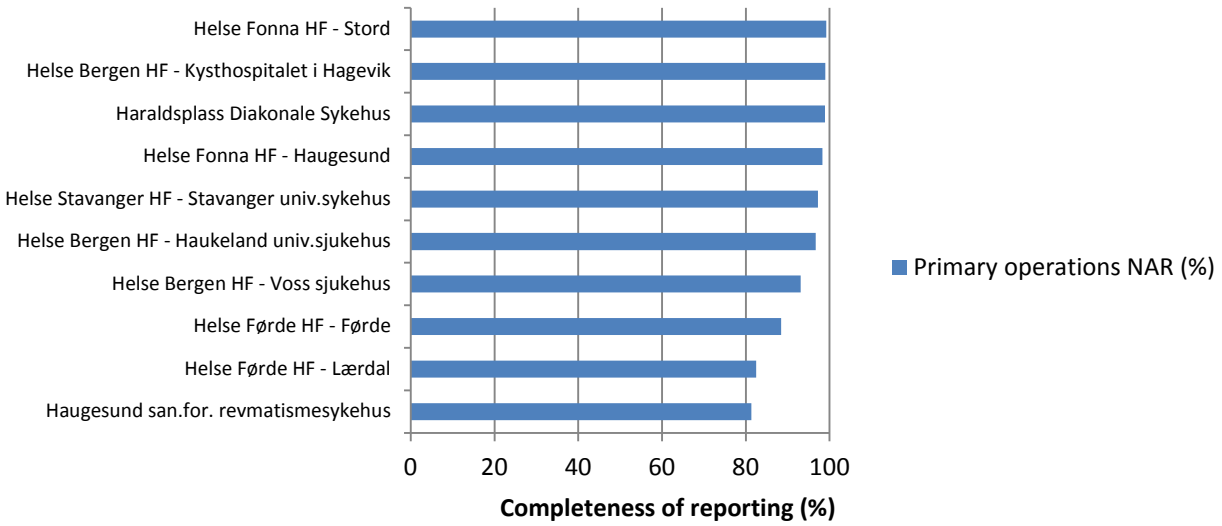


Helse Vest

Table: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Helse Vest:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Helse Fonna HF - Stord	133	99,2	98,5
Helse Bergen HF - Kysthospitalet i Hagevik	788	99	100
Haraldsplass Diakonale Sykehus	360	98,9	98,1
Helse Fonna HF - Haugesund	236	98,3	99,2
Helse Stavanger HF - Stavanger univ.sykehus	718	97,2	99,4
Helse Bergen HF - Haukeland univ.sjukehus	211	96,7	92,9
Helse Bergen HF - Voss sjukehus	144	93,1	95,8
Helse Førde HF - Førde	225	88,4	98,7
Helse Førde HF - Lærdal	137	82,5	93,4
Haugesund san.for. revmatismesykehus	64	81,3	96,9

Figure: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

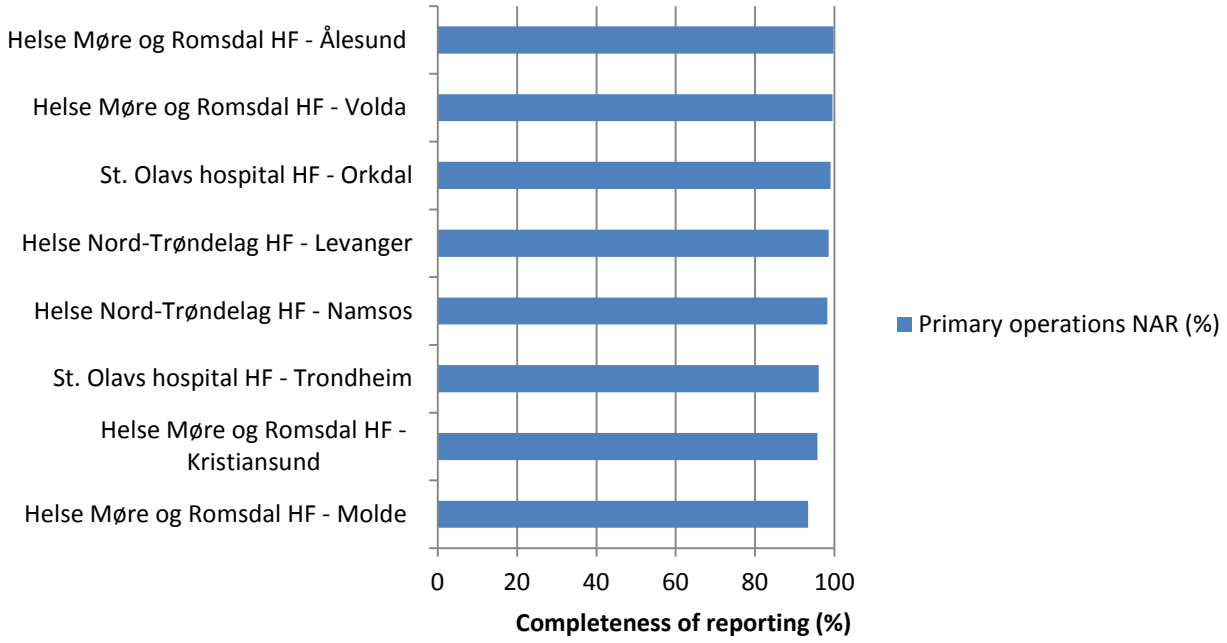


Helse Midt-Norge

Table: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Helse Midt-Norge:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Helse Møre og Romsdal HF - Ålesund	304	99,7	98,4
Helse Møre og Romsdal HF - Volda	186	99,5	99,5
St. Olavs hospital HF - Orkdal	295	99	98,6
Helse Nord-Trøndelag HF - Levanger	267	98,5	97
Helse Nord-Trøndelag HF - Namsos	275	98,2	99,6
St. Olavs hospital HF - Trondheim	703	96	98,3
Helse Møre og Romsdal HF - Kristiansund	277	95,7	99,6
Helse Møre og Romsdal HF - Molde	91	93,4	98,9

Figure: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

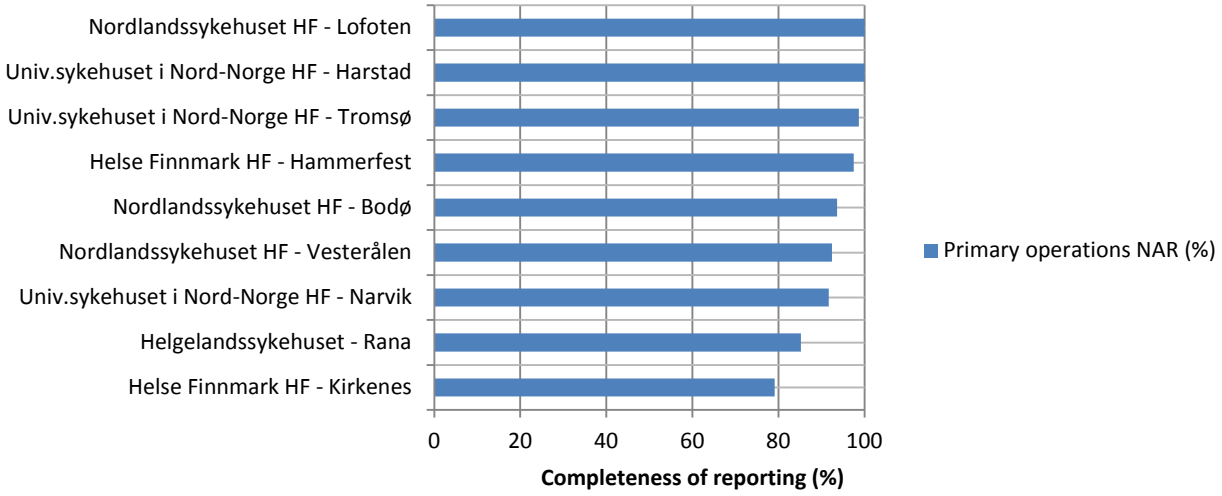


Helse Nord

Table: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Helse Nord:	Total number NAR+NPR	NAR(%)	NPR(%)
Univ.sykehuset i Nord-Norge HF - Harstad	89	100	92,1
Nordlandssykehuset HF - Lofoten	47	100	100
Univ.sykehuset i Nord-Norge HF - Tromsø	313	98,7	97,8
Helse Finnmark HF - Hammerfest	121	97,5	98,3
Nordlandssykehuset HF - Bodø	235	93,6	97,9
Nordlandssykehuset HF - Vesterålen	92	92,4	100
Univ.sykehuset i Nord-Norge HF - Narvik	48	91,7	97,9
Helgelandssykehuset - Rana	183	85,2	98,9
Helse Finnmark HF - Kirkenes	67	79,1	97

Figure: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

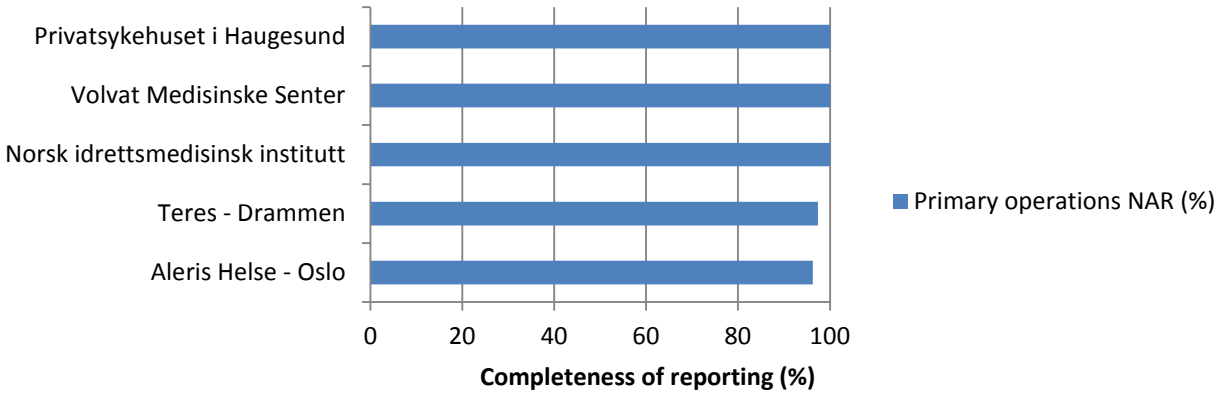


Private hospitals with agreement with RHF

Table: Completeness of reporting for primary hip prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Private hospitals with agreement with RHF:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Norsk idrettsmedisinsk institutt	26	100	0
Volvat Medisinske Senter	51	100	0
Privatsykehuset i Haugesund	23	100	0
Teres - Drammen	117	97,4	42,7
Aleris Helse - Oslo	217	96,3	81,1

Figure: Completeness of reporting for primary hip prosthesis operations, 2013-2014.



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ARTHROPLASTY OF THE KNEE AND OTHER JOINTS
2016 ANNUAL REPORT

In the period 1994-2015, a total of 75 012 knee replacements and 16 170 replacements of other joints than the hip and knee were recorded. There has been an increase of 9% in primary knee replacements since 2014. The number of unicondylar knee replacements has also risen in the past year. Osteoarthritis is the dominant cause of knee arthroplasties. The number of shoulder prostheses has increased by 8% since 2014.
A comparative study of the incidence of knee arthroplasty in the Nordic countries and Australia showed that Norway still has the lowest proportion of knee arthroplasties (abstract Ackerman IN 2016).

NEW TABLES FOR KNEE AND SHOULDER PROSTHESES

We have created new tables for knee prostheses with more detailed information on prosthesis design (Table 6)and age (Figure i-l). There are a particularly large number of reoperations in patients under the age of 60. In collaboration with NARA (Nordic Arthroplasty Register Association), we have created a new classification for shoulder prostheses.

QUALITY OF ARTHROPLASTY IN NORWAY

Survival curves show a gradual improvement since 1994 in results of total knee prostheses, when 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). Unicondylar knee replacements should be concentrated at a smaller number of hospitals (Badawy 2014) to decrease the number of reoperations. Since 2012, there appears to have been a reduction in reoperations for unicondylar knee 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, who dominated previously. There is a need for randomised trials to clarify which patients should have ankle prostheses and which patients should have arthrodesis.

KNEE ARTHROPLASTY REVISIONS

There were 545 knee arthroplasty revisions reported to the Register in 2015. PhD candidate Tesfaye Leta is conducting a study of aseptic 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 gave better results than revision of individual components. 22% of the revisions are operated again after 10 years, and half of the revisions take place within two years. Most early revisions are due to infection and instability. Results for revisionoperations 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-stems can be used both on the femoral and tibial side, and if this is not checked on the reporting form, we have no way of knowing where the stem was used.
In knee arthroplasty revisions involving only insertion of the patellar component due to pain, patients' quality of life improved significantly. The effect was most pronounced in the patients with the most pain before the revision. In one-third of patients, the surgery had no effect (Leta T 2015).

Total arthroplasty revision was technically more challenging than revision of unicondylar knee prostheses, demanding more bone packing and stems, and with a higher infection rate. However, no difference was found in pain, quality of life, function or survival of the prostheses between revision of a total knee arthroplasty and revision of a unicondylar knee arthroplasty (Leta T 2016).

COMPLETENESS ANALYSIS

In this report, we only show completeness of reporting for primary operations. We are working on new coverage analyses for revision arthroplasty of the knee and other joints. These will be published in the reports for each hospital.

SUMMARY OF SIGNIFICANT SCIENTIFIC FINDINGS LAST YEAR

We have published an article on shoulder prostheses (Fevang BT 2015) showing that the durability of shoulder prostheses has improved in recent years, particularly for anatomic total prostheses. The results were generally somewhat better for cemented than for uncemented prostheses. Results for cup prostheses (resurfacing) have deteriorated in recent years, and were especially poor for uncemented prostheses.

Several RCTs have shown that the outcomes of conservative treatment and hemiarthroplasties are equally good for dislocated three or four part shoulder fractures. However, the use of reverse shoulder prostheses in acute fractures is increasing, which may be due to an ongoing RCT. There is a need for RCTs to study the efficacy of this type of prosthesis in comparison with non-operative treatment.

The four Nordic countries (Nordic Arthroplasty Register Association) have begun to collaborate on shoulder prosthesis studies, and the first study has now been published (Rasmussen J 2016). Shoulder arthroplasty has increased in all the countries, mostly due to osteoarthritis (34%) and fractures (34%). Especially arthroplasty for osteoarthritis has increased. The incidence of shoulder prostheses was lower in Norway than in Denmark and Sweden. Results for the Delta Xtend reverse prosthesis were significantly better than for the Delta III, but the surgery took place in different timeperiods.

With previous tibial osteotomy, knee arthroplasty took 13 minutes longer, but prosthesis survival was the same as with knee arthroplasty without previous osteotomy (Badawy M 2015).

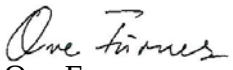
We found a reduction in arthroplasty, arthrodesis and synovectomy for due to the diagnosis of rheumatoid arthritis from 1994 to 2012. This is linked to improvements in the pharmacological treatment of rheumatoid arthritis (Nystad T 2015).

Hybrid fixation (uncemented femur and cemented tibia) of total knee prosthesis gave equally good survival results, or better, depending on the type of prosthesis, with 11 years of follow-up. Operating time was shorter with hybrid fixation (Petursson G 2015).

We now have an interesting partnership with Oslo University Hospital, with a link between HUNT (the Nord-Trøndelag Health Study) and the Hip and Knee Arthroplasty Registers. Marianne Bakke Johnsen and Alf Inge Hellevik are the PhD candidates involved. The first article has been published (Johnson MB 2016) and examines physical activity in leisure time. High levels of physical activity in leisure time increased the risk of total hip arthroplasty in both men and women, but for knee arthroplasty, this effect was only seen in women.

Thank you for good reporting and we welcome suggestions for research projects.

Bergen, 17.06.2016



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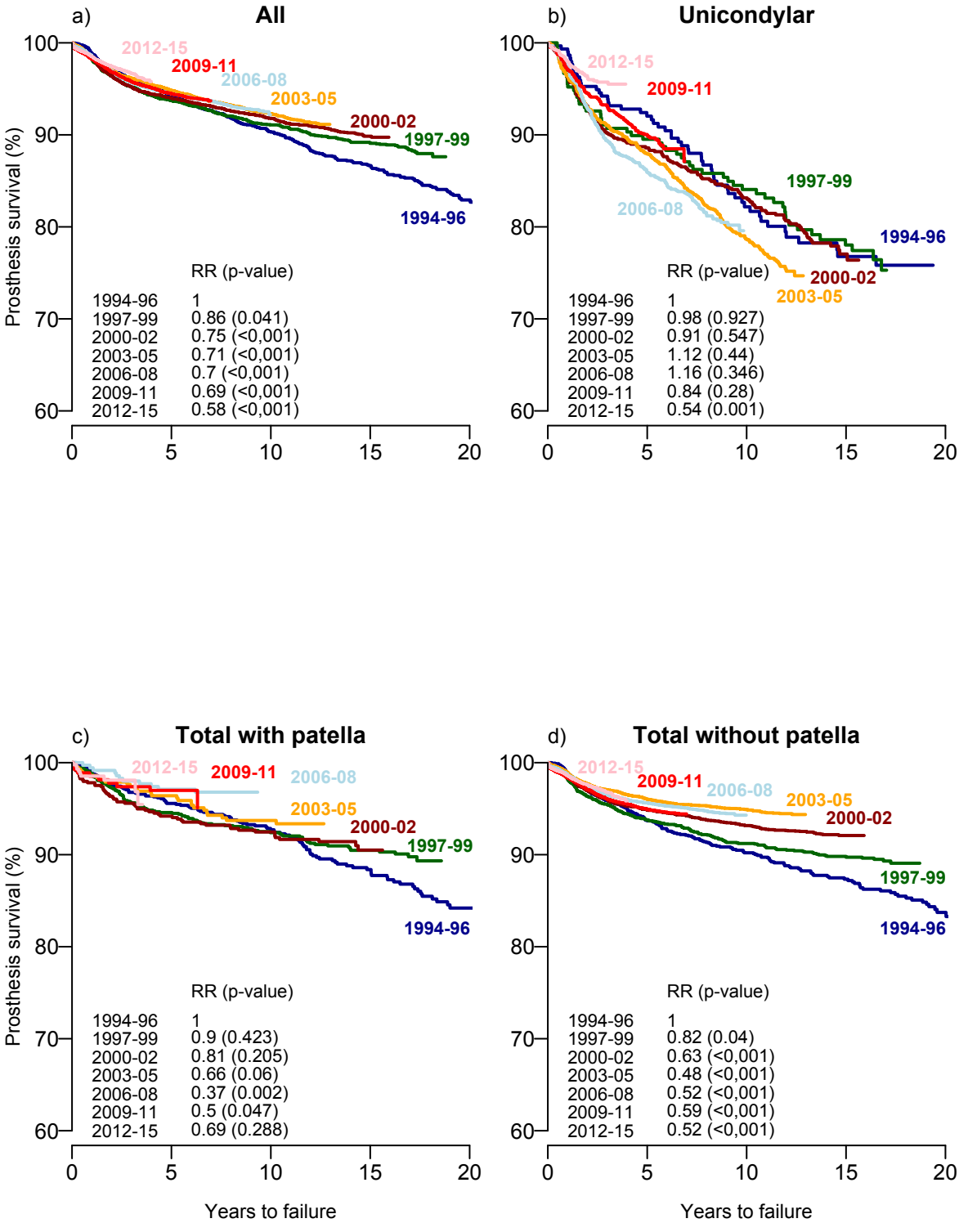
IT Consultant

Christoffer Bartz-Johannessen
Biostatistician/Researcher

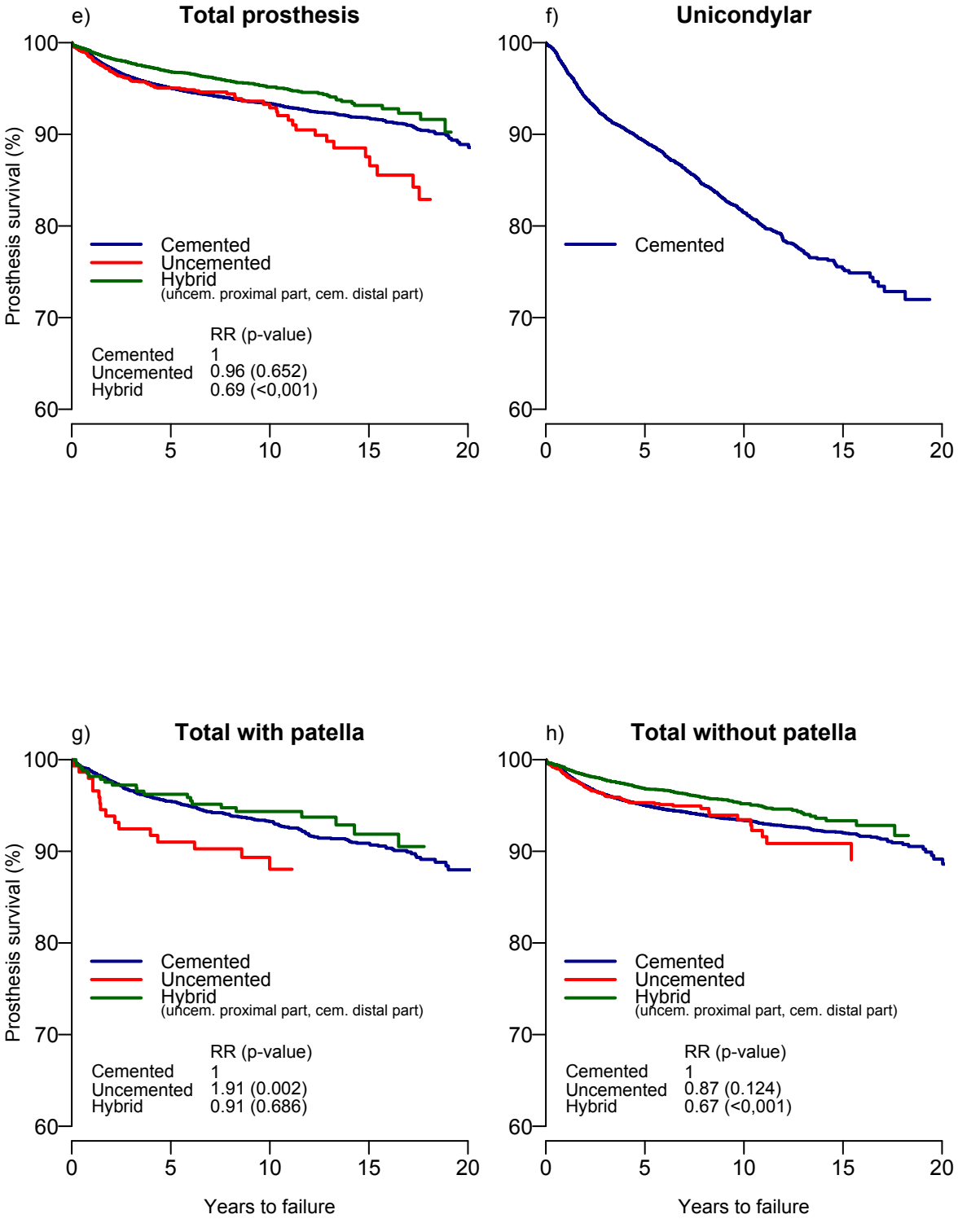
Survival curves for knee prostheses



Survival curves estimated by the Kaplan-Meier method. Survival estimate is given as long as > 50 prostheses are in the risk set. Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

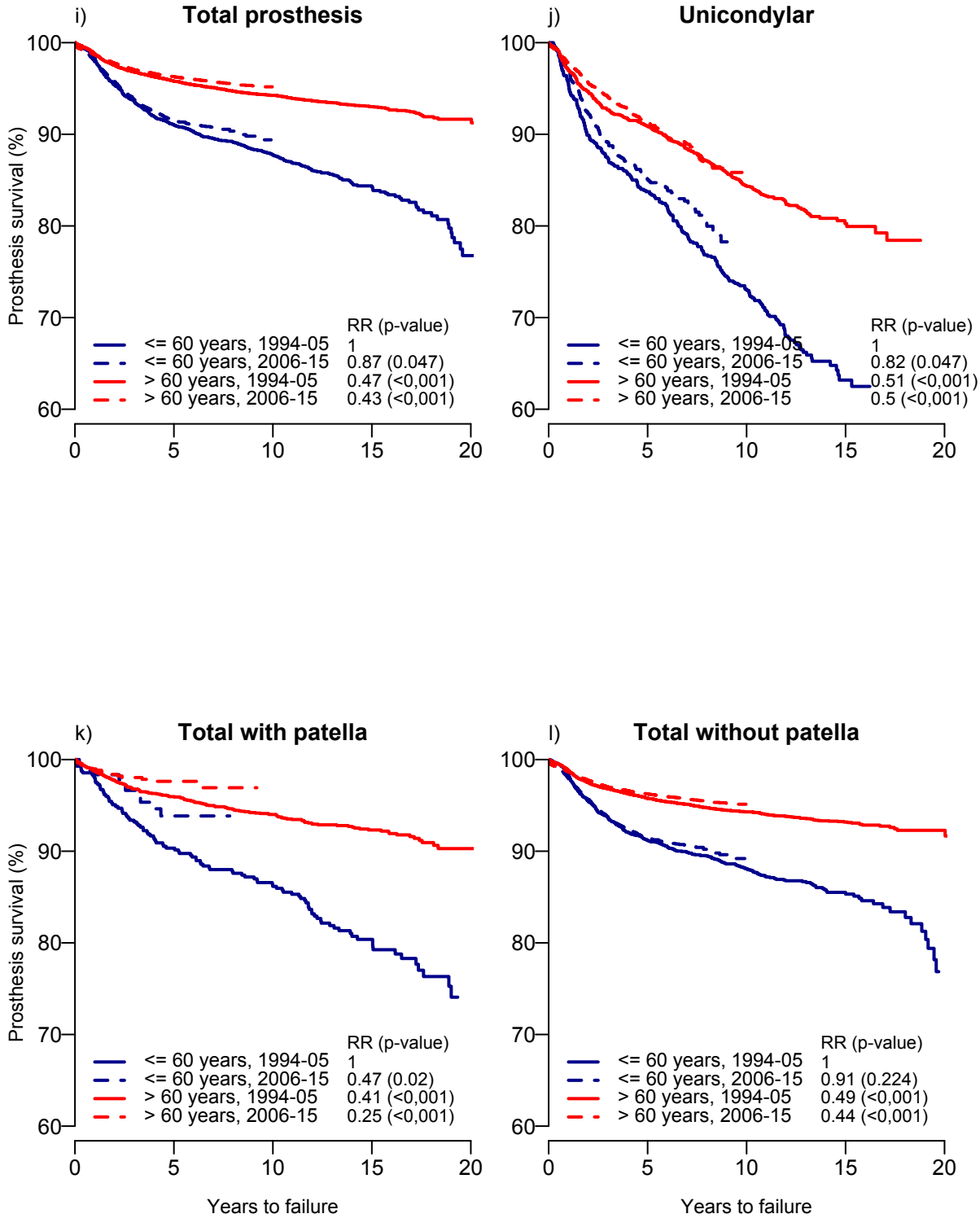
Survival curves for knee prostheses - Fixation

1994 - 2015



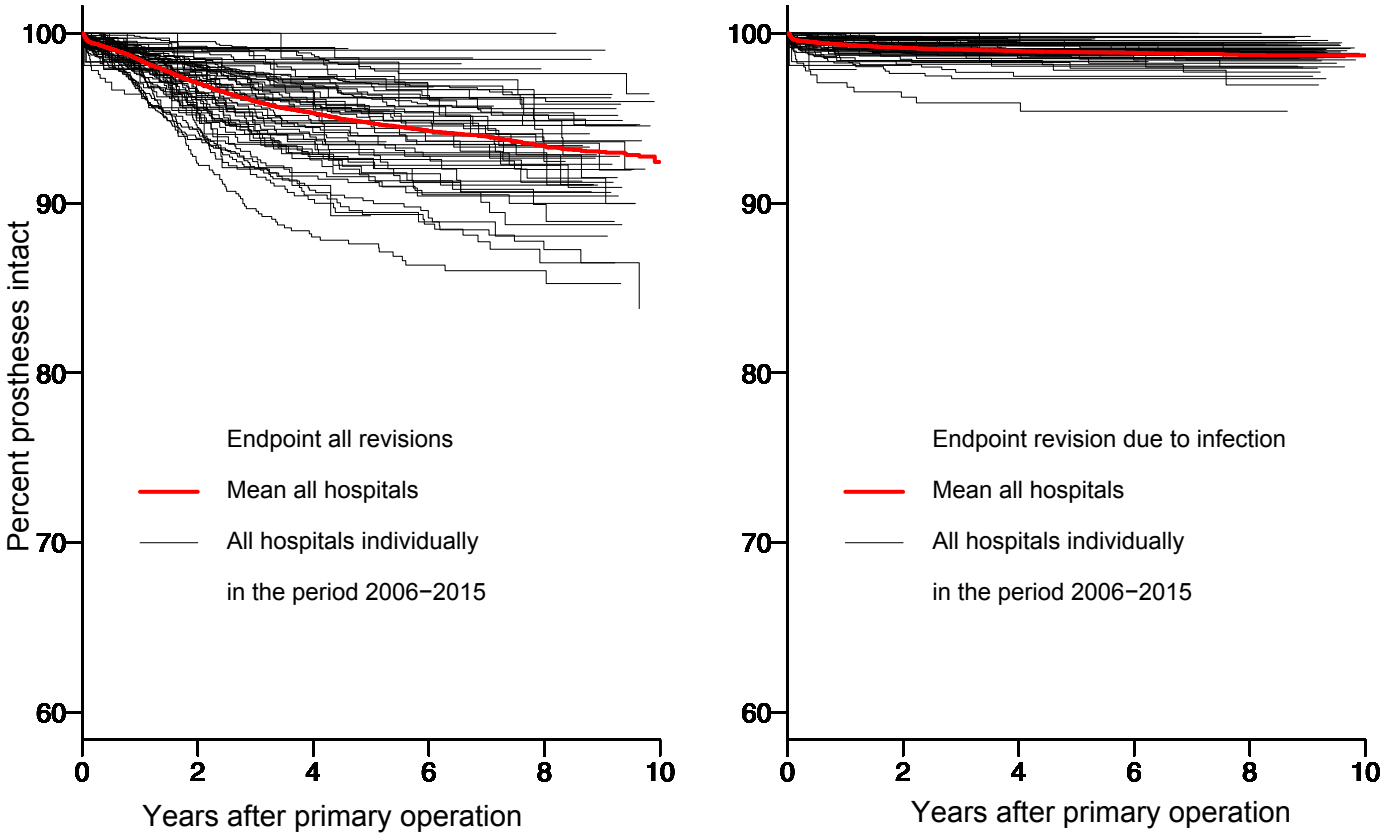
Knee Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are in the risk set. Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

Survival curves for knee prostheses - Age 1994 - 2015



Survival curves estimated by the Kaplan-Meier method. Survival estimate is given as long as > 50 prostheses are in the risk set.
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

Last 10 years survival curves for all hospitals individually



One stage bilateral knee prosthesis operations

Year	1994-2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Sum:
Number of patients	34	4	4	6	3	8	8	8	6	21	21	40	48	211

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.

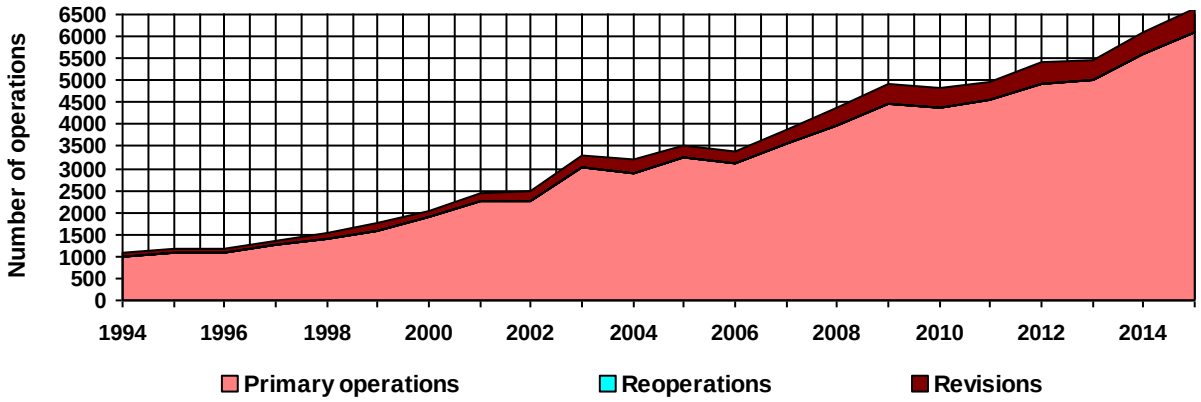
KNEE PROSTHESES

Table 1: Annual numbers of operations

Year	Primary operations		Reoperations *		Revisions		Total
2015	6 093	(91,7%)	9	(0,1%)	545	(8,2%)	**6 647**
2014	5 589	(91,8%)	7	(0,1%)	490	(8,1%)	**6 086**
2013	5 004	(91,3%)	6	(0,1%)	473	(8,6%)	**5 483**
2012	4 915	(90,9%)	7	(0,1%)	486	(9,0%)	**5 408**
2011	4 544	(91,3%)	2	(0,0%)	429	(8,6%)	**4 975**
2010	4 400	(91,5%)		(0,0%)	411	(8,5%)	**4 811**
2009	4 468	(91,1%)		(0,0%)	438	(8,9%)	**4 906**
2008	3 990	(91,6%)		(0,0%)	367	(8,4%)	**4 357**
2007	3 588	(92,3%)		(0,0%)	301	(7,7%)	**3 889**
2006	3 109	(92,1%)		(0,0%)	267	(7,9%)	**3 376**
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**
1994-99	7 412	(91,7%)		(0,0%)	675	(8,3%)	**8 087**
Total	**68 694**	**(91,6%)**	**31**	**(0,0%)**	**6 287**	**(8,4%)**	**75 012**

* 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



53,4 % of all operations were performed on the right side. 64,1 % performed in women.

Mean age at primary surgery was 68,6 years, 69,3 years for women and 67,4 years for men

Figure 2: Incidence of primary knee prostheses

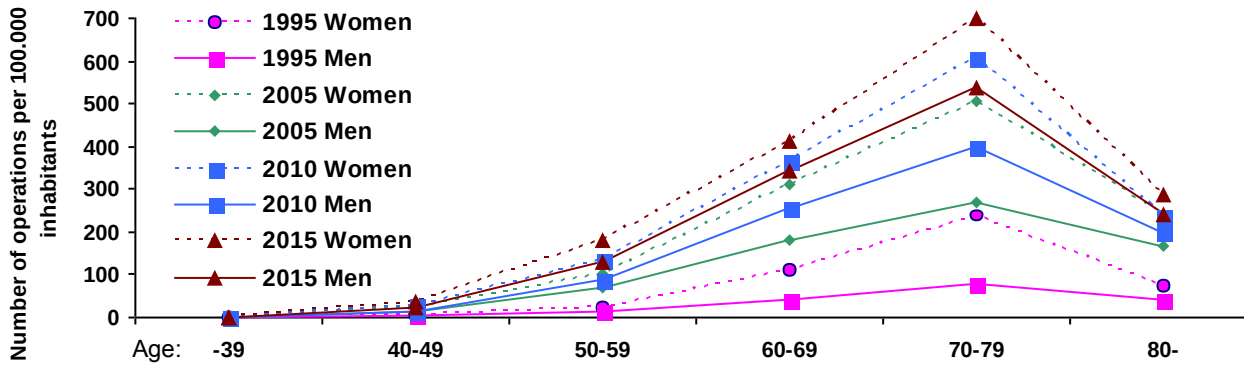


Figure 3: Age at the insertion of primary total knee prostheses

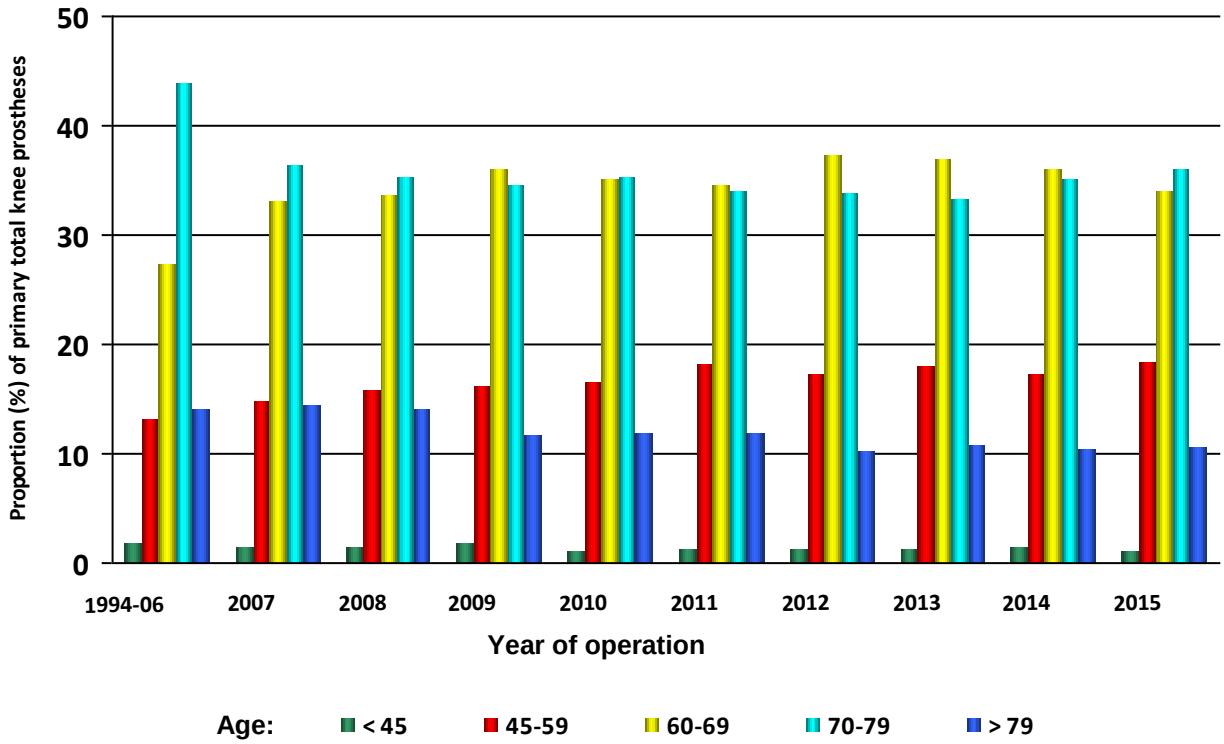
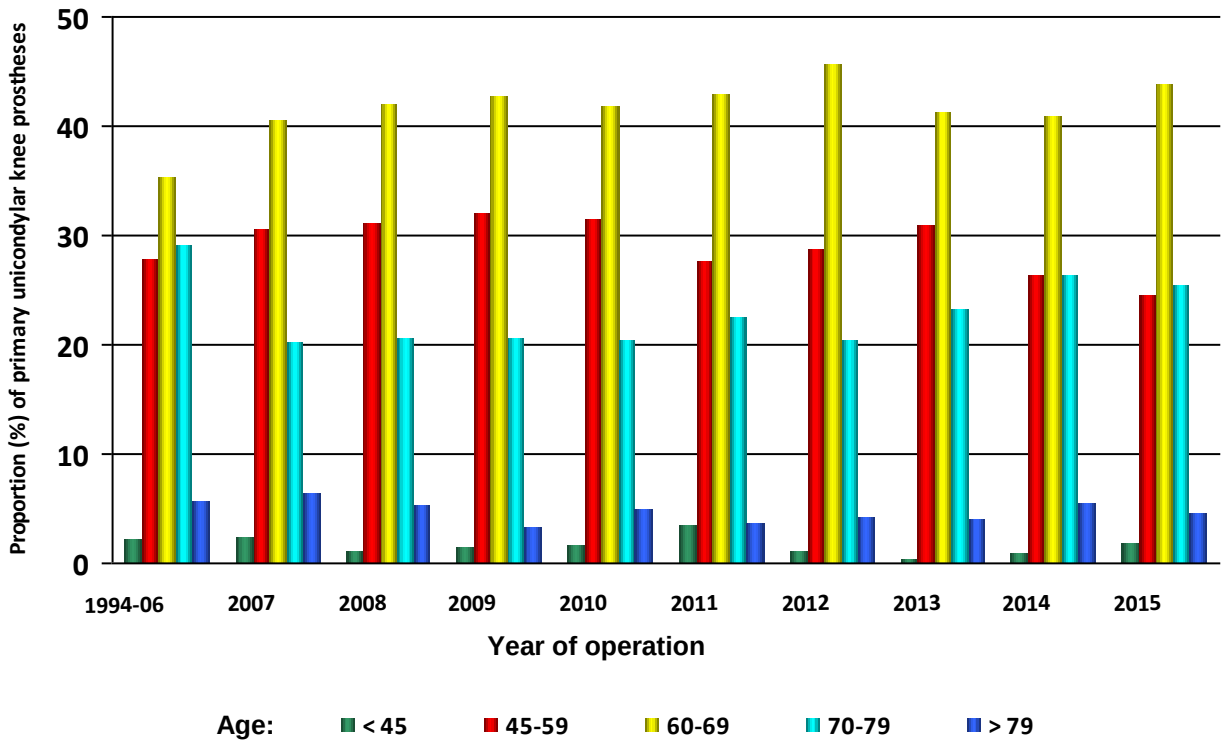


Figure 4: Age at the insertion of primary unicondylar knee prostheses



Types of knee prostheses

Table 2: Primary operations

Year	Total with patella		Total without patella		Unicondylar		Patello-femoral		Bicompart-mental		Hinged * prostheses		Missing		Total
2015	157	(2,6%)	5 119	(84,0%)	747	(12,3%)	39	(0,6%)			31	(0,5%)			**6 093**
2014	111	(2,0%)	4 847	(86,7%)	586	(10,5%)	38	(0,7%)			7	(0,1%)			**5 589**
2013	87	(1,7%)	4 403	(88,0%)	468	(9,4%)	38	(0,8%)			6	(0,1%)	2	(0,0%)	**5 004**
2012	99	(2,0%)	4 296	(87,4%)	473	(9,6%)	33	(0,7%)			12	(0,2%)	2	(0,0%)	**4 915**
2011	88	(1,9%)	3 976	(87,5%)	439	(9,7%)	29	(0,6%)			12	(0,3%)			**4 544**
2010	88	(2,0%)	3 867	(87,9%)	414	(9,4%)	23	(0,5%)			8	(0,2%)			**4 400**
2009	96	(2,1%)	3 887	(87,0%)	463	(10,4%)	19	(0,4%)	1	(0,0%)	2	(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%)	1	(0,0%)			**3 588**
1994-06	3 619	(13,9%)	19 282	(73,9%)	3 152	(12,1%)	48	(0,2%)			1	(0,0%)	1	(0,0%)	**26 103**
Total	**4 601**	**(6,7%)**	**56 061**	**(81,6%)**	**7 648**	**(11,1%)**	**296**	**(0,4%)**	**3**	**(0,0%)**	**80**	**(0,1%)**	**5**	**(0,0%)**	**68 694**

* Indicated by the surgeon on the report form

Figure 5: Primary operations

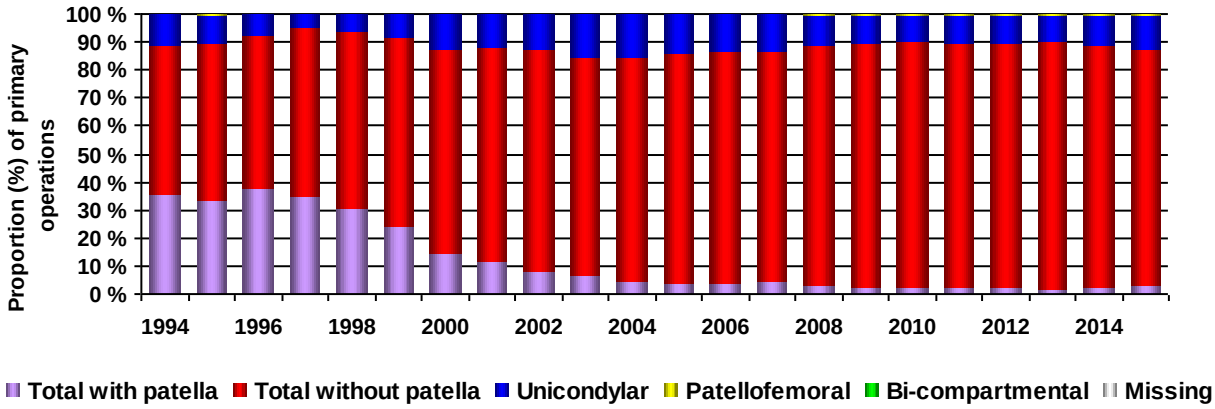


Table 3: Classification of stability and modularity in primary total prostheses

Year	---------- MS ---------- All poly	MBT	---------- PS ---------- All poly	MBT	CCK	Rotating platform	Hinged * prostheses	Total
2015	2	3518	0	330	21	1 398	33	**5 302**
2014	2	3365	0	130	22	1 414	19	**4 952**
2013	2	3149	0	53	25	1 254	9	**4 492**
2012	5	2852	0	23	16	1 487	17	**4 400**
2011	5	2537	0	13	9	1 485	19	**4 068**
2010	3	2486	0	20	5	1 425	18	**3 957**
2009	3	2536	0	9	8	1 412	5	**3 973**
2008	1	2162	0	25	3	1 324	8	**3 523**
2007	0	1925	0	16	2	1 162	6	**3 111**
2006	0	1636	0	9	2	1 045	2	**2 694**
2005	0	1617	0	11	0	1 156	3	**2 787**
2004	0	1507	0	8	3	920	1	**2 439**
2003	3	1762	0	7	0	778	1	**2 551**
2002	2	1253	0	14	0	702	3	**1 974**
2001	0	1233	0	12	1	704	3	**1 953**
2000	0	1113	0	3	1	501	2	**1 620**
1994-99	3	5825	0	30	10	876	16	**6 760**

MS = Minimally stabilized = Posterior cruciate retaining prosthesis and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
MBT = Metal backed tibia
All poly = All polyethylene tibial component

* Information taken from the catalogue number of prostheses

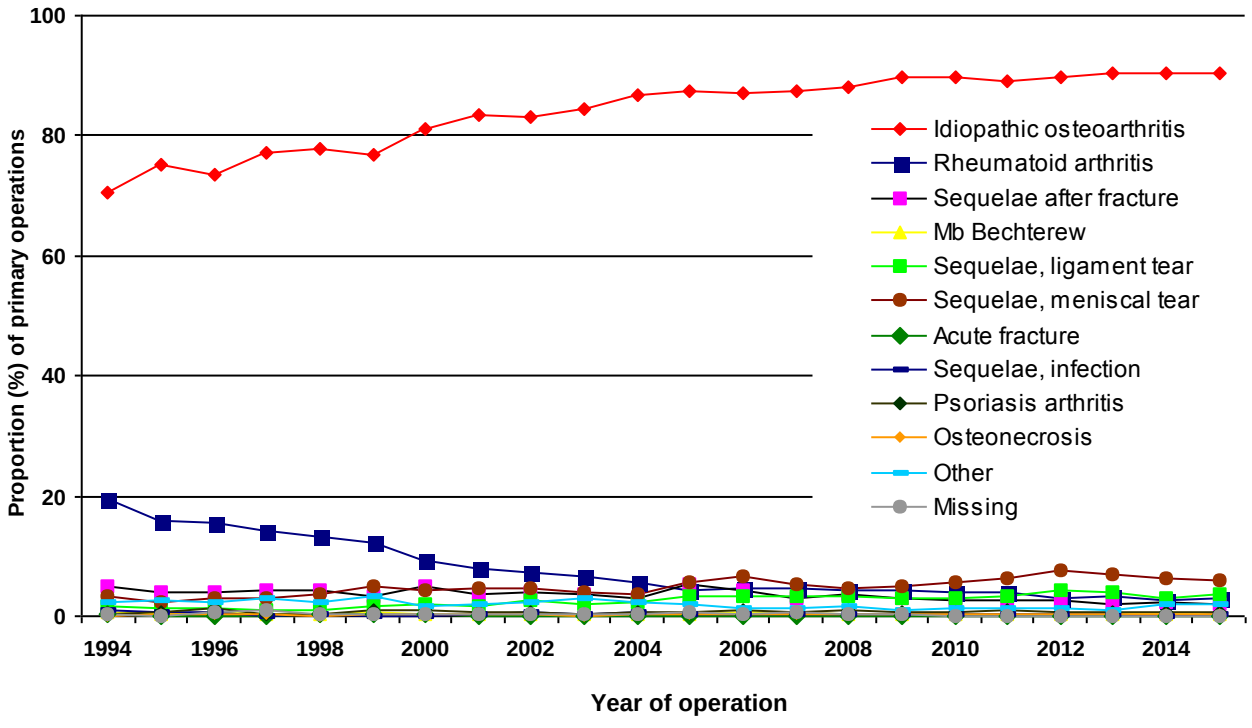
Reasons for primary operations - Total knee prostheses

Table 4:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Acute fracture	Sequelae, infection	Psoriasis arthritis	Osteonecrosis	Other	Missing
2015	4 771	165	113	16	199	320	1	18	36	10	106	2
2014	4 484	134	122	22	140	305	3	7	30	16	93	2
2013	4 060	144	95	11	173	308	1	16	28	9	41	4
2012	3 945	126	110	15	182	332	2	13	33	11	61	4
2011	3 616	161	114	12	134	260	1	18	35	10	54	2
2010	3 552	156	101	13	117	217	2	10	25	7	58	3
2009	3 574	167	118	11	116	200	2	13	25	7	46	10
2008	3 105	149	125	14	116	169	3	9	30	10	54	8
2007	2 719	146	95	17	98	162	4	11	17	11	44	16
2006	2 354	123	114	14	92	178	0	12	23	11	40	5
2005	2 434	120	145	13	94	155	2	11	19	7	53	14
2004	2 129	138	76	6	59	89	0	15	14	6	54	10
2003	2 167	174	94	9	49	98	2	11	8	1	78	6
2002	1 648	144	79	7	54	90	3	10	12	6	49	5
2001	1 645	157	75	5	35	90	1	6	11	7	38	8
2000	1 324	151	79	6	35	69	3	2	14	4	28	4
1999	1 124	180	50	9	24	73	3	2	13	5	49	3
1998	1 033	177	55	3	15	47	5	5	3	2	31	4
1997	907	167	49	3	10	34	1	1	5	2	36	10
1996	725	154	40	8	14	29	1	8	12	3	23	6
1995	735	154	39	4	13	22	0	6	6	4	26	1
1994	624	173	44	5	15	29	2	10	4	0	20	2
Total	**52 675**	**3 360**	**1 932**	**223**	**1 784**	**3 276**	**42**	**214**	**403**	**149**	**1 082**	**129**

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

Figure 6:



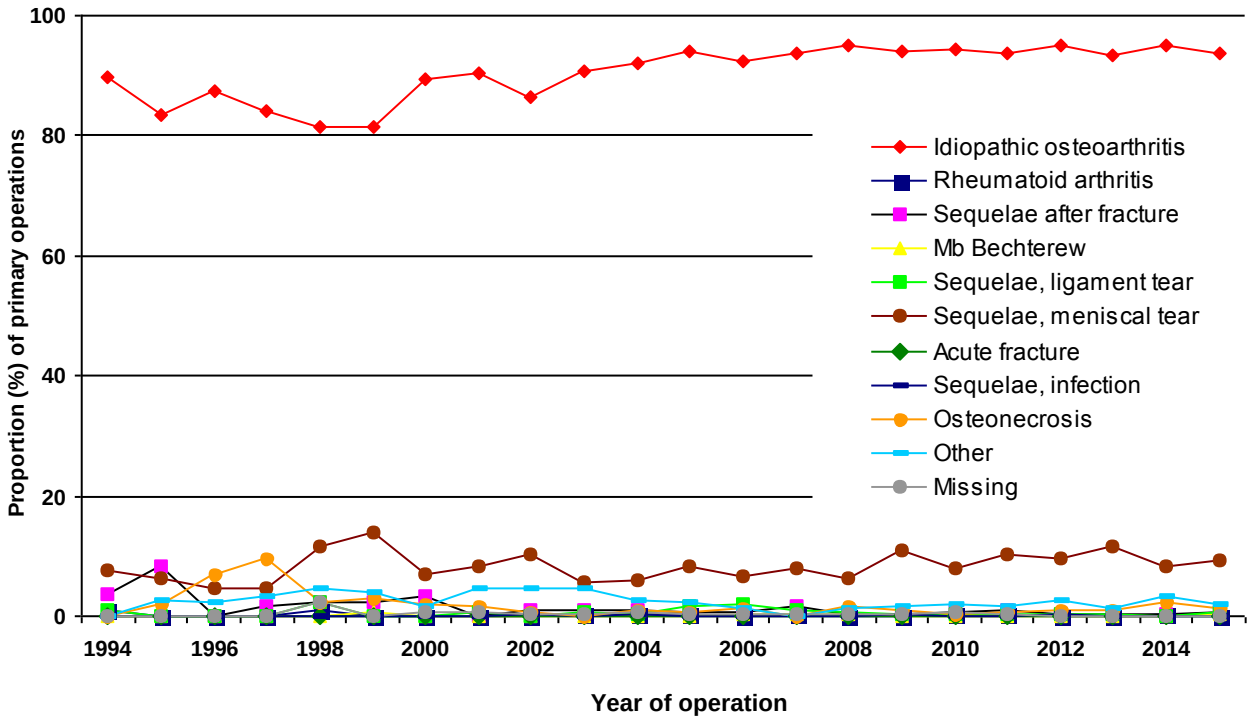
Reasons for primary operations - Unicondylar knee prostheses

Table 5:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Sequelae, infection	Osteonecrosis	Other	Missing
2015	699	0	4	2	5	70	0	11	14	0
2014	556	2	2	0	0	49	0	13	20	0
2013	437	0	1	0	1	55	0	4	6	0
2012	450	0	1	0	1	46	1	4	13	0
2011	412	1	4	0	1	45	0	3	7	1
2010	391	2	3	0	1	33	0	2	8	3
2009	435	0	1	0	2	50	1	5	8	2
2008	418	0	2	1	3	27	0	7	6	2
2007	436	2	7	1	4	37	0	0	0	2
2006	369	0	2	1	8	26	0	5	5	1
2005	429	2	3	0	7	38	0	3	10	1
2004	411	1	4	0	1	27	2	5	12	3
2003	426	2	5	0	3	27	0	0	21	1
2002	251	0	3	0	0	30	1	2	13	1
2001	241	0	0	0	2	22	0	4	12	2
2000	216	0	8	0	0	17	0	5	4	2
1999	105	0	3	1	0	18	0	4	5	0
1998	71	1	2	0	2	10	0	2	4	2
1997	53	0	1	0	0	3	0	6	2	0
1996	76	0	0	0	0	4	0	6	2	0
1995	91	0	9	0	0	7	0	2	3	0
1994	96	1	4	0	1	8	0	0	0	0
Total	**7 069**	**14**	**69**	**6**	**42**	**649**	**5**	**93**	**175**	**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

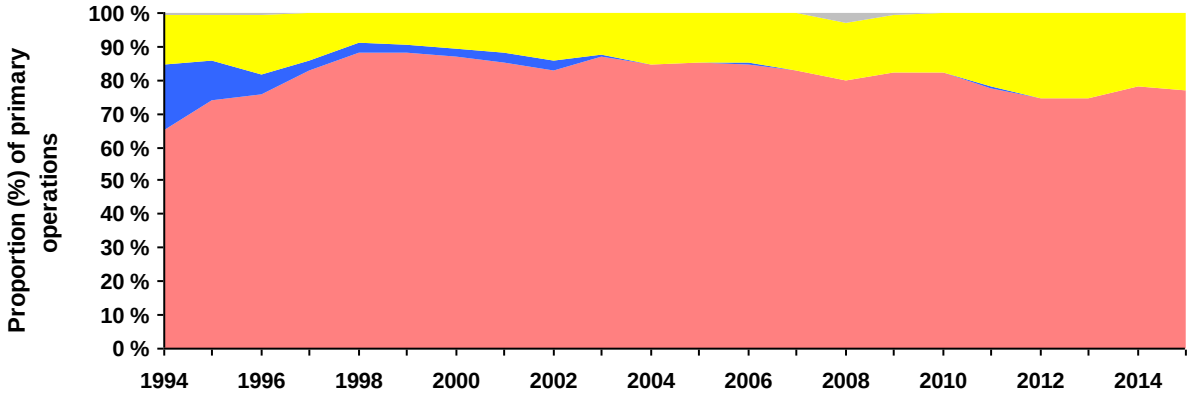


Figure 9: Tibia

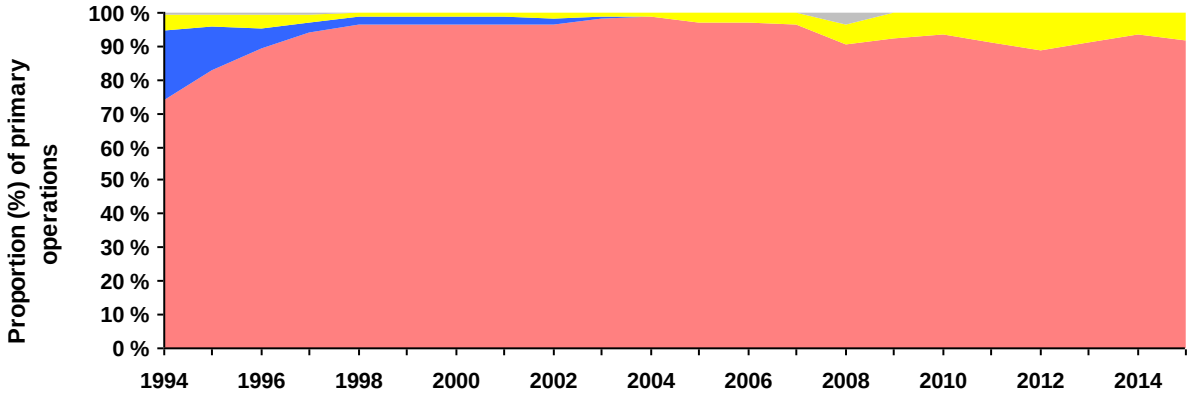
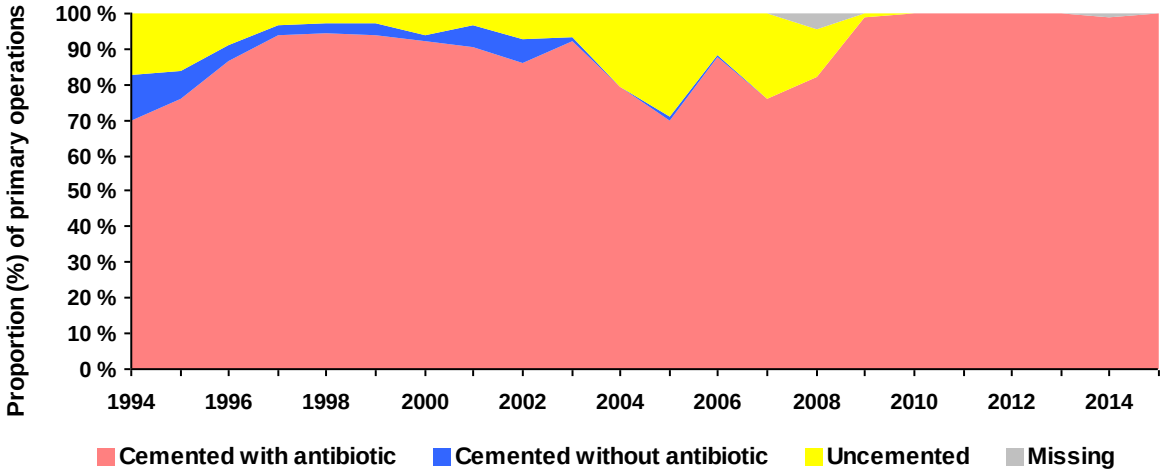


Figure 10: Patella



Use of cement in total knee prostheses

Figure 11: Primary operations

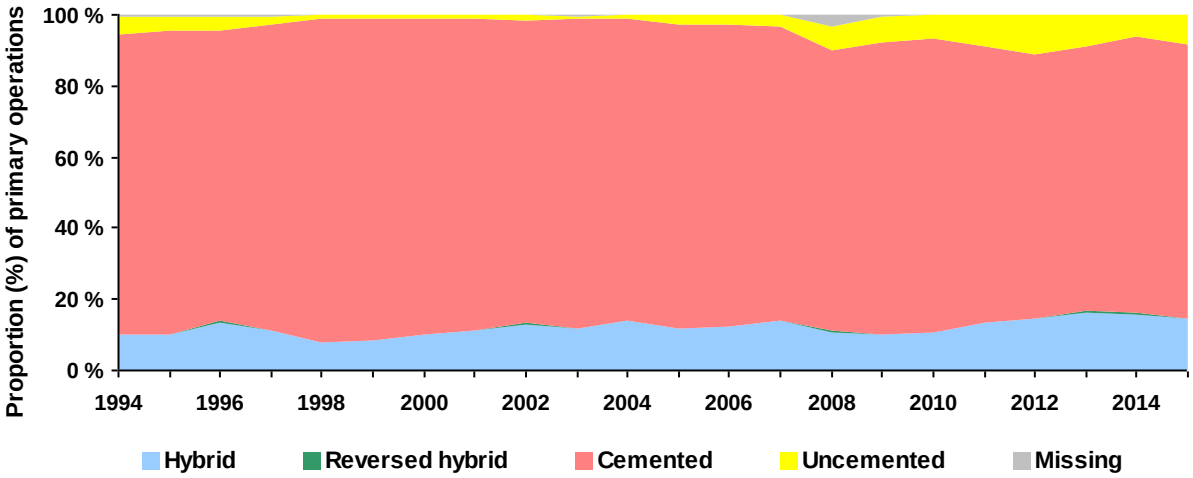
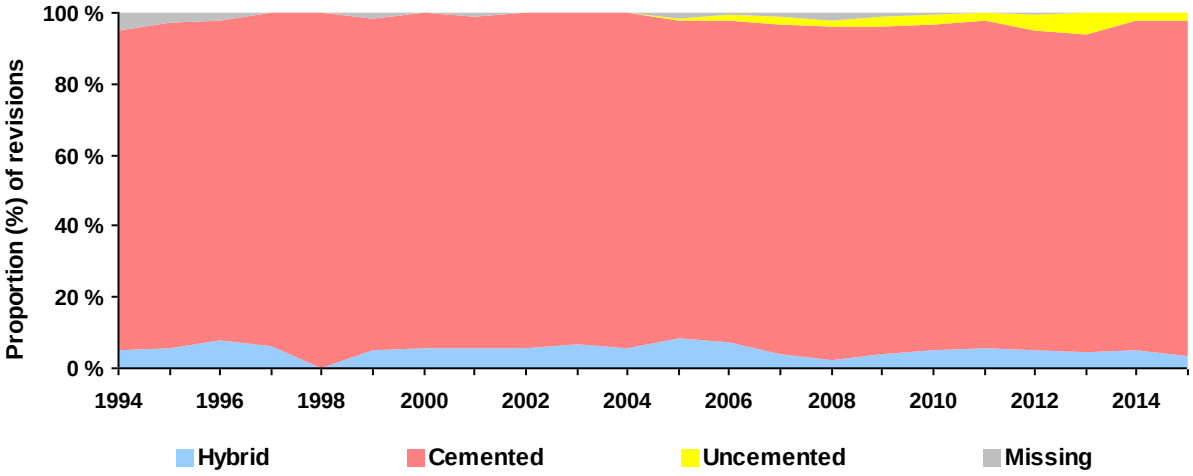
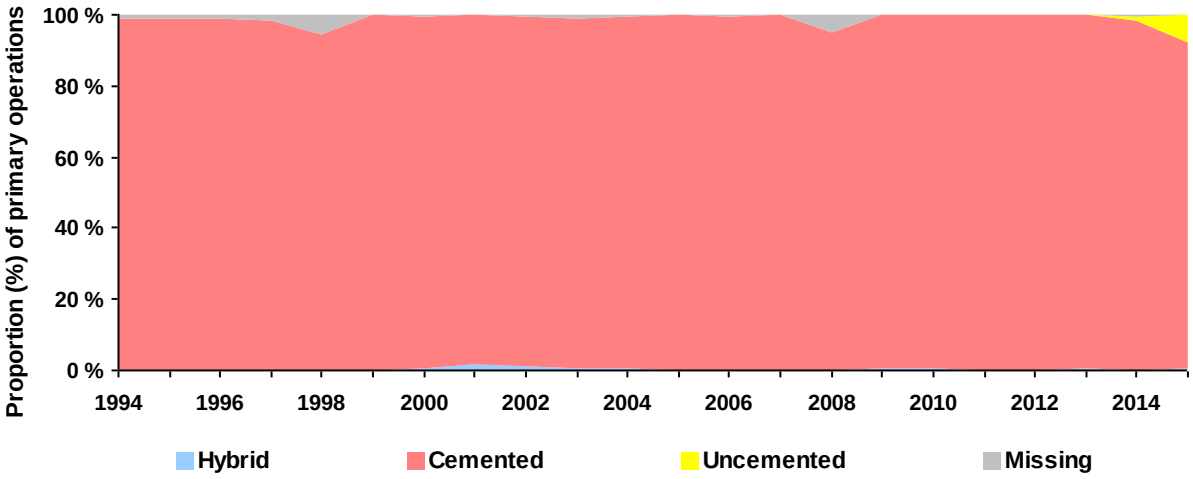


Figure 12: Revisions



Use of cement in unicondylar knee prostheses

Figure 13: Primary operations



The 7 most common primary total prostheses without patella component in 2013-2015

Table 6:

Product	Cemented *	Uncemented *	Hybrid	All poly	Rotating platform	HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
NexGen	5 911	304	468	0	0	323	6255	409	91	**6 688**
LCS Complete	1 799	58	327	0	2 184	0	2184	1	0	**2 187**
PFC-Sigma	1 140	614	131	0	1 882	0	1879	5	3	**1 887**
Legion	607	2	946	0	0	48	1509	53	3	**1 557**
PROFIX	681	147	317	2	0	0	1146	0	0	**1 146**
Triathlon	633	21	114	0	0	752	744	16	13	**769**
Vanguard TM	261	0	0	0	0	0	260	17	0	**261**

Hybrid = Uncemented femur and cemented tibia
All poly = All polyethylene tibial component
HXLPE = Highly cross linked polyethylene
MS = Minimally stabilized = Posterior cruciate retaining prostheses and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
* Surgeon's report for fixation

Table 6 A: Femur component

Product: NexGen (31)

Product Category	Cemented *	Uncemented*	Stabilization MS	Stabilization PS	Stabilization CCK	Total
CR Option	4 428	2	4432	0	0	**4 432**
CR-flex Option	608	0	608	0	0	**608**
CR-flex porous uncemented	25	379	404	0	0	**404**
CR-flex gender	373	0	373	0	0	**373**
CR Porous uncemented	34	261	295	0	0	**295**
LPS Option	142	0	0	142	0	**142**
CR Precoat	121	1	122	0	0	**122**
LPS-flex porous standard	2	109	0	111	0	**111**
LCCK Option	90	0	0	0	90	**90**
LPS-flex Option	81	2	0	83	0	**83**
CR-flex porous	2	8	10	0	0	**10**
Other	10	4	1	13	0	**14**
Unknown	4	0	0	0	0	**4**

Product: PROFIX (35)

Product Category	Cemented *	Uncemented *	Stabilization MS	Stabilization PS	Stabilization CCK	Total
CR non-porous cemented	576	2	578	0	0	**578**
CR porous uncemented	98	457	555	0	0	**555**
CR Oxinium	5	0	5	0	0	**5**
Other	2	0	2	0	0	**2**
Unknown	4	1	0	0	0	**6**

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	Stabilization MS	Stabilization PS	Stabilization CCK	Total
Cemented	1 764	0	0	0	0	**1 765**
Uncemented	31	386	0	0	0	**417**
Other	4	0	0	0	0	**4**
Unknown	1	0	0	1	0	**1**

Product: PFC-Sigma (49)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	1 131	0	1132	0	0	**1 132**
CR uncemented	5	742	747	0	0	**747**
PS	5	0	0	5	0	**5**
Other	2	0	0	0	0	**2**
Unknown	1	0	0	0	0	**1**

Product: Triathlon (58)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	601	3	605	0	0	**605**
Beaded CR uncemented	3	132	135	0	0	**135**
TS cemented	12	0	0	0	12	**12**
PS cemented	10	0	0	10	0	**10**
Unknown	7	0	0	0	0	**7**

Product: Legion (62)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR uncemented	10	942	953	0	0	**953**
CR cemented	545	0	545	0	0	**545**
PS cemented	46	5	0	51	0	**51**
CR Oxinium cemented	8	0	8	0	0	**8**
Other	3	1	0	1	3	**4**
Unknown	1	0	0	0	0	**1**

Product: Vanguard TM (67)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR Anatomic interlok cemented	258	0	258	0	0	**258**
PS Anatomic interlok cemented	15	0	0	15	0	**15**
Other	3	0	2	1	0	**3**
Unknown	1	0	0	0	0	**1**

MS = Minimally stabilized = Posterior cruciate retaining prostheses and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
* Surgeon's report for fixation

Table 6 B: Tibia

Product: NexGen (31)

Product Category	Cemented *	Uncemented *	All poly	Total
Option cemented	4 339	8	0	**4 347**
Precoat PMMA stemmed cemented	1 922	1	0	**1 924**
Trabecular metal uncemented	6	301	0	**307**
Precoat AP wedge stemmed	99	1	0	**100**
Unknown	8	0	0	**8**

Product: PROFIX (35)

Product Category	Cemented *	Uncemented *	All poly	Total
Non porous cemented	958	3	0	**961**
Porous w/o hole uncemented	1	148	0	**149**
Porous uncemented	31	0	0	**31**
Other	2	0	2	**2**
Unknown	3	0	0	**3**

Table 6 B: Tibia

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	All poly	Total
No keel MBT* cemented	2 110	1	0	**2 112**
No keel MBT* uncemented	1	56	0	**57**
MBT* revision	13	0	0	**13**
Other	2	1	0	**3**
Unknown	1	0	0	**1**

* MBT = Mobile bearing tray

Product: PFC-Sigma (49)

Product Category	Cemented *	Uncemented *	All poly	Total
With keel MBT* cemented	1 235	4	0	**1 239**
With keel MBT* uncemented	10	605	0	**615**
No keel MBT* cemented	13	1	0	**14**
MBT* revision	6	7	0	**13**
Unknown	4	1	0	**5**

* MBT = Mobile bearing tray

Product: Triathlon (58)

Product Category	Cemented *	Uncemented *	All poly	Total
Cemented	719	1	0	**720**
PA uncemented	3	20	0	**23**
Universal cemented	21	0	0	**21**
Unknown	5	0	0	**5**

Product: Legion (62)

Product Category	Cemented *	Uncemented *	All poly	Total
Male tapered cemented	1 549	3	0	**1 552**
Other	4	0	4	**4**
Unknown	5	0	0	**5**

Product: Vanguard TM (67)

Product Category	Cemented *	Uncemented *	All poly	Total
Highly polished modular PCR	257	0	0	**257**
Interlok Monobloc PCR cemented	15	0	0	**15**
Other	4	0	0	**4**

All poly = All polyethylene tibial component
MS = Minimally stabilized = Posterior cruciate retaining prostheses and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized
* Surgeon's report for fixation

Table 6 C: Foring Tibia Insert

Product: NexGen (31)

Product Category	Rotating platform	HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
CR-Flex	0	0	5880	0	0	**5 880**
LPS-FlexFixed	0	0	0	398	0	**398**
CR-Prolong	0	321	321	0	0	**321**
LCCK	0	0	0	0	61	**61**
CR	0	0	9	0	0	**9**
Other	0	2	0	2	0	**2**
Unknown	0	0	0	0	0	**17**

Product: PROFIX (35)

Product Category	Rotating platform	HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
Conforming PCR	0	0	1002	0	0	**1 002**
Conforming+	0	0	136	0	0	**136**
Unknown	0	0	8	0	0	**8**

Product: LCS Complete (48)

Product Category	Rotating platform	HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
Rotating platform RP	2 184	0	2184	0	0	**2 184**
Unknown	0	0	0	0	0	**3**

Product: PFC-Sigma (49)

Product Category	Rotating platform	HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
Rotating platform RP-CV	1 874	0	1874	0	0	**1 874**
Revision STB	5	0	0	0	0	**5**
Other	3	0	1	0	3	**4**
Unknown	0	0	0	0	0	**4**

Product: Triathlon (58)

Product Category	Rotating platform	HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
CR-X3 HXLPE	0	640	640	0	0	**640**
CS-X3 HXLPE	0	93	93	0	0	**93**
PS-X3 HXLPE	0	12	0	12	0	**12**
CR	0	0	10	0	0	**10**
TS-X3 HXLPE	0	7	0	0	7	**7**
Other	0	0	0	4	0	**4**
Unknown	0	0	0	0	0	**3**

Product: Legion (62)

Product Category	Rotating platform	HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
CR standard	0	0	885	0	0	**885**
Dished	0	0	616	0	0	**616**
PS high flex	0	42	0	42	0	**42**
PS	0	0	0	7	0	**7**
CR-highflex HXLPE	0	5	5	0	0	**5**
Other	0	1	1	0	0	**1**
Unknown	0	0	0	0	0	**1**

Product: Vanguard TM (67)

Product Category	Rotating platform	HXLPE	Stabilization MS	Stabilization PS	Stabilization CCK	Total
Arcom CR	0	0	247	0	0	**247**
Arcom PS	0	0	0	14	0	**14**
Unknown	0	0	0	0	0	**1**

HXLPE = Highly cross linked polyethylene
MS = Minimally stabilized = Posterior cruciate retaining prostheses and deep dish
PS = Posterior cruciate stabilizing prostheses
CCK = Constrained Condylar Knee = high level stabilized

Table 7: Femoral prostheses in primary operations

Prosthesis	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Profix	6385	1125	1097	1216	1155	1169	1388	1032	114		**14681**
LCS Complete	1378	1153	1315	1374	1420	1491	1487	802	711	674	**11805**
NexGen	815	155	172	205	251	220	656	1592	2420	2676	**9162**
AGC	3008	377	352	341	290	247	224	27			**4866**
LCS	4818										**4818**
Genesis I	3293										**3293**
Duracon	601	214	463	508	470	396	101				**2753**
PFC-Sigma	1					3	1	453	706	728	**1892**
Triathlon		51	48	178	164	287	329	244	229	296	**1826**
Legion							3	136	673	753	**1565**
Tricon -C with Pro-Fit	1085										**1085**
Vanguard TM	1		3	66	144	198	149	147	65	65	**838**
E-motion	395	8	9	46	10						**468**
Kinemax	411										**411**
Tricon M	337										**337**
Advance	79		15	38	29	44	43	51	12		**311**
Scorpio	38	22	44	7	12	2	2				**127**
Interax I.S.A.	106										**106**
NexGen Rotating Hinge	2	3	6	3	10	16	10	4	19	29	**102**
Journey II BCS									7	70	**77**
AGC Dual	43										**43**
Search	40										**40**
Kotz	33										**33**
RT-Plus Modular		1			4	1	6	4			**16**
Other (n<15)	28	3	3	2	4	2	5	2	7	16	**72**
Total	**22897**	**3112**	**3527**	**3984**	**3963**	**4076**	**4404**	**4494**	**4963**	**5307**	**60727**

Table 8: Femoral prostheses in revisions

Prosthesis	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Profix	344	49	53	48	54	47	40	43	6		**684**
NexGen	68	21	26	34	29	42	60	107	102	122	**611**
LCS Complete	54	52	60	71	61	60	57	42	31	16	**504**
Genesis I	211										**211**
NexGen Rotating Hinge	11	8	9	12	9	12	17	18	47	53	**196**
LCS	177	4									**181**
Triathlon				1	10	17	29	34	24	23	**138**
Scorpio	1	10	16	19	25	16	7				**94**
Legion			1	8	7		1	6	26	40	**89**
AGC	59	6	7	1	3	2	4	1			**83**
Duracon	31	5	9	17	5	5	4				**76**
Vanguard TM			1	17	23	21	3	2			**67**
AGC Dual	62										**62**
PFC-Sigma								12	21	24	**57**
Dual Articular 2000	21	6	3								**30**
RT-Plus Modular				3	1	1	9	9	1		**24**
Tricon -C with Pro-Fit	21										**21**
S-ROM Rotat. Hinge	3			2		7	2	1	4	1	**20**
E-motion	4	2	4	5	1						**16**
Kinemax	16										**16**
Other (n<15)	53	2	4	7	3	7	5	3	3	7	**94**
Total	**1136**	**165**	**193**	**245**	**231**	**237**	**238**	**278**	**265**	**286**	**3274**

Table 9: Tibial prostheses in primary operations

Prosthesis	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Profix	6379	1125	1097	1216	1155	1169	1388	1032	114		**14675**
LCS Complete	1355	1136	1307	1374	1419	1491	1487	802	711	674	**11756**
NexGen	815	155	172	205	251	220	656	1592	2420	2676	**9162**
AGC	3017	377	351	341	290	247	224	27			**4874**
LCS	4471	18	8								**4497**
Genesis I	3293										**3293**
Duracon	601	214	463	508	470	396	101				**2753**
PFC-Sigma	1					3	1	453	706	729	**1893**
Triathlon		51	48	178	164	287	329	244	229	296	**1826**
Legion							3	136	673	753	**1565**
Tricon II	1417										**1417**
Vanguard TM	1		3	66	144	198	148	146	65	65	**836**
E-motion	395	8	9	46	10						**468**
Kinemax	411										**411**
LCS Universal	373										**373**
Advance	79		15	38	29	44	43	51	12		**311**
Scorpio	38	22	44	7	12	2	2				**127**
Interax I.S.A.	106										**106**
NexGen Rotating Hinge	2	3	6	3	10	16	10	4	19	29	**102**
Journey II BCS									7	70	**77**
Search	40										**40**
Kotz	33										**33**
AGC Dual	27										**27**
RT-Plus Modular		1			4	1	6	4			**16**
Other (n<15)	34	3	4	2	4	1	5	3	7	15	**78**
Total	**22888**	**3113**	**3527**	**3984**	**3962**	**4075**	**4403**	**4494**	**4963**	**5307**	**60716**

Table 10: Tibial prostheses in revisions

Prosthesis	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Profix	351	51	49	47	53	45	45	44	7	1	**693**
LCS Complete	64	70	81	94	73	81	68	55	46	25	**657**
NexGen	67	21	27	33	30	42	61	111	109	124	**625**
Genesis I	256		2			1					**259**
LCS	230	6									**236**
NexGen Rotating Hinge	11	8	9	12	8	12	16	18	47	51	**192**
Triathlon				1	10	18	31	35	24	24	**143**
Duracon	35	6	12	21	12	14	11	7			**118**
Scorpio	1	10	16	19	26	17	8			1	**98**
Legion			1	8	7		1	6	26	39	**88**
AGC	61	6	7	1	4	2	4				**85**
Tricon II	70										**70**
Vanguard TM				17	22	21	4	3			**67**
AGC Dual	59										**59**
PFC-Sigma								12	20	24	**56**
Dual Articular 2000	21	5	3								**29**
RT-Plus Modular				3	1	1	9	9	1		**24**
Maxim	19	2			1						**22**
E-motion	4	2	4	6	1		1				**18**
Kinemax	17										**17**
Other (n<15)	29	1	4	5	3	6	9	3	5	7	**72**
Total	**1295**	**188**	**215**	**267**	**251**	**260**	**268**	**303**	**285**	**296**	**3628**

Unicondylar knee prostheses

Table 11: Femoral prostheses in primary operations

Prosthesis	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Oxford UNI (III)	2154	405	400	444	400	412	334	225	193	194	**5161**
Oxford Partial Knee						1	104	205	370	513	**1193**
Genesis UNI	342	2	1	1							**346**
Miller/Galante UNI	255	27	10	4							**296**
MOD III	200										**200**
Preservation	96	31	20	7	11						**165**
LINK Schlitten UNI	9					3	14	20	13	17	**76**
Duracon	49										**49**
Oxford UNI (II)	45										**45**
Sigma High Performance Uni						8	6	11	6	9	**40**
Journey Uni						7	14	3	3	12	**39**
ZUK (Unicondylar)			9	7	3	8	1				**28**
Other (n<15)	1	1						3	1	2	**8**
Total	**3151**	**466**	**440**	**463**	**414**	**439**	**473**	**467**	**586**	**747**	**7646**

Table 12: Tibial prostheses in primary operations

Prosthesis	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Oxford UNI (III)	2153	405	399	444	400	412	334	224	194	190	**5155**
Oxford Partial Knee						1	104	206	369	517	**1197**
Genesis UNI	342	2	1	1							**346**
Miller/Galante UNI	247	27	10	4							**288**
MOD III	201										**201**
Preservation	96	31	20	7	11						**165**
LINK Schlitten UNI	9					3	14	20	13	17	**76**
Duracon	49										**49**
Oxford UNI (II)	45		1								**46**
Sigma High Performance Uni						8	6	11	6	9	**40**
Journey Uni						6	14	3	3	12	**38**
ZUK (Unicondylar)			9	7	3	8	1				**28**
Other (n<15)	1					1		3		2	**7**
Total	**3143**	**465**	**440**	**463**	**414**	**439**	**473**	**467**	**585**	**747**	**7636**

Patellofemoral prostheses

Table 13: Femoral prostheses in primary operations

Prosthesis	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Journey PFJ		3	16	18	21	25	14	18	22	7	**144**
NexGen PFJ Gender					2	4	19	16	16	32	**89**
Patella Mod III / II	30	2									**32**
LCS PFJ	14	3		1							**18**
Other (n<5)	3		5					4			**12**
Total	**47**	**8**	**21**	**19**	**23**	**29**	**33**	**38**	**38**	**39**	**295**

Table 14: Patella prostheses in primary operations

Prosthesis	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Journey PFJ		3	14	18	21	25	14	18	22	7	**142**
NexGen PFJ Gender					2	4	19	16	16	31	**88**
Patella Mod III / II	31	2									**33**
LCS PFJ	14	3									**17**
Other (n<5)	3		5	1				4		1	**14**
Total	**48**	**8**	**19**	**19**	**23**	**29**	**33**	**38**	**38**	**39**	**294**

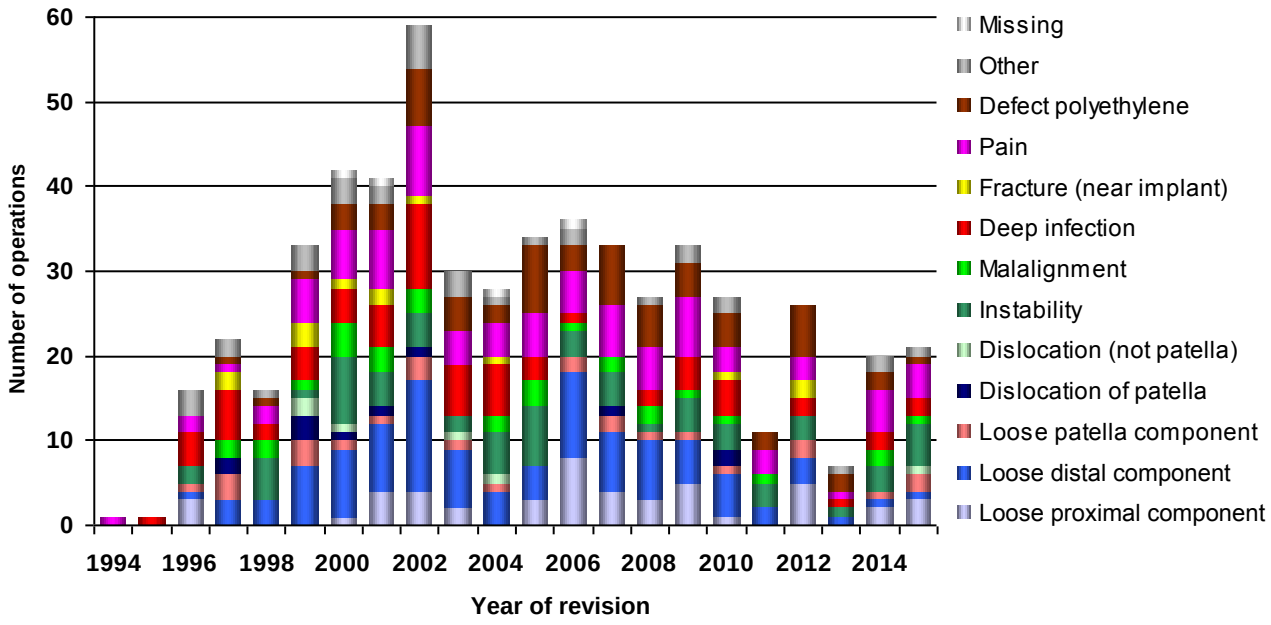
Reasons for revisions

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
2015	3	1	2	0	1	5	1	2	0	4	1	1	0
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	3	1	0	0	3	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	**48**	**100**	**26**	**11**	**6**	**68**	**31**	**69**	**13**	**87**	**66**	**35**	**4**

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

Figure 14: Reasons for revisions of total knee prostheses with patella



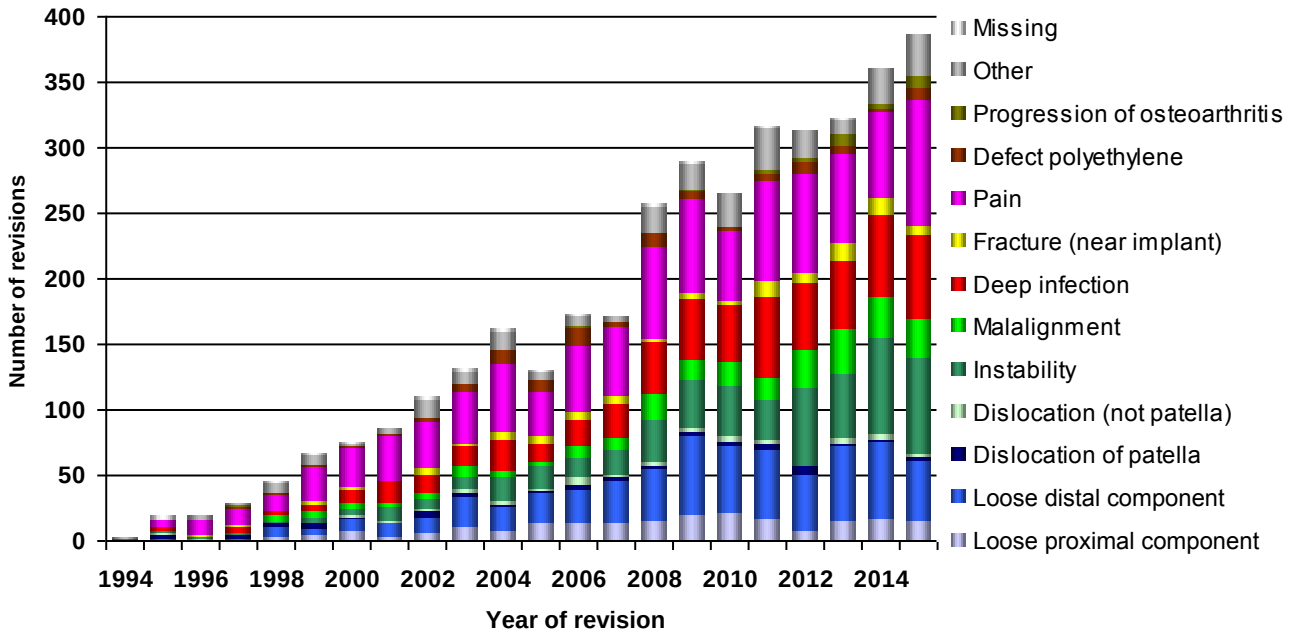
Reasons for revisions

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
2015	15	46	3	3	73	30	64	7	96	8	10	32	0
2014	16	60	2	4	73	31	62	14	65	4	2	28	0
2013	15	58	1	5	49	34	52	14	68	6	8	11	1
2012	8	42	7	0	60	28	52	7	77	9	3	21	0
2011	16	54	5	3	29	17	63	12	76	6	3	31	1
2010	21	51	4	4	38	19	44	3	52	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	11		20	2
2007	13	33	3	1	19	10	25	7	53	2		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	9		6	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	**208**	**580**	**64**	**45**	**502**	**251**	**577**	**105**	**975**	**104**	**29**	**270**	**24**

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

Figure 15: Reasons for revisions of total knee prostheses without patella



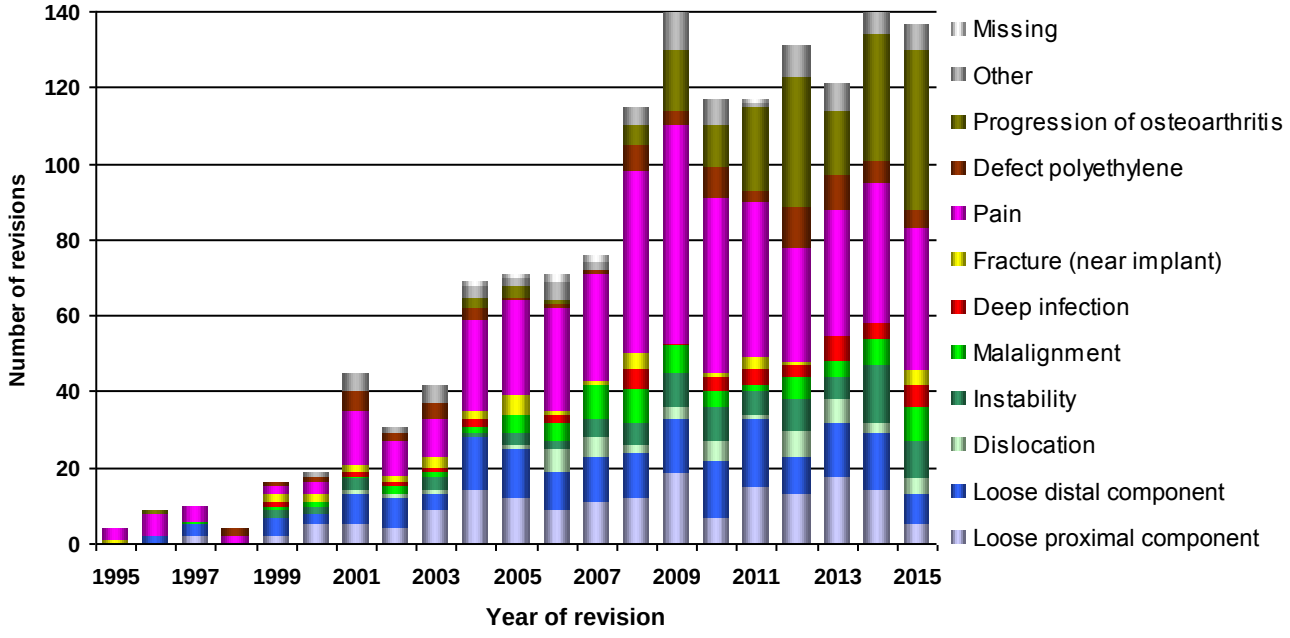
Reasons for revisions

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
2015	5	8	4	10	9	6	4	37	5	42	7	0
2014	14	15	3	15	7	4	0	37	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	3	41	3	22	1	1
2010	7	15	5	9	4	4	1	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	4	48	7	5	5	0
2007	11	12	5	5	9	0	1	28	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	2	1	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	**176**	**188**	**46**	**91**	**76**	**42**	**34**	**486**	**75**	**188**	**76**	**7**

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

Figure 16: Reasons for revisions of unicondylar knee prostheses

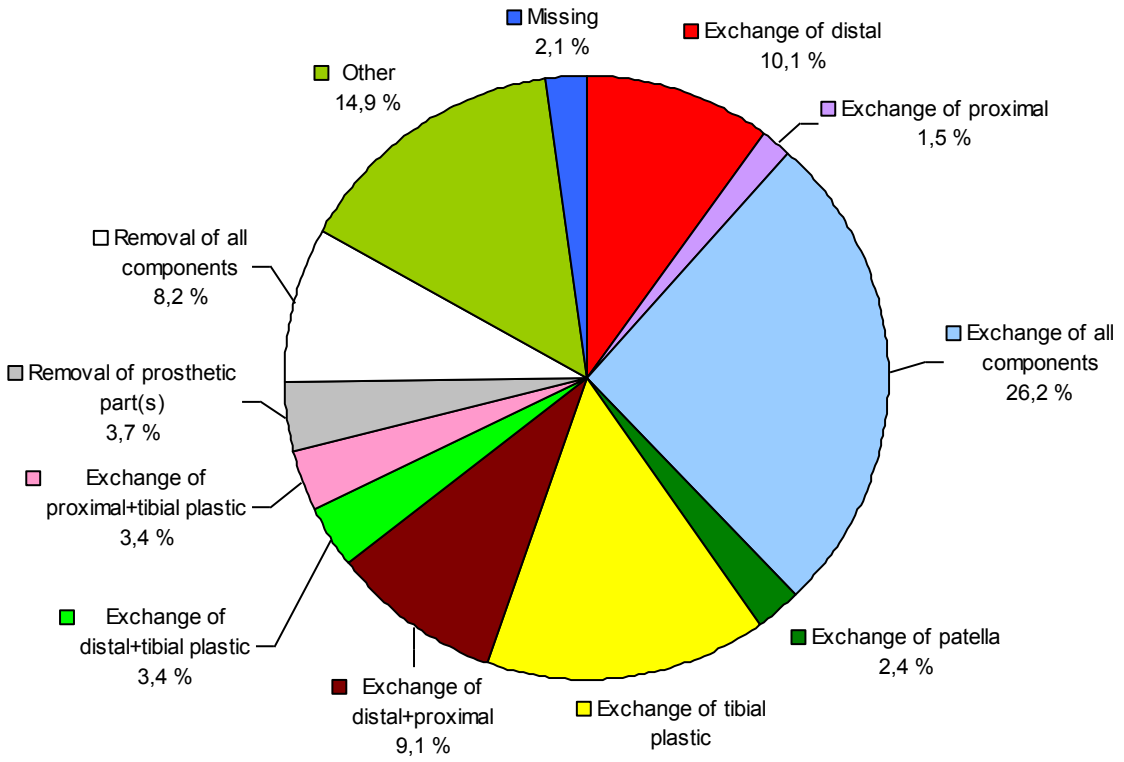


Type of revision

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
2015											1		**1**
2014						2						1	**3**
2012		1	1	1		1							**4**
2011						2							**2**
2010						1							**1**
2009						2		1			2		**6**
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	1		**9**
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	3		5	6		4		1	3	1	1		**24**
1999	5	3	6	6	2	4		1	6		2		**35**
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	12		4		2	3	2	7	2	**39**
1995	1		7	14		6	2	1	4		9		**44**
1994	1	1	2	15	2	2	1			1	6	1	**32**
Total	**33**	**11**	**30**	**86**	**8**	**49**	**5**	**11**	**27**	**12**	**49**	**7**	**329**

Figure 17: Total knee prostheses with patella

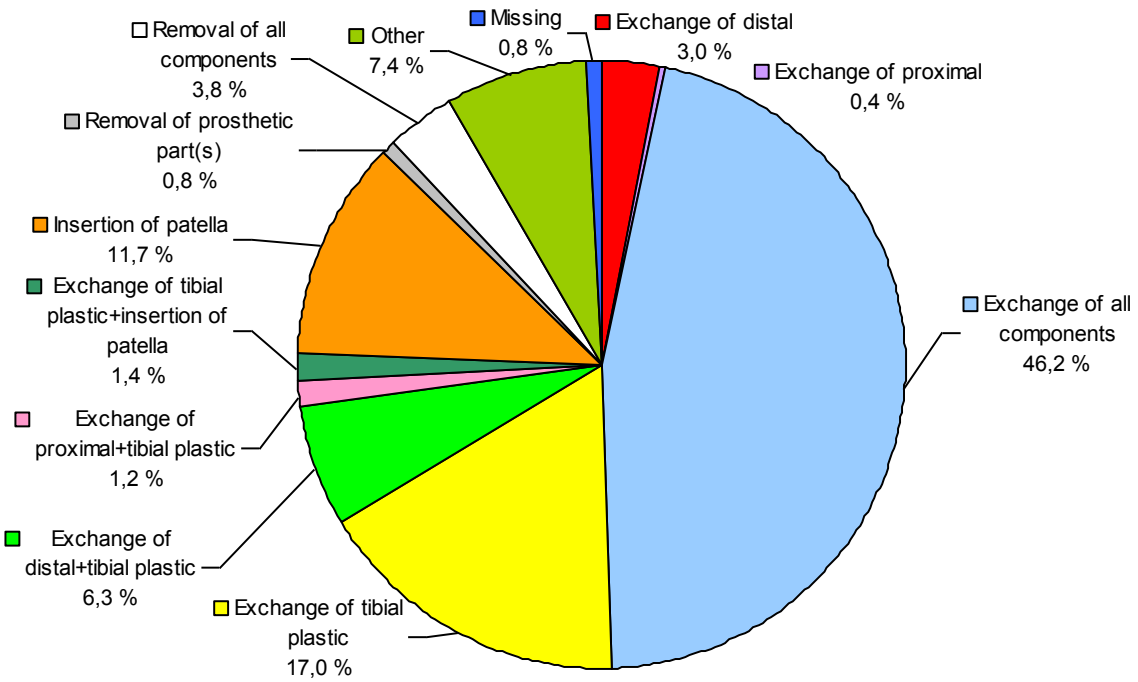


Type of revision

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
2015		1	8		26						8		**43**
2014		9	36		36			6			9		**96**
2013	1	8	58		35		4	1			10		**117**
2012	1	18	96		46			5	2		11	1	**180**
2011	1	23	138		53		2	7			18	1	**243**
2010	1	20	118	2	45		2	6	2	1	13		**210**
2009	4	20	114	1	48		6	9	1	13	14		**230**
2008	1	19	103	6	44	1	2	9	2	14	13	1	**215**
2007	1	13	118	4	28	1	2	5	1	12	13		**198**
2006	5	11	80	3	14	1	2	9	1	22	14	1	**163**
2005	6	11	62	1	12		2	6		22	18		**140**
2004	9	11	60	2	26		5	9		18	10	2	**152**
2003	5	6	66	1	27		2	12		24	12	1	**156**
2002	9	11	52	6	20		2	5	1	26	7	1	**140**
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	20	2	9			5	1	23	5	4	**78**
1997	3	1	40	1	6	2		1	2	26	7	1	**90**
1996	5	2	28	3	6	1		5	3	20	9	2	**84**
1995			34		5	1		1	1	23	4	2	**71**
1994	3		42		3		1	3	1	24	10	3	**90**
Total	**92**	**196**	**1427**	**44**	**527**	**11**	**38**	**116**	**24**	**363**	**229**	**25**	**3092**

Figure 18: Total knee prostheses without patella

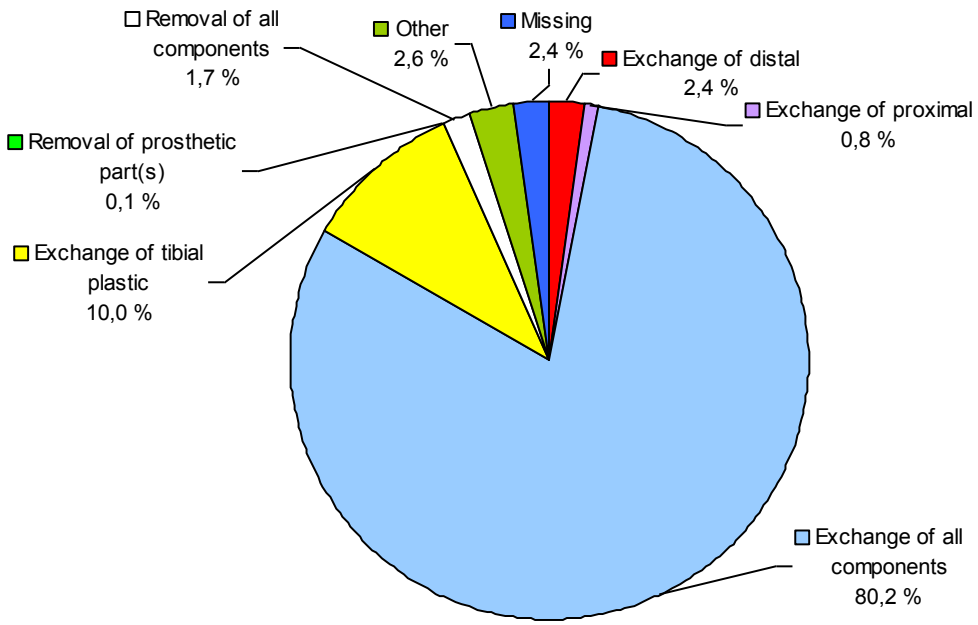


Type of revision

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
2015	1	2	3						**6**
2014	1	8	3		1		2		**15**
2013		7	6		1				**14**
2012	2	15	9		1				**27**
2011		25	5				2	1	**33**
2010		37	9				1		**47**
2009		43	11		1		1		**56**
2008	1	56	8		2				**67**
2007		74	7	1	2		4	2	**90**
2006	1	67	6	1	1		3	2	**81**
2005	1	73	8				1	4	**87**
2004		87	5		2			2	**96**
2003	4	97	6	1			7	6	**121**
2002		34	6	2	2	1			**45**
2001	7	38	6		2		2	1	**56**
2000	1	52	4		1		1	1	**60**
1999	2	20		1				3	**26**
1998	2	16		1			1		**20**
1997		13		1					**14**
1996		9			1			1	**11**
1995	1	22							**23**
1994		21					1	1	**23**
Total	**24**	**816**	**102**	**8**	**17**	**1**	**26**	**24**	**1018**

Figure 19: Unicondylar prostheses



ASA classification all knee prostheses

Table 21: Primary operations all knee prostheses

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2015	679	4 135	1 186	7		87	**6 094**
2014	575	3 878	1 054	8		74	**5 589**
2013	544	3 495	890	5	1	69	**5 004**
2012	667	3 275	901	8		64	**4 915**
2011	582	3 019	872	6		65	**4 544**
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	1 718	541	10	1	70	**3 109**
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
2015	35	313	180	7		19	**554**
2014	50	295	137	2		13	**497**
2013	44	290	133			12	**479**
2012	52	287	135	3		16	**493**
2011	54	249	119			9	**431**
2010	77	199	121	1		13	**411**
2009	93	212	117	1		15	**438**
2008	102	164	88			13	**367**
2007	73	141	69	2		16	**301**
2006	57	134	57	4		15	**267**
2005	61	94	70			26	**251**

Figure 20: Primary operations

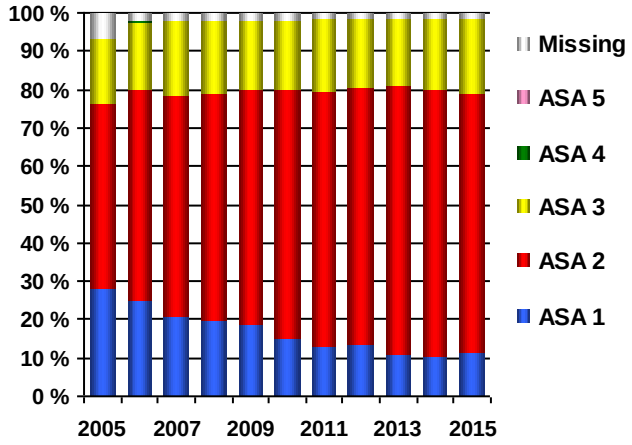
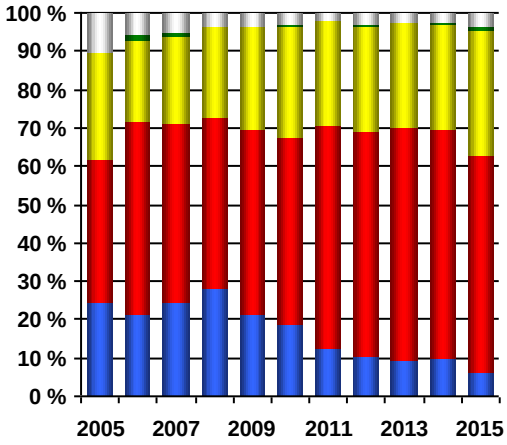


Figure 21: Revisions



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
2015	923	4 287	814	29	41	**6 094**
2014	798	3 985	755	25	26	**5 589**
2013	895	3 328	716	10	55	**5 004**
2012	1 131	2 878	871	7	28	**4 915**
2011	1 267	2 287	953	8	29	**4 544**
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	578	14	40	**3 109**
2005	2 021	388	702	8	135	**3 254**

Table 24: Revisions

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2015	64	406	68	11	5	**554**
2014	69	349	67	7	5	**497**
2013	75	316	77	6	5	**479**
2012	105	268	111	6	3	**493**
2011	97	229	100	2	3	**431**
2010	107	227	70	6	1	**411**
2009	93	262	74	4	5	**438**
2008	106	184	62	7	8	**367**
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 22: Primary operations

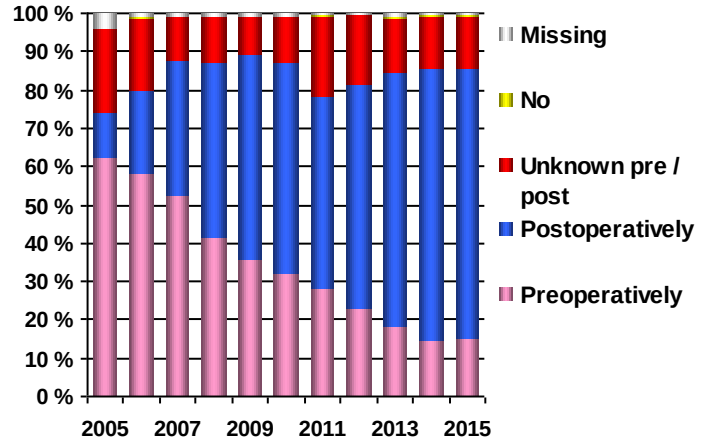
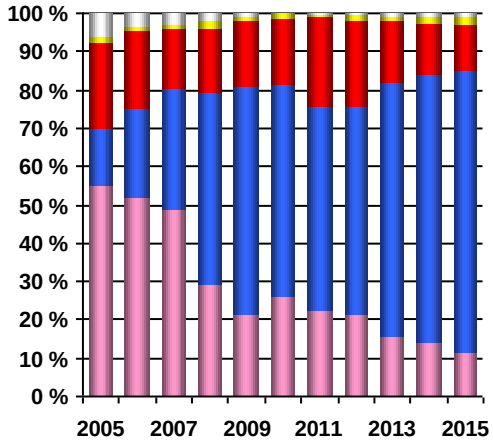


Figure 23: Revisions



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	2015
Apixiban (Eliquis)									1,2%	1,1%	0,9%
Dalteparin (Fragmin)	48,0%	51,2%	56,1%	57,2%	52,6%	62,4%	64,4%	59,1%	53,9%	50,2%	56,3%
Enoksaparin (Klexane)	42,2%	42,9%	39,6%	38,0%	43,4%	32,8%	28,1%	29,2%	30,2%	32,4%	26,8%
Rivaroksaban (Xarelto)						0,1%	2,2%	2,6%	2,5%	1,8%	1,4%
Ximelagatran (Exanta, Malagatran)	2,5%	1,0%									
No drugs	0,3%	0,5%	0,2%	0,5%	0,3%	0,3%	0,2%	0,2%	0,3%	0,5%	0,6%
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%	12,3%	12,2%
Other	0,6%	0,4%	0,2%	0,3%	0,1%	0,1%	0,1%	0,2%	0,2%	0,6%	0,5%
Missing	4,6%	2,1%	1,9%	1,7%	1,5%	1,1%	1,4%	1,3%	1,6%	1,2%	1,4%

Figure 24: Drugs

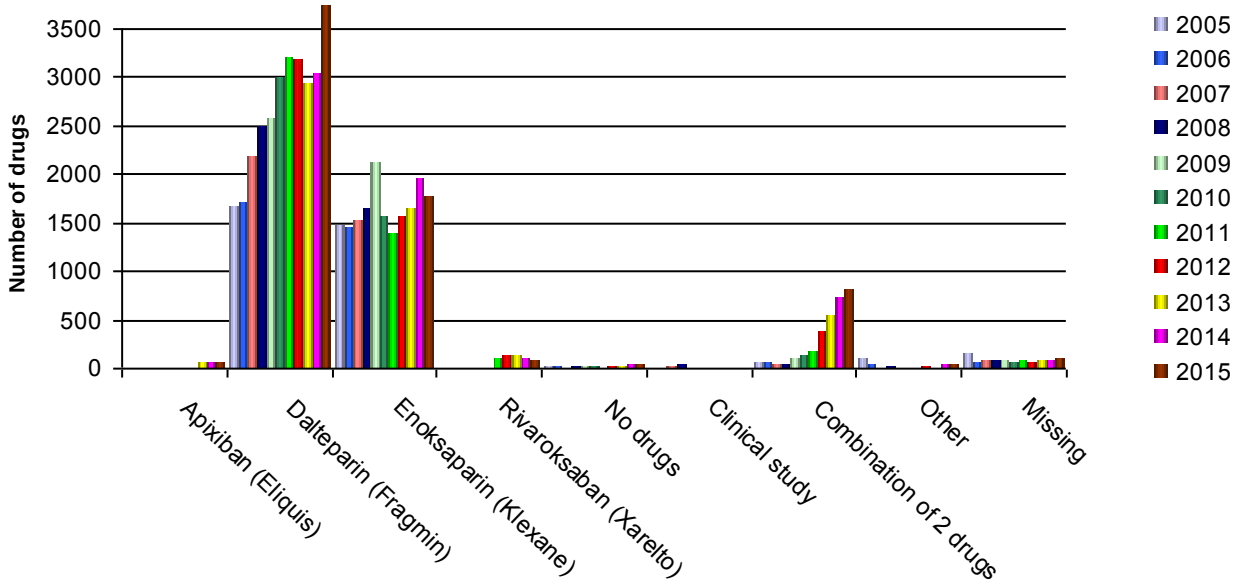


Table 26: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2015	1 005	2 382	977	327	865	143	40	908	**6 647**
2014	949	1 775	1 017	373	1 064	158	32	721	**6 089**
2013	702	1 580	997	408	994	131	16	655	**5 483**
2012	564	1 632	1 202	346	890	105	13	656	**5 408**
2011	285	1 343	1 370	412	795	107	10	653	**4 975**
2010	347	1 346	1 319	242	776	57	14	710	**4 811**
2009	398	1 586	1 164	229	760	10	14	745	**4 906**
2008	423	1 454	827	171	749	38	20	675	**4 357**
2007	489	1 175	793	122	740	16	9	545	**3 889**
2006	440	1 035	572	115	540	20	17	637	**3 376**
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	2015
Cyclokapron (Tranexamic acid)	2	1371	3482	3912	4682	5309
Missing		74	153	116	112	68
Total	**2**	**1445**	**3635**	**4028**	**4794**	**5377**

Registration of fibrinolysis inhibitor started in 2011

Perioperative complications

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

Type	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Patella tendon rupture / Avulsion fractures / ligament rupture / tendon injury					1	13	12	10	20	17	73
Technical problem with cement	12	6	1	6	6	10	6	6	5	4	62
Rupture / damage MCL (medial colateral ligament)			1	7	14	5	12	12	5	5	61
Fracture of distal bone	22	3	4	4	6	8	3	3	3	4	60
Failure of instruments	11	5	7	3	4	3	5	3	7	1	49
Blood torniquet failing	20	1	8	1	4	5	4	3		1	47
Fissure in the distal bone	16	2	4	5	1	8	4	2	1	2	45
Fracture of proximal bone	12	1	3	3	3	1	4	5	3	6	41
Adm. failure (missing comp. etc.)	15	2		4	1	2	7	7	2		40
Problem due to difficult anatomy	1	2	7	2	5	3	6	3	5	5	39
Other periop. compl.	79	19	21	25	29	32	29	36	41	44	355

Previous operation in relevant joint

Table 29: For primary total prostheses

Type	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Meniscus	2048	336	321	411	511	582	706	699	767	755	7136
Osteotomy	1371	109	114	122	121	109	116	110	134	119	2425
Synovectomy	698	72	72	100	58	68	65	64	66	66	1329
Osteosynthesis of intraarticular joint fracture	523	54	76	89	77	84	74	62	95	93	1227
Ligament	110	9	18	13	16	18	23	24	64	86	381
Artrodesis	19	1	2		1	1	2	2			28
Other previous op.	1039	167	123	163	217	227	283	266	307	321	3113

Mini-invasive surgery

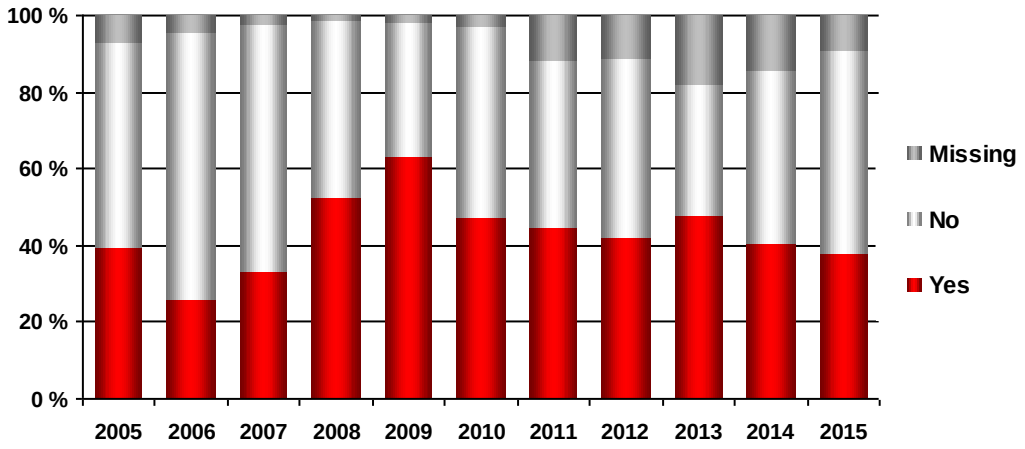
Table 30: Primary operations - Total knee prostheses

Year	Yes	No	Missing	Total
2015	5 (0%)	4 615 (87%)	656 (12%)	**5 276**
2014	4 (0%)	4 310 (87%)	644 (13%)	**4 958**
2013	11 (0%)	3 764 (84%)	715 (16%)	**4 490**
2012	16 (0%)	3 694 (84%)	685 (16%)	**4 395**
2011	15 (0%)	3 585 (88%)	464 (11%)	**4 064**
2010	21 (1%)	3 749 (95%)	185 (5%)	**3 955**
2009	25 (1%)	3 793 (95%)	165 (4%)	**3 983**
2008	14 (0%)	3 357 (95%)	157 (4%)	**3 528**
2007	22 (1%)	2 961 (95%)	129 (4%)	**3 112**
2006	3 (0%)	2 580 (96%)	115 (4%)	**2 698**
2005	5 (0%)	2 484 (89%)	300 (11%)	**2 789**

Table 31: Primary operations - Unicondylar knee prostheses

År	Yes	No	Missing	Total
2015	283 (38%)	395 (53%)	69 (9%)	**747**
2014	237 (40%)	264 (45%)	85 (15%)	**586**
2013	223 (48%)	161 (34%)	84 (18%)	**468**
2012	199 (42%)	220 (47%)	54 (11%)	**473**
2011	196 (45%)	191 (44%)	52 (12%)	**439**
2010	196 (47%)	205 (50%)	13 (3%)	**414**
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 25: Primary operations - Unicondylar knee prostheses



Registration of MIS started in 2005

Computernavigation

Table 32: Primary operations - Total knee prostheses

Year	Yes	No	Missing	Total
2015	467 (9%)	4 159 (79%)	650 (12%)	**5 276**
2014	433 (9%)	3 880 (78%)	645 (13%)	**4 958**
2013	381 (8%)	3 387 (75%)	722 (16%)	**4 490**
2012	416 (9%)	3 297 (75%)	682 (16%)	**4 395**
2011	443 (11%)	3 175 (78%)	446 (11%)	**4 064**
2010	659 (17%)	3 111 (79%)	185 (5%)	**3 955**
2009	761 (19%)	3 062 (77%)	160 (4%)	**3 983**
2008	742 (21%)	2 640 (75%)	146 (4%)	**3 528**
2007	374 (12%)	2 619 (84%)	119 (4%)	**3 112**
2006	254 (9%)	2 335 (87%)	109 (4%)	**2 698**
2005	185 (7%)	2 332 (84%)	272 (10%)	**2 789**

Figure 25: Primary operations - Total knee prostheses

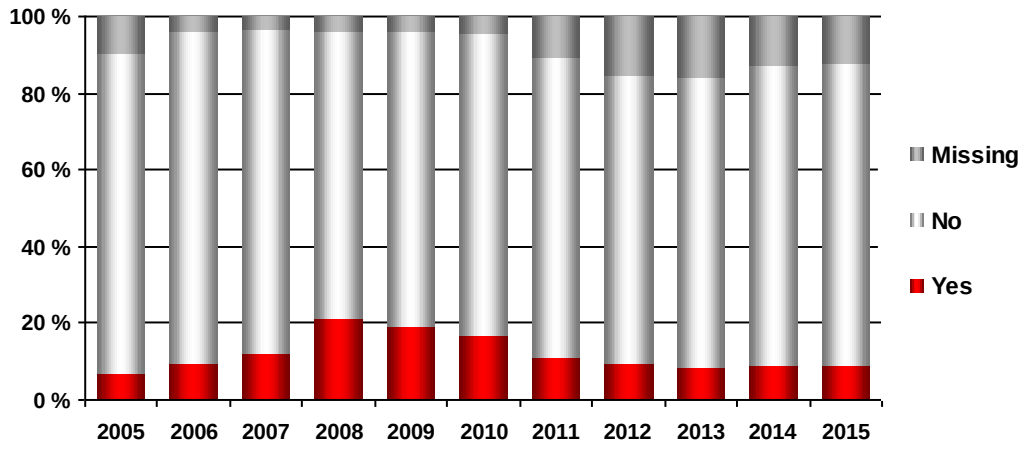


Table 33: Primary operations - Unicondylar knee prostheses

Year	Yes	No	Missing	Total
2015	3 (0%)	676 (90%)	68 (9%)	**747**
2014	0	500 (85%)	86 (15%)	**586**
2013	0	382 (82%)	86 (18%)	**468**
2012	0	417 (88%)	56 (12%)	**473**
2011	1 (0%)	387 (88%)	51 (12%)	**439**
2010	7 (2%)	394 (95%)	13 (3%)	**414**
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	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Palacos w/gentamicin	14676										**14676**
Palacos R + G	1335	1311	1449	1779	1666	1314	1274	1390	1431	1476	**14425**
Optipac Refobacin Bonecement R	1	1	159	679	1100	1326	1314	1322	1736	2148	**9786**
Refobacin Bone Cement R	1195	1007	911	531	366	410	396	349	356	158	**5679**
Cemex w/gentamycin	293	195	88	118	110	173	189	216	209	160	**1751**
Refobacin-Palacos	1577										**1577**
SmartSet GHV Genta. Smartmix		30	37	7		22	189	183	268	292	**1028**
Simplex w/Tobramycin	273	64	89	170	78						**674**
Palacos	424										**424**
Cemex System Genta FAST		24	88	44	34	13					**203**
Simplex	183	1									**184**
CMW I w/gentamicin	169		1						1		**171**
CMW I	53										**53**
Other (n<50)	121	1	10	9		2	3	7	7	7	**167**
Missing information	5	1	42	8	9	15	4	2			**86**
Total	**20305**	**2635**	**2874**	**3345**	**3363**	**3275**	**3369**	**3469**	**4008**	**4241**	**50884**

Table 35: Primary operations - Tibia

Cement	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Palacos R + G	1737	1751	1847	2266	2190	1951	1953	2117	2172	2220	**20204**
Palacos w/gentamicin	17790										**17790**
Optipac Refobacin Bonecement R	1	1	180	727	1178	1416	1447	1471	1907	2315	**10643**
Refobacin Bone Cement R	1283	1059	953	564	393	447	471	394	376	171	**6111**
Cemex w/gentamycin	339	250	110	118	112	181	190	214	222	165	**1901**
Refobacin-Palacos	1626										**1626**
SmartSet GHV Genta. Smartmix	1	39	37	7		22	189	182	269	294	**1040**
Simplex w/Tobramycin	281	64	88	169	77						**679**
Palacos	452										**452**
Cemex System Genta FAST		55	116	61	38	13					**283**
CMW I w/gentamicin	192		1		1		1				**195**
Simplex	185	1									**186**
CMW I	54										**54**
Other (n<50)	130	5	15	12	1	3	5	9	7	12	**199**
Missing information	5	1	46	9	10	9	3	3	1	1	**88**
Total	**24076**	**3226**	**3393**	**3933**	**4000**	**4042**	**4259**	**4390**	**4954**	**5178**	**61451**

Cements used in unicondylar knee prostheses

Table 36: Primary operations - Femur

Cement	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Palacos R + G	179	211	210	244	232	220	254	279	372	425	**2626**
Palacos w/gentamicin	2202										**2202**
Optipac Refobacin Bonecement R			27	100	110	159	164	156	167	225	**1108**
Refobacin Bone Cement R	247	193	141	56	46	40	49	18	26	25	**841**
Refobacin-Palacos	269										**269**
Simplex w/Tobramycin	125	29	11	36	14	4		2	2		**223**
Cemex w/gentamycin	37	17	6	3							**63**
Cemex System Genta FAST		7	26	22	7						**62**
SmartSet GHV		2				8	6	11	6	9	**42**
Simplex	40										**40**
Other (n<20)	54	7	4		3	7		2	3	2	**82**
Total	**3151**	**466**	**425**	**461**	**412**	**438**	**473**	**468**	**576**	**686**	**7558**

Table 37: Primary operations - Tibia

Cement	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Palacos R + G	182	217	205	247	236	221	254	278	375	425	**2640**
Palacos w/gentamicin	2193										**2193**
Optipac Refobacin Bonecement R			27	100	107	159	164	154	166	225	**1102**
Refobacin Bone Cement R	244	187	144	55	46	40	49	18	26	25	**834**
Refobacin-Palacos	266										**266**
Simplex w/Tobramycin	119	29	9	36	14	4		2	2		**215**
Cemex w/gentamycin	37	15	8	3							**63**
Cemex System Genta FAST		7	25	22	7						**61**
SmartSet GHV		2				8	6	11	6	9	**42**
Simplex	39										**39**
Other (n<20)	50	8	4		3	7		2	3	2	**79**
Total	**3130**	**465**	**422**	**463**	**413**	**439**	**473**	**465**	**578**	**686**	**7534**

Antibiotic prophylaxis

Table 38: Primary operations

Drugs	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Cefalotin (Keflin)	20137	2935	3274	3696	3628	3731	3939	4165	4862	5218	**55585**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	2836	153	168	141	172	205	162	92	14		**3943**
Kloksacillin (Ekvacillin)	692	79	130	206	249	234	265	185	134	207	**2381**
Klindamycin (Dalacin, Clindamycin)	353	78	99	125	112	146	215	227	280	316	**1951**
Dikloksacillin (Diclocil, Dicillin)	1264	163	101	67	13	27	17	22	8	1	**1683**
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, Abboticin)	16							1			**17**
Combination of 2 drugs	540	166	187	182	175	155	271	273	230	302	**2481**
Other (n<10)	20	3	6	2		3	2	2	2	4	**44**
Missing	129	6	24	44	51	43	42	36	56	45	**476**
Total	**26103**	**3588**	**3990**	**4468**	**4400**	**4544**	**4915**	**5004**	**5589**	**6093**	**68694**

Table 39: Revisions

Drugs	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Cefalotin (Keflin)	1444	216	256	281	275	271	291	299	289	321	**3943**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	276	6	5	10	8	6	12	2	1	1	**327**
Klindamycin (Dalacin, Clindamycin)	78	15	18	26	12	17	27	23	27	25	**268**
Dikloksacillin (Diclocil, Dicillin)	161	4	15	4	3	8	12	8	3	6	**224**
Kloksacillin (Ekvacillin)	71	6	5	3	6	19	9	18	21	19	**177**
Vankomycin (Vancomycin, Vancocin)	19	16	10	14	16	11	13	21	19	8	**147**
Benzylpenicillin (Penicillin G)	14	1	2	6	5	2		3	2	4	**39**
Ampicillin (Pentrexyl, Pondocillin, Doktacilin)	10					2		1			**13**
Combination of 2 drugs	181	30	31	64	63	71	123	97	122	157	**939**
Other (n<10)	19	3	2	1	4	1	1	1	5	6	**43**
Missing	74	4	23	29	19	23	5	6	8	7	**198**
Total	**2347**	**301**	**367**	**438**	**411**	**431**	**493**	**479**	**497**	**554**	**6318**

Patient specific instruments

Table 40:

Year	Yes	No	Missing	Total
2015	14	6200	1 513	**7 727**
2014	22	5462	1 564	**7 048**
2013	25	4647	1 778	**6 450**
2012	88	4240	1 959	**6 287**
2011	65	1693	4 141	**5 899**

Registration started in 2011

Drain

Table 41:

Year	Yes	No	Missing	Total
2015	2 274	4674	779	**7 727**
2014	2 242	3889	917	**7 048**
2013	2 070	3326	1 054	**6 450**
2012	2 207	2840	1 240	**6 287**
2011	1 095	1127	3 677	**5 899**

Registration started in 2011

Completeness analysis for the Knee Arthroplasty Register, 2013-2014

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 Knee Arthroplasty Register (NRL). A report on the implementation and further results will be published on www.helsedirektoratet.no. There are separate statistics on primary operations and revisions. Here we only present the analysis for primary operations, as the compilation work on revisions has not been completed. Some hospitals have few knee arthroplasty operations and the completeness rate must be seen in this light.

NCSP codes for combined data from NPR hospital stays and the Norwegian Arthroplasty Register (NAR) (Knee)

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

The completeness rate for the The Norwegian Arthroplasty Register (NAR) for Knee was follows:

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

Coverage for the NPR was calculated in a similar way:

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

Primary operations. From 2013 to 2014, 11 011 primary knee replacements were reported to one or both of the registers. 95.3% of these were reported to the NRL, while 97.9% were reported to the NPR. The analysis by hospital, divided into health regions, shows a completeness rate for the Knee Arthroplasty Register ranging from 77.1% to 100% between the different hospitals. For hospitals with a low completeness rate for the Knee Arthroplasty Register, either the form was not sent in or other interventions than knee arthroplasties were incorrectly coded with NGB 0*/NGB 1*/NGB 20/NGB 30/NGB 40 (There were only 9 operations in the category NFB 99 during the period).

Procedure codes to be used for primary operations:

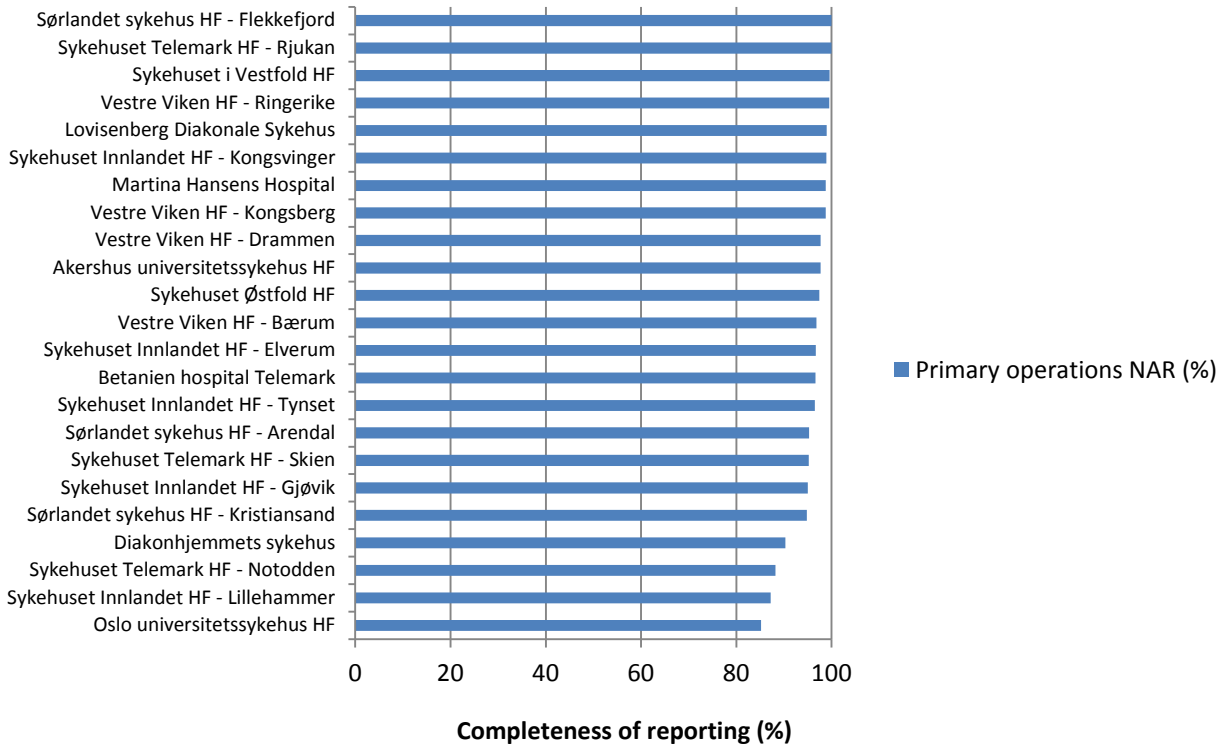
NGB 0* - NGB 1* - NGB 20 - NGB 30 - NGB 40

Helse Sør-Øst

Table: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Sør-Øst:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Sykehuset Telemark HF - Rjukan	49	100	100
Sørlandet sykehus HF - Flekkefjord	59	100	100
Sykehuset i Vestfold HF	487	99,6	99,8
Vestre Viken HF - Ringerike	201	99,5	99,5
Lovisenberg Diakonale Sykehus	976	99	99,7
Sykehuset Innlandet HF - Kongsvinger	261	98,9	98,9
Vestre Viken HF - Kongsberg	160	98,8	100
Martina Hansens Hospital	768	98,8	99,6
Akershus universitetssykehus HF	264	97,7	98,9
Vestre Viken HF - Drammen	172	97,7	100
Sykehuset Østfold HF	312	97,4	99,7
Vestre Viken HF - Bærum	154	96,8	97,4
Sykehuset Innlandet HF - Elverum	244	96,7	99,2
Betanien hospital Telemark	146	96,6	97,3
Sykehuset Innlandet HF - Tynset	315	96,5	97,5
Sørlandet sykehus HF - Arendal	258	95,3	98,4
Sykehuset Telemark HF - Skien	126	95,2	100
Sykehuset Innlandet HF - Gjøvik	159	95	100
Sørlandet sykehus HF - Kristiansand	210	94,8	97,1
Diakonhjemmets sykehus	486	90,3	99,8
Sykehuset Telemark HF - Notodden	17	88,2	100
Sykehuset Innlandet HF - Lillehammer	133	87,2	99,2
Oslo universitetssykehus HF	182	85,2	97,8

Figure: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

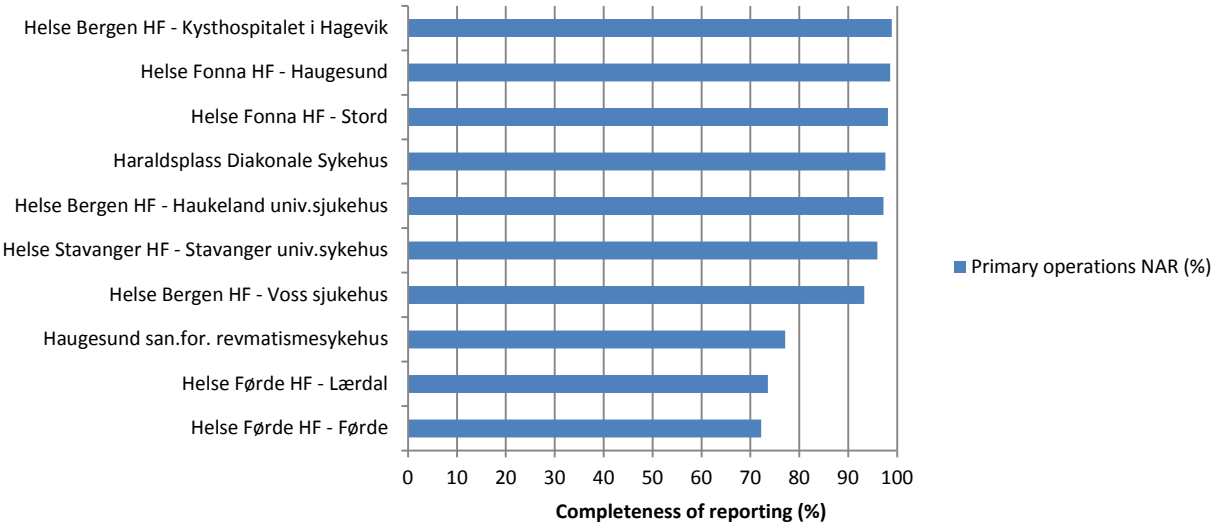


Helse Vest

Table: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Vest:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Helse Bergen HF - Kysthospitalet i Hagevik	360	98,9	100
Helse Fonna HF - Haugesund	142	98,6	100
Helse Fonna HF - Stord	54	98,1	98,1
Haraldsplass Diakonale Sykehus	254	97,6	99,2
Helse Bergen HF - Haukeland univ.sjukehus	106	97,2	99,1
Helse Stavanger HF - Stavanger univ.sykehus	329	96	100
Helse Bergen HF - Voss sjukehus	134	93,3	99,3
Haugesund san.for. revmatismesykehus	70	77,1	98,6
Helse Førde HF - Lærdal	554	73,6	98,9
Helse Førde HF - Førde	72	72,2	100

Figure: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

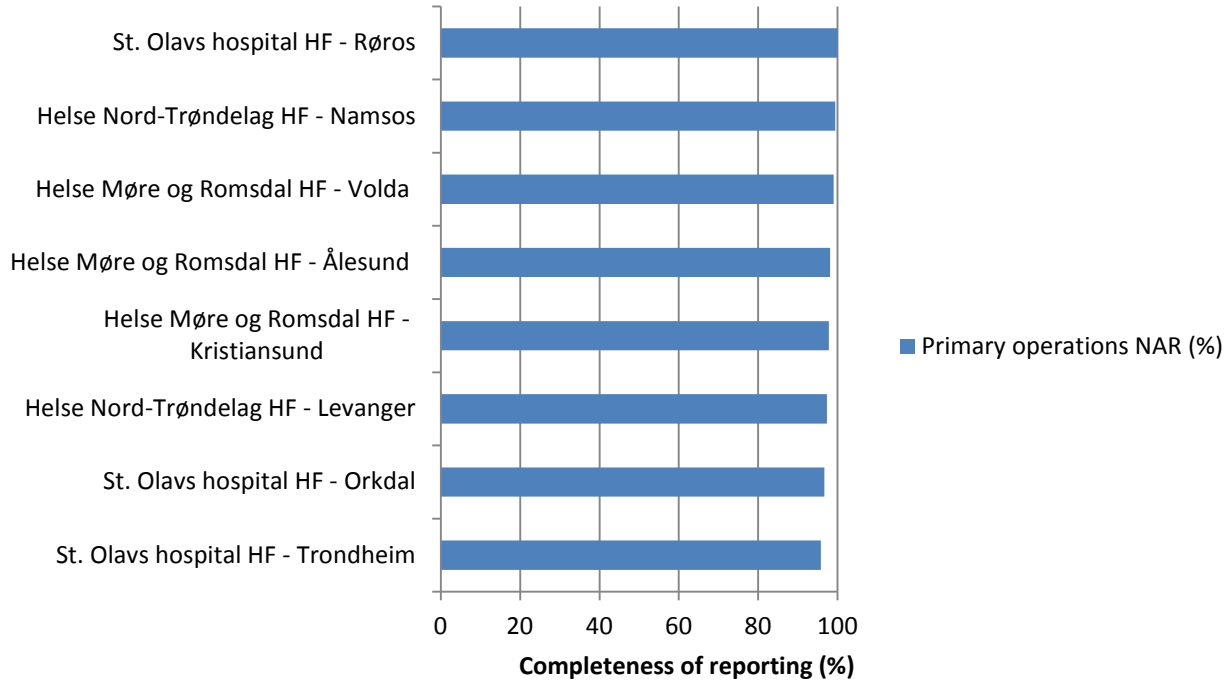


Helse Midt-Norge

Table: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Midt-Norge:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
St. Olavs hospital HF - Røros	98	100	99
Helse Nord-Trøndelag HF - Namsos	177	99,4	97,2
Helse Møre og Romsdal HF - Volda	102	99	100
Helse Møre og Romsdal HF - Ålesund	210	98,1	99
Helse Møre og Romsdal HF - Kristiansund	312	97,8	99
Helse Nord-Trøndelag HF - Levanger	220	97,3	100
St. Olavs hospital HF - Orkdal	184	96,7	99,5
St. Olavs hospital HF - Trondheim	400	95,8	98,8

Figure: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

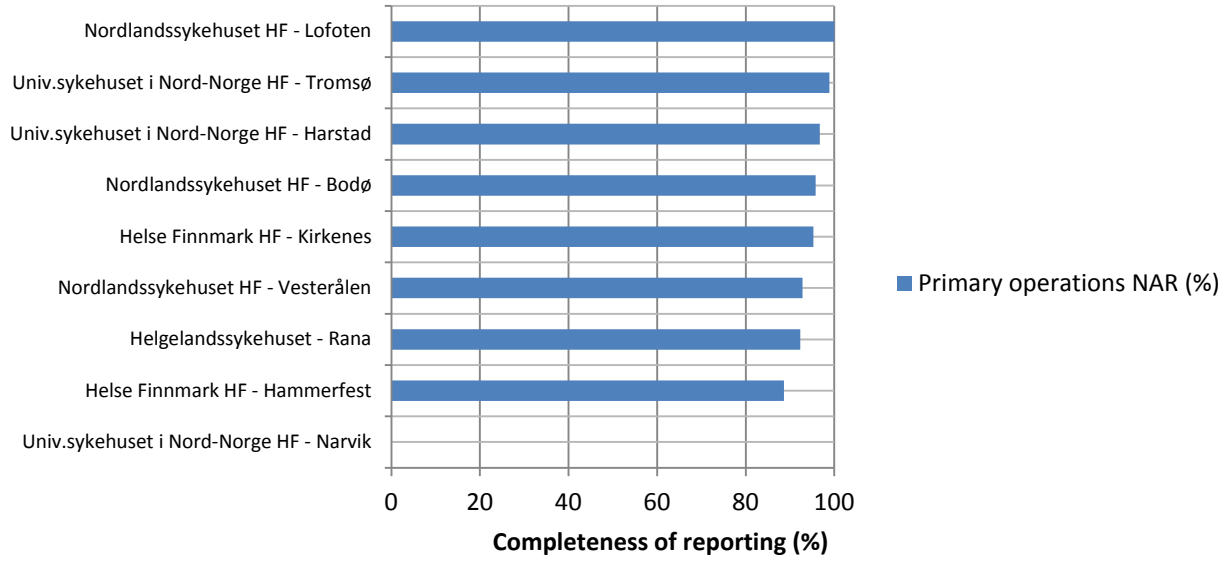


Helse Nord

Table: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Nord:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Nordlandssykehuset HF - Lofoten	38	100	100
Univ.sykehuset i Nord-Norge HF - Tromsø	188	98,9	99,5
Univ.sykehuset i Nord-Norge HF - Harstad	152	96,7	98,7
Nordlandssykehuset HF - Bodø	166	95,8	95,8
Helse Finnmark HF - Kirkenes	43	95,3	90,7
Nordlandssykehuset HF - Vesterålen	69	92,8	100
Helgelandssykehuset - Rana	104	92,3	96,2
Helse Finnmark HF - Hammerfest	44	88,6	100
Univ.sykehuset i Nord-Norge HF - Narvik	1	0	100

Figure: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

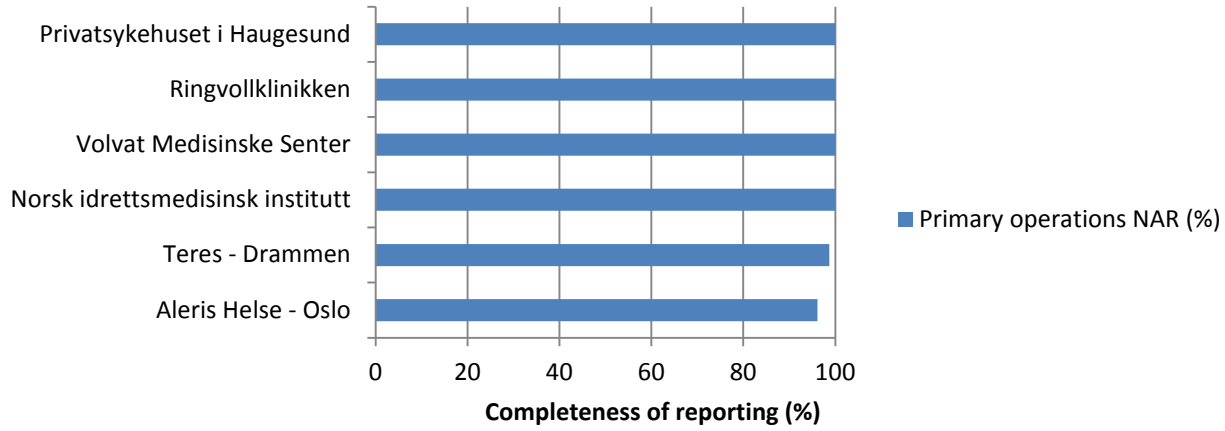


Private hospitals with agreement with RHF

Table: Completeness of reporting for primary knee prosthesis operations, 2013-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Private hospitals with agreement with RHF:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Norsk idrettsmedisinsk institutt	23	100	0
Volvat Medisinske Senter	27	100	0
Ringvollklinikken	12	100	0
Privatsykehuset i Haugesund	14	100	0
Teres - Drammen	77	98,7	41,6
Aleris Helse - Oslo	127	96,1	88,2

Figure: Completeness of reporting for primary knee prosthesis operations, 2013-2014.



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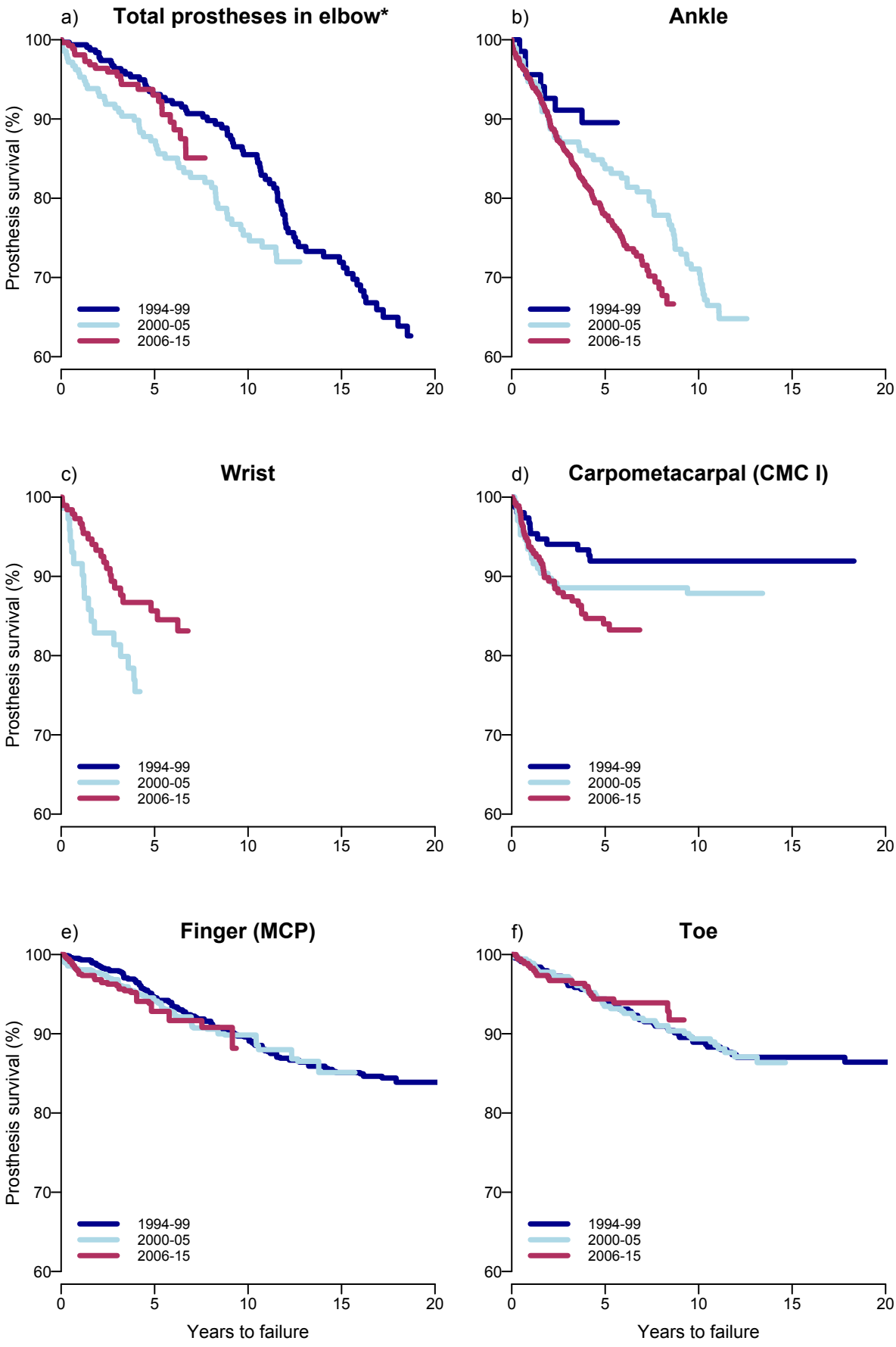
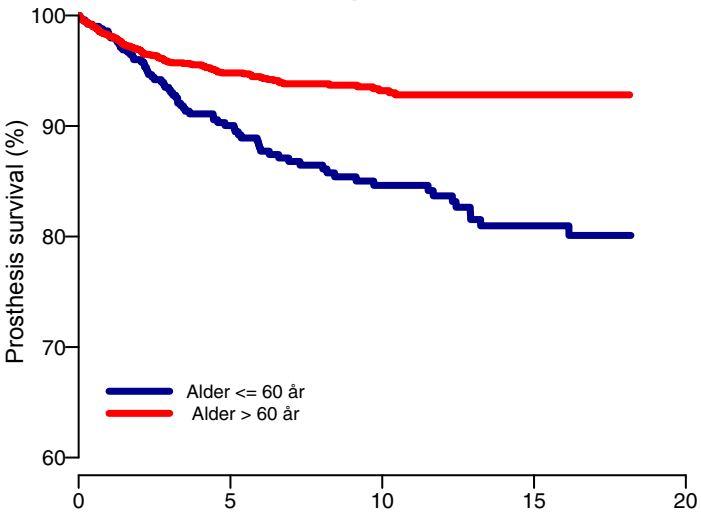
Survival curves for joint prostheses

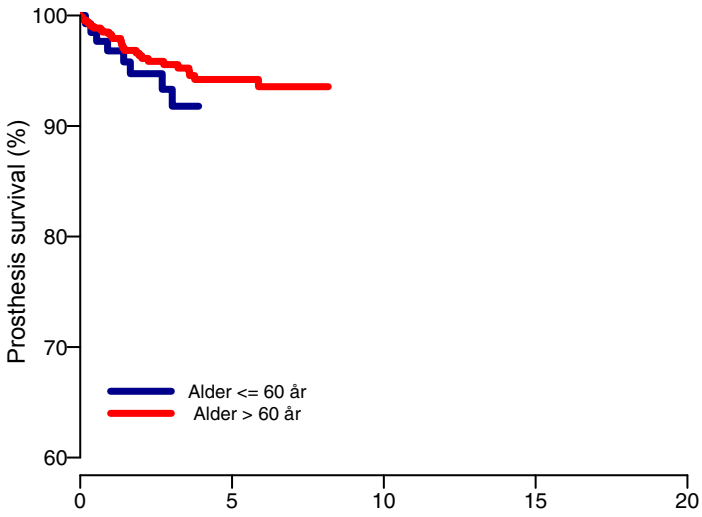


*Caput radii prosthesis for acute fracture is not included.
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are in the risk set.

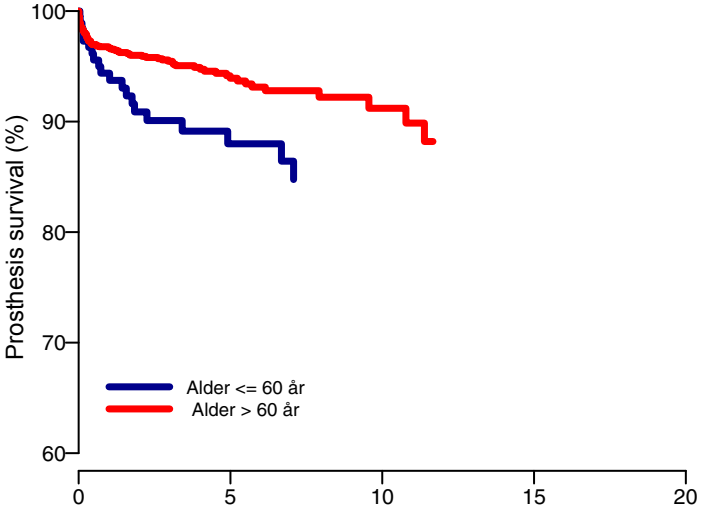
g) **Shoulder, hemiprostheses with stem**



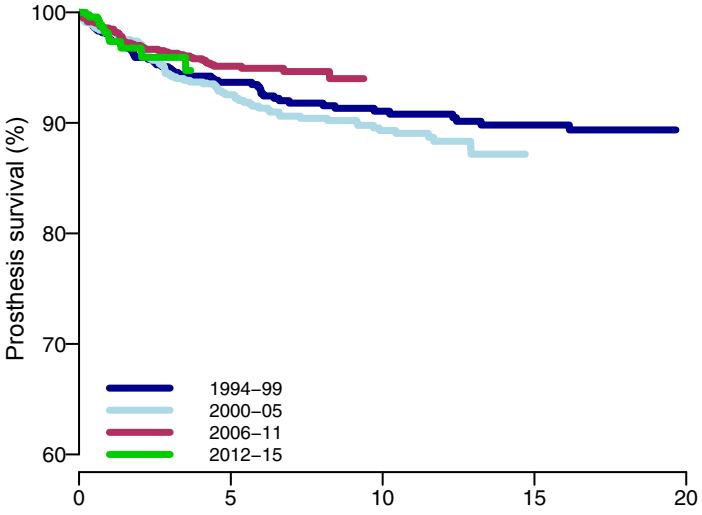
h) **Shoulder, anatomic total prostheses with stem**



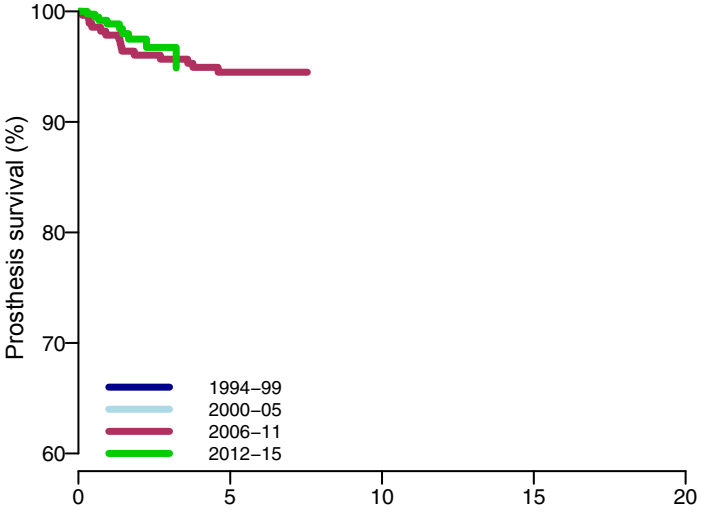
i) **Shoulder, reversed total prostheses with stem**



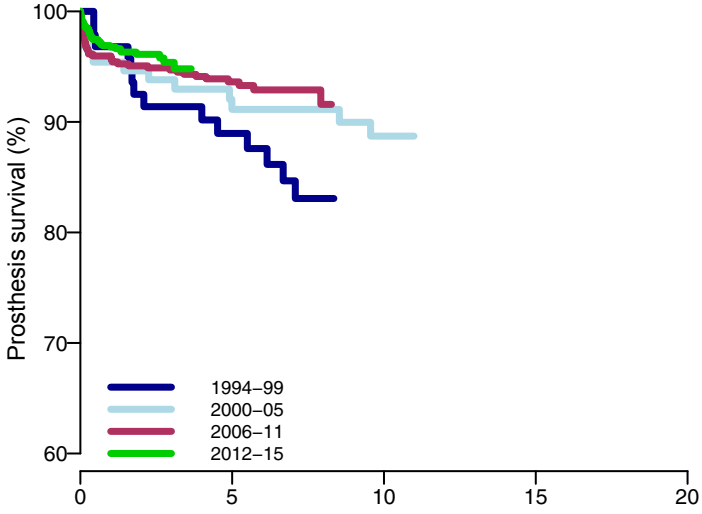
j) **Shoulder, hemiprostheses with stem**



k) **Shoulder, anatomic total prostheses with stem**



l) **Shoulder, reversed total prostheses with stem**

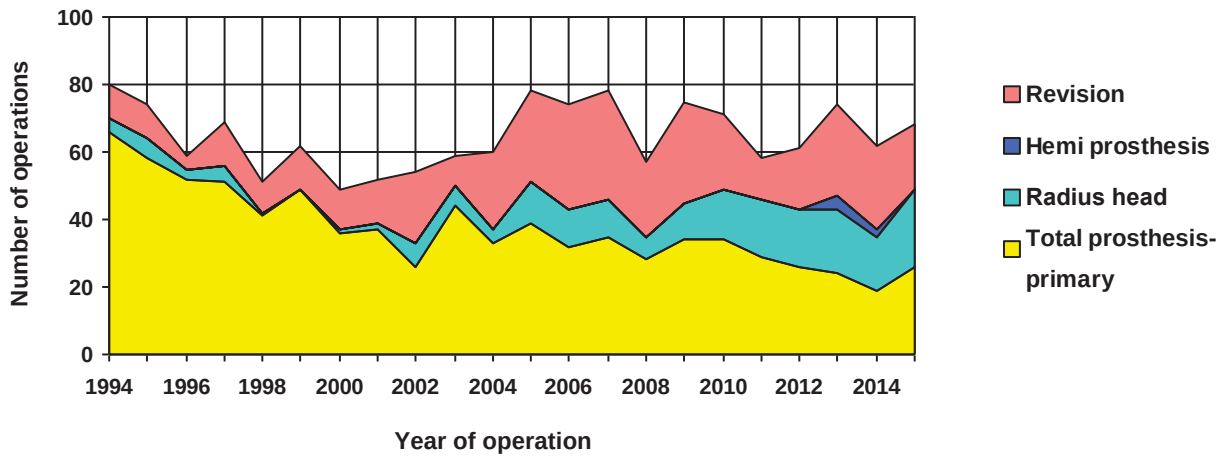


ELBOW PROSTHESES

Table 1: Annual number of prostheses

Year	Primary operations								Revisions		Total
	Hemi prosthesis		Total prosthesis		Radius head						
2015			26	(38,2%)	23	(33,8%)			19	(27,9%)	**68**
2014	2	(3,2%)	19	(30,6%)	16	(25,8%)			25	(40,3%)	**62**
2013	4	(5,4%)	24	(32,4%)	19	(25,7%)			27	(36,5%)	**74**
2012			26	(42,6%)	17	(27,9%)			18	(29,5%)	**61**
2011			29	(50,0%)	17	(29,3%)			12	(20,7%)	**58**
2010			34	(47,9%)	15	(21,1%)			22	(31,0%)	**71**
2009			34	(45,3%)	11	(14,7%)			30	(40,0%)	**75**
2008			28	(49,1%)	7	(12,3%)			22	(38,6%)	**57**
2007			35	(44,9%)	11	(14,1%)			32	(41,0%)	**78**
2006			32	(43,2%)	11	(14,9%)			31	(41,9%)	**74**
2005			39	(50,0%)	12	(15,4%)			27	(34,6%)	**78**
2004			33	(55,0%)	4	(6,7%)			23	(38,3%)	**60**
2003			44	(74,6%)	6	(10,2%)			9	(15,3%)	**59**
2002			26	(48,1%)	7	(13,0%)			21	(38,9%)	**54**
2001			37	(71,2%)	2	(3,8%)			13	(25,0%)	**52**
2000			36	(73,5%)	1	(2,0%)			12	(24,5%)	**49**
1994-99			317	(80,3%)	19	(4,8%)			59	(14,9%)	**395**
Total	**6**	**(0,4%)**	**819**	**(57,5%)**	**198**	**(13,9%)**			**402**	**(28,2%)**	**1425**

Figure 1: Annual numbers of operations



52,9 % of all operations were performed on the right side. 75,4 % performed in women. Mean age: 62,1 years.

Table 2: Elbow disease in primary operations - Total prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2015	1	13	4			8		2	
2014		13	5			3			
2013	2	9	6		1	7		3	
2012	1	16	5			4		1	
2011	4	18	6			3		1	
2010	6	19	5			2		4	
2009	1	18	6		1	7	1	6	
2008	1	19	1			6	1	1	
2007	3	22	4			2		6	
2006	3	19	9					1	
2005	6	26	9	3	1	2		1	
2004	2	23	2	2		4		2	2
2003	5	32	6					3	
2002	1	24				1		1	
2001	2	33	1	1			1		
2000	2	32	2					2	
1994-99	8	295	10			4		10	5
Total	**48**	**631**	**81**	**6**	**3**	**53**	**3**	**44**	**7**

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

Table 3: Elbow disease in primary operations - Hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2014		1				2			
2013			1			3			
Total	**0**	**1**	**1**	**0**	**0**	**5**	**0**	**0**	**0**

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

Table 4: Elbow disease in primary operations - Radius head prostheses (Caput radii)

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2015			5			20		1	
2014	1		3			12			
2013	1					19			
2012	1		3			13			
2011	2		2			13			
2010			2			13			
2009						11			
2008			2			5			
2007						11			
2006			5			5		1	
2005	2		2		1	6		1	1
2004	1		1			2			
2003			1			5			
2002	1		2			4		2	
2001			1			1			
2000						1			
1994-99		13	5			1		1	
Total	**9**	**13**	**34**	**0**	**1**	**142**	**0**	**6**	**1**

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

Use of cement in elbow prostheses

Table 5: Primary operations - Humerus

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2015	25	(96,2%)			1	(3,8%)			**26**
2014	18	(85,7%)					3	(14,3%)	**21**
2013	26	(92,9%)			2	(7,1%)			**28**
2012	23	(88,5%)			3	(11,5%)			**26**
2011	26	(89,7%)			1	(3,4%)	2	(6,9%)	**29**
2010	30	(88,2%)			4	(11,8%)			**34**
2009	29	(85,3%)			4	(11,8%)	1	(2,9%)	**34**
2008	24	(85,7%)			2	(7,1%)	2	(7,1%)	**28**
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	12	(46,2%)	3	(11,5%)	10	(38,5%)	1	(3,8%)	**26**
2001	12	(32,4%)	3	(8,1%)	22	(59,5%)			**37**
2000	19	(52,8%)	5	(13,9%)	12	(33,3%)			**36**
1994-99	174	(54,9%)	81	(25,6%)	58	(18,3%)	4	(1,3%)	**317**
Total	**537**	**(65,1%)**	**95**	**(11,5%)**	**180**	**(21,8%)**	**13**	**(1,6%)**	**825**

Table 6: Primary operations - Ulna/radius

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2015	31	(63,3%)			18	(36,7%)			**49**
2014	21	(63,6%)	1	(3,0%)	9	(27,3%)	2	(6,1%)	**33**
2013	23	(53,5%)			20	(46,5%)			**43**
2012	24	(55,8%)			19	(44,2%)			**43**
2011	40	(87,0%)			4	(8,7%)	2	(4,3%)	**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%)			4	(11,4%)	2	(5,7%)	**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	21	(63,6%)	3	(9,1%)	9	(27,3%)			**33**
2001	30	(76,9%)	3	(7,7%)	6	(15,4%)			**39**
2000	25	(67,6%)	5	(13,5%)	6	(16,2%)	1	(2,7%)	**37**
1994-99	230	(68,5%)	81	(24,1%)	23	(6,8%)	2	(0,6%)	**336**
Total	**743**	**(73,2%)**	**97**	**(9,6%)**	**158**	**(15,6%)**	**17**	**(1,7%)**	**1 015**

Prostheses used in elbow prostheses - Total prostheses

Table 7: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Norway	180										**180**
Discovery	24	16	9	21	24	21	18	19	9	18	**179**
Kudo	162										**162**
IBP	112	6	3	4	5	2	3	1			**136**
GSB III	33	10	9	7	5	2	4	3	3	1	**77**
NES	45	1	7	1							**54**
Mark II		2		1		1	1		1	2	**8**
IBP Reconstruction	5										**5**
Coonrad/Morrey	1					2			1	1	**5**
Other (n < 5)	2					1		1	5	4	**13**
Total	**564**	**35**	**28**	**34**	**34**	**29**	**26**	**24**	**19**	**26**	**819**

Table 8: Primary operations - Ulna/radius

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Norway	179										**179**
Discovery	24	16	9	21	24	21	18	19	9	18	**179**
Kudo	162										**162**
IBP	112	6	3	4	5	2	3	1			**136**
GSB III	33	10	9	7	5	2	4	3	3	1	**77**
NES	46	1	7	1							**55**
Mark II		2		1		1	1		1	2	**8**
IBP Reconstruction	5										**5**
Coonrad/Morrey	1					2			1	1	**5**
Other (n < 5)	2					1		1	3	4	**11**
Total	**564**	**35**	**28**	**34**	**34**	**29**	**26**	**24**	**17**	**26**	**817**

Prostheses used in elbow prostheses - Hemiprostheses

Table 9: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Latitude Anatomic hemi								4	2		**6**
Total								**4**	**2**		**6**

Prostheses used in elbow prostheses - Radius head prostheses

Table 10: Primary operations - Radius

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
rHead	23	6	4	9	9	8	1		2		**62**
Acumed anatomic radial head			1			4	11	16	5	13	**50**
Radial Head	16	5	1	2	5						**29**
Silastic H.P. 100	20										**20**
Explor						2	2	3	5	7	**19**
Link radius						2	1		4	3	**10**
Evolve	2		1				2				**5**
Other (n < 5)	1				1	1					**3**
Total	**62**	**11**	**7**	**11**	**15**	**17**	**17**	**19**	**16**	**23**	**198**

Reasons for revisions in elbow prostheses

Table 11:

Year	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015	4	4	1	1		6		1	7	2	1
2014	5	5		1	1	6	3	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	5	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	
1994-99	32	26	3	2	2	4	11	7		9	1
Total	**117**	**138**	**24**	**29**	**18**	**59**	**59**	**52**	**55**	**84**	**8**

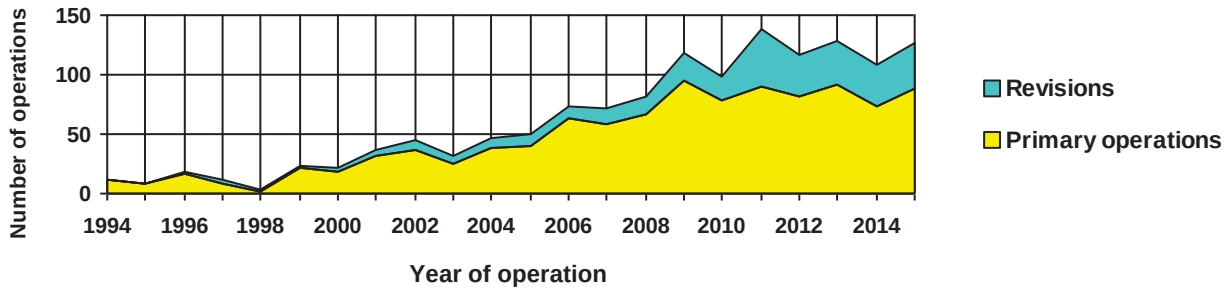
More than one reason for revision is possible

ANKLE PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2015	89	(70,1%)	38	(29,9%)	**127**
2014	74	(68,5%)	34	(31,5%)	**108**
2013	92	(71,9%)	36	(28,1%)	**128**
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**
1994-99	68	(88,3%)	9	(11,7%)	**77**
Total	**1047**	**(76,4%)**	**324**	**(23,6%)**	**1371**

Figure 1: Annual numbers of operations



56,7 % of all operations were performed on the right side. 55,2 % performed in women. Mean age: 59,6 years.

Table 2: Ankle disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2015	22	18	25	2	18			11	
2014	21	11	27	1	10			5	
2013	36	20	25	1	16			2	1
2012	21	8	44		9			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	
1994-99	6	52	5	1	1			5	
Total	**292**	**295**	**337**	**10**	**103**	**0**	**4**	**63**	**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
2015					89	(100,0%)			**89**
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**	**(2,8%)**	**10**	**(1,0%)**	**1 000**	**(95,6%)**	**7**	**(0,7%)**	**1 046**

Table 4: Primary operations - Talus

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2015					89	(100,0%)			**89**
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					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	7	(63,6%)	4	(36,4%)					**11**
Total	**31**	**(3,0%)**	**11**	**(1,1%)**	**998**	**(95,4%)**	**6**	**(0,6%)**	**1 046**

Prostheses used in ankle prostheses

Table 5: Primary operations - Tibia

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Link S.T.A.R.	280	52	59	57	40	50	39	38		1	**616**
Salto Talaris								26	62	85	**173**
Mobility		4	2	25	26	16	12	15			**100**
CCI			4	12	13	17	12	11	9		**78**
Norwegian TPR	32										**32**
Rebalance						7	8				**15**
Salto Mobile							11	1			**12**
Hintegra	7	2	1	1							**11**
TM Total Ankle									3	3	**6**
AES	3										**3**
Total	**322**	**58**	**66**	**95**	**79**	**90**	**82**	**91**	**74**	**89**	**1046**

Table 6: Primary operations - Talus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Link S.T.A.R.	280	52	59	57	40	50	39	38		1	**616**
Salto Talaris								22	61	84	**167**
Mobility		4	2	25	26	16	12	15			**100**
CCI			4	12	13	17	12	11	9		**78**
Norwegian TPR	32										**32**
Rebalance						7	8				**15**
Salto Mobile							11	1			**12**
Hintegra	7	2	1	1							**11**
TM Total Ankle									3	3	**6**
Salto XT								4	1	1	**6**
AES	3										**3**
Total	**322**	**58**	**66**	**95**	**79**	**90**	**82**	**91**	**74**	**89**	**1046**

Reasons for revisions in ankle prostheses

Table 7:

Year	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015	6	6		1	7	4		16	10	6	
2014	14	11		1	4	1		14	9	2	
2013	6	3	1	5	9	3	1	14	17	3	
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			
1994-99	7	7		2	2		1	2		1	
Total	**83**	**62**	**4**	**36**	**56**	**26**	**9**	**128**	**72**	**27**	**0**

More than one reason for revision is possible

FINGER JOINT PROSTHESES

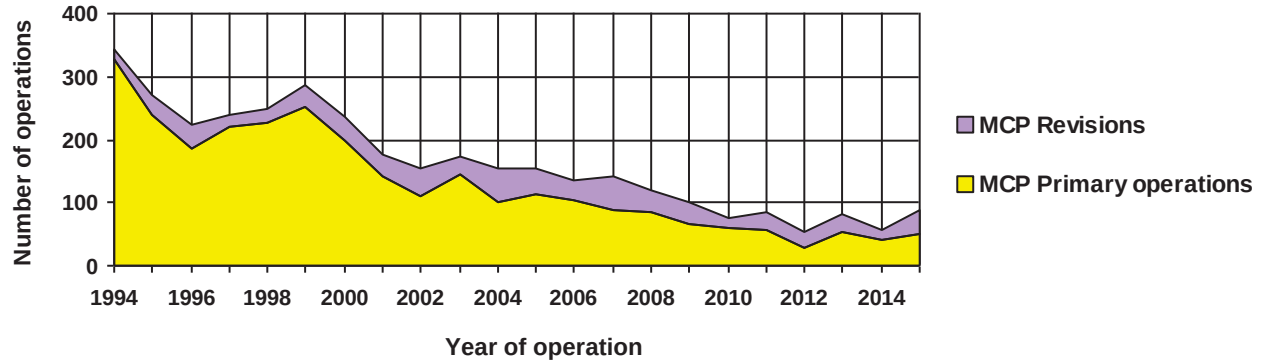
Table 1: Annual number of operations - MCP

Year	Primary operations		Revisions		Total
2015	51	(57,3%)	38	(42,7%)	**89**
2014	42	(75,0%)	14	(25,0%)	**56**
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	(66,0%)	34	(34,0%)	**100**
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**
1994-99	1453	(90,3%)	156	(9,7%)	**1609**
Total	**2893**	**(80,5%)**	**702**	**(19,5%)**	**3595**

Table 2: Annual number of operations - PIP

Year	Primary operations		Revisions		Total
2015	5	(100,0%)			**5**
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**
1994-99	19	(76,0%)	6	(24,0%)	**25**
Total	**88**	**(86,3%)**	**14**	**(13,7%)**	**102**

Figure 1: Annual number of operations



61,3 % of all operations were performed on the right side. 87,7 % 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
2015	5	43		1				2	
2014		33					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	**74**	**2724**	**16**	**10**	**1**	**1**	**3**	**90**	**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
2015	3		2						
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	**34**	**36**	**11**	**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
2015	1 (2,0%)		48 (94,1%)	2 (3,9%)	**51**
2014			41 (97,6%)	1 (2,4%)	**42**
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			198 (100,0%)		**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	**4 (0,1%)**	**2 (0,1%)**	**2 872 (99,4%)**	**12 (0,4%)**	**2 890**

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
2015			5 (100,0%)		**5**
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			**85 (97,7%)**	**2 (2,3%)**	**87**

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	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Silastic HP 100	1594	80	81	61	53	49	27	25		5	**1975**
Avanta	553	1			1					1	**556**
NeuFlex	188	5	1	4							**198**
Silastic HP 100 II					4	6		28	41	45	**124**
Ascension MCP	21	2	2	1	1	2			1		**30**
MCS	6										**6**
Moje	1										**1**
Total	**2363**	**88**	**84**	**66**	**59**	**57**	**27**	**53**	**42**	**51**	**2890**

Table 10: MCP prostheses in primary operations - Distal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Ascension MCP	19	2	2	1	1	2			1		**28**
MCS	6										**6**
Moje	1										**1**
Total	**26**	**2**	**2**	**1**	**1**	**2**			**1**		**35**

Table 11: PIP prostheses in primary operations - Proximal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Silastic HP 100	21							4	2		**27**
SR Avanta		3	3	3	4	1		1	1	5	**21**
Ascension MCP	15	2	1								**18**
NeuFlex	7										**7**
Ascension PIP PyroCarbon					2	2			1		**5**
MCS	4										**4**
Avanta	3							1			**4**
Moje	1										**1**
Total	**51**	**5**	**4**	**3**	**6**	**3**		**6**	**4**	**5**	**87**

Table 12: PIP prostheses in primary operations - Distal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Ascension MCP	15	2	1								**18**
Ascension PIP PyroCarbon					2	2			1		**5**
MCS	4										**4**
Moje	2										**2**
Total	**21**	**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
2015	6	2		6		1		15	9	8	10	
2014		1		4				2	4		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	1	2	3	2	2	4		6	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	**14**	**27**	**41**	**90**	**104**	**18**	**23**	**203**	**38**	**335**	**93**	**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**

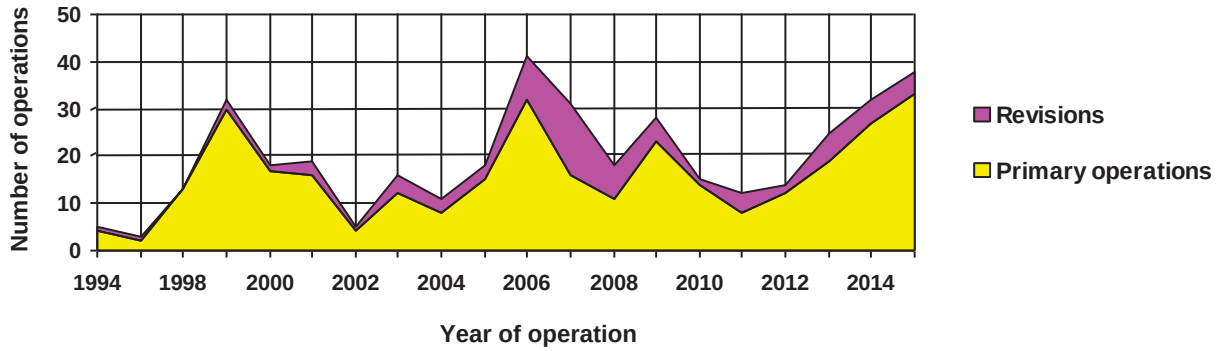
Revision reasons are not mutually exclusive. More than one reason for revision is possible

WRIST PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2015	33	(86,8%)	5	(13,2%)	**38**
2014	27	(84,4%)	5	(15,6%)	**32**
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**
1994-99	49	(92,5%)	4	(7,5%)	**53**
Total	**316**	**(80,2%)**	**78**	**(19,8%)**	**394**

Figure 1: Annual number of operations



57,1 % of all operations were performed on the right side.65 % performed in women. Mean age: 55,8 years.

Table 2: Wrist disease in primary operations

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Other	Missing
2015	4	2	13		10			7	
2014	7	1	11		9			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	
1994-99	2	43		1				3	
Total	**41**	**140**	**71**	**1**	**36**	**0**	**2**	**37**	**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
2015			31 (96,9%)	1 (3,1%)	**32**
2014			27 (100,0%)		**27**
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 (2,2%)**	**1 (0,3%)**	**301 (95,9%)**	**5 (1,6%)**	**314**

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2015			33 (100,0%)		**33**
2014			27 (100,0%)		**27**
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 (3,0%)**		**293 (96,7%)**	**1 (0,3%)**	**303**

Wrist prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Motec Wrist	32	15	9	21	14	5	5	4	9	17	**131**
Biax	90										**90**
Remotion Wrist						3	3	10	13	13	**42**
Elos[1]	23										**23**
Scheker Radio-ulnar		1	1				1	3	3	1	**10**
Uhead (Druj)							3	2	2	1	**8**
Silastic ulnar head	7										**7**
Eclypse radio-ulnar				2							**2**
TMW	1										**1**
Total	**153**	**16**	**10**	**23**	**14**	**8**	**12**	**19**	**27**	**32**	**314**

Table 6: Primary operations - Distal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Motec Wrist	32	15	9	21	14	5	5	4	9	17	**131**
Biax	89										**89**
Remotion Wrist						3	3	10	13	14	**43**
Elos[1]	23										**23**
Uhead (Druj)							3	2	2	1	**8**
Scheker Radio-ulnar							1	3	3	1	**8**
TMW	1										**1**
Total	**145**	**15**	**9**	**21**	**14**	**8**	**12**	**19**	**27**	**33**	**303**

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
2015		2		1		1		1	1	1		7
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**	**30**	**2**	**5**	**12**	**16**	**0**	**24**	**3**	**10**	**0**	**107**

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

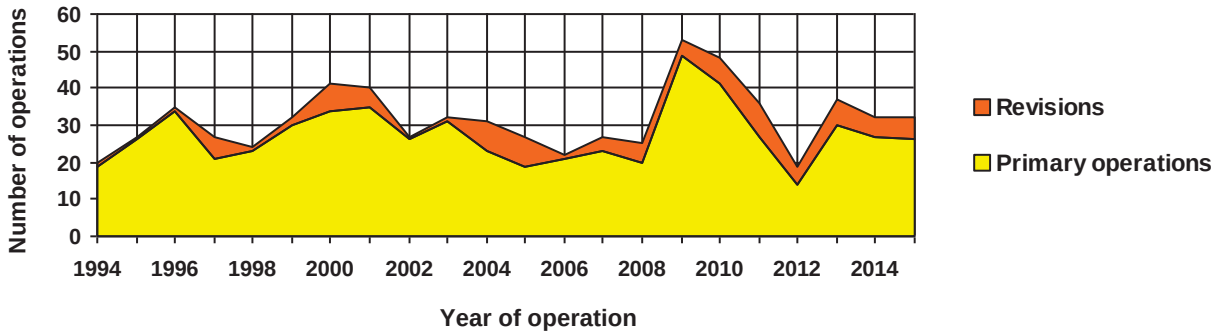
[1]Elos are 3 different development models of Motec Wrist. Motec Wrist was previously sold under the name Gibbon.

CARPOMETACARPAL PROSTHESES (CMC I)

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2015	26	(81,3%)	6	(18,8%)	**32**
2014	27	(84,4%)	5	(15,6%)	**32**
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**
1994-99	153	(92,7%)	12	(7,3%)	**165**
Total	**599**	**(86,3%)**	**95**	**(13,7%)**	**694**

Figure 1: Annual number of operations



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

Table 2: Carpometacarpal disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2015	24	1				1			
2014	24	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	
1994-99	95	55	2	2				4	
Total	**470**	**107**	**3**	**5**	**0**	**1**	**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
2015			26 (100,0%)		**26**
2014			26 (96,3%)	1 (3,7%)	**27**
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**
1994-99	1 (0,7%)		151 (98,7%)	1 (0,7%)	**153**
Total	**3 (0,5%)**		**588 (98,3%)**	**7 (1,2%)**	**598**

Carpometacarpal prostheses - Prosthesis brand

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

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Silastic Trapezium	258	23	17	16	11	9	6	8	8	4	**360**
Swanson Titanium Basal	71				1						**72**
Motec				21	17	15	2				**55**
Elektra	2		3	10	12	3	5	4	5	8	**52**
Motec II							1	18	14	14	**47**
Avanta Trapezium	6			1							**7**
Custom made	5										**5**
Total	**342**	**23**	**20**	**48**	**41**	**27**	**14**	**30**	**27**	**26**	**598**

Reasons for revisions

Table 5:

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015	4		1	1		1		3			
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			
1994-99	1		6					4		5	
Total	**27**	**0**	**37**	**10**	**0**	**2**	**1**	**46**	**2**	**11**	**1**

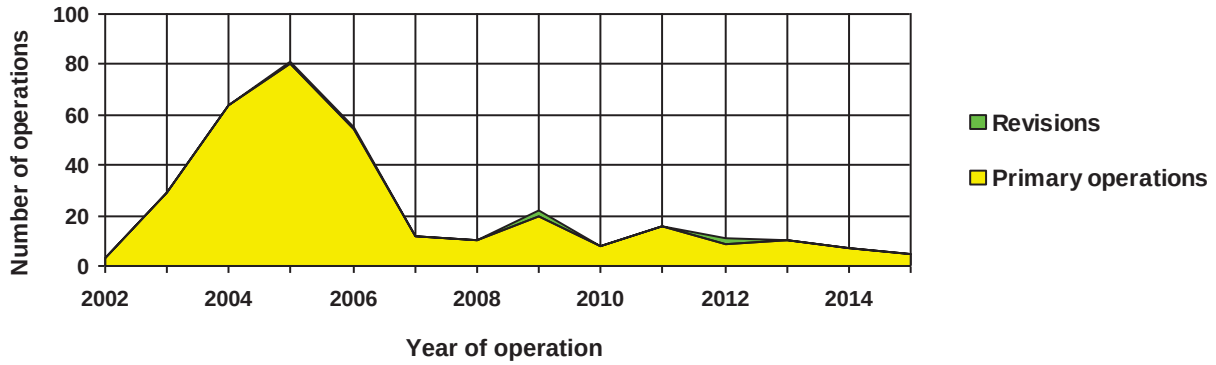
Revision reasons are not mutually exclusive. More than one reason for revision is possible

LUMBAR DISC PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2015	5	(100,0%)			**5**
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	**327**	**(98,2%)**	**6**	**(1,8%)**	**333**

Figure 1: Annual number of operations



60,1 % 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
2015					5			
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**	**118**	**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
2015			5 (100,0%)		**5**
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			**327 (100,0%)**		**327**

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2015			5 (100,0%)		**5**
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%)**		**322 (98,5%)**	**2 (0,6%)**	**327**

Lumbar disc prostheses - Prosthesis brand

Table 5: Primary operations - Proximal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Prodisc	210	4	2		4	16	9	10	7	5	**267**
Charité	22	8	8	20	4						**62**
Total	**232**	**12**	**10**	**20**	**8**	**16**	**9**	**10**	**7**	**5**	**329**

Table 6: Primary operations - Distal

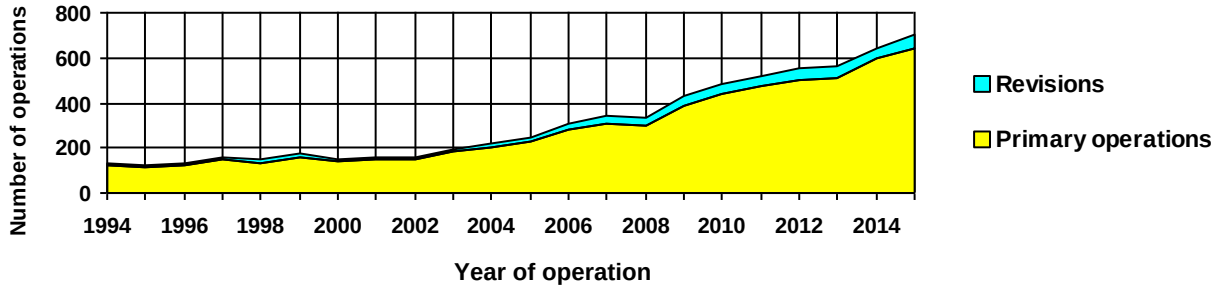
Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Prodisc	210	4	2		4	16	9	10	7	5	**267**
Charité	22	8	8	20	4						**62**
Total	**232**	**12**	**10**	**20**	**8**	**16**	**9**	**10**	**7**	**5**	**329**

SHOULDER PROSTHESES

Table 1: Annual number of operations in shoulder prostheses

Year	Primary operations		Revisions		Total
2015	642	(91,7%)	58	(8,3%)	**700**
2014	594	(92,5%)	48	(7,5%)	**642**
2013	517	(91,2%)	50	(8,8%)	**567**
2012	500	(89,3%)	60	(10,7%)	**560**
2011	481	(92,5%)	39	(7,5%)	**520**
2010	447	(91,2%)	43	(8,8%)	**490**
2009	392	(90,7%)	40	(9,3%)	**432**
2008	302	(89,9%)	34	(10,1%)	**336**
2007	309	(90,4%)	33	(9,6%)	**342**
1994-06	2117	(91,7%)	191	(8,3%)	**2308**
Total	**6301**	**(91,4%)**	**596**	**(8,6%)**	**6897**

Figure 1: Annual number of operations - All prostheses



53,1 % of all operations were performed on the right side. 72,2 % performed in women. Mean age: 69,7 years.

Table 2: Annual number of operations - Stemmed shoulder hemiprostheses

Year	Primary operations		Revisions		Total
2015	111	(85,4%)	19	(14,6%)	**130**
2014	123	(93,2%)	9	(6,8%)	**132**
2013	108	(85,7%)	18	(14,3%)	**126**
2012	166	(91,7%)	15	(8,3%)	**181**
2011	177	(92,7%)	14	(7,3%)	**191**
2010	176	(92,6%)	14	(7,4%)	**190**
2009	161	(91,5%)	15	(8,5%)	**176**
2008	137	(94,5%)	8	(5,5%)	**145**
2007	148	(88,1%)	20	(11,9%)	**168**
1994-06	1550	(93,4%)	110	(6,6%)	**1660**
Total	**2857**	**(92,2%)**	**242**	**(7,8%)**	**3099**

Table 3: Annual number of operations - Anatomic stemmed total shoulder prostheses

Year	Primary operations		Revisions		Total
2015	139	(96,5%)	5	(3,5%)	**144**
2014	120	(93,8%)	8	(6,3%)	**128**
2013	99	(96,1%)	4	(3,9%)	**103**
2012	61	(95,3%)	3	(4,7%)	**64**
2011	79	(94,0%)	5	(6,0%)	**84**
2010	69	(90,8%)	7	(9,2%)	**76**
2009	56	(98,2%)	1	(1,8%)	**57**
2008	37	(97,4%)	1	(2,6%)	**38**
2007	31	(100,0%)			**31**
1994-06	68	(76,4%)	21	(23,6%)	**89**
Total	**759**	**(93,2%)**	**55**	**(6,8%)**	**814**

Table 4: Annual number of operations - Resurfacing shoulder hemiprostheses

Year	Primary operations		Revisions		Total
2015	2	(28,6%)	5	(71,4%)	**7**
2014			11	(100,0%)	**11**
2013	9	(52,9%)	8	(47,1%)	**17**
2012	10	(43,5%)	13	(56,5%)	**23**
2011	20	(71,4%)	8	(28,6%)	**28**
2010	25	(71,4%)	10	(28,6%)	**35**
2009	53	(84,1%)	10	(15,9%)	**63**
2008	43	(81,1%)	10	(18,9%)	**53**
2007	66	(94,3%)	4	(5,7%)	**70**
1994-06	200	(98,0%)	4	(2,0%)	**204**
Total	**428**	**(83,8%)**	**83**	**(16,2%)**	**511**

Table 5: Annual number of operations - Resurfacing total shoulder prostheses

Year	Primary operations		Revisions		Total
2012	1	(100,0%)			**1**
2011	1	(100,0%)			**1**
2009	2	(100,0%)			**2**
2008	1	(50,0%)	1	(50,0%)	**2**
1994-06	5	(83,3%)	1	(16,7%)	**6**
Total	**10**	**(83,3%)**	**2**	**(16,7%)**	**12**

Table 6: Annual number of operations - Reversed stemmed total shoulder prostheses

Year	Primary operations		Revisions		Total
2015	348	(92,3%)	29	(7,7%)	**377**
2014	304	(94,1%)	19	(5,9%)	**323**
2013	252	(95,1%)	13	(4,9%)	**265**
2012	216	(90,4%)	23	(9,6%)	**239**
2011	161	(95,8%)	7	(4,2%)	**168**
2010	131	(93,6%)	9	(6,4%)	**140**
2009	100	(92,6%)	8	(7,4%)	**108**
2008	75	(92,6%)	6	(7,4%)	**81**
2007	61	(85,9%)	10	(14,1%)	**71**
1994-06	268	(89,0%)	33	(11,0%)	**301**
Total	**1916**	**(92,4%)**	**157**	**(7,6%)**	**2073**

Table 7: Annual number of operations - Non stemmed hemiprostheses

Year	Primary operations		Revisions		Total
2015	16	(72,7%)	6	(27,3%)	**22**
2014	23	(82,1%)	5	(17,9%)	**28**
2013	26	(100,0%)			**26**
2012	23	(82,1%)	5	(17,9%)	**28**
2011	21	(95,5%)	1	(4,5%)	**22**
2010	33	(100,0%)			**33**
2009	5	(100,0%)			**5**
Total	**147**	**(89,6%)**	**17**	**(10,4%)**	**164**

Table 8: Annual number of operations - Non stemmed total shoulder prostheses

Year	Primary operations		Revisions		Total
2015	15	(75,0%)	5	(25,0%)	**20**
2014	21	(95,5%)	1	(4,5%)	**22**
2013	18	(100,0%)			**18**
2012	20	(80,0%)	5	(20,0%)	**25**
2011	15	(100,0%)			**15**
2010	8	(100,0%)			**8**
2009	8	(100,0%)			**8**
2008	3	(100,0%)			**3**
Total	**108**	**(90,8%)**	**11**	**(9,2%)**	**119**

Table 9: Annual number of operations - Reversed non stemmed total shoulder prostheses

Year	Primary operations	Revisions	Total
2015	3 (100,0%)		**3**
2014	1 (100,0%)		**1**
Total	**4 (100,0%)**		**4**

Reasons for primary operations

Table 10: Shoulder disease in primary operations - Stemmed shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	14	1	15			81	1		5	
2014	21		15			88			4	
2013	21	1	7		1	77		2	3	
2012	22	3	13			126			4	
2011	34	4	26			115			3	
2010	35	8	22	1		109			2	
2009	28	9	27			101		1	3	
2008	21	13	29	1		69		2	4	2
2007	27	10	32			77		1	3	1
1994-06	297	412	331	13	8	477	7	2	75	8
Total	**520**	**461**	**517**	**15**	**9**	**1320**	**8**	**8**	**106**	**11**

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

Table 11: Shoulder disease in primary operations - Anatomic stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	124	3	7		1		1		6	
2014	96	5	14		3				3	
2013	84	3	10		1	1	1			
2012	54	1	4		1				2	
2011	68	3	10				1			
2010	58	2	3		2				3	1
2009	38	5	11		1		1		2	
2008	28	2	3			1			3	
2007	23	2	3		1				2	
1994-06	38	12	11	1		1	1		4	1
Total	**611**	**38**	**76**	**1**	**10**	**3**	**5**	**0**	**25**	**2**

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

Table 12: Shoulder disease in primary operations - Resurfacing shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	2									
2013	8		1	1						
2012	8								2	
2011	18	1						1	1	
2010	17	3	3						2	
2009	33	13	5		2			1		1
2008	32	10	1						1	1
2007	43	18	2	2	2	1			1	
1994-06	124	49	22	1	1		3	3	10	2
Total	**285**	**94**	**34**	**4**	**5**	**1**	**3**	**5**	**17**	**4**

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

Table 13: Shoulder disease in primary operations - Resurfacing total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2012	1									
2011	1									
2009	2									
2008	1									
1994-06	4								2	
Total	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

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

Table 14: Shoulder disease in primary operations - Reversed stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	123	30	62	1	17	76	4	56	23	
2014	116	22	45	2	18	86	2	38	13	
2013	87	26	37		14	76	1	24	5	
2012	61	19	50		24	43	4	33	10	
2011	46	21	30	1	9	30	1	35	9	1
2010	41	27	26		5	12	4	21	8	1
2009	42	19	15	1	1	9	2	13	4	
2008	22	19	19	1	1	5	1	7	4	
2007	11	13	20			3		16	2	1
1994-06	58	134	48	1	2	4	2	15	20	
Total	**607**	**330**	**352**	**7**	**91**	**344**	**21**	**258**	**98**	**3**

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

Table 15: Shoulder disease in primary operations - Non stemmed shoulder hemiprostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	13		3			1		1		
2014	16		2		1				4	
2013	23	1	2						2	
2012	15	3	3	2				1		
2011	13	6	2						1	
2010	23	3	7			1			2	
2009	2		1		1				2	
Total	**105**	**13**	**20**	**2**	**2**	**2**	**0**	**2**	**11**	**0**

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

Table 16: Shoulder disease in primary operations - Non stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	13		1		1					
2014	18		3							
2013	15		1		1				2	
2012	17			1	1				1	
2011	13	2								
2010	6	1							1	
2009	5	2	1							
2008	2	1								
Total	**89**	**6**	**6**	**1**	**3**	**0**	**0**	**0**	**4**	**0**

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

Table 17: Shoulder disease in primary operations - Reversed non stemmed total shoulder prostheses

Year	Idiopathic osteo-arthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechte-rew	Sequelae ligament tear	Acute fracture	Sequelae after infection	Rotarcuff arthropathy	Other	Missing
2015	2					1				
2014						1				
Total	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**

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

Use of cement in shoulder prostheses

Table 18: Stemmed shoulder hemiprostheses - Primary operations - Humerus

Year	Cem. with antib.		Cem. without antib.		Uncemented		Missing		Total
2015	68	(61,3%)			41	(36,9%)	2	(1,8%)	**111**
2014	84	(68,3%)			36	(29,3%)	3	(2,4%)	**123**
2013	80	(74,1%)			28	(25,9%)			**108**
2012	140	(84,3%)			26	(15,7%)			**166**
2011	130	(73,4%)	1	(0,6%)	37	(20,9%)	9	(5,1%)	**177**
2010	135	(76,7%)			36	(20,5%)	5	(2,8%)	**176**
2009	117	(72,7%)			33	(20,5%)	11	(6,8%)	**161**
2008	87	(63,5%)	2	(1,5%)	36	(26,3%)	12	(8,8%)	**137**
2007	118	(79,7%)			30	(20,3%)			**148**
1994-06	922	(59,5%)	39	(2,5%)	587	(37,9%)	2	(0,1%)	**1 550**
Total	**1 881**	**(65,8%)**	**42**	**(1,5%)**	**890**	**(31,2%)**	**44**	**(1,5%)**	**2 857**

Table 19: Anatomic stemmed total shoulder prostheses - Primary operations - Glenoid

Year	Cem. with antib.		Cem. without antib.		Uncemented		Missing		Total
2015	125	(89,9%)			14	(10,1%)			**139**
2014	99	(82,5%)			18	(15,0%)	3	(2,5%)	**120**
2013	77	(79,4%)			20	(20,6%)			**97**
2012	50	(83,3%)			10	(16,7%)			**60**
2011	65	(82,3%)			14	(17,7%)			**79**
2010	57	(82,6%)			11	(15,9%)	1	(1,4%)	**69**
2009	40	(71,4%)			15	(26,8%)	1	(1,8%)	**56**
2008	30	(81,1%)			2	(5,4%)	5	(13,5%)	**37**
2007	22	(73,3%)	1	(3,3%)	7	(23,3%)			**30**
1994-06	21	(31,3%)	2	(3,0%)	44	(65,7%)			**67**
Total	**586**	**(77,7%)**	**3**	**(0,4%)**	**155**	**(20,6%)**	**10**	**(1,3%)**	**754**

Table 20: Anatomic stemmed total shoulder prostheses - Primary operations - Humerus

Year	Cem. with antib.		Cem. without antib.		Uncemented		Missing		Total
2015	24	(17,3%)			115	(82,7%)			**139**
2014	24	(20,2%)			93	(78,2%)	2	(1,7%)	**119**
2013	58	(58,6%)			41	(41,4%)			**99**
2012	45	(73,8%)			15	(24,6%)	1	(1,6%)	**61**
2011	58	(74,4%)			20	(25,6%)			**78**
2010	54	(81,8%)			11	(16,7%)	1	(1,5%)	**66**
2009	38	(69,1%)			16	(29,1%)	1	(1,8%)	**55**
2008	28	(75,7%)			3	(8,1%)	6	(16,2%)	**37**
2007	18	(58,1%)			13	(41,9%)			**31**
1994-06	25	(45,5%)	1	(1,8%)	29	(52,7%)			**55**
Total	**372**	**(50,3%)**	**1**	**(0,1%)**	**356**	**(48,1%)**	**11**	**(1,5%)**	**740**

Table 21: Resurfacing shoulder hemiprostheses - Primary operations - Humerus

Year	Cem. with antib.		Cem. without antib.		Uncemented		Missing		Total
2015					2	(100,0			**2**
2013					9	(100,0			**9**
2012					10	(100,0			**10**
2011			2	(10,0%)	17	(85,0%)	1	(5,0%)	**20**
2010	1	(4,0%)	2	(8,0%)	22	(88,0%)			**25**
2009					44	(83,0%)	9	(17,0%)	**53**
2008					13	(30,2%)	30	(69,8%)	**43**
2007					19	(28,8%)	47	(71,2%)	**66**
1994-06					27	(13,5%)	173	(86,5%)	**200**
Total	**1**	**(0,2%)**	**4**	**(0,9%)**	**163**	**(38,1%)**	**260**	**(60,7%)**	**428**

Table 22: Resurfacing total shoulder prostheses - Primary operations - Glenoid

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2011	1 (100,0				**1**
1994-06			2 (100,0		**2**
Total	**1 (33,3%)**		**2 (66,7%)**		**3**

Table 23: Resurfacing total shoulder prostheses - Primary operations - Humerus

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2012			1 (100,0		**1**
2011				1 (100,0	**1**
2009				2 (100,0	**2**
2008			1 (100,0		**1**
1994-06				5 (100,0	**5**
Total			**2 (20,0%)**	**8 (80,0%)**	**10**

Table 24: Reversed stemmed total shoulder prostheses - Primary operations - Glenoid

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2015	3 (0,9%)		344 (98,9%)	1 (0,3%)	**348**
2014	9 (3,0%)		295 (97,0%)		**304**
2013	2 (0,8%)		250 (99,2%)		**252**
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%)		97 (97,0%)	1 (1,0%)	**100**
2008	1 (1,3%)		65 (86,7%)	9 (12,0%)	**75**
2007	5 (8,2%)		56 (91,8%)		**61**
1994-06	21 (7,9%)	1 (0,4%)	245 (91,8%)		**267**
Total	**51 (2,7%)**	**4 (0,2%)**	**1 845 (96,3%)**	**15 (0,8%)**	**1 915**

Table 25: Reversed stemmed total shoulder prostheses - Primary operations - Humerus

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2015	214 (61,5%)		134 (38,5%)		**348**
2014	180 (59,2%)		119 (39,1%)	5 (1,6%)	**304**
2013	143 (56,7%)		107 (42,5%)	2 (0,8%)	**252**
2012	140 (64,8%)		76 (35,2%)		**216**
2011	99 (61,5%)		60 (37,3%)	2 (1,2%)	**161**
2010	72 (55,0%)		57 (43,5%)	2 (1,5%)	**131**
2009	50 (50,0%)		49 (49,0%)	1 (1,0%)	**100**
2008	51 (68,0%)		16 (21,3%)	8 (10,7%)	**75**
2007	44 (72,1%)		17 (27,9%)		**61**
1994-06	82 (30,6%)	1 (0,4%)	184 (68,7%)	1 (0,4%)	**268**
Total	**1 075 (56,1%)**	**1 (0,1%)**	**819 (42,7%)**	**21 (1,1%)**	**1 916**

Table 26: Non stemmed shoulder hemiprostheses - Primary operations - Humerus

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2015			5 (100,0		**5**
2014			12 (92,3%)	1 (7,7%)	**13**
2013			11 (100,0		**11**
2012		1 (7,1%)	13 (92,9%)		**14**
2011			16 (100,0		**16**
2010	1 (3,3%)		29 (96,7%)		**30**
2009			5 (100,0		**5**
Total	**1 (1,1%)**	**1 (1,1%)**	**91 (96,8%)**	**1 (1,1%)**	**94**

Table 27: Non stemmed total shoulder prostheses - Primary operations - Glenoid

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2015	15 (100,0				**15**
2014	21 (100,0				**21**
2013	14 (77,8%)		4 (22,2%)		**18**
2012	18 (90,0%)		1 (5,0%)	1 (5,0%)	**20**
2011	14 (93,3%)			1 (6,7%)	**15**
2010	6 (75,0%)		2 (25,0%)		**8**
2009	3 (42,9%)		4 (57,1%)		**7**
2008			3 (100,0		**3**
Total	**91 (85,0%)**		**14 (13,1%)**	**2 (1,9%)**	**107**

Table 28: Non stemmed total shoulder prostheses - Primary operations - Humerus

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2015	1 (10,0%)		9 (90,0%)		**10**
2014	1 (5,9%)		16 (94,1%)		**17**
2013	2 (12,5%)		13 (81,3%)	1 (6,3%)	**16**
2012	2 (11,8%)		15 (88,2%)		**17**
2011	1 (7,1%)		13 (92,9%)		**14**
2010	1 (12,5%)		7 (87,5%)		**8**
2009			8 (100,0		**8**
2008			3 (100,0		**3**
Total	**8 (8,6%)**		**84 (90,3%)**	**1 (1,1%)**	**93**

Table 29: Reversed non stemmed total shoulder prostheses - Primary operations - Glenoid

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2015			3 (100,0		**3**
2014			1 (100,0		**1**
Total			**4 (100,0%**		**4**

Table 30: Reversed non stemmed total shoulder prostheses - Primary operations - Humerus

Year	Cem. with antib.	Cem. without antib.	Uncemented	Missing	Total
2015	3 (100,0				**3**
2014			1 (100,0		**1**
Total	**3 (75,0%)**		**1 (25,0%)**		**4**

Prosthesis brand

Stemmed hemiprostheses shoulder

Table 31: Primary operations- Caput humeri

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Bio - Modular	616	24	18	21	36	13	20	2	1	2	**753**
Global Advantage	250	82	55	53	54	66	44	36	40	34	**714**
Global Fx	56	2	10	26	29	47	50	17	16	13	**266**
Global	248										**248**
Nottingham	135	20	28	7	7	3	3				**203**
EPOCA				27	20	28	24	20	21	5	**145**
Delta I	60	2									**62**
Aequalis	1	4	9	6	5	8	7	6			**46**
Promos standard							8	13	12	11	**44**
Nottingham 1	1		1	12	15	2	4	2			**37**
Aequalis-Fracture		3	6	3	7	7	2	3	3	1	**35**
Modular	33										**33**
Global Unite							1		11	21	**33**
Bigliani/Flatow	6	8	4	4	1	3		2		1	**29**
JR-Vaios Anatomic								1	7	9	**17**
Comprehensive							2	4	6	2	**14**
Aequalis Ascend Flex Anatomic								2	2	8	**12**
Other (n < 10)	2	2	2	1					4	4	**15**
Total	**1408**	**147**	**133**	**160**	**174**	**177**	**165**	**108**	**123**	**111**	**2706**

Table 32: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Bio - Modular	628	26	21	21	34	13	20	2	1	2	**768**
Global Advantage	147	40	37	45	42	60	41	35	38	33	**518**
Global Fx	160	44	28	34	41	53	54	18	18	14	**464**
Global	261										**261**
Nottingham	135	18	26	10	10	4	7				**210**
EPOCA				27	21	28	24	20	21	5	**146**
Delta I	61	2									**63**
Scan Shoulder	56										**56**
Neer II	45		2								**47**
Promos standard							8	13	12	11	**44**
Aequalis	1	4	8	4	5	8	7	5			**42**
Aequalis-Fracture		3	7	5	7	7	2	4	3	1	**39**
Modular	33										**33**
Global Unite							1		11	21	**33**
Nottingham 1	1	1	2	10	15	1		2			**32**
Bigliani/Flatow	7	8	4	4	1	3		2		1	**30**
JR-Vaios Anatomic								1	7	9	**17**
Comprehensive Fracture				1			2	4	6	2	**15**
Monosperical	13		1								**14**
Aequalis Ascend Flex Anatomic								2	2	8	**12**
Other (n < 10)	2	2	1						4	4	**13**
Total	**1550**	**148**	**137**	**161**	**176**	**177**	**166**	**108**	**123**	**111**	**2857**

Anatomic stemmed total shoulder prostheses

Table 33: Primary operations - Glenoid

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Aequalis	3	15	22	31	51	51	32	36	3		**244**
Global	3	5	8	20	14	18	14	30	9	1	**122**
Aequalis Ascend Flex Anatomic								11	68	15	**94**
Global unite anatomic									3	81	**84**
Global Advantage	3	1						2	18	27	**51**
Bio - Modular	43	6		1							**50**
JR-Vaios Anatomic								4	8	8	**20**
Bigliani/Flatow	1	3	6	1		2	4	1	2		**20**
Promos standard							1	3	6	6	**16**
Anatomical shoulder							5	8	2	1	**16**
Nottingham	13										**13**
Other (n < 10)	1		1	3	4	8	4	2	1		**24**
Total	**67**	**30**	**37**	**56**	**69**	**79**	**60**	**97**	**120**	**139**	**754**

Table 34: Primary operations - Caput humeri

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Aequalis	3	15	22	31	51	51	33	36	6		**248**
Global Advantage	6	7	8	19	14	18	14	31	27	28	**172**
Aequalis Ascend Flex Anatomic								12	65	14	**91**
Global unite anatomic									3	81	**84**
Bio - Modular	31	4		1							**36**
JR-Vaios Anatomic								4	8	8	**20**
Bigliani/Flatow	1	3	6	1		2	4	1	2		**20**
Promos standard							1	4	6	6	**17**
Anatomical shoulder							5	8	2	2	**17**
Nottingham	14	1									**15**
Other (n < 10)	1		1	4	4	8	4	3	1		**26**
Total	**56**	**30**	**37**	**56**	**69**	**79**	**61**	**99**	**120**	**139**	**746**

Table 35: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Aequalis	3	15	22	31	51	51	33	36	6		**248**
Global Advantage	5	7	8	18	14	18	14	31	26	27	**168**
Aequalis Ascend Flex Anatomic								12	63	14	**89**
Global unite anatomic									3	81	**84**
Bio - Modular	29	5		1							**35**
Bigliani/Flatow	1	3	6	1		2	4	1	2		**20**
JR-Vaios Anatomic								3	8	8	**19**
Promos standard							1	4	6	6	**17**
Anatomical shoulder							5	8	1	2	**16**
Nottingham	14	1									**15**
Other (n < 10)	3		1	4	1	7	4	4	4	1	**29**
Total	**55**	**31**	**37**	**55**	**66**	**78**	**61**	**99**	**119**	**139**	**740**

Resurfacing shoulder hemiprostheses

Table 36: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Copeland	175	40	28	35	12	4	4				**298**
Global C.A.P.	25	19	11	12	8	11	4	2		2	**94**
EPOCA Resurfacing				2	3	4	2	7			**18**
Aequalis Resurfacing		6	4	2		1					**13**
Other (n < 10)		1		2	2						**5**
Total	**200**	**66**	**43**	**53**	**25**	**20**	**10**	**9**		**2**	**428**

Resurfacing total shoulder prostheses

Table 37: Primary operations - Glenoid

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Copeland	2										**2**
Aequalis Resurfacing						1					**1**
Total	**2**					**1**					**3**

Table 38: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Copeland	5			1							**6**
Aequalis Resurfacing			1	1		1	1				**4**
Total	**5**		**1**	**2**		**1**	**1**				**10**

Reversed stemmed total shoulder prostheses

Table 39: Primary operations - Glenoid

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Delta Xtend	1	14	49	64	91	114	147	142	178	221	**1021**
Delta III	265	41	5	1	1						**313**
Tess Reversed			15	30	31	28	32	30	38	39	**243**
Aequalis Ascend Flex Reverse								17	38	47	**102**
Aequalis Reversed II						1	18	36	11	13	**79**
Promos Reverse						9	10	16	21	13	**69**
Aequalis-Reversed		6	5	3	8	7	2				**31**
JRI-Vaios Inverse								9	5	4	**18**
Trebecular Metal Reverse Shou			1	2		1	1	1	3	2	**11**
Comprehensive Reverse						1	1	1	3	5	**11**
Anatomical shoulder Reversed							5		5		**10**
Other (n < 10)									2	4	**6**
Total	**266**	**61**	**75**	**100**	**131**	**161**	**216**	**252**	**304**	**348**	**1914**

Table 40: Primary operations - Caput humeri

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Delta Xtend	1	14	49	64	91	115	147	142	178	221	**1022**
Delta III	261	39	5	1	1						**307**
Tess Reversed			15	29	31	27	32	30	38	39	**241**
Aequalis Ascend Flex Reversed								17	41	44	**102**
Promos Reverse						9	10	16	21	13	**69**
Aequalis-Reversed		3	5	3	8	8	10	13			**50**
Aequalis Reversed Fracture							3	15	8	16	**42**
JRI-Vaios Inverse								9	5	4	**18**
Aequalis Reversed II							6	8			**14**
Comprehensive Reverse						1	1	1	3	5	**11**
Trebecular Metal Reverse Shoulder			1	2		1	1		3	2	**10**
Anatomical shoulder Reversed							5		5		**10**
Other (n < 10)									2	4	**6**
Total	**262**	**56**	**75**	**99**	**131**	**161**	**215**	**251**	**304**	**348**	**1902**

Table 41: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Delta Xtend	1	14	49	64	91	115	147	142	178	221	**1022**
Delta III	267	41	5	1	1						**315**
Tess Reversed			15	30	31	27	32	30	38	39	**242**
Aequalis Ascend Flex Reversed								17	41	44	**102**
Promos Reverse						9	10	16	21	13	**69**
Aequalis-Reversed		6	5	3	8	8	12	19			**61**
Aequalis Reversed Fracture							3	15	8	16	**42**
JRI-Vaios Inverse								9	5	4	**18**
Trebecular Metal Reverse Shoulder			1	2		1	1	1	3	2	**11**
Comprehensive Reverse						1	1	1	3	5	**11**
Anatomical shoulder Reversed							5		5		**10**
Other (n < 10)							5	2	2	4	**13**
Total	**268**	**61**	**75**	**100**	**131**	**161**	**216**	**252**	**304**	**348**	**1916**

Non stemmed shoulder hemiprostheses

Table 42: Primary operations - Caput humeri

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Tess-Anatomic				5	30	16	13	7	7	3	**81**
ECLIPSE TM					3	5	9	15	10	11	**53**
Other (n < 10)							1	4	6	2	**13**
Total				**5**	**33**	**21**	**23**	**26**	**23**	**16**	**147**

Table 43: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Tess-Anatomic				5	30	16	13	7	7	3	**81**
Other (n < 10)							1	4	6	2	**13**
Total				**5**	**30**	**16**	**14**	**11**	**13**	**5**	**94**

Non stemmed total shoulder prostheses

Table 44: Primary operations - Glenoid

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Tess-Anatomic			3	7	8	14	7	3	3	3	**48**
Simpliciti							10	10			**20**
Aequalis Ascend Flex Anatomic									13	7	**20**
ECLIPSE TM						1	3	2	4	5	**15**
Other (n < 10)								3	1		**4**
Total			**3**	**7**	**8**	**15**	**20**	**18**	**21**	**15**	**107**

Table 45: Primary operations - Caput humeri

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Tess-Anatomic			3	8	8	14	7	4	3	3	**50**
Simpliciti							10	12	13	7	**42**
ECLIPSE TM						1	3	2	4	5	**15**
Other (n < 10)									1		**1**
Total			**3**	**8**	**8**	**15**	**20**	**18**	**21**	**15**	**108**

Table 46: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Tess-Anatomic			3	8	8	14	7	4	3	3	**50**
Simpliciti							10	12	14	7	**43**
Total			**3**	**8**	**8**	**14**	**17**	**16**	**17**	**10**	**93**

Reversed stemmed total shoulder prostheses

Table 47: Primary operations - Glenoid

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Comprehensive Nano Stemless										3	**3**
Comprehensive Reverse									1		**1**
Total									**1**	**3**	**4**

Table 48: Primary operations - Caput humeri

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Comprehensive Nano Stemless Reverse										3	**3**
Comprehensive Reverse									1		**1**
Total									**1**	**3**	**4**

Table 49: Primary operations - Humerus

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Comprehensive Nano Stemless Reverse									1	3	**4**
Total									**1**	**3**	**4**

Reasons for revisions

Table 50: Stemmed shoulder hemiprostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015	1	2	1	3	1	2		10		6	
2014			2	1		1		6		2	
2013		2	2	5		3	2	12	2	4	
2012	1	2	4	1			1	5		5	1
2011			3	2		3		6		4	
2010		3	3	1		2	1	9		5	
2009			1	3		3	1	10		4	
2008			1	2		1		5		2	1
2007	1	1	1	3		2		12		2	2
2006	1	3		4		2	2	10	1	4	
2005	1	2		1	1	3		5		3	
2004		1	5	3				5		5	
2003		1		1		2		6		3	
2002		1						5			
2001	1		1	1				4		2	1
2000	1	1	1	2		2		4		2	
1999			2			1		5		1	
1998			1			1	2	6		2	1
1997				1				1			
1996		1	1					2		2	
1995								1		1	
Total	**7**	**20**	**29**	**34**	**2**	**28**	**9**	**129**	**3**	**59**	**6**

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

Table 51: Anatomic stemmed total shoulder prostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015						1		4		1	
2014	2			4	1		1	3		3	
2013						3		2			
2012			1	2				1	2		
2011	1	1	3					1			
2010			1	2		4		1		1	
2009			1								
2008								1			
2006		1	1							1	
2004	1										
2003								1			
2002	1	1	1					1			
2001	1							1			
1999	1							2		1	
1998			1					1		1	
1997				1				1			
1996	2		1			1					
1995			1			1					
1994			1							1	
Total	**9**	**3**	**12**	**9**	**1**	**10**	**1**	**20**	**2**	**9**	**0**

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

Table 52: Resurfacing shoulder hemiprostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015	1	2						1		1	
2014		1		1				10		3	
2013		1						7		1	
2012		1	1	2		2		6		3	
2011					1			6		5	
2010								9		1	
2009								9		2	
2008		2		1				10		2	
2007	1		1			1		2	1		
2006		1		1		1		2			
2005		1						1			
Total	**2**	**9**	**2**	**5**	**1**	**4**	**0**	**63**	**1**	**18**	**0**

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

Table 53: Resurfacing total shoulder prostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2008								1			
2005			1	1							
Total	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**

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

Table 54: Reversed stemmed total shoulder prostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015	6	2	4	1	1	12	2	2	3	2	
2014	1	2	3	2		8	1	2		2	
2013	3	3	4	1		6		1		2	
2012	6	5	6	1		7		1	2	2	
2011	1		1	1			3			1	
2010	3	1	2	1		1				3	
2009	2	1				4				2	
2008	1		3		1					1	
2007	2	2	3	2		7		1			
2006	1	1	1	1		1			1	1	
2005	1	1						1			
2004	4	3	3	1						3	
2003	2		1					1			1
2002	1					1					
2001	3					2					
2000	1			1		2	1				
1999		1									
1998						1				1	
1996								1			
1995						2				1	
Total	**38**	**22**	**31**	**12**	**2**	**54**	**7**	**10**	**6**	**21**	**1**

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

Table 55: Non stemmed shoulder hemiprostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015								3		3	
2014		1						4		1	
2012			1			2		1		2	
2011										1	
Total	**0**	**1**	**1**	**0**	**0**	**2**	**0**	**8**	**0**	**7**	**0**

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

Table 56: Non stemmed total shoulder prostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015	2			1		3		1			
2014	1							1			
2012	4					3		1			
Total	**7**	**0**	**0**	**1**	**0**	**6**	**0**	**3**	**0**	**0**	**0**

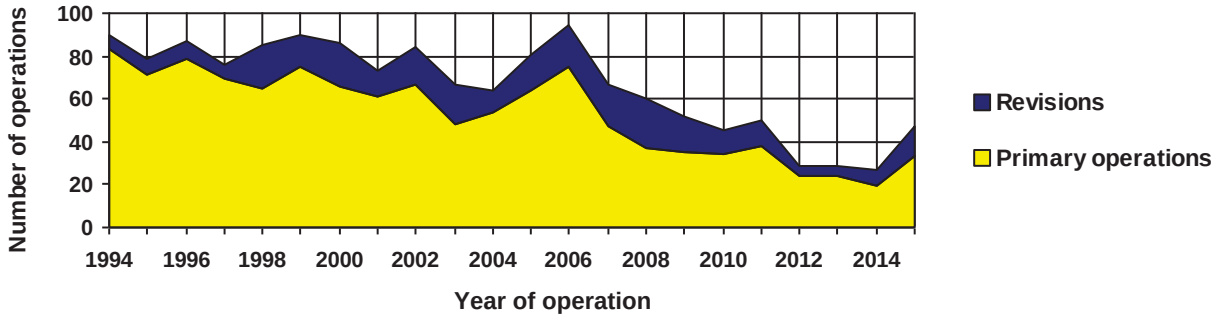
Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

TOE JOINT PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2015	33	(70,2%)	14	(29,8%)	**47**
2014	19	(70,4%)	8	(29,6%)	**27**
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**
1994-99	442	(87,2%)	65	(12,8%)	**507**
Total	**1168**	**(79,9%)**	**294**	**(20,1%)**	**1 462**

Figure 1: Annual number of operations



52,3 % of all operations were performed on the right side. 83,9 % performed in women. Mean age: 60,3 years.

Table 2: Toe disease in primary operations

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae ligament tear	Acute fracture	Sequelae of infection	Other	Missing
2015	22	5	2					4	
2014	10	9							
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						
1994-99	30	384	2	2	1			22	3
Total	**244**	**832**	**19**	**10**	**2**	**1**	**2**	**82**	**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
2015			32 (97,0%)	1 (3,0%)	**33**
2014			19 (100,0%)		**19**
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%)**		**1 153 (98,8%)**	**8 (0,7%)**	**1 167**

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2015			1 (100,0%)		**1**
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%)**		**92 (93,9%)**	**3 (3,1%)**	**98**

Toe joint prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Silastic HP 100	741	35	30	25	22	22	14	13	11	11	**924**
LPT	24	5	3	3	6	14	9	10	8	20	**102**
Toefit-plus	26	5	4	7	5	2	1	1		1	**52**
Sutter	25	1									**26**
Biomet Total Toe	25										**25**
Moje	18										**18**
LaPorta	14										**14**
Swanson Titanium	4				1						**5**
Epyc										1	**1**
Total	**877**	**46**	**37**	**35**	**34**	**38**	**24**	**24**	**19**	**33**	**1167**

Table 6: Primary operations - Distal

Prostheses	1994-06	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Toefit-plus	26	5	4	7	5	2	1	1		1	**52**
Biomet Total Toe	25										**25**
Moje	18										**18**
Silastic HP 100	3										**3**
Total	**72**	**5**	**4**	**7**	**5**	**2**	**1**	**1**		**1**	**98**

Reasons for revisions

Table 7:

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2015				1	5			4	5	3	
2014		1		1	2			2	4		
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**	**16**	**82**	**27**	**3**	**131**	**22**	**92**	**9**

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

Completeness analysis for the Norwegian Arthroplasty Register, prostheses in other joints, 2008-2014

A completeness analysis for the Norwegian Arthroplasty Register, prostheses in other joints, has for the first time 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 (NRL). A report on the implementation and further results will be published on www.helsedirektoratet.no. There are separate statistics on primary operations and revisions. Some hospitals have few arthroplasties and the coverage rate must be seen in this light. Here we only present the completeness analysis for primary operations, as the compilation work on revisions has not been completed.

Elbow prostheses

NCSP codes for combining data from NPR hospital stays and the National Arthroplasty Register (NAR) for partial and total elbow prostheses

Type	Code	Description
Primary operation	**NCB 0y**	Primary partial prosthetic replacement of elbow joint not using cement
	NCB 1y	Primary partial prosthetic replacement of elbow joint using cement
	NCB 20	Primary total prosthetic replacement of elbow joint not using cement
	NCB 30	Primary total prosthetic replacement of elbow joint using hybrid technique
	NCB 40	Primary total prosthetic replacement of elbow joint using cement
	NCB 99	Other primary prosthetic replacement of elbow joint

The coverage rate for elbow prostheses in the National Arthroplasty Register (NAR) was calculated as follows:

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

Coverage for the NPR was calculated in a similar way:

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

Primary operations. From 2008 to 2014, 222 primary partial elbow arthroplasties and 223 primary total elbow arthroplasties were reported to one or both of the registers. For partial prostheses, 47.3% were reported to the NRL while 84.7% were reported to the NPR. For total prostheses, the corresponding figures were 87.9% and 93.7%. Completeness by hospital, divided into health regions, shows a rate for the NAR ranging from 0% to 100% between the different hospitals. For hospitals with a low completeness rate for elbow prostheses, either the form was not sent, or other interventions than elbow arthroplasties were incorrectly coded with NCB 0y/NCB 1y/NCB 20/NCB 30/NCB 40. (There were only 18 partial elbow arthroplasties and 34 total elbow arthroplasties in the category NCB 99 during the period).

Procedure codes to be used for primary operations:

NCB 0y - NCB 1y - NCB 20 - NCB 30 - NCB 40

Ankle prostheses

NCSP codes for combining data from NPR hospital stays and the National Arthroplasty Register (NAR) for ankle prostheses

Type	Code	Description
Primary operation	**NHB 0y**	Primary partial prosthetic replacement of ankle joint not using cement
	NHB 1y	Primary partial prosthetic replacement of ankle joint using cement
	NHB 20	Primary total prosthetic replacement of ankle joint not using cement
	NHB 30	Primary total prosthetic replacement of ankle joint using hybrid technique
	NHB 40	Primary total prosthetic replacement of ankle joint using cement
	NHB 99	Other primary prosthetic replacement of joint of ankle or foot

The coverage rate for ankle prostheses in the National Arthroplasty Register was calculated as follows:

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

Coverage for the NPR was calculated in a similar way:

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

Primary operations. From 2008 to 2014, 625 primary ankle arthroplasties were reported to one or both of the registers. 92.5% of these were reported to the NAR while 97.1% were reported to the NPR. Complteness by hospital, divided into health regions, shows a rate for the NAR ranging from 0% to 100% between the different hospitals. For hospitals with a low completeness rate for ankle prostheses, either the form was not sent, or other interventions than ankle arthroplasties were incorrectly coded with NHB 0y/NHB 1y/NHB 20/NHB 30/NHB 40. (There were only 13 additional arthroplasties in the category NHB 99 during the period).

Procedure codes to be used for primary operations:

NHB 0y - NHB 1y - NHB 20 - NHB 30 - NHB 40

Finger prostheses

NCSP codes for combining data from NPR hospital stays and the National Arthroplasty Register (NAR) for finger prostheses

Type	Code	Description
Primary operation	**NDB 8y**	Primary prosthetic replacement of joint of finger or metacarpal
	NDB 99	Other primary prosthetic replacement of joint of wrist or hand

The completeness rate for finger prostheses in the National Arthroplasty Register was calculated as follows:

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

Completeness for the NPR was calculated in a similar way:

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

Primary operations. From 2008 to 2014, 329 primary finger arthroplasties were reported to one or both of the registers. 57.4% of these were reported to the NAR while 94.5% were

reported to the NPR. Completeness by hospital, divided into health regions, shows a rate for the NAR ranging from 0% to 100% between the different hospitals. For hospitals with a low completeness rate for finger prostheses, either the form was not sent, or other interventions than finger arthroplasties were incorrectly coded with NDB 8y. (There were 84 arthroplasties in the category NDB 99 during the period).

Procedure code to be used for primary operations: NDB 8y

Wrist/carpus/distal radioulnar joint (DRUJ)

NCSP codes for combining data from NPR hospital stays and the National Arthroplasty Register (NAR) for wrist/carpal/DRUJ prostheses

Type	Code	Description
Primary operation	**NDB 0y**	Primary partial prosthetic replacement of joint of wrist not using cement
	NDB 1y	Primary partial prosthetic replacement of joint of wrist using cement
	NDB 2y	Primary total prosthetic replacement of joint of wrist not using cement
	NDB 3y	Primary total prosthetic replacement of joint of wrist using hybrid technique
	NDB 4y	Primary total prosthetic replacement of joint of wrist using cement
	NDB 5y	Primary prosthetic interposition arthroplasty of joint of wrist
	NDB 99	Other primary prosthetic replacement of joint of wrist or hand

The completeness rate for wrist/carpal/DRUJ prostheses in the National Arthroplasty Register (NAR) was calculated as follows:

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

Coverage for the NPR was calculated in a similar way:

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

Primary operations. From 2008 to 2014, 425 primary wrist/carpal/DRUJ arthroplasties were reported to one or both of the registers. 75.1% of these were reported to the NRL, while 61.2% were reported to the NPR. Coverage by hospital, divided into health regions, shows a rate for the NRL ranging from 0% to 100% between the different hospitals. For hospitals with a low coverage rate for wrist/carpal/DRUJ prostheses, either the form was not sent, or other interventions than wrist/carpal/DRUJ arthroplasties were incorrectly coded with NDB 0y/NDB 1y/NDB 2y/NDB 3y/NDB 4y/NDB 5y. (There were 29 partial and 34 total arthroplasties in the category NDB 99 during the period).

Procedure codes to be used for primary operations:
NDB 0y - NDB 1y - NDB 2y - NDB 3y - NDB 4y

Spinal prostheses

NCSP codes for combining data from NPR hospital stays and the National Arthroplasty Register (NAR) for spinal prostheses

Type	Code	Description
Primary operation	**NAB 9y**	Primary prosthetic replacement of joint of cervical spine

The completeness rate for spinal prostheses in the National Arthroplasty Register was calculated as follows:

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

Coverage for the NPR was calculated in a similar way:

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

Primary operations. From 2008 to 2014, 169 primary spinal arthroplasties were reported to one or both of the registers. 40.8% of these were reported to the NRL while 100% were reported to the NPR. Coverage by hospital, divided into health regions, shows a rate for the NRL ranging from 0% to 100% between the different hospitals. For hospitals with a low coverage rate for spinal prostheses, either the form was not sent, or other interventions than spinal arthroplasties were incorrectly coded with NAB 9y.

Procedure code to be used for primary operations: NAB 9y

Shoulder prostheses

NCSP codes for combining data from NPR hospital stays and the National Arthroplasty Register (NAR) for shoulder prostheses

Type	Code	Description
Primary Operation	**NBB 0y**	Primary partial prosthetic replacement of humero-scapular joint not using cement
	NBB 1y	Primary partial prosthetic replacement of humero-scapular joint using cement
	NBB 20	Primary total prosthetic replacement of humero-scapular joint not using cement
	NBB 30	Primary total prosthetic replacement of humero-scapular joint using hybrid technique
	NBB 40	Primary total prosthetic replacement of humero-scapular joint using cement
	NBB 99	Other primary prosthetic replacement of joint of shoulder

The completeness rate for shoulder prostheses in the National Arthroplasty Register was calculated as follows:

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

Coverage for the NPR was calculated in a similar way:

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

Primary operations. From 2008 to 2014, 3552 primary shoulder arthroplasties were reported to one or both of the registers. 90.7% of these were reported to the NRL while 96.2% were reported to the NPR. Completeness by hospital, divided into health regions, shows a rate for the NRL ranging from 0% to 100% between the different hospitals. For hospitals with a low completness rate for shoulder prostheses, either the form was not sent, or other interventions than shoulder arthroplasties were incorrectly coded with NBB 0y/NBB 1y/NBB 20/NBB 30/NBB 40. (There were only an additional 10 arthroplasties in the category NBB 99 during the period).

Procedure codes to be used for primary operations:
NBB 0y - NBB 1y - NBB 20 - NBB 30 - NBB 40

Toe joint prostheses

NCSP codes for combining data from NPR hospital stays and the National Arthroplasty Register (NAR) for toe joint prostheses

Type	Code	Description
Primary operation	**NHB 6y**	Primary prosthetic replacement of first metatarsophalangeal joint
	NHB 7y	Primary prosthetic replacement of other metatarsophalangeal joint
	NHB 8y	Primary prosthetic replacement of other joint of foot
	NHB 99	Other primary prosthetic replacement of joint of ankle or foot

Primary operations. From 2008 to 2014, 251 primary toe joint arthroplasties were reported to one or both of the registers. 79.3% of these were reported to the NRL while 94.8% were reported to the NPR. Coompleteness by hospital, divided into health regions, shows a rate for the NRL ranging from 0% to 100% between the different hospitals. For hospitals with a low completeness rate for toe joint prostheses, either the form was not sent, or other interventions than toe joint arthroplasties were incorrectly coded with NHB 6y/NHB 7y/NHB 8y.

Procedure codes to be used for primary operations:

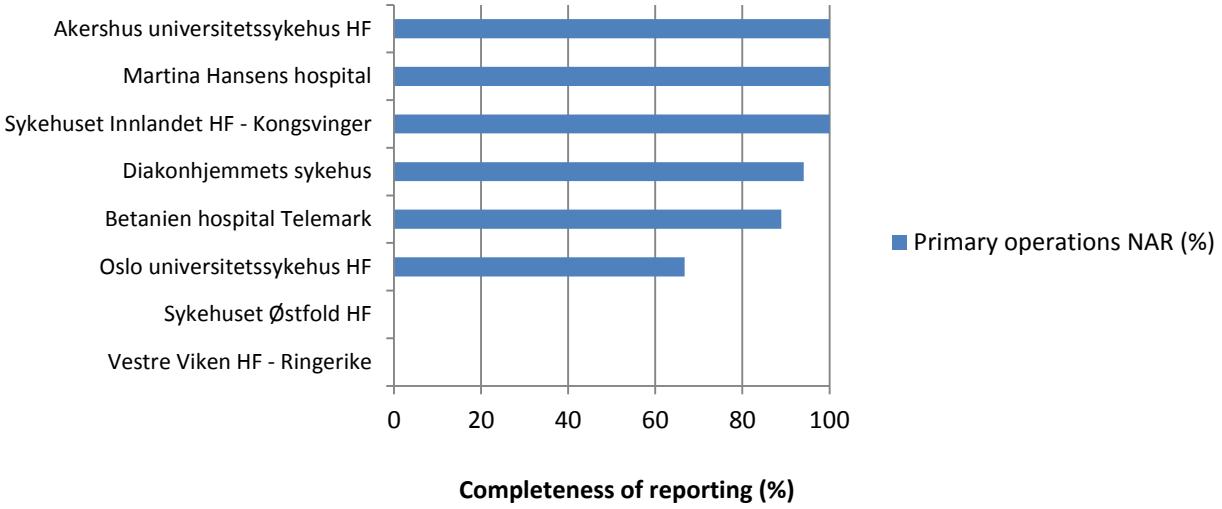
NHB 6y - NHB 7y - NHB 8y

Helse Sør-Øst: total prosthesis in elbow

Table: Completeness of reporting for primary total prosthesis operations in elbow, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Sør-Øst:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Sykehuset Innlandet HF - Kongsvinger	7	100	100
Martina Hansens hospital	5	100	100
Akershus universitetssykehus HF	1	100	0
Diakonhjemmets sykehus	119	94,1	94,1
Betanien hospital Telemark	9	88,9	88,9
Oslo universitetssykehus HF	12	66,7	83,3
Vestre Viken HF - Ringerike	1	0	100
Sykehuset Østfold HF	2	0	100

Figure: Completeness of reporting for primary total prosthesis operations in elbow, 2008-2014.

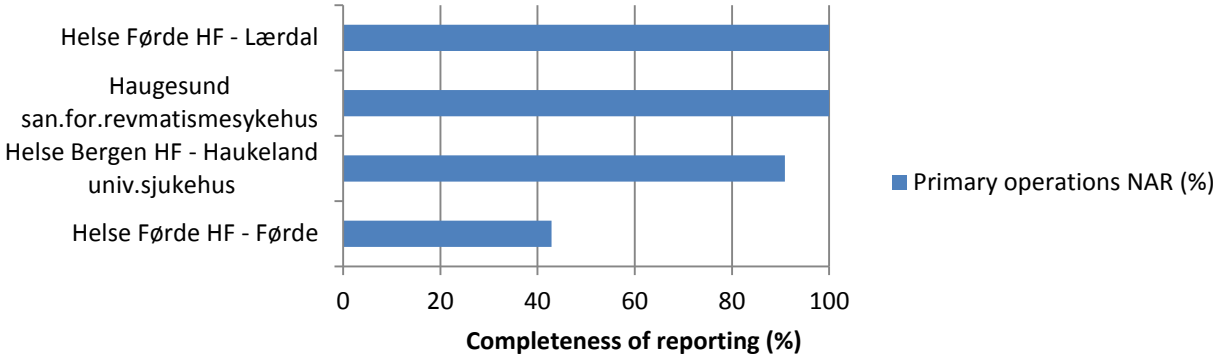


Helse Vest: total prosthesis in elbow

Table: Completeness of reporting for primary total prosthesis operations in elbow, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Vest:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Haugesund san.for.revmatismesykehus	5	100	100
Helse Førde HF - Lærdal	1	100	100
Helse Bergen HF - Haukeland univ.sjukehus	22	90,9	95,5
Helse Førde HF - Førde	8	42,9	85,7

Figure: Completeness of reporting for primary total prosthesis operations in elbow, 2008-2014.

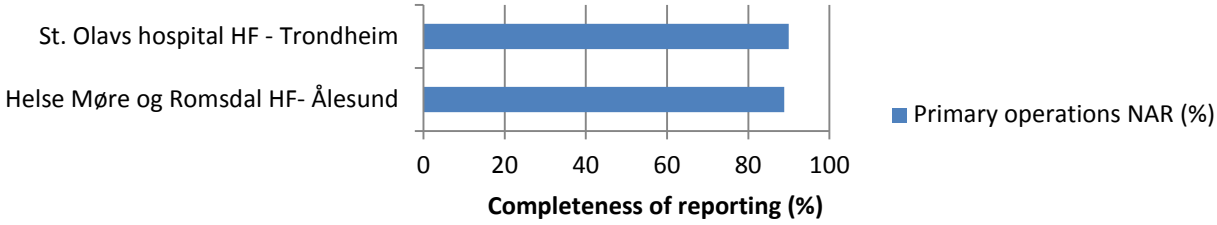


Helse Midt-Norge: total prosthesis in elbow

Table: Completeness of reporting for primary total prosthesis operations in elbow, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Midt-Norge:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
St. Olavs hospital HF - Trondheim	10	90	90
Helse Møre og Romsdal HF- Ålesund	18	88,9	100

Figure: Completeness of reporting for primary total prosthesis operations in elbow, 2008-2014.

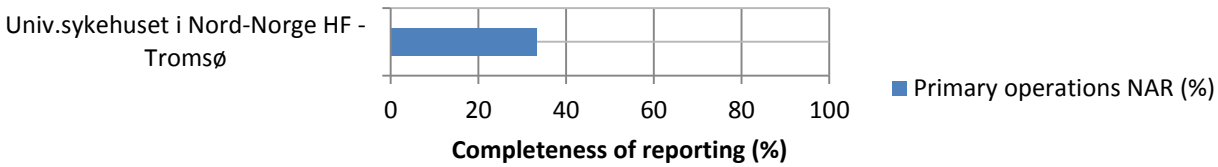


Helse Nord: total prosthesis in elbow

Table: Completeness of reporting for primary total prosthesis operations in elbow, 2008-2014.

		Primary operations		
	NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Nord:		Total number NAR+NPR	NAR(%)	NPR(%)
Univ.sykehuset i Nord-Norge HF - Tromsø		3	33,3	100

Figure: Completeness of reporting for primary total prosthesis operations in elbow, 2008-2014.

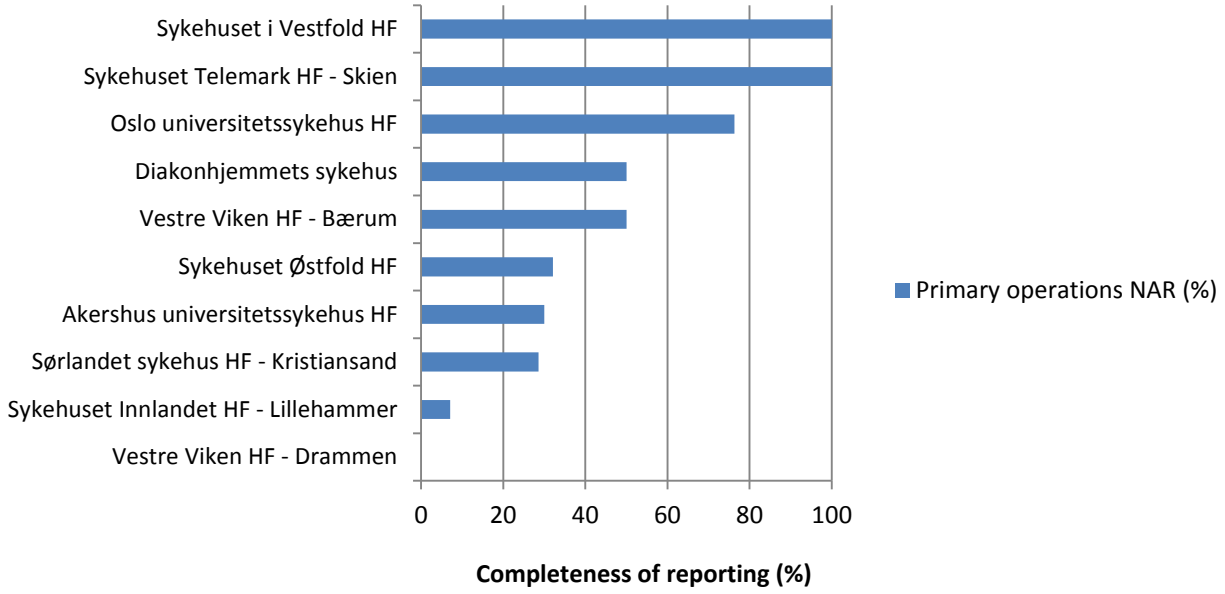


Helse Sør-Øst: partial prosthesis in elbow

Table: Completeness of reporting for primary partial prosthesis operations in elbow, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Sør-Øst:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Sykehuset Telemark HF - Skien	2	100	50
Sykehuset i Vestfold HF	1	100	100
Oslo universitetssykehus HF	59	76,3	59,3
Vestre Viken HF - Bærum	6	50	100
Diakonhjemmets sykehus	6	50	83,3
Sykehuset Østfold HF	28	32,1	100
Akershus universitetssykehus HF	20	30	100
Sørlandet sykehus HF - Kristiansand	7	28,6	100
Sykehuset Innlandet HF - Lillehammer	14	7,1	100
Vestre Viken HF - Drammen	1	0	100

Figure: Completeness of reporting for primary partial prosthesis operations in elbow, 2008-2014.

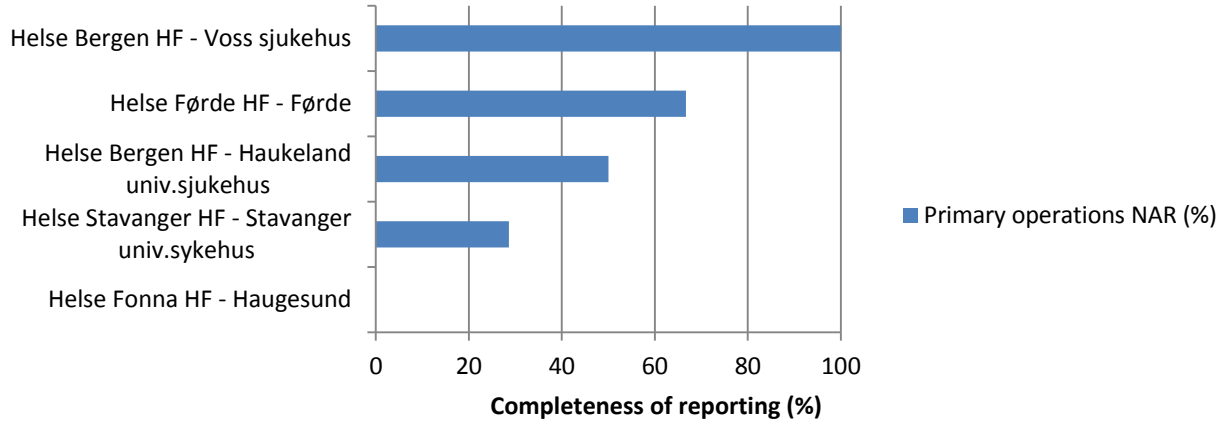


Helse Vest: partial prosthesis in elbow

Table: Completeness of reporting for primary partial prosthesis operations in elbow, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Vest:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Helse Bergen HF - Voss sjukehus	1	100	100
Helse Førde HF - Førde	12	66,7	100
Helse Bergen HF - Haukeland univ.sjukehus	22	50	86,4
Helse Stavanger HF - Stavanger univ.sykehus	21	28,6	90,5
Helse Fonna HF - Haugesund	1	0	100

Figure: Completeness of reporting for primary partial prosthesis operations in elbow, 2008-2014.

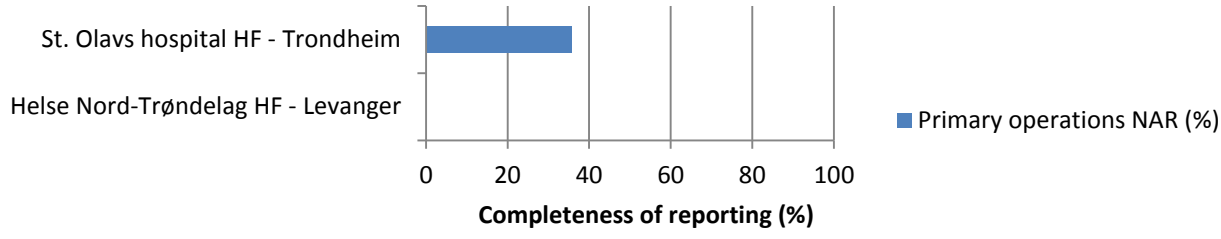


Helse Midt-Norge: partial prosthesis in elbow

Table: Completeness of reporting for primary partial prosthesis operations in elbow, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Midt-Norge:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
St. Olavs hospital HF - Trondheim	14	35,7	85,7
Helse Nord-Trøndelag HF - Levanger	1	0	100

Figure: Completeness of reporting for primary partial prosthesis operations in elbow, 2008-2014.

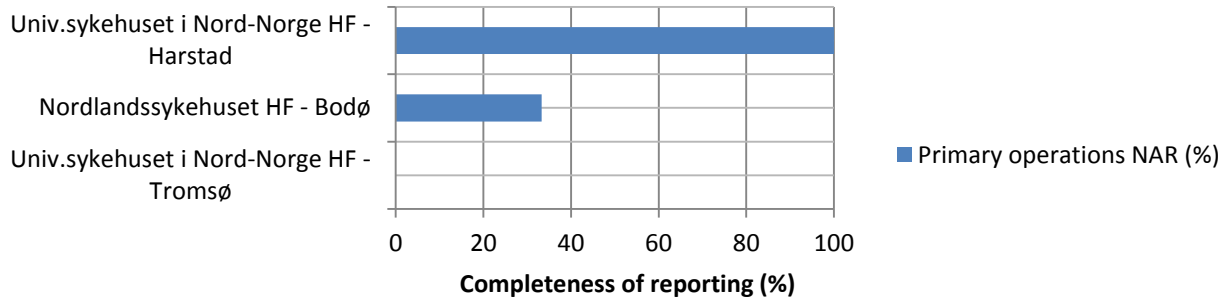


Helse Nord: partial prosthesis in elbow

Table: Completeness of reporting for primary partial prosthesis operations in elbow, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Nord:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Univ.sykehuset i Nord-Norge HF - Harstad	1	100	0
Nordlandssykehuset HF - Bodø	3	33,3	100
Univ.sykehuset i Nord-Norge HF - Tromsø	2	0	100

Figure: Completeness of reporting for primary partial prosthesis operations in elbow, 2008-2014.

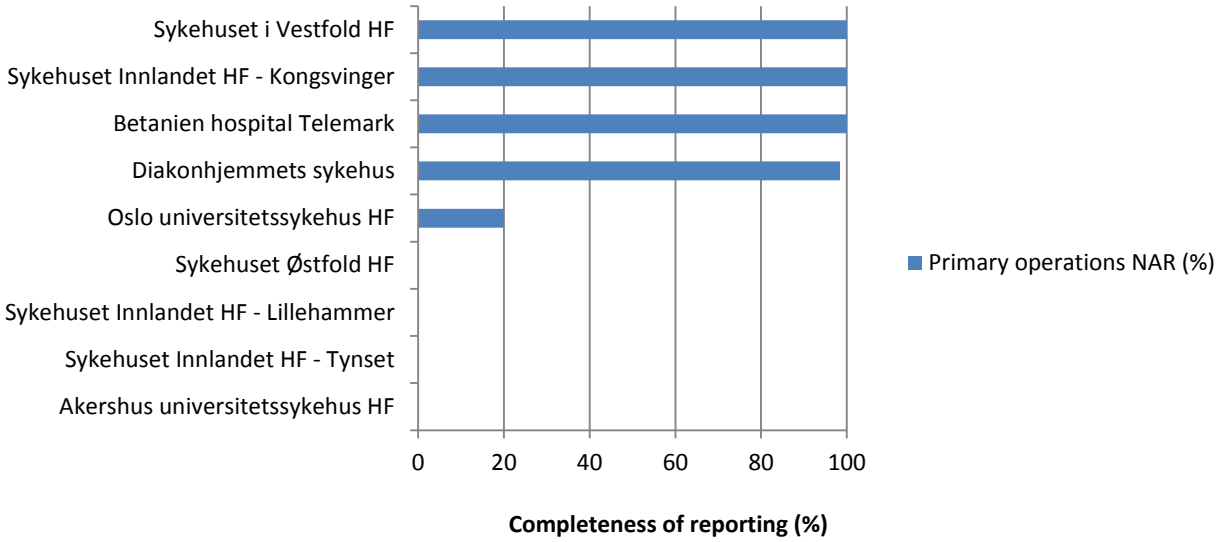


Helse Sør-Øst: ankle

Table: Completeness of reporting for primary operations in ankel, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Sør-Øst:	Total number NAR+NPR	NAR(%)	NPR(%)
Betanien hospital Telemark	45	100	91,1
Sykehuset Innlandet HF - Kongsvinger	9	100	100
Sykehuset i Vestfold HF	5	100	100
Diakonhjemmets sykehus	322	98,4	99,4
Oslo universitetssykehus HF	5	20	100
Akershus universitetssykehus HF	1	0	100
Sykehuset Innlandet HF - Tynset	1	0	100
Sykehuset Innlandet HF - Lillehammer	1	0	100
Sykehuset Østfold HF	2	0	100

Figure: Completeness of reporting for primary operations in ankle, 2008-2014.

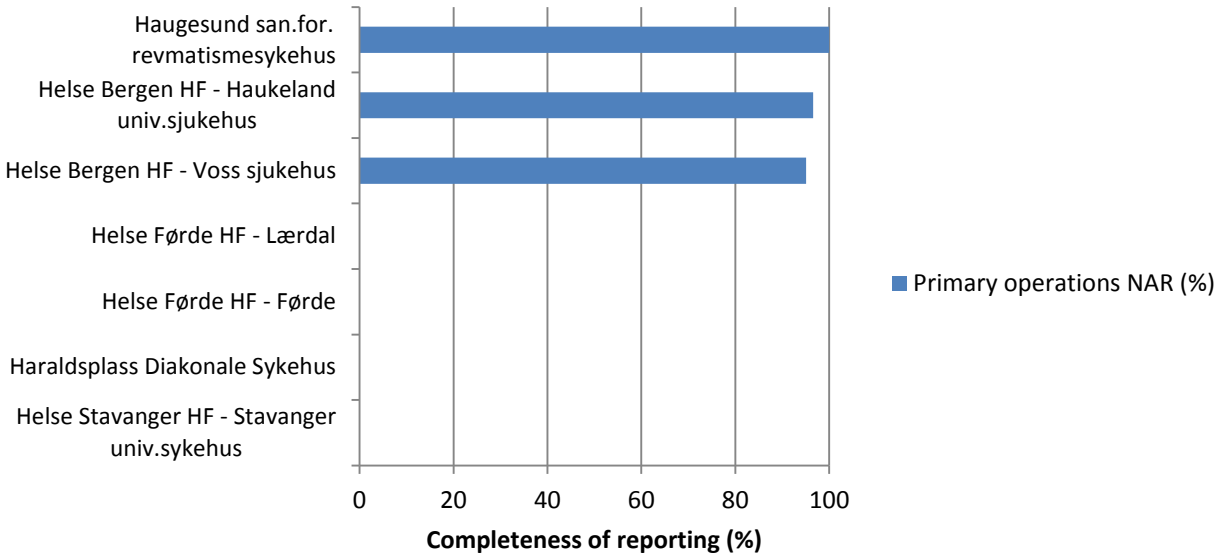


Helse Vest: ankle

Table: Completeness of reporting for primary operations in ankle, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Vest:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Haugesund san.for. revmatismesykehus	4	100	100
Helse Bergen HF - Haukeland univ.sjukehus	29	96,6	96,6
Helse Bergen HF - Voss sjukehus	81	95,1	97,5
Helse Stavanger HF - Stavanger univ.sykehus	2	0	100
Haraldsplass Diakonale Sykehus	2	0	100
Helse Førde HF - Førde	2	0	100
Helse Førde HF - Lærdal	11	0	100

Figure: Completeness of reporting for primary operations in ankle, 2008-2014.

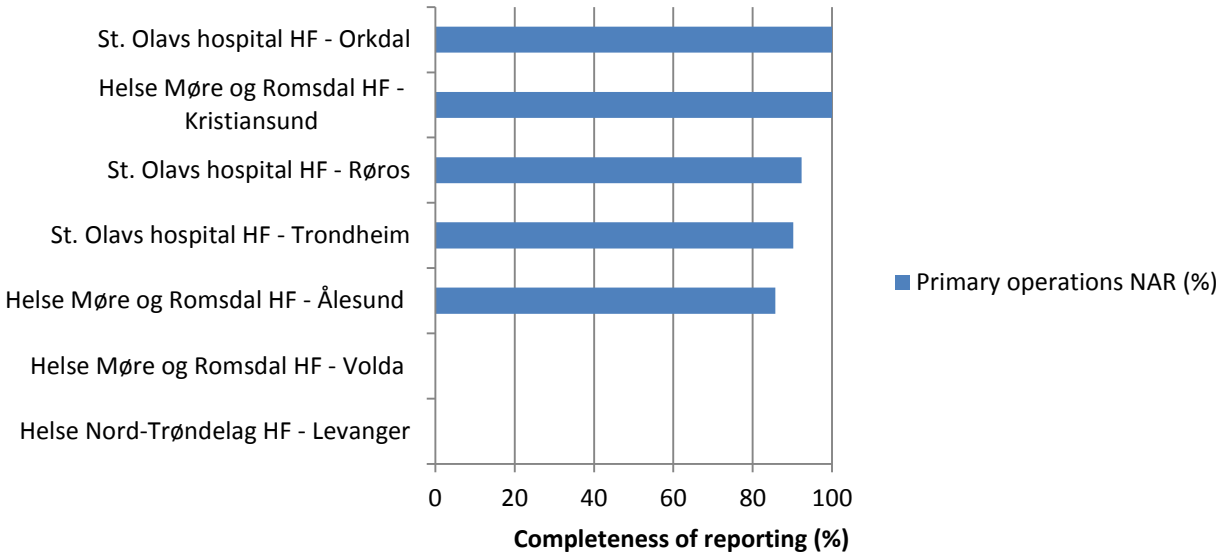


Helse Midt-Norge: ankle

Table: Completeness of reporting for primary operations in ankle, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Midt-Norge:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Helse Møre og Romsdal HF - Kristiansund	1	100	100
St. Olavs hospital HF - Orkdal	9	100	100
St. Olavs hospital HF - Røros	13	92,3	100
St. Olavs hospital HF - Trondheim	61	90,2	100
Helse Møre og Romsdal HF - Ålesund	7	85,7	100
Helse Nord-Trøndelag HF - Levanger	1	0	100
Helse Møre og Romsdal HF - Volda	1	0	100

Figure: Completeness of reporting for primary operations in ankle, 2008-2014.



Helse Nord: ankle

Table: Completeness of reporting for primary operations in ankle, 2008-2014.

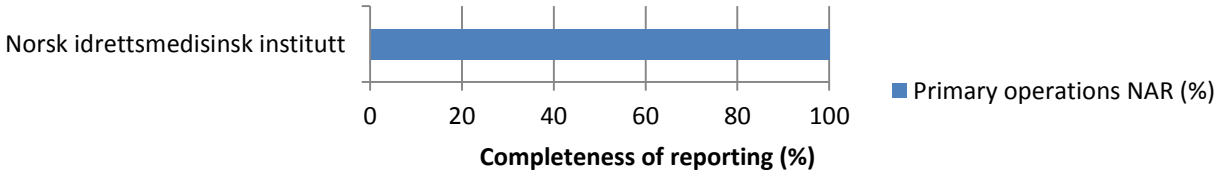
	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Nord:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Univ.sykehuset i Nord-Norge HF - Tromsø	1	0	100

Private hospitals with agreement with RHF: ankle

Table: Completeness of reporting for primary operations in ankle, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Private hospitals with agreement with RHF:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Norsk idrettsmedisinsk institutt	9	100	0

Figure: Completeness of reporting for primary operations in ankle, 2008-2014.

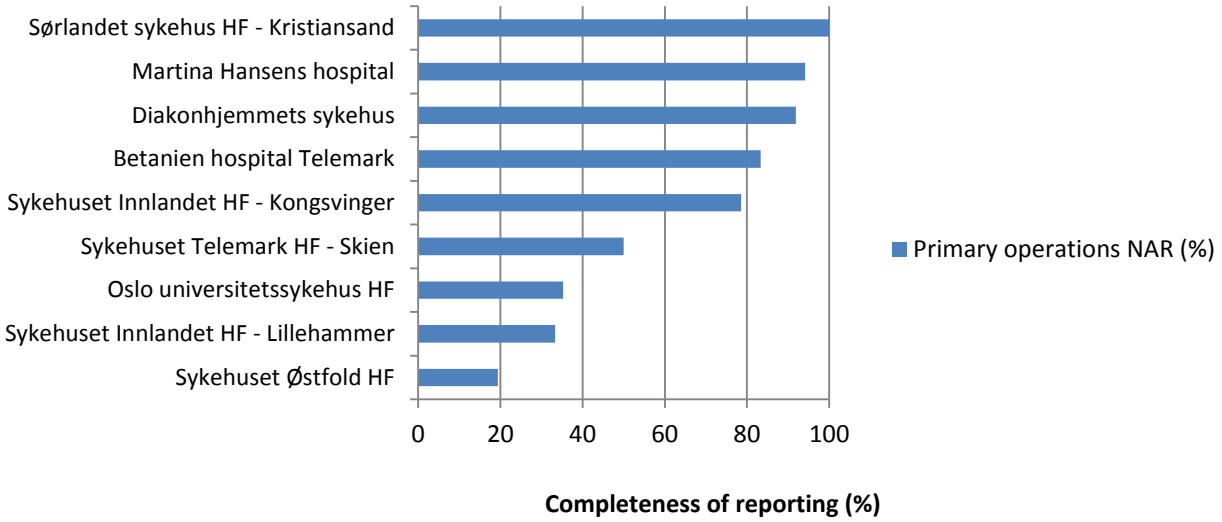


Helse Sør-Øst: finger

Table: Completeness of reporting for primary operations in finger, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Sør-Øst:	Total number NAR+NPR	NAR(%)	NPR(%)
Sørlandet sykehus HF - Kristiansand	1	100	100
Martina Hansens hospital	17	94,1	94,1
Diakonhjemmets sykehus	86	91,9	93
Betanien hospital Telemark	18	83,3	94,4
Sykehuset Innlandet HF - Kongsvinger	14	78,6	85,7
Sykehuset Telemark HF - Skien	2	50	50
Oslo universitetssykehus HF	34	35,3	97,1
Sykehuset Innlandet HF - Lillehammer	6	33,3	83,3
Sykehuset Østfold HF	72	19,4	97,2

Figure: Completeness of reporting for primary operations in finger, 2008-2014.

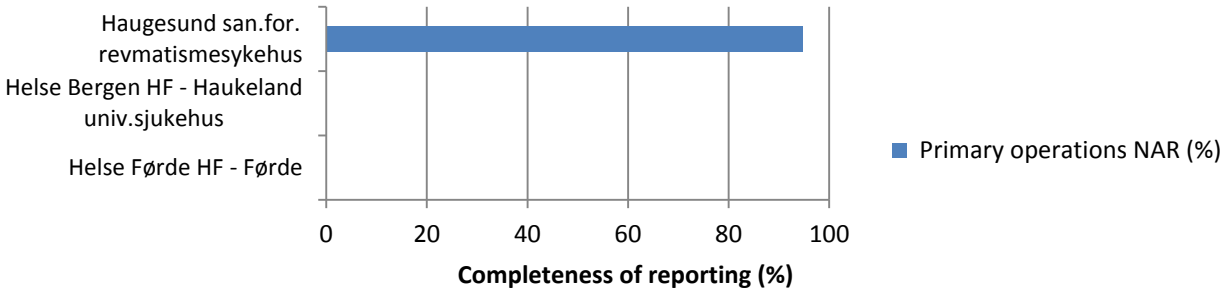


Helse Vest: finger

Table: Completeness of reporting for primary operations in finger, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Vest:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Haugesund san.for. revmatismesykehus	19	94,7	100
Helse Førde HF - Førde	8	0	100
Helse Bergen HF - Haukeland univ.sjukehus	12	0	100

Figure: Completeness of reporting for primary operations in finger, 2008-2014.

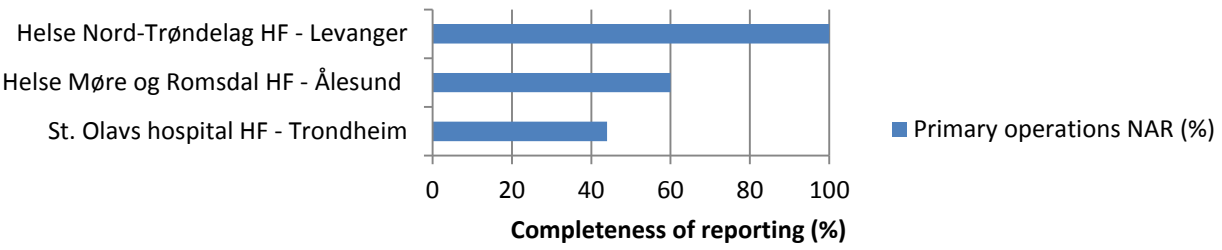


Helse Midt-Norge: finger

Table: Completeness of reporting for primary operations in finger, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Midt-Norge:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Helse Nord-Trøndelag HF - Levanger	2	100	50
Helse Møre og Romsdal HF - Ålesund	5	60	100
St. Olavs hospital HF - Trondheim	25	44	92

Figure: Completeness of reporting for primary operations in finger, 2008-2014.

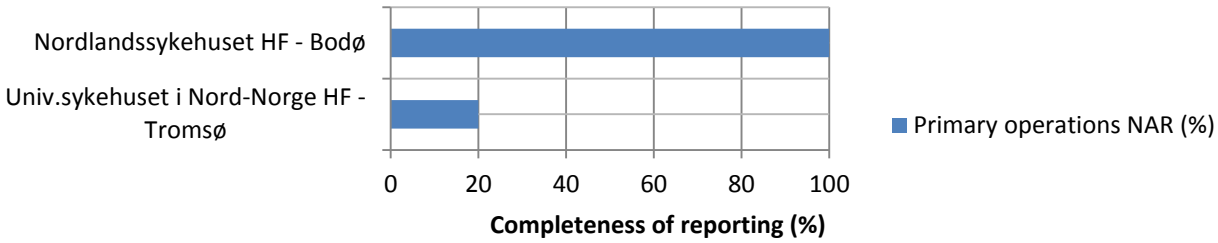


Helse Nord: finger

Table: Completeness of reporting for primary operations in finger, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Nord:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Nordlandssykehuset HF - Bodø	3	100	100
Univ.sykehuset i Nord-Norge HF - Tromsø	5	20	100

Figure: Completeness of reporting for primary operations in finger, 2008-2014.

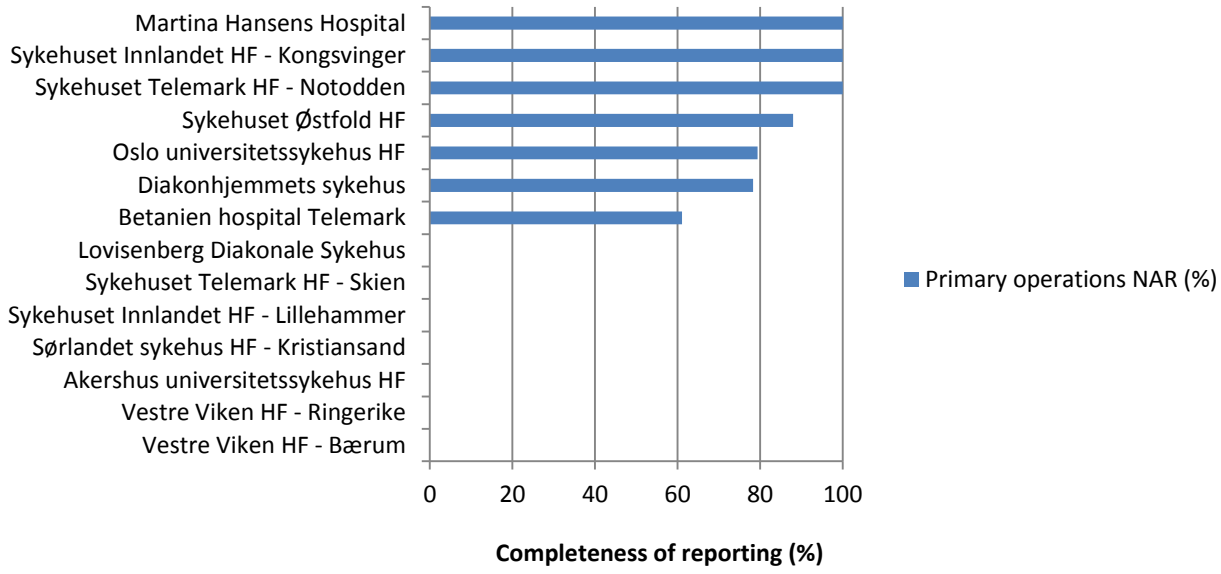


Helse Sør-Øst: wrist

Table: Completeness of reporting for primary operations in wrist, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Sør-Øst:	Total number NAR+NPR	NAR(%)	NPR(%)
Sykehuset Telemark HF - Notodden	1	100	0
Sykehuset Innlandet HF - Kongsvinger	1	100	0
Martina Hansens Hospital	7	100	100
Sykehuset Østfold HF	108	88	41,7
Oslo universitetssykehus HF	131	79,4	67,2
Diakonhjemmets sykehus	23	78,3	73,9
Betanien hospital Telemark	54	61,1	40,7
Vestre Viken HF - Bærum	1	0	100
Vestre Viken HF - Ringerike	2	0	100
Akershus universitetssykehus HF	1	0	100
Sørlandet sykehus HF - Kristiansand	2	0	100
Sykehuset Innlandet HF - Lillehammer	2	0	100
Sykehuset Telemark HF - Skien	3	0	100
Lovisenberg Diakonale Sykehus	5	0	100

Figure: Completeness of reporting for primary operations in wrist, 2008-2014.

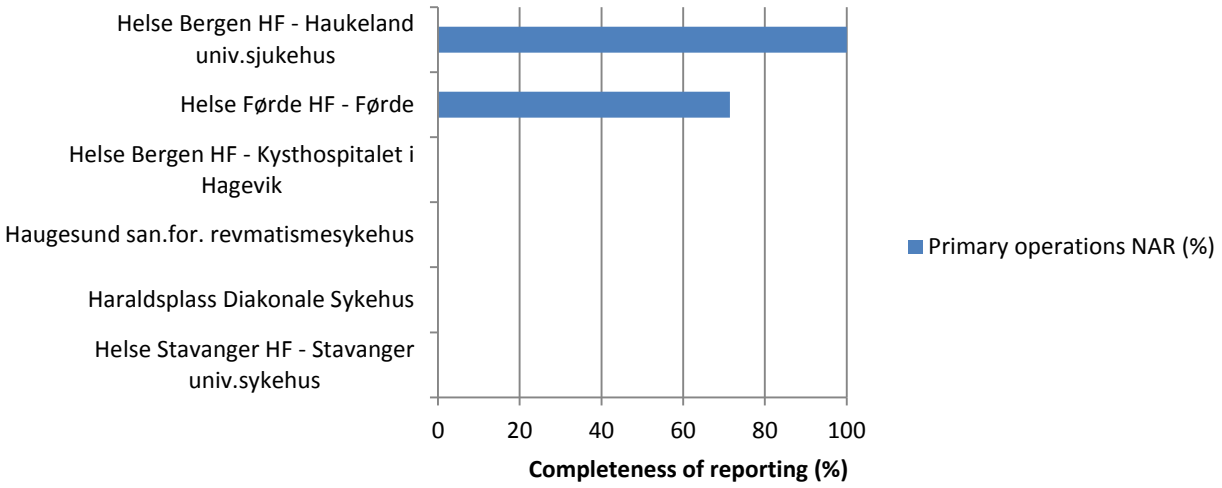


Helse Vest: wrist

Table: Completeness of reporting for primary operations in wrist, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Vest:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Helse Bergen HF - Haukeland univ.sjukehus	13	100	100
Helse Førde HF - Førde	49	71,4	67,3
Helse Stavanger HF - Stavanger univ.sykehus	2	0	100
Haraldsplass Diakonale Sykehus	1	0	100
Haugesund san.for. revmatismesykehus	1	0	100
Helse Bergen HF - Kysthospitalet i Hagevik	1	0	100

Figure: Completeness of reporting for primary operations in wrist, 2008-2014.

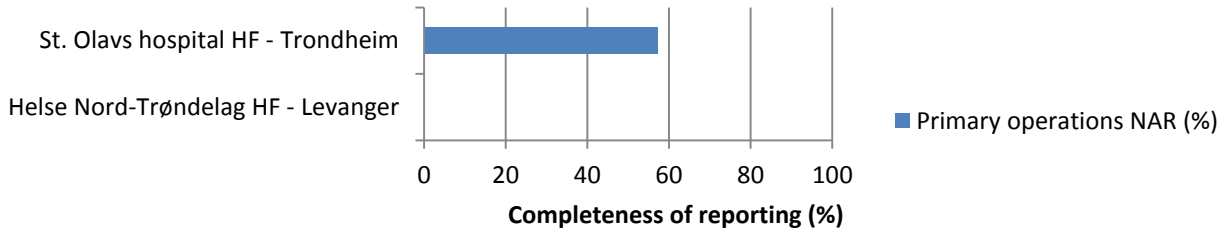


Helse Midt-Norge: wrist

Table: Completeness of reporting for primary operations in wrist, 2008-2014.

		Primary operations
	NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40
Helse Midt-Norge:	Total number NAR+NPR	NAR(%)	NPR(%)
St. Olavs hospital HF - Trondheim	7	57,1	71,4
Helse Nord-Trøndelag HF - Levanger	1	0	100

Figure: Completeness of reporting for primary operations in wrist, 2008-2014.

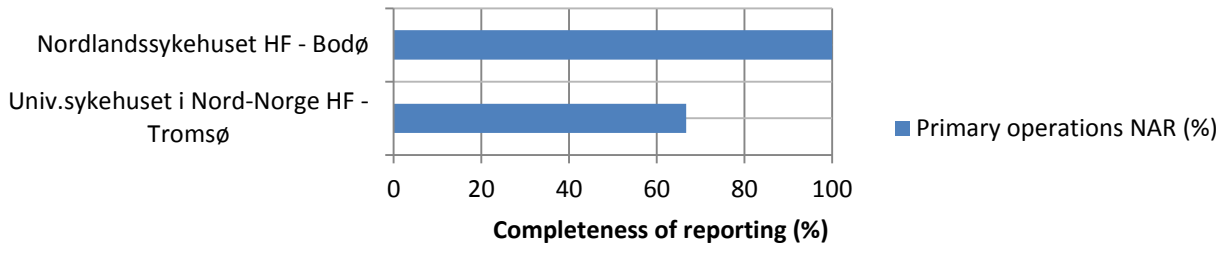


Helse Nord: wrist

Table: Completeness of reporting for primary operations in wrist, 2008-2014.

		Primary operations
	NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40
Helse Nord:	Total number NAR+NPR	NAR(%)	NPR(%)
Nordlandssykehuset HF - Bodø	5	100	100
Univ.sykehuset i Nord-Norge HF - Tromsø	3	66,7	100

Figure: Completeness of reporting for primary operations in wrist, 2008-2014.

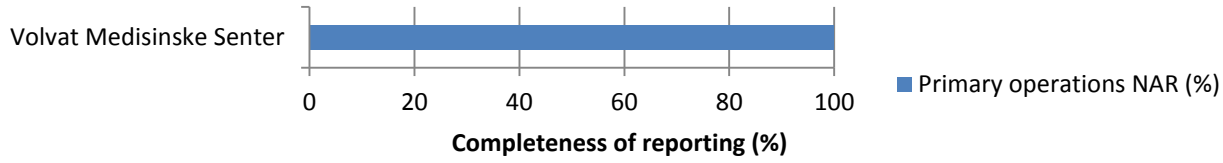


Private hospitals with agreement with RHF: wrist

Table: Completeness of reporting for primary operations in wrist, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
	Total number		
Private hospitals with agreement with RHF:	NAR+NPR	NAR(%)	NPR(%)
Volvat Medisinske Senter	1	100	0

Figure: Completeness of reporting for primary operations in wrist, 2008-2014.



The entire country: lumbar disc

Table: Completeness of reporting for primary operations in lumbar disc, 2008-2014.

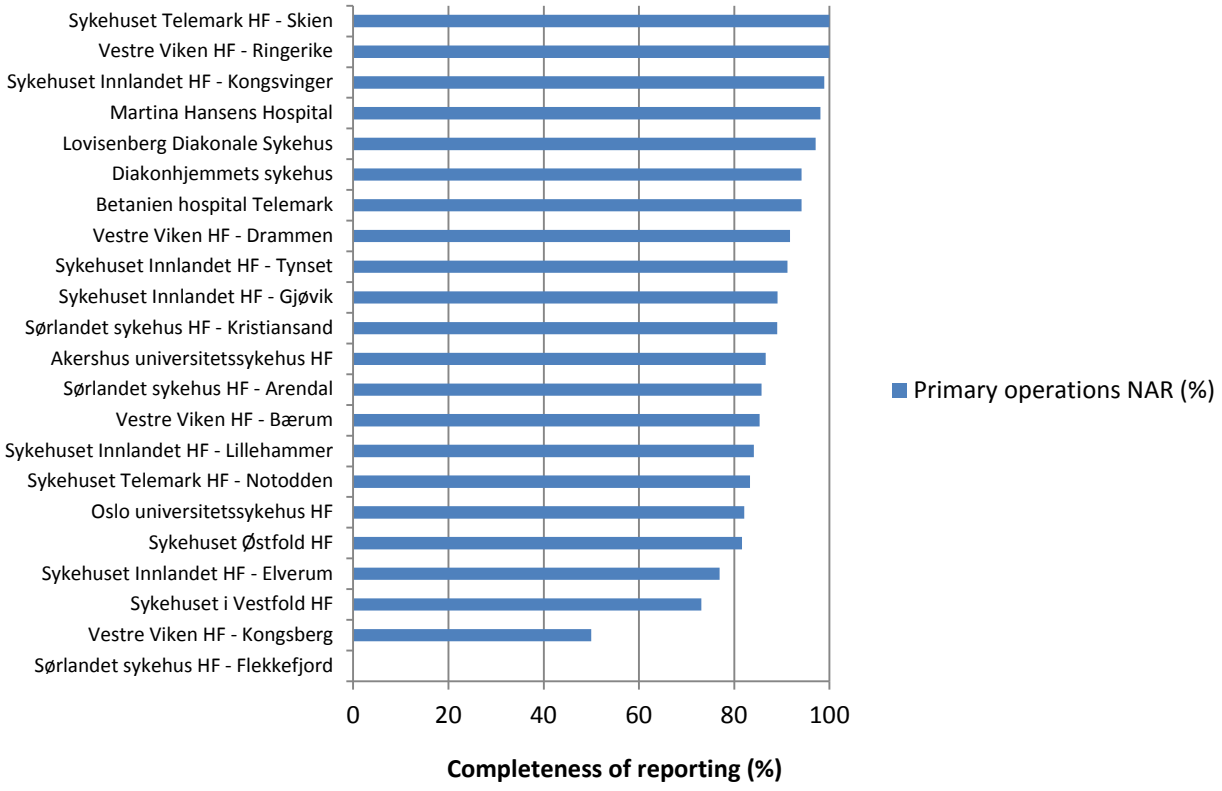
	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Sør-Øst:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Oslo universitetssykehus HF	68	0	100
Vestre Viken HF - Drammen	2	0	100
Sykehuset Innlandet HF - Elverum	1	0	100
Helse Vest:			
Helse Stavanger HF - Stavanger univ.sykehus	1	100	100
Helse Bergen HF - Haukeland univ.sjukehus	10	0	100
Helse Midt-Norge:			
Helse Møre og Romsdal HF - Ålesund sjukehus	69	95,7	100
St. Olavs hospital HF - Trondheim	4	0	100
Helse Nord:			
Univ.sykehuset i Nord-Norge HF - Tromsø	10	20	100
Private hospitals with agreement with RHF:			
Ulriksdal sykehus	4	0	100

Helse Sør-Øst: shoulder

Table: Completeness of reporting for primary operations in shoulder, 2008-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Helse Sør-Øst:	Total number NAR+NPR	NAR(%)	NPR(%)
Vestre Viken HF - Ringerike	8	100	100
Sykehuset Telemark HF - Skien	26	100	100
Sykehuset Innlandet HF - Kongsvinger	176	98,9	100
Martina Hansens Hospital	158	98,1	99,4
Lovisenberg Diakonale Sykehus	448	97,1	96,7
Betanien hospital Telemark	119	94,1	85,7
Diakonhjemmets sykehus	304	94,1	99,3
Vestre Viken HF - Drammen	108	91,7	97,2
Sykehuset Innlandet HF - Tynset	34	91,2	100
Sykehuset Innlandet HF - Gjøvik	46	89,1	100
Sørlandet sykehus HF - Kristiansand	143	89	95,3
Akershus universitetssykehus HF	112	86,6	99,1
Sørlandet sykehus HF - Arendal	14	85,7	100
Vestre Viken HF - Bærum	109	85,3	90,8
Sykehuset Innlandet HF - Lillehammer	63	84,1	98,4
Sykehuset Telemark HF - Notodden	6	83,3	100
Oslo universitetssykehus HF	151	82,1	97,4
Sykehuset Østfold HF	125	81,6	90,4
Sykehuset Innlandet HF - Elverum	13	76,9	100
Sykehuset i Vestfold HF	78	73,1	98,7
Vestre Viken HF - Kongsberg	8	50	100
Sørlandet sykehus HF - Flekkefjord	1	0	100

Figure: Completeness of reporting for primary operations in shoulder, 2008-2014.

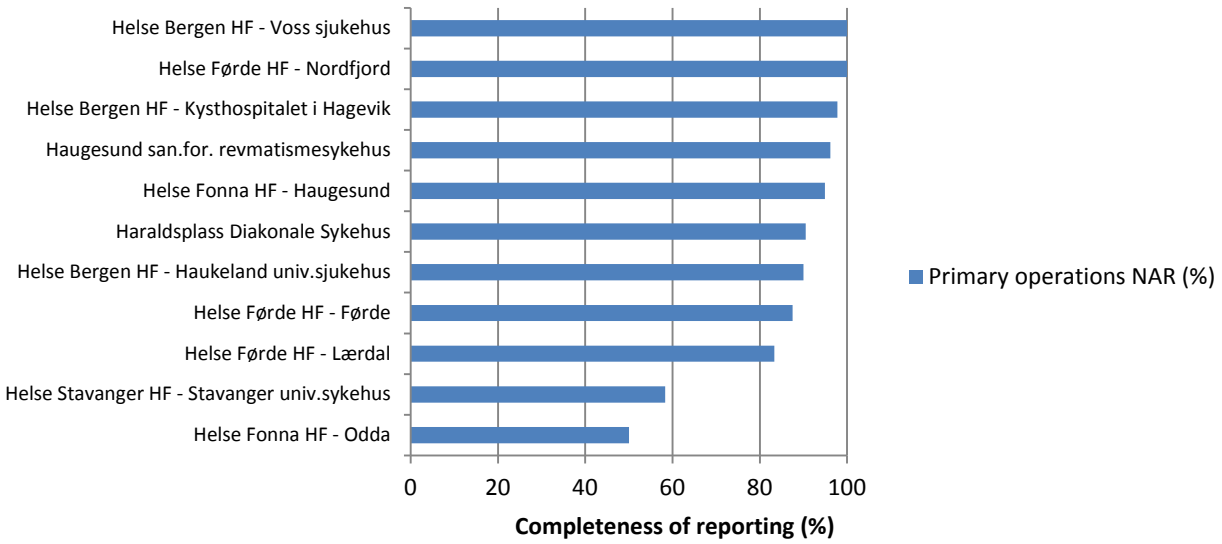


Helse Vest: shoulder

Table: Completeness of reporting for primary operations in shoulder, 2008-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Helse Vest:	Total number NAR+NPR	NAR(%)	NPR(%)
Helse Førde HF - Nordfjord	3	100	100
Helse Bergen HF - Voss sjukehus	2	100	100
Helse Bergen HF - Kysthospitalet i Hagevik	91	97,8	96,7
Haugesund san.for. revmatismesykehus	53	96,2	98,1
Helse Fonna HF - Haugesund	39	94,9	97,4
Haraldsplass Diakonale Sykehus	84	90,5	97,6
Helse Bergen HF - Haukeland univ.sjukehus	320	90	98,1
Helse Førde HF - Førde	41	87,5	54,2
Helse Førde HF - Lærdal	6	83,3	83,3
Helse Stavanger HF - Stavanger univ.sykehus	36	58,3	80,6
Helse Fonna HF - Odda	2	50	100

Figure: Completeness of reporting for primary operations in shoulder, 2008-2014.

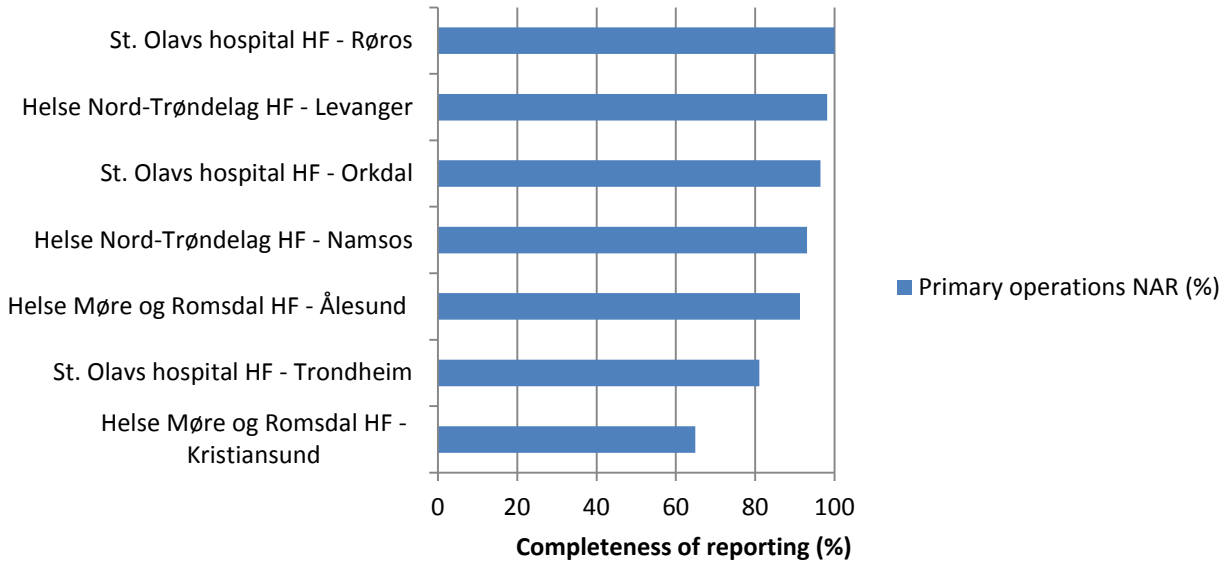


Helse Midt-Norge: shoulder

Table: Completeness of reporting for primary operations in shoulder, 2008-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Helse Midt-Norge:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
St. Olavs hospital HF - Røros	2	100	100
Helse Nord-Trøndelag HF - Levanger	52	98,1	98,1
St. Olavs hospital HF - Orkdal	56	96,4	100
Helse Nord-Trøndelag HF - Namsos	43	93	95,3
Helse Møre og Romsdal HF - Ålesund	104	91,3	96,2
St. Olavs hospital HF - Trondheim	142	81	97,2
Helse Møre og Romsdal HF - Kristiansund	37	64,9	94,6

Figure: Completeness of reporting for primary operations in shoulder, 2008-2014.

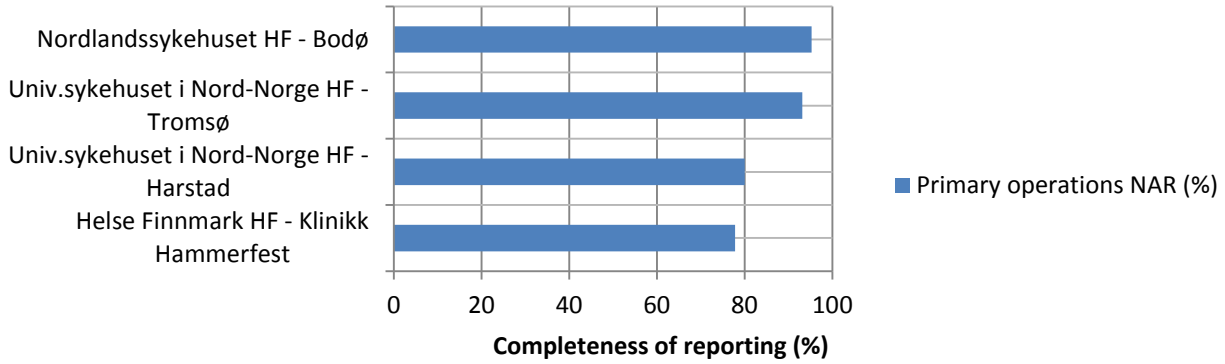


Helse Nord: shoulder

Table: Completeness of reporting for primary operations in shoulder, 2008-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Helse Nord:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Nordlandssykehuset HF - Bodø	84	95,2	98,8
Univ.sykehuset i Nord-Norge HF - Tromsø	78	93,1	98,6
Univ.sykehuset i Nord-Norge HF - Harstad	5	80	100
Helse Finnmark HF - Klinikk Hammerfest	9	77,8	88,9

Figure: Completeness of reporting for primary operations in shoulder, 2008-2014.

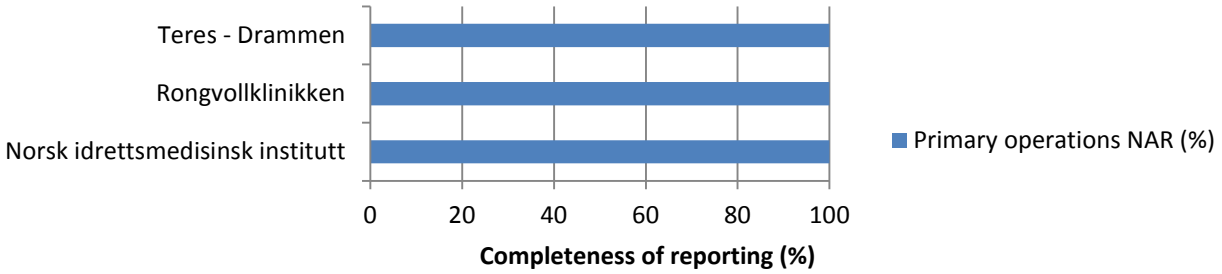


Private hospitals with agreement with RHF: shoulder

Table: Completeness of reporting for primary operations in shoulder, 2008-2014.

	Primary operations		
NCSP-codes:	NFB 20 / NFB 30 / NFB 40 / NFB 99		
Private hospitals with agreement with RHF:	Total number NAR+NPR	NAR(%)	NPR(%)
Norsk idrettsmedisinsk institutt	9	100	0
Rongvollklinikken	2	100	0
Teres - Drammen	2	100	0

Figure: Completeness of reporting for primary operations in shoulder, 2008-2014.

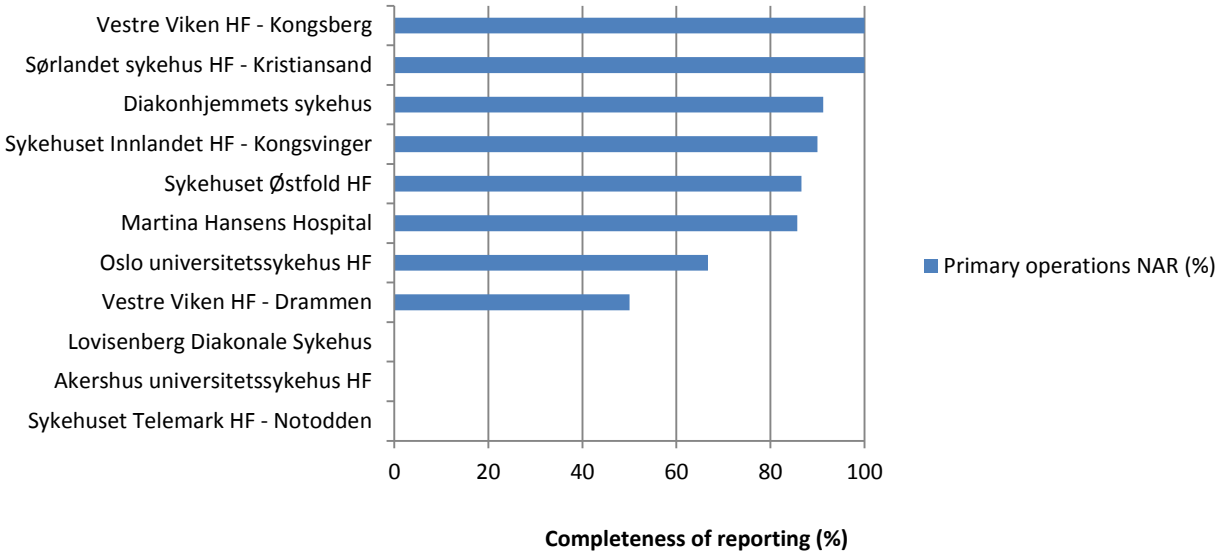


Helse Sør-Øst: toe

Table: Completeness of reporting for primary operations in toe, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Sør-Øst:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Sørlandet sykehus HF - Kristiansand	8	100	100
Vestre Viken HF - Kongsberg	6	100	100
Diakonhjemmets sykehus	57	91,2	93
Sykehuset Innlandet HF - Kongsvinger	10	90	90
Sykehuset Østfold HF	67	86,6	95,5
Martina Hansens Hospital	7	85,7	100
Oslo universitetssykehus HF	3	66,7	100
Vestre Viken HF - Drammen	2	50	100
Sykehuset Telemark HF - Notodden	1	0	100
Akershus universitetssykehus HF	1	0	100
Lovisenberg Diakonale Sykehus	3	0	100

Figure: Completeness of reporting for primary operations in toe, 2008-2014.

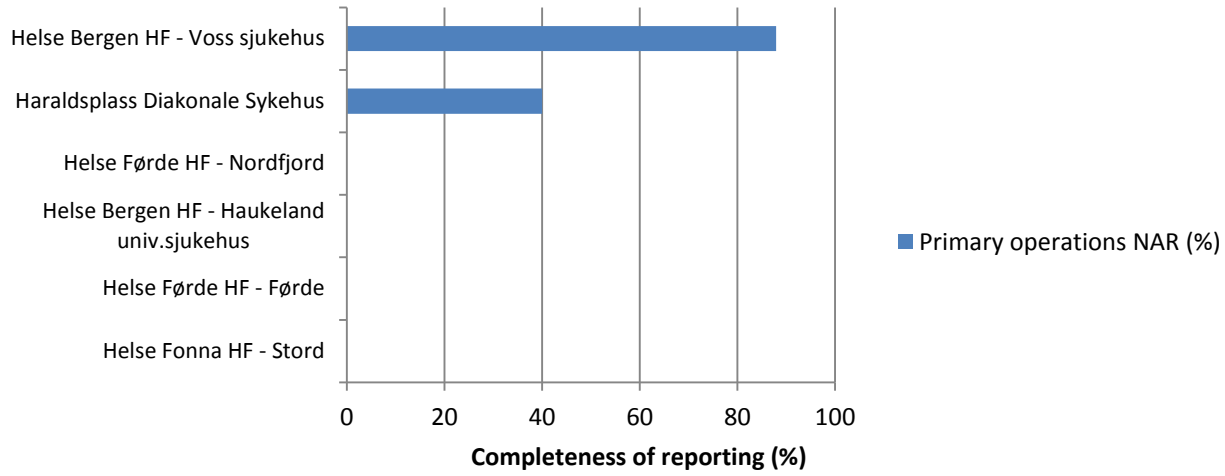


Helse Vest: toe

Table: Completeness of reporting for primary operations in toe, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Vest:	**Total number NAR+NPR**	**NAR(%)**	**NPR(%)**
Helse Bergen HF - Voss sjukehus	33	87,9	90,9
Haraldsplass Diakonale Sykehus	5	40	100
Helse Fonna HF - Stord	1	0	100
Helse Førde HF - Førde	2	0	100
Helse Bergen HF - Haukeland univ.sjukehus	1	0	100
Helse Førde HF - Nordfjord	1	0	100

Figure: Completeness of reporting for primary operations in toe, 2008-2014.

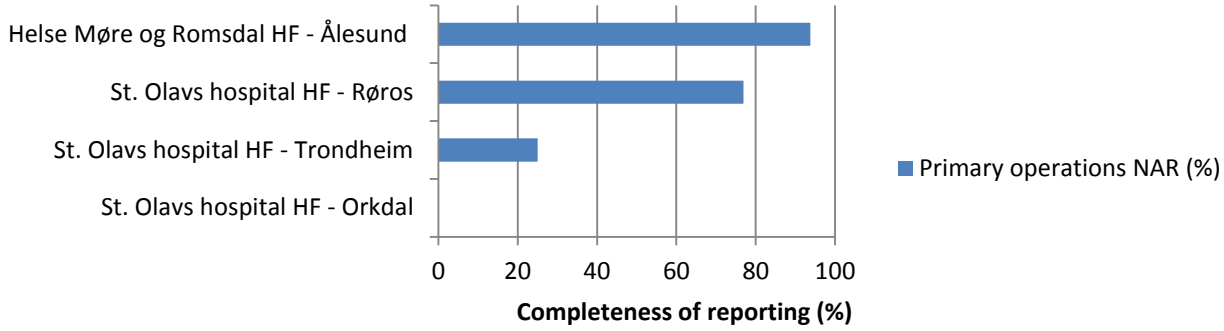


Helse Midt-Norge: toe

Table: Completeness of reporting for primary operations in toe, 2008-2014.

		Primary operations		
	NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Midt-Norge:		Total number NAR+NPR	NAR(%)	NPR(%)
Helse Møre og Romsdal HF - Ålesund		16	93,8	93,8
St. Olavs hospital HF - Røros		13	76,9	100
St. Olavs hospital HF - Trondheim		8	25	100
St. Olavs hospital HF - Orkdal		1	0	100

Figure: Completeness of reporting for primary operations in toe, 2008-2014.

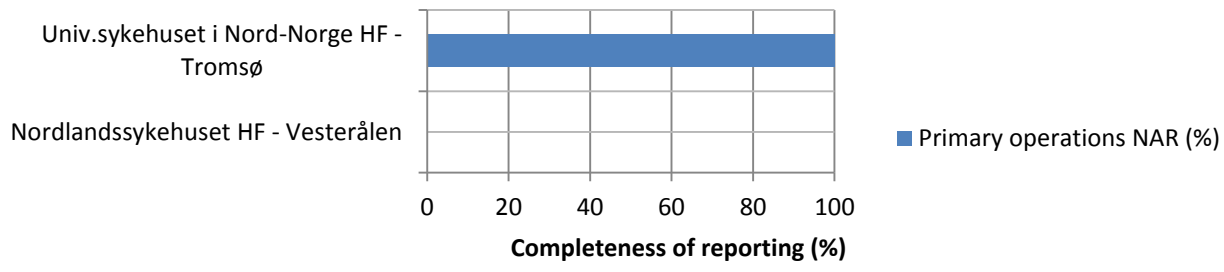


Helse Nord: toe

Table: Completeness of reporting for primary operations in toe, 2008-2014.

		Primary operations		
	NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Helse Nord:		Total number NAR+NPR	NAR(%)	NPR(%)
Univ.sykehuset i Nord-Norge HF - Tromsø		1	100	100
Nordlandssykehuset HF - Vesterålen		1	0	100

Figure: Completeness of reporting for primary operations in toe, 2008-2014.



Private hospitals with agreement with RHF: toe

Table: Completeness of reporting for primary operations in toe, 2008-2014.

	Primary operations		
NCSP-codes:	NGB 0 / NGB 1 / NGB 20 / NGB 30 / NGB 40		
Private hospitals with agreement with RHF:	Total number NAR+NPR	NAR(%)	NPR(%)
Medi3	1	0	100
Teres - Tromsø	2	0	100

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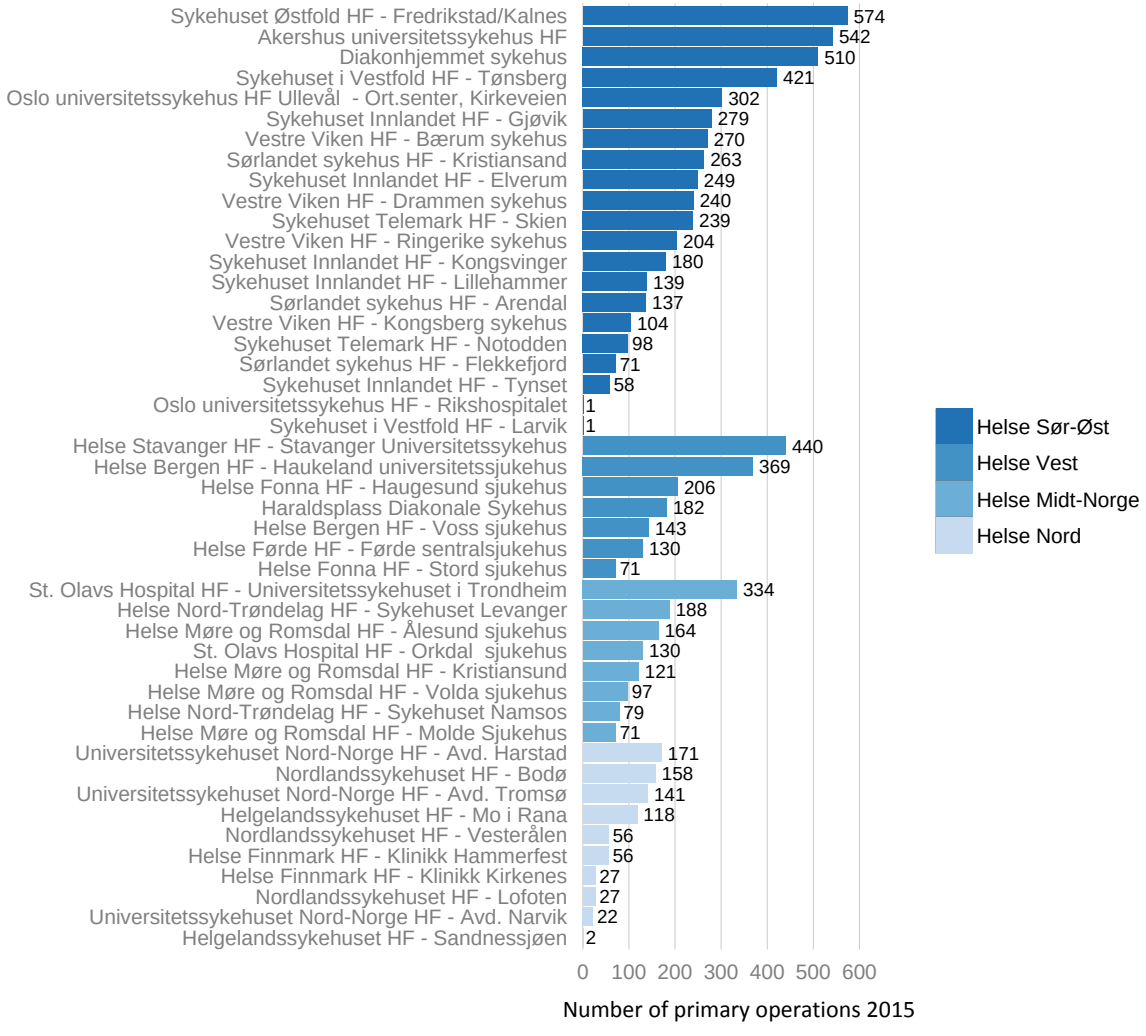
ANNUAL REPORT FOR THE NORWEGIAN HIP FRACTURE REGISTER

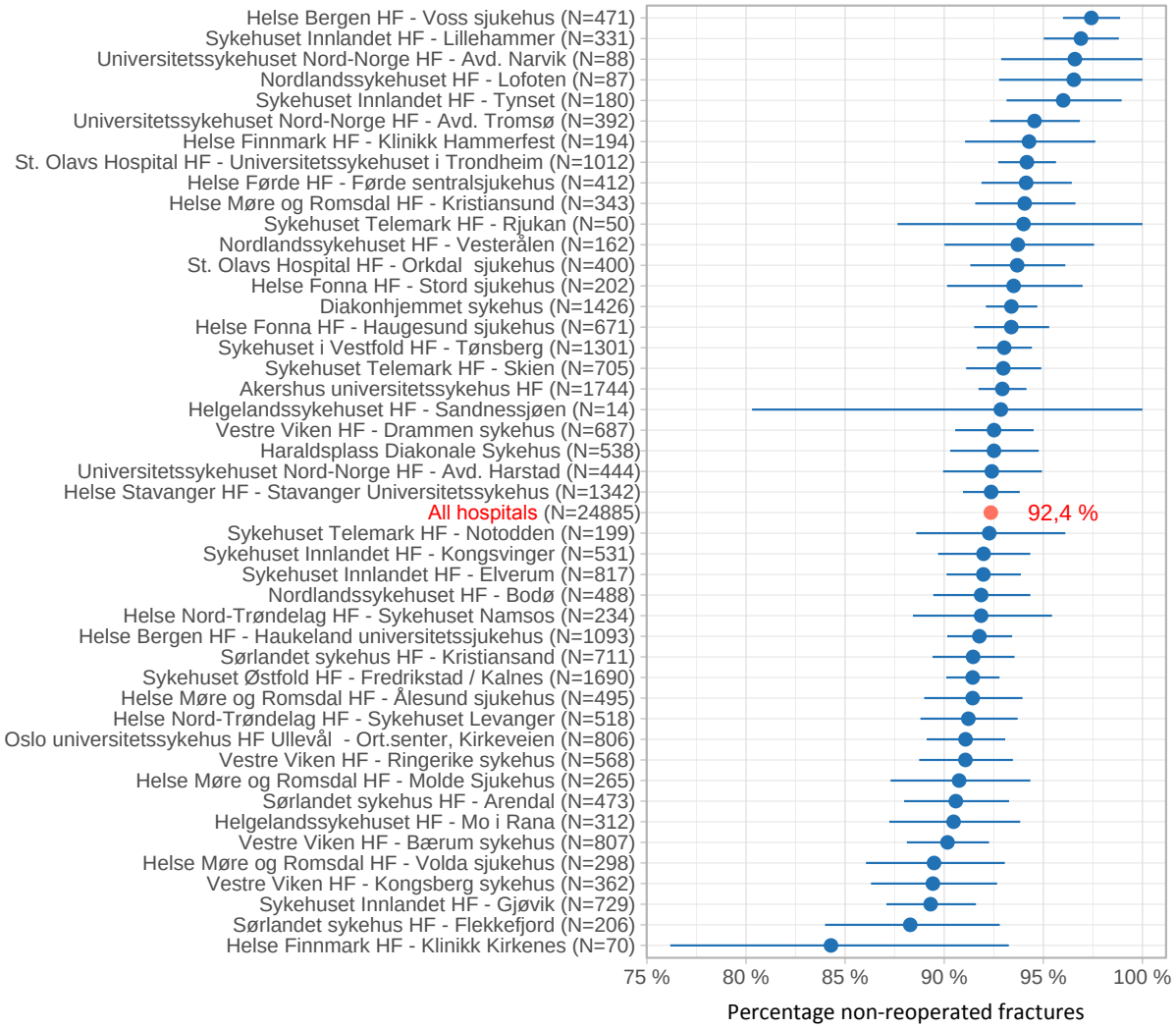
The number of primary hip fracture operations reported for 2015 has risen by over 200 to 8400, compared with 2014. This is somewhat surprising, as the number has been declining since the peak year of 2011 (8599 primary operations) (Table 1). The reason is unclear, but improved reporting in 2015 may be an explanation.

Completeness analyses (i.e. validation) of reporting to the Norwegian Hip Fracture Register (NHBR), compared to the Norwegian Patient Register (NPR) for 2013-2014, which have just been completed (at the end of this hip fracture report), also indicate poorer reporting compared to the NPR than for the period 2008-2012. Reporting to the NHBR of primary hemiprostheses is now 92%, compared to 94% before, and for primary osteosynthesis it is 80%, compared to 86% previously. This is worrying, and we urge you all to continue to report both primary operations for hip fracture and reoperations after hip fracture to the Register. We are working on validation of reoperations in the Register compared to NPR data, but the results are as yet uncertain, partly because of the difficulty of clear identification of reoperations in the NPR.

The Hip Fracture Register is asked to publish data at hospital level. The figure below shows the number of hip fractures reported to the Hip Fracture Register from 46 different hospitals in 2015 (grouped according to health region).



Patients with hip fractures have an average age of 80 years, and many have comorbidities that increase the risk of death associated with the surgery. The one-year mortality rate for this group is about 24% and the five-year rate is 60%. It is therefore important that these patients get the attention they deserve, to enable the number of complications and mortality to be reduced to a minimum. The figure below presents 30-day survival rates of hip fracture patients operated in 2013-2015 by hospital (95% confidence interval). The number of primary fractures for each hospital during this period is shown in brackets.



The year 2015 was successful from an operational and scientific point of view. Marit Bakken successfully defended her thesis in 2015, partly with data from the Hip Fracture Register. Sabine Ruths published an article with data from the Hip Fracture Register, which showed a reduced risk of hip fracture associated with the use of most antihypertensive medications, but a higher risk of hip fracture for patients taking loop diuretics and ACE inhibitors.

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 fruitful cooperation!

Due to minor fixes in the database, there are differences in numbers in the Norwegian report and this English version.

Bergen, 16 June 2016

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HIP FRACTURES

Numbers of operations

Table 1: Annual numbers of operations

Year	Primary operation		Reoperation		Total
2015	8400	(90,4%)	895	(9,6%)	**9295**
2014	8173	(91,4%)	772	(8,6%)	**8945**
2013	8306	(90,4%)	884	(9,6%)	**9190**
2012	8434	(90,5%)	882	(9,5%)	**9316**
2011	8599	(90,5%)	908	(9,6%)	**9507**
2010	8362	(90,8%)	852	(9,3%)	**9214**
2009	8256	(89,6%)	962	(10,4%)	**9218**
2008	8362	(90,0%)	929	(10,0%)	**9291**
2007	7870	(89,4%)	930	(10,6%)	**8800**
2006	7517	(89,4%)	890	(10,6%)	**8407**
2005	5879	(89,9%)	661	(10,1%)	**6540**
Total	**88158**	**(90,2%) ***	**9565**	**(9,8%) ****	**97723**

49% 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.
 * 2181 (2%) were primary operations with total hip prostheses from the Norwegian Arthroplasty Register.
 ** 3065 (32%) were reoperations with total hip prostheses from the Norwegian Arthroplasty Register.

Figure 1: Annual numbers of operations

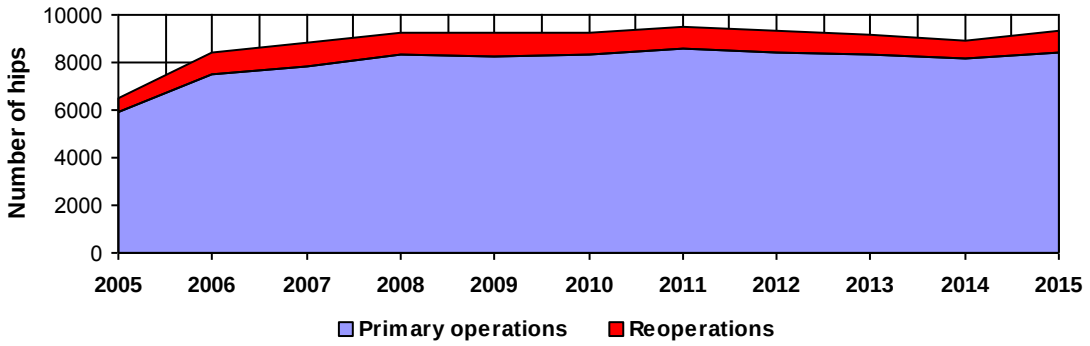
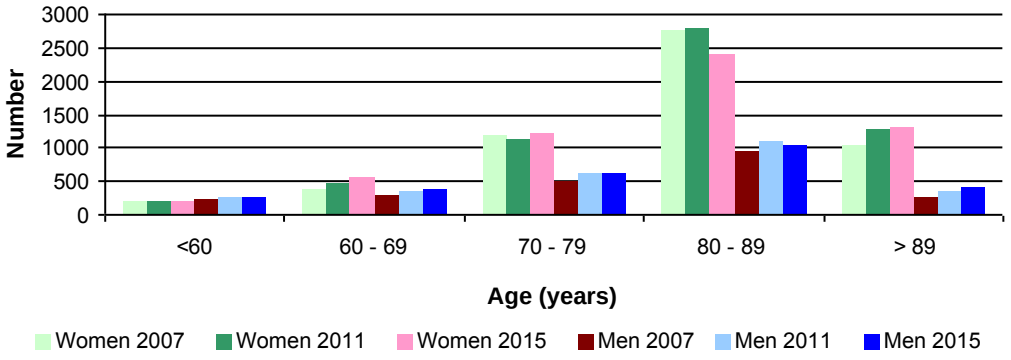


Figure 2: Age by primary operation (in 2007, 2011 and 2015)



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
2015	308 (3,8%)	1082 (13,4%)	3051 (37,8%)	2328 (28,8%)	1104 (13,7%)	203 (2,5%)	**8076**
2014	325 (4,1%)	1155 (14,6%)	2994 (38,0%)	2187 (27,7%)	1045 (13,3%)	178 (2,3%)	**7884**
2013	314 (3,9%)	1129 (14,1%)	2932 (36,6%)	2261 (28,2%)	1198 (15,0%)	177 (2,2%)	**8011**
2012	316 (3,8%)	1167 (14,2%)	2937 (35,7%)	2309 (28,1%)	1326 (16,1%)	170 (2,1%)	**8225**
2011	313 (3,7%)	1206 (14,3%)	2843 (33,8%)	2419 (28,8%)	1421 (16,9%)	205 (2,4%)	**8407**
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	465 (6,3%)	1488 (20,2%)	2647 (35,9%)	1683 (22,8%)	983 (13,3%)	115 (1,6%)	**7381**
2005	445 (7,7%)	1294 (22,4%)	1974 (34,2%)	1147 (19,9%)	809 (14,0%)	105 (1,8%)	**5774**
Total	**4031 (4,7%)**	**13782 (16,0%)**	**30562 (35,5%)**	**22751 (26,5%)**	**13012 (15,1%)**	**1839 (2,1%)**	**85977**

* Total hip prostheses are not included

Figure 3: Time from fracture to operation - grouped in hours (n=85977)

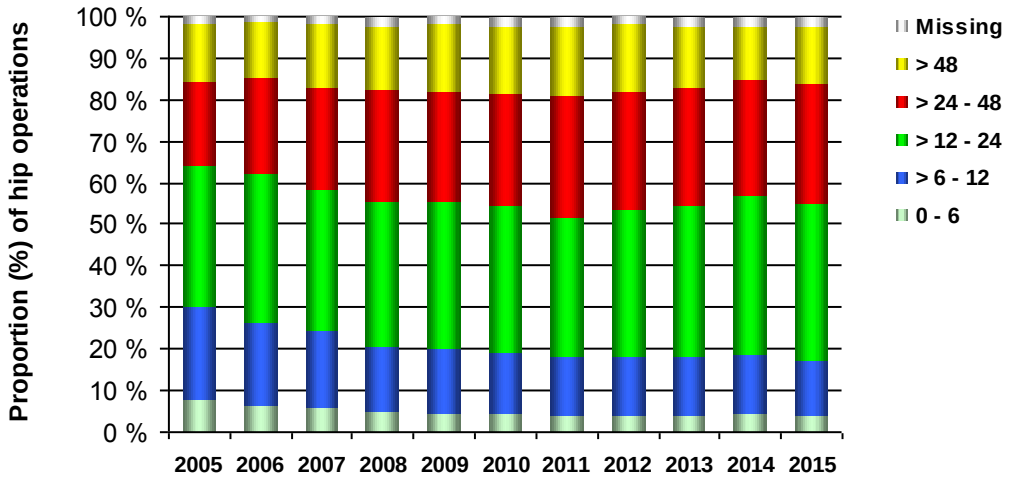
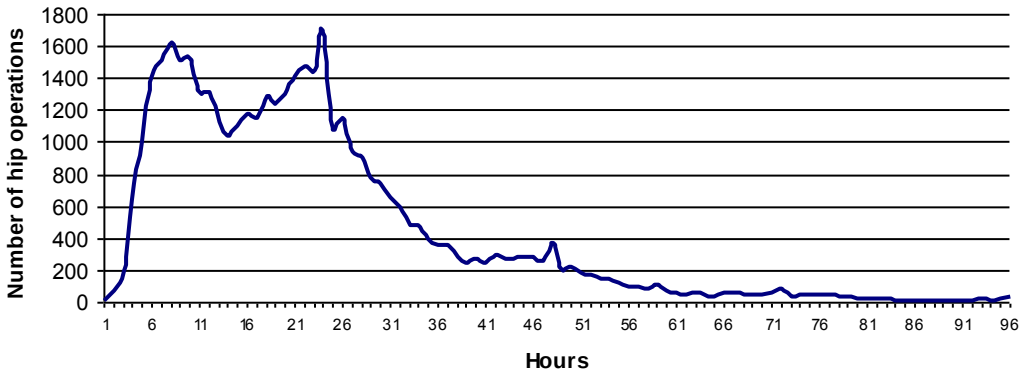


Figure 4: Time from fracture to operation - continuous (n=42669)



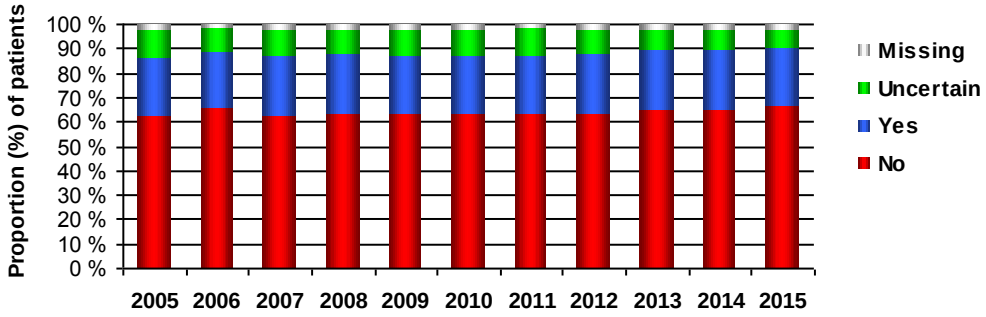
Mean time from fracture to operation was 23 hours (median 20 hours).

Cognitive impairment

Table 3: Cognitive impairment - primary operations*

	No		Yes		Uncertain		Missing		Total
2015	5378	(66,6%)	1917	(23,7%)	600	(7,4%)	181	(2,2%)	**8076**
2014	5129	(65,1%)	1933	(24,5%)	642	(8,1%)	180	(2,3%)	**7884**
2013	5235	(65,3%)	1938	(24,2%)	675	(8,4%)	163	(2,0%)	**8011**
2012	5222	(63,5%)	2007	(24,4%)	821	(10,0%)	175	(2,1%)	**8225**
2011	5347	(63,6%)	1990	(23,7%)	901	(10,7%)	169	(2,0%)	**8407**
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	4845	(65,6%)	1675	(22,7%)	720	(9,8%)	141	(1,9%)	**7381**
2005	3610	(62,5%)	1384	(24,0%)	649	(11,2%)	131	(2,3%)	**5774**
Total	**55160**	**(64,2%)**	**20550**	**(23,9%)**	**8304**	**(9,7%)**	**1963**	**(2,3%)**	**85977**

Figure 5: Cognitive impairment - primary operations*

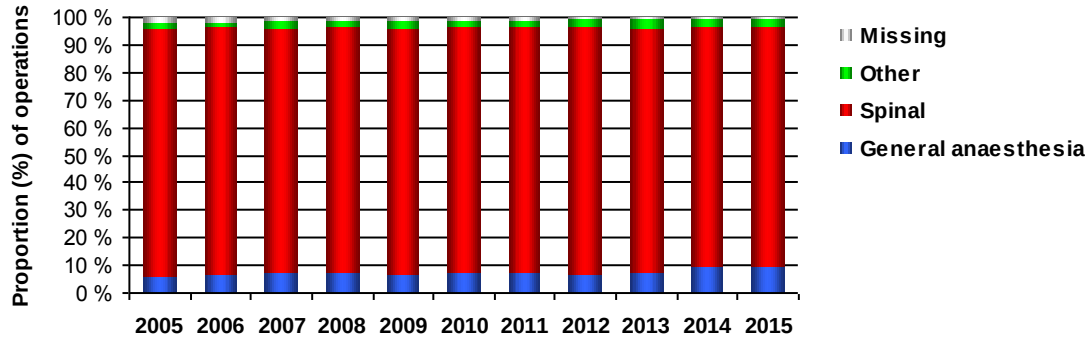


Type of anaesthesia

Table 4: Type of anaesthesia - primary operations*

	General anaesthesia		Spinal		Other		Missing		Total
2015	757	(9,4%)	7032	(87,1%)	225	(2,8%)	62	(0,8%)	**8076**
2014	731	(9,3%)	6884	(87,3%)	203	(2,6%)	66	(0,8%)	**7884**
2013	588	(7,3%)	7095	(88,6%)	256	(3,2%)	72	(0,9%)	**8011**
2012	560	(6,8%)	7365	(89,5%)	219	(2,7%)	81	(1,0%)	**8225**
2011	586	(7,0%)	7506	(89,3%)	219	(2,6%)	96	(1,1%)	**8407**
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	472	(6,4%)	6632	(89,9%)	137	(1,9%)	140	(1,9%)	**7381**
2005	323	(5,6%)	5222	(90,4%)	123	(2,1%)	106	(1,8%)	**5774**
Total	**6243**	**(7,3%)**	**76450**	**(88,9%)**	**2133**	**(2,5%)**	**1151**	**(1,3%)**	**85977**

Figure 6: Type of anaesthesia in primary operations*



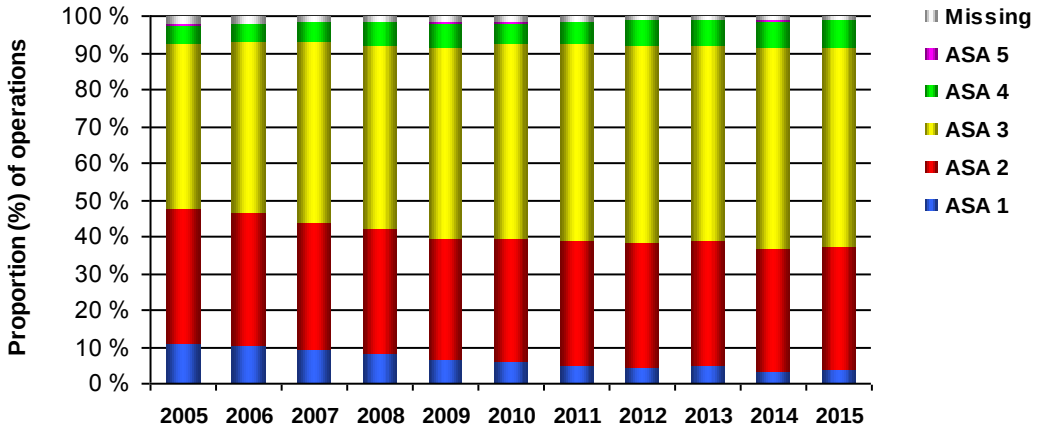
* Total hip prostheses are not included

ASA classification (ASA = American Society of Anaesthesiologists)

Table 5: ASA classification - all operations

	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2015	330 (3,6%)	3150 (33,9%)	5011 (53,9%)	678 (7,3%)	12 (0,1%)	113 (1,2%)	**9294**
2014	284 (3,2%)	2990 (33,4%)	4898 (54,8%)	641 (7,2%)	16 (0,2%)	116 (1,3%)	**8945**
2013	431 (4,7%)	3150 (34,3%)	4847 (52,7%)	645 (7,0%)	17 (0,2%)	100 (1,1%)	**9190**
2012	394 (4,2%)	3157 (33,9%)	5012 (53,8%)	629 (6,8%)	9 (0,1%)	115 (1,2%)	**9316**
2011	483 (5,1%)	3196 (33,6%)	5106 (53,7%)	582 (6,1%)	6 (0,1%)	134 (1,4%)	**9507**
2010	539 (5,8%)	3100 (33,6%)	4866 (52,8%)	526 (5,7%)	17 (0,2%)	166 (1,8%)	**9214**
2009	599 (6,5%)	3038 (33,0%)	4799 (52,1%)	602 (6,5%)	10 (0,1%)	170 (1,8%)	**9218**
2008	755 (8,1%)	3162 (34,0%)	4636 (49,9%)	567 (6,1%)	9 (0,1%)	162 (1,7%)	**9291**
2007	790 (9,0%)	3084 (35,0%)	4288 (48,7%)	477 (5,4%)	7 (0,1%)	154 (1,8%)	**8800**
2006	852 (10,1%)	3038 (36,1%)	3945 (46,9%)	396 (4,7%)	13 (0,2%)	163 (1,9%)	**8407**
2005	704 (10,8%)	2403 (36,7%)	2930 (44,8%)	339 (5,2%)	13 (0,2%)	151 (2,3%)	**6540**
Total	**6161** (6,3%)	**33468** (34,2%)	**50338** (51,5%)	**6082** (6,2%)	**129** (0,1%)	**1544** (1,6%)	**97723**

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: Fracture type (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
2015	1154 13,7%	3344 39,8%	243 2,9%	1333 15,9%	1254 14,9%	442 5,3%	322 3,8%	2 0,0%	228 2,7%	76 0,9%	2 0,0%	**8400**
2014	1051 12,9%	3330 40,7%	286 3,5%	1332 16,3%	1242 15,2%	418 5,1%	287 3,5%	2 0,0%	161 2,0%	63 0,8%	1 0,0%	**8173**
2013	1171 14,1%	3298 39,7%	260 3,1%	1301 15,7%	1275 15,4%	447 5,4%	291 3,5%	4 0,0%	167 2,0%	91 1,1%	1 0,0%	**8306**
2012	1226 14,5%	3475 41,2%	261 3,1%	1277 15,1%	1271 15,1%	466 5,5%	206 2,4%	3 0,0%	172 2,0%	74 0,9%	3 0,0%	**8434**
2011	1316 15,3%	3445 40,1%	276 3,2%	1346 15,7%	1391 16,2%	398 4,6%	188 2,2%	4 0,0%	162 1,9%	73 0,8%	0 0,0%	**8599**
2010	1249 14,9%	3288 39,3%	320 3,8%	1313 15,7%	1363 16,3%	431 5,2%	161 1,9%	2 0,0%	167 2,0%	66 0,8%	2 0,0%	**8362**
2009	1233 14,9%	3371 40,8%	328 4,0%	1306 15,8%	1208 14,6%	425 5,1%	151 1,8%	7 0,1%	149 1,8%	70 0,8%	8 0,1%	**8256**
2008	1316 15,7%	3223 38,5%	351 4,2%	1474 17,6%	1240 14,8%	439 5,2%	149 1,8%	2 0,0%	83 1,0%	82 1,0%	3 0,0%	**8362**
2007	1417 18,0%	2997 38,1%	391 5,0%	1353 17,2%	1050 13,3%	438 5,6%	158 2,0%	1 0,0%	0 0,0%	63 0,8%	2 0,0%	**7870**
2006	1410 18,8%	2821 37,5%	342 4,5%	1311 17,4%	1009 13,4%	414 5,5%	131 1,7%	5 0,1%	0 0,0%	70 0,9%	4 0,1%	**7517**
2005	1075 18,3%	2292 39,0%	274 4,7%	1010 17,2%	757 12,9%	318 5,4%	102 1,7%	3 0,1%	0 0,0%	35 0,6%	13 0,2%	**5879**
Total	**13618** **15,4%**	**34884** **39,6%**	**3332** **3,8%**	**14356** **16,3%**	**13060** **14,8%**	**4636** **5,3%**	**2146** **2,4%**	**35** **0,0%**	**1289** **1,5%**	**763** **0,9%**	**39** **0,0%**	**88158**

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 fracture type

Type of primary operation	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
	Fracture type										
Two screws or pins	12301	6354	122	8	3	1	0	0	0	11	5
Three screws or pins	177	385	2	0	1	1	0	0	0	0	0
Bipolar hemiprosthesis	718	27197	274	35	72	32	0	0	8	146	20
Unipolar hemiprosthesis	4	298	12	0	0	0	0	0	0	2	1
Hip compression screw and plate	301	313	1898	10242	4526	868	0	0	131	114	6
Hip compression screw with lateral support plate	8	24	70	855	4768	1393	0	0	656	171	2
Angle plate	1	0	1	2	1	0	0	0	0	0	0
Short intramedullary nail without distal locking	6	4	28	223	51	4	0	0	3	1	0
Short intramedullary nail with distal locking	17	31	285	2499	2704	395	0	0	201	53	2
Long intramedullary nail without distal locking	0	0	0	6	19	42	0	0	4	5	0
Long intramedullary nail with distal locking	4	8	18	181	620	1823	0	0	255	169	0
Total hip prosthesis	0	0	0	0	0	0	2146	35	0	0	0
Other:Hip compression screw system and additional anti-rotational screw	73	136	596	264	117	16	0	0	5	38	2
Other	8	133	26	39	178	60	0	0	26	53	0
Missing	0	1	0	2	0	1	0	0	0	0	1

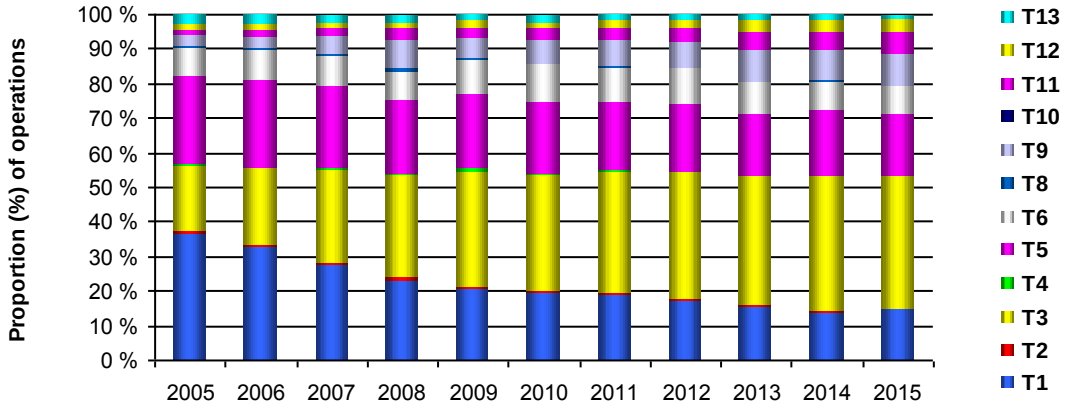
* Total hip prostheses reported to the Norwegian Arthroplasty Register

** 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
2015	1239	36	3230	2	1497	664	0	14	756	8	509	324	120	1	**8400**
	14,8%	0,4%	38,5%	0,0%	17,8%	7,9%	0,0%	0,2%	9,0%	0,1%	6,1%	3,9%	1,4%	0,0%	
2014	1127	31	3187	1	1551	689	0	17	732	7	414	289	128	0	**8173**
	13,8%	0,4%	39,0%	0,0%	19,0%	8,4%	0,0%	0,2%	9,0%	0,1%	5,1%	3,5%	1,6%	0,0%	
2013	1289	32	3100	3	1496	749	0	20	747	4	429	295	142	0	**8306**
	15,5%	0,4%	37,3%	0,0%	18,0%	9,0%	0,0%	0,2%	9,0%	0,0%	5,2%	3,6%	1,7%	0,0%	
2012	1455	27	3137	5	1632	848	1	19	635	8	332	209	126	0	**8434**
	17,3%	0,3%	37,2%	0,1%	19,4%	10,1%	0,0%	0,2%	7,5%	0,1%	3,9%	2,5%	1,5%	0,0%	
2011	1649	50	3003	19	1697	870	0	12	658	14	281	192	154	0	**8599**
	19,2%	0,6%	34,9%	0,2%	19,7%	10,1%	0,0%	0,1%	7,7%	0,2%	3,3%	2,2%	1,8%	0,0%	
2010	1616	83	2781	29	1733	900	0	17	571	4	280	163	185	0	**8362**
	19,3%	1,0%	33,3%	0,3%	20,7%	10,8%	0,0%	0,2%	6,8%	0,0%	3,3%	1,9%	2,2%	0,0%	
2009	1686	81	2755	82	1765	788	0	50	489	8	228	158	166	0	**8256**
	20,4%	1,0%	33,4%	1,0%	21,4%	9,5%	0,0%	0,6%	5,9%	0,1%	2,8%	1,9%	2,0%	0,0%	
2008	1943	64	2439	70	1782	692	2	64	686	10	266	151	193	0	**8362**
	23,2%	0,8%	29,2%	0,8%	21,3%	8,3%	0,0%	0,8%	8,2%	0,1%	3,2%	1,8%	2,3%	0,0%	
2007	2181	50	2115	48	1867	645	0	36	430	6	157	159	175	1	**7870**
	27,7%	0,6%	26,9%	0,6%	23,7%	8,2%	0,0%	0,5%	5,5%	0,1%	2,0%	2,0%	2,2%	0,0%	
2006	2466	60	1643	34	1889	630	1	43	272	4	127	136	211	1	**7517**
	32,8%	0,8%	21,9%	0,5%	25,1%	8,4%	0,0%	0,6%	3,6%	0,1%	1,7%	1,8%	2,8%	0,0%	
2005	2154	52	1112	24	1490	472	1	28	211	3	55	105	170	2	**5879**
	36,6%	0,9%	18,9%	0,4%	25,3%	8,0%	0,0%	0,5%	3,6%	0,1%	0,9%	1,8%	2,9%	0,0%	
Total	**18805**	**566**	**28502**	**317**	**18399**	**7947**	**5**	**320**	**6187**	**76**	**3078**	**2181**	**1770**	**5**	**88158**
	21,3%	**0,6%**	**32,3%**	**0,4%**	**20,9%**	**9,0%**	**0,0%**	**0,4%**	**7,0%**	**0,1%**	**3,5%**	**2,5%**	**2,0%**	**0,0%**	

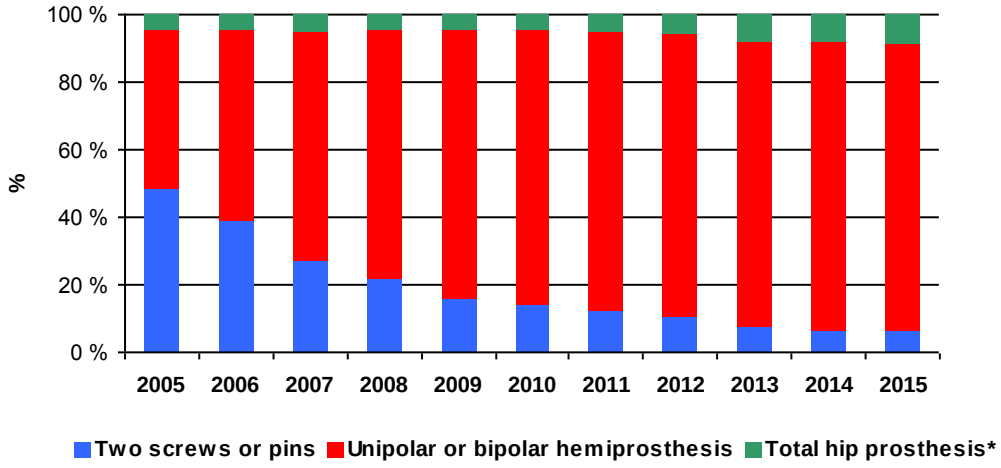
Figure 8: Type of primary operations - all fractures



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 displacement of fracture

Figure 9b: Time trend for treatment of trochanteric fractures

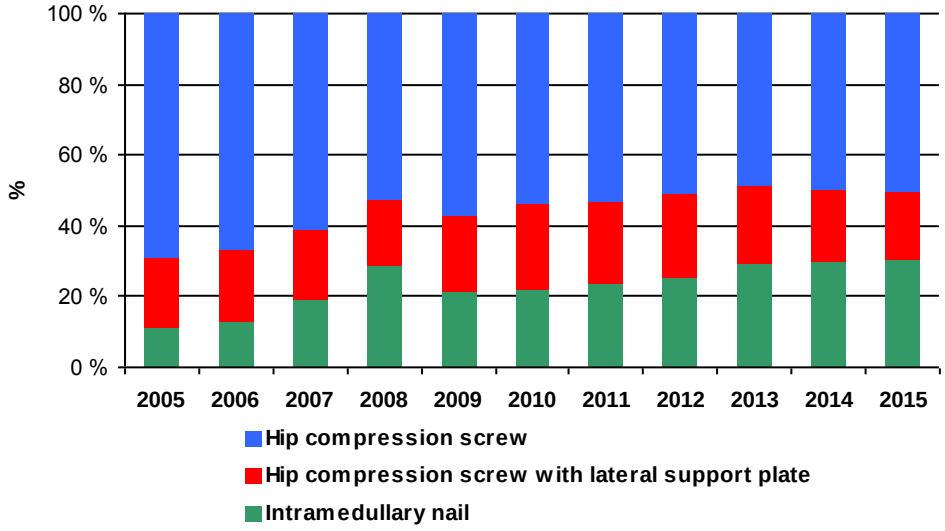
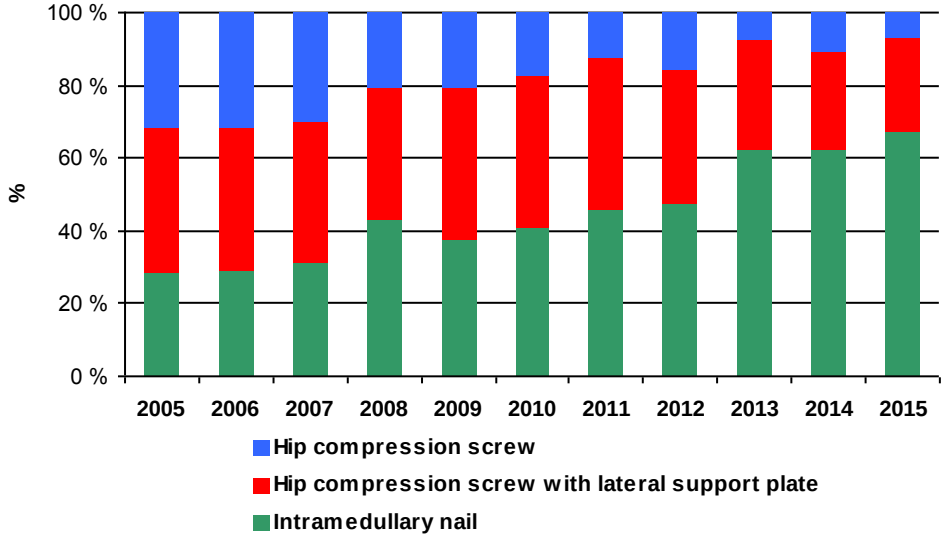


Figure 9c: Time trend for treatment of inter-* and subtrochanteric fractures



* Intertrochanteric fracture = (AO OTA type A3)

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

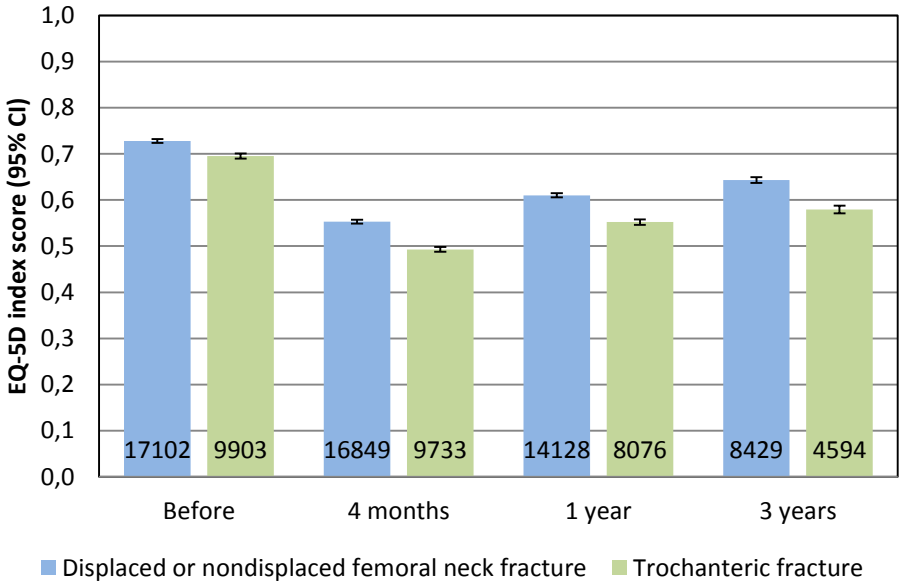
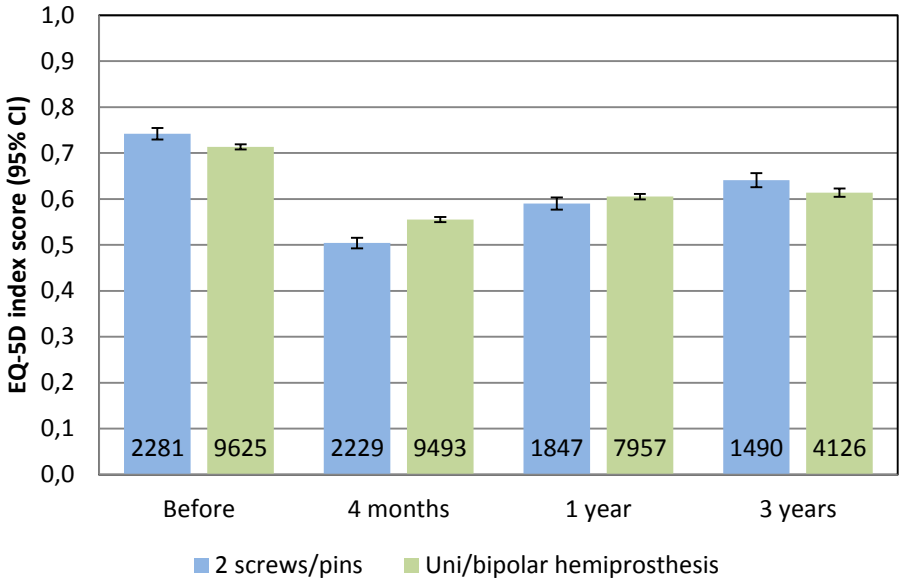


Figure 10b: Quality of life (EQ-5D) among patients with displaced femoral neck fracture



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
2015	160	70	34	59	8	10	173	18	35	33	82	11	46	356	**1095**
	14,6%	6,4%	3,1%	5,4%	0,7%	0,9%	15,8%	1,6%	3,2%	3,0%	7,5%	1,0%	4,2%	32,5%	
2014	111	58	31	50	7	4	149	14	20	20	65	16	23	354	**922**
	12,0%	6,3%	3,4%	5,4%	0,8%	0,4%	16,2%	1,5%	2,2%	2,2%	7,0%	1,7%	2,5%	38,4%	
2013	140	56	33	73	5	10	158	15	28	22	76	7	47	376	**1046**
	13,4%	5,4%	3,2%	7,0%	0,5%	1,0%	15,1%	1,4%	2,7%	2,1%	7,3%	0,7%	4,5%	35,9%	
2012	153	65	37	75	18	9	183	15	34	22	63	4	43	339	**1060**
	14,4%	6,1%	3,5%	7,1%	1,7%	0,8%	17,3%	1,4%	3,2%	2,1%	5,9%	0,4%	4,1%	32,0%	
2011	157	75	59	82	12	5	147	12	41	23	67	8	32	340	**1060**
	14,8%	7,1%	5,6%	7,7%	1,1%	0,5%	13,9%	1,1%	3,9%	2,2%	6,3%	0,8%	3,0%	32,1%	
2010	176	79	48	79	11	11	129	14	44	26	58	10	37	288	**1010**
	17,4%	7,8%	4,8%	7,8%	1,1%	1,1%	12,8%	1,4%	4,4%	2,6%	5,7%	1,0%	3,7%	28,5%	
2009	216	96	59	95	8	18	150	7	38	36	49	9	57	296	**1134**
	19,0%	8,5%	5,2%	8,4%	0,7%	1,6%	13,2%	0,6%	3,4%	3,2%	4,3%	0,8%	5,0%	26,1%	
2008	245	104	63	101	10	10	104	20	39	42	57	10	33	258	**1096**
	22,4%	9,5%	5,7%	9,2%	0,9%	0,9%	9,5%	1,8%	3,6%	3,8%	5,2%	0,9%	3,0%	23,5%	
2007	287	132	85	111	10	10	84	13	32	39	48	9	31	251	**1142**
	25,1%	11,6%	7,4%	9,7%	0,9%	0,9%	7,4%	1,1%	2,8%	3,4%	4,2%	0,8%	2,7%	22,0%	
2006	318	125	64	101	7	8	77	20	21	30	33	7	21	204	**1036**
	30,7%	12,1%	6,2%	9,7%	0,7%	0,8%	7,4%	1,9%	2,0%	2,9%	3,2%	0,7%	2,0%	19,7%	
2005	281	107	71	85	9	12	50	16	25	27	33	2	23	76	**817**
	34,4%	13,1%	8,7%	10,4%	1,1%	1,5%	6,1%	2,0%	3,1%	3,3%	4,0%	0,2%	2,8%	9,3%	
Total	**2244**	**967**	**584**	**911**	**105**	**107**	**1404**	**164**	**357**	**320**	**631**	**93**	**393**	**3138**	**11418**
	19,7%	**8,5%**	**5,1%**	**8,0%**	**0,9%**	**0,9%**	**12,3%**	**1,4%**	**3,1%**	**2,8%**	**5,5%**	**0,8%**	**3,4%**	**27,5%**	

R1: Osteosynthesis failure
R2: Nonunion
R3: Avascular necrosis (segmental collaps)
R4: Local pain due to osteosynthesis material
R5: Malunion
R6: Infection - superficial
R7: Infection - deep
R8: Haematoma
R9: Dislocation of hemiprosthesis
R10: Cut out 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 fracture type

In patients where both primary operation and the related reoperation are registered.

Multiple causes for each reoperation can be registered.

Fracture type

Reasons for reoperation	Intracapsular fracture, undisplaced	Intracapsular fracture, displaced	Basocervical fracture	Trochanteric fracture (2 fragments)	Trochanteric fracture (multifragment)	Subtrochanteric fracture	Intertrochanteric fracture*	Other	Missing
Osteosynthesis failure	534	622	113	120	239	118	38	14	1
Nonunion	223	246	51	38	105	63	10	5	0
Avascular necrosis (segmental collaps)	177	154	27	17	23	3	3	2	0
Local pain due to osteosynthesis material	218	239	52	54	77	41	12	2	0
Malunion	21	22	8	13	13	2	1	1	0
Infection - superficial	6	60	1	8	9	6	0	3	0
Infection - deep	96	792	38	59	201	89	19	13	1
Haematoma	13	96	4	12	20	7	4	2	0
Dislocation of hemiprosthesis	20	280	10	4	9	4	1	2	1
Penetration of osteosynthesis material through caput	47	51	28	44	68	13	7	5	0
New fracture around implant	137	168	10	40	58	29	7	8	0
Loosening of hemiprosthesis	5	55	2	0	3	3	0	1	0
Other	74	84	17	43	57	37	7	12	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
2015	65	30	180	0	115	118	19	4	147	345	**1023**
	6,4%	2,9%	17,6%	0,0%	11,2%	11,5%	1,9%	0,4%	14,4%	33,7%	
2014	50	22	156	0	84	103	7	4	101	336	**863**
	5,8%	2,5%	18,1%	0,0%	9,7%	11,9%	0,8%	0,5%	11,7%	38,9%	
2013	72	30	158	0	119	105	14	7	118	363	**986**
	7,3%	3,0%	16,0%	0,0%	12,1%	10,6%	1,4%	0,7%	12,0%	36,8%	
2012	79	36	188	0	91	129	14	9	109	328	**983**
	8,0%	3,7%	19,1%	0,0%	9,3%	13,1%	1,4%	0,9%	11,1%	33,4%	
2011	72	32	214	0	98	93	19	13	113	344	**998**
	7,2%	3,2%	21,4%	0,0%	9,8%	9,3%	1,9%	1,3%	11,3%	34,5%	
2010	91	35	220	2	91	93	15	11	103	281	**942**
	9,7%	3,7%	23,4%	0,2%	9,7%	9,9%	1,6%	1,2%	10,9%	29,8%	
2009	124	36	254	0	97	110	10	11	94	294	**1030**
	12,0%	3,5%	24,7%	0,0%	9,4%	10,7%	1,0%	1,1%	9,1%	28,5%	
2008	113	38	317	1	86	72	10	15	91	254	**997**
	11,3%	3,8%	31,8%	0,1%	8,6%	7,2%	1,0%	1,5%	9,1%	25,5%	
2007	121	28	371	1	78	58	5	11	64	236	**973**
	12,4%	2,9%	38,1%	0,1%	8,0%	6,0%	0,5%	1,1%	6,6%	24,3%	
2006	97	37	371	6	82	59	8	5	56	203	**924**
	10,5%	4,0%	40,2%	0,6%	8,9%	6,4%	0,9%	0,5%	6,1%	22,0%	
2005	82	25	322	35	46	36	9	7	42	78	**682**
	12,0%	3,7%	47,2%	5,1%	6,7%	5,3%	1,3%	1,0%	6,2%	11,4%	
Total	**966**	**349**	**2751**	**45**	**987**	**976**	**130**	**97**	**1038**	**3062**	**10401**
	9,3%	**3,4%**	**26,4%**	**0,4%**	**9,5%**	**9,4%**	**1,2%**	**0,9%**	**10,0%**	**29,4%**	

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

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2015	3	2	18	0	1	58	15	1	73	47	**218**
	1,4%	0,9%	8,3%	0,0%	0,5%	26,6%	6,9%	0,5%	33,5%	21,6%	
2014	1	8	19	0	3	41	5	4	61	38	**180**
	0,6%	4,4%	10,6%	0,0%	1,7%	22,8%	2,8%	2,2%	33,9%	21,1%	
2013	1	10	15	0	2	59	9	4	77	37	**214**
	0,5%	4,7%	7,0%	0,0%	0,9%	27,6%	4,2%	1,9%	36,0%	17,3%	
2012	4	7	23	0	0	49	10	8	56	30	**187**
	2,1%	3,7%	12,3%	0,0%	0,0%	26,2%	5,3%	4,3%	29,9%	16,0%	
2011	2	8	14	0	1	49	16	8	70	32	**200**
	1,0%	4,0%	7,0%	0,0%	0,5%	24,5%	8,0%	4,0%	35,0%	16,0%	
2010	4	4	17	0	3	46	10	9	68	17	**178**
	2,2%	2,2%	9,6%	0,0%	1,7%	25,8%	5,6%	5,1%	38,2%	9,6%	
2009	3	6	10	0	0	30	7	9	49	20	**134**
	2,2%	4,5%	7,5%	0,0%	0,0%	22,4%	5,2%	6,7%	36,6%	14,9%	
2008	1	9	7	0	2	37	5	12	45	20	**138**
	0,7%	6,5%	5,1%	0,0%	1,4%	26,8%	3,6%	8,7%	32,6%	14,5%	
2007	0	5	9	0	0	21	3	10	35	11	**94**
	0,0%	5,3%	9,6%	0,0%	0,0%	22,3%	3,2%	10,6%	37,2%	11,7%	
2006	0	6	2	0	0	24	4	3	29	10	**78**
	0,0%	7,7%	2,6%	0,0%	0,0%	30,8%	5,1%	3,8%	37,2%	12,8%	
2005	0	1	1	0	0	11	3	3	13	2	**34**
	0,0%	2,9%	2,9%	0,0%	0,0%	32,4%	8,8%	8,8%	38,2%	5,9%	
Total	**19**	**66**	**135**	**0**	**12**	**425**	**87**	**71**	**576**	**264**	**1655**
	1,1%	**4,0%**	**8,2%**	**0,0%**	**0,7%**	**25,7%**	**5,3%**	**4,3%**	**34,8%**	**16,0%**	

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	2015
Attempt on closed reduction	**1**					1						
Cable Ready plate + cerclage	**5**		1	1					1		2	
Cement spacer	**15**				1		1	2	1	3	3	4
Cerclage	**15**		1		2	1		2	1	3	2	3
Dall Miles plate + cerclage	**16**					1	3	3	1		4	4
Drainage of haematoma	**25**	3	7	3	5	1	3	2	1			
Exchange of caput/bipolar head	**451**	8	19	27	35	42	56	58	42	67	43	54
Exchange of caput/bipolar head + osteosynthesis with plate/cerclage	**5**						2			1	1	1
Extension of collum (BioBall)	**1**								1			
Fixation of trochanter (Dall Miles)	**3**			1				1	1			
LISS plate	**2**								1		1	
Missing	**1**										1	
Plate + cerclage	**10**	2			1				1	1	1	4
Reaming in acetabulum	**1**			1								
Removal of cement in acetabulum	**3**			1							1	1
Removal of drain	**3**		1			1				1		
Revision of prosthesis + osteosynthesis	**2**							1	1			
Suture of muscle/fascie	**7**				1	1	3		1			1
Suture of skin + fascie	**4**			1		1			1		1	
Unspecified plate + cerclage	**6**							1	2	1	1	1
Total	**576**	**13**	**29**	**35**	**45**	**49**	**68**	**70**	**56**	**77**	**61**	**73**

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

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2015	21	3	65	0	22	3	0	1	7	127	**249**
	8,4%	1,2%	26,1%	0,0%	8,8%	1,2%	0,0%	0,4%	2,8%	51,0%	
2014	16	0	70	0	25	3	0	0	4	134	**252**
	6,3%	0,0%	27,8%	0,0%	9,9%	1,2%	0,0%	0,0%	1,6%	53,2%	
2013	34	2	72	0	35	1	0	1	2	139	**286**
	11,9%	0,7%	25,2%	0,0%	12,2%	0,3%	0,0%	0,3%	0,7%	48,6%	
2012	31	10	98	0	27	4	0	0	3	130	**303**
	10,2%	3,3%	32,3%	0,0%	8,9%	1,3%	0,0%	0,0%	1,0%	42,9%	
2011	36	9	113	0	23	2	0	0	7	138	**328**
	11,0%	2,7%	34,5%	0,0%	7,0%	0,6%	0,0%	0,0%	2,1%	42,1%	
2010	43	11	113	1	26	2	0	0	4	125	**325**
	13,2%	3,4%	34,8%	0,3%	8,0%	0,6%	0,0%	0,0%	1,2%	38,5%	
2009	65	8	125	0	15	7	0	0	5	137	**362**
	18,0%	2,2%	34,5%	0,0%	4,1%	1,9%	0,0%	0,0%	1,4%	37,8%	
2008	53	12	161	0	21	3	0	0	3	134	**387**
	13,7%	3,1%	41,6%	0,0%	5,4%	0,8%	0,0%	0,0%	0,8%	34,6%	
2007	64	8	198	1	15	1	0	0	5	141	**433**
	14,8%	1,8%	45,7%	0,2%	3,5%	0,2%	0,0%	0,0%	1,2%	32,6%	
2006	34	5	193	5	21	2	0	0	2	125	**387**
	8,8%	1,3%	49,9%	1,3%	5,4%	0,5%	0,0%	0,0%	0,5%	32,3%	
2005	4	6	124	12	6	4	0	0	4	48	**208**
	1,9%	2,9%	59,6%	5,8%	2,9%	1,9%	0,0%	0,0%	1,9%	23,1%	
Total	**401**	**74**	**1332**	**19**	**236**	**32**	**0**	**2**	**46**	**1378**	**3520**
	11,4%	**2,1%**	**37,8%**	**0,5%**	**6,7%**	**0,9%**	**0,0%**	**0,1%**	**1,3%**	**39,1%**	

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

Implants

Table 15: Cemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	Total	-06 2005	2007	2008	2009	2010	2011	2012	2013	2014	2015
Charnley		Hastings bipolar head	**2768**	848	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)	**675**			3	28	31	23	36	55	241	258
Charnley Modular	Unknown caput	Hastings bipolar head	**12**		5	2	1		2	1	1		
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**295**				1	1	9	40	51	75	118
Corail	Articul/Eze CoCr	Vario-Cup (Link)	**105**					1	6	8	8	35	47
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**10**							5	2	2	1
Corail	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**10**	4	2	1	2	1					
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**77**			1	14	31	22	9			
CPS-PLUS	Metal Ball Head	Bipolar Ball Head	**23**	1			1	19	2				
C-Stem	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**12**										12
Elite	Elite	Hastings bipolar head	**23**	4	2	6	5	1	4		1		
ETS			**300**	54	48	71	79	23	16	3	2	2	2
Exeter/V40	Exeter/V40	Self-centering bipolar (DePuy)	**653**				1	7	42	31	94	250	228
Exeter/V40	Exeter/V40	UHR	**9785**	582	487	700	752	852	1139	1241	1262	1317	1453
Exeter/V40	Exeter/V40	Unknown bipolar head	**27**	2	3		2	4	8	3	2	2	1
MS-30	Femoral head (VerSys co.cr)	Self-centering bipolar (DePuy)	**11**										11
MS-30	Protasul/Metasul	UHR	**22**	11	10				1				
SP II (Link)	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**27**							1		17	9
SP II (Link)	CoCrMo (Link)	Self-centering bipolar (DePuy)	**126**								7	49	70
SP II (Link)	CoCrMo (Link)	UHR	**484**								62	204	218
SP II (Link)	CoCrMo (Link)	Vario-Cup (Link)	**1825**	81	84	182	292	279	251	233	263	71	89
Spectron	Cobalt Chrom (S&N)	Biarticular cup (Permedica)	**33**		5	17	7	2	2				
Spectron	Cobalt Chrom (S&N)	HIP Bipolar Cup	**104**				8	12	19	9	16	21	19
Spectron	Cobalt Chrom (S&N)	Landos bipolar cup (DePuy)	**112**	68	31	12	1						
Spectron	Cobalt Chrom (S&N)	Self-centering bipolar (DePuy)	**30**			7	14	9					
Spectron	Cobalt Chrom (S&N)	Tandem	**1090**	199	171	204	182	70	104	95	65		
Spectron	Cobalt Chrom (S&N)	Universal bipolar	**17**	17									
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**	15	1								
Titan	Alumina Biolox (DePuy)	Landos bipolar cup (DePuy)	**11**	10	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**	273	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**	11	2	2							
Other*			**256**	38	46	26	25	24	24	10	23	19	21
Unknown			**35**	10	3	6	8	2	1			2	3
Total			**21312**	**2253**	**1763**	**2077**	**2225**	**1932**	**1963**	**2006**	**2164**	**2369**	**2560**

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

Table 16: Uncemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	Total	-06	2005	2007	2008	2009	2010	2011	2012	2013	2014	2015
Accolade II	Exeter/V40	Vario-Cup (Link)	**21**									2	8	11
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)	**2712**				23	87	202	348	620	532	471	429
Corail	Articul/Eze CoCr	UHR	**307**						17	49	44	40	82	75
Corail	Articul/Eze CoCr	Vario-Cup (Link)	**158**						21	37	32	47	17	4
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**399**							21	143	146	80	9
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)	**779**	393	194	164	21	7						
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**1144**		1	61	323	383	344	31	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**	8		2								
Corail	Unknown caput	Unknown bipolar head	**15**	3			5	4	1	1	1			
Filler	Biotechni fem. head	Biarticular cup (Permedica)	**24**	17	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	**563**				33	95	129	126	99	37	44	
Filler	Hipball Premium	UHR	**38**									10	22	6
Furlong	Furlong	UHR	**21**											21
HACTIV	HACTIV head	Moonstone	**22**	21	1									
HACTIV	HACTIV head	Tandem	**19**	9		4	2			1	2	1		
HACTIV	HACTIV head	UHR	**63**										41	22
Polarstem	Cobalt Chrom (S&N)	Tandem	**213**						18	64	74	39	16	2
Polarstem	Cobalt Chrom (S&N)	UHR	**59**										25	34
SL-PLUS	HACTIV head	Bipolar Ball Head	**16**	16										
SL-PLUS	Metal Ball Head	Bipolar Ball Head	**155**	51	29	36	32	7						
Other*			**216**	25	18	26	26	41	13	18	13	20	16	
Unknown			**6**	2		1	2						1	
Total			**7513**	**560**	**400**	**432**	**612**	**879**	**1060**	**1138**	**939**	**820**	**673**	

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

Table 17: Cemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	Total	2005 -06	2007	2008	2009	2010	2011	2012	2013	2014	2015
Charnley		Hastings bipolar head	**490**	226	73	65	50	40	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)	**34**			2		1	3	7	1	12	8
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**25**						4	8	1	5	7
Corail	Articul/Eze CoCr	Vario-Cup (Link)	**5**						1			3	1
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**	14	1	4	3				1		
Exeter/V40	Exeter/V40	Self-centering bipolar (DePuy)	**44**					1	3	8	7	14	11
Exeter/V40	Exeter/V40	UHR	**732**	167	101	74	57	42	55	64	52	47	73
Exeter/V40	Exeter/V40	Unknown bipolar head	**5**		1	1		1			1	1	
Fjord	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**7**	4	2	1							
MS-30	Protasul/Metasul	UHR	**5**	4	1								
Restoration Modular (femur)	Exeter/V40	Self-centering bipolar (DePuy)	**11**				2	3	3	1	1		1
Restoration Modular (femur)	Exeter/V40	UHR	**8**								4	2	2
SP II (Link)	CoCrMo (Link)	UHR	**29**								2	12	15
SP II (Link)	CoCrMo (Link)	Vario-Cup (Link)	**144**	22	13	14	11	18	24	19	12	7	4
Spectron	Cobalt Chrom (S&N)	HIP Bipolar Cup	**5**					1	3				1
Spectron	Cobalt Chrom (S&N)	Landos bipolar cup (DePuy)	**11**	3	3	5							
Spectron	Cobalt Chrom (S&N)	Tandem	**128**	42	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**	77	37	17	4						
Titan	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**19**		1	5	9	3	1				
Other*			**90**	24	13	14	9	7	2	3	3	6	9
Unknown			**5**	3		1			1				
Total			**2084**	**599**	**291**	**247**	**183**	**142**	**142**	**133**	**102**	**113**	**132**

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

Table 18: Uncemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	Total	2005 -06	2007	2008	2009	2010	2011	2012	2013	2014	2015
Arcos	Modular Head (Biomet)	Self-centering bipolar (DePuy)	**7**									2	5
Corail	Articul/Eze CoCr	Landos bipolar cup (DePuy)	**23**		12	11							
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**95**			2	4	19	10	15	19	12	14
Corail	Articul/Eze CoCr	UHR	**11**					3	4			2	2
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**30**						4	13	9	2	2
Corail	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**92**	56	19	13	2	2					
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**75**			4	28	25	17	1			
Corail	Cobalt chrome (DePuy)	UHR	**6**			1	2	1	1	1			
Filler	Biotechni fem. head	Biarticular cup (Permedica)	**21**	20		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)	**57**	9	23	18	7						
Filler	Hipball Premium	HIP Bipolar Cup	**73**				4	8	21	7	13	12	8
HACTIV	HACTIV head	Moonstone	**7**	6	1								
KAR	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**7**							3	3	1	
KAR	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**7**							4	3		
KAR	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**20**	6	6	6	1		1				
KAR	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**14**				6	5	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**	6	2	1	2	1					
TTHR	Articul/Eze CoCr	UHR	**5**									4	1
TTHR	TETE Inox	Self-centering bipolar (DePuy)	**5**					4	1				
Other*			**119**	23	9	10	13	9	12	10	9	7	17
Unknown			**3**	2	1								
Total			**713**	**135**	**81**	**71**	**72**	**79**	**73**	**55**	**56**	**42**	**49**

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

Table 19: Screws - primary operations

Product	Total	2005-06	2007	2008	2009	2010	2011	2012	2013	2014	2015
Asnis III	**1244**	217	98	75	49	126	177	156	105	121	120
Hansson pin system (LIH)	**2013**	684	287	253	235	212	112	69	60	41	60
Olmed	**10006**	2728	1310	1230	1121	790	675	660	563	448	481
Richards CHP	**6122**	1109	538	454	365	572	733	597	593	547	614
Other*	**2**						2				
Unknown	**1**									1	
Total	**19388**	**4738**	**2233**	**2012**	**1770**	**1700**	**1699**	**1482**	**1321**	**1158**	**1275**

Table 20: Hip compression screws - primary operations

Product	Total	2005-06	2007	2008	2009	2010	2011	2012	2013	2014	2015
DHS	**4236**	1574	1076	1009	337	108	58	28	8	13	25
LCP DHS	**4643**			34	705	476	485	458	468	662	1355
Omega	**111**	88	10	3	1	2	3	2	2		
Richards CHS	**17342**	2818	1426	1426	1510	2047	2021	1992	1765	1564	773
Other*	**13**	1		2					1	1	8
Total	**26345**	**4481**	**2512**	**2474**	**2553**	**2633**	**2567**	**2480**	**2244**	**2240**	**2161**

Table 21: Intramedullary nails - primary operations

Product	Total	2005-06	2007	2008	2009	2010	2011	2012	2013	2014	2015
ACE	**49**	13	17	12	7						
Gamma 3	**5455**	239	284	502	505	656	672	657	765	708	467
IMHS	**27**	15	7	3	1	1					
IMHS CP	**10**	10									
LFN	**66**	1	5	3	10	12	8	8	8	7	4
PFN	**26**	24		2							
PFNA	**740**	28	44	39	41	30	40	91	136	117	174
T2	**13**	2	2		2	1	3	1		2	
T2 recon	**206**		1		1	19	38	29	61	33	24
T-Gamma	**507**	357	91	34	22	3					
Trigen Intertan	**2252**	1	148	406	150	133	190	186	198	281	559
Trigen TAN/FAN	**309**	49	30	25	35	17	14	22	33	22	62
Other*	**5**	5									
Unknown	**5**				2			1		1	1
Total	**9670**	**744**	**629**	**1026**	**776**	**872**	**965**	**995**	**1201**	**1171**	**1291**

Fixation of hemiprostheses

Table 22: Primary operations

	Uncemented		Cement with antibiotics		Cement without antibiotics		Missing		Total
2015	667	(20,6%)	2559	(79,2%)	1	(0,0%)	6	(0,2%)	**3233**
2014	811	(25,4%)	2359	(74,0%)	3	(0,1%)	16	(0,5%)	**3189**
2013	921	(29,7%)	2154	(69,4%)	0	(0,0%)	28	(0,9%)	**3103**
2012	1064	(33,8%)	1959	(62,3%)	11	(0,3%)	110	(3,5%)	**3144**
2011	987	(32,6%)	1925	(63,7%)	6	(0,2%)	105	(3,5%)	**3023**
2010	837	(29,8%)	1896	(67,4%)	7	(0,2%)	71	(2,5%)	**2811**
2009	568	(20,0%)	2174	(76,6%)	8	(0,3%)	87	(3,1%)	**2837**
2008	399	(15,9%)	2010	(80,1%)	8	(0,3%)	92	(3,7%)	**2509**
2007	387	(17,9%)	1726	(79,8%)	1	(0,0%)	49	(2,3%)	**2163**
2006	323	(19,3%)	1331	(79,4%)	3	(0,2%)	20	(1,2%)	**1677**
2005	233	(20,5%)	882	(77,6%)	4	(0,4%)	17	(1,5%)	**1136**
Total	**7197**	**(25,0%)**	**20975**	**(72,8%)**	**52**	**(0,2%)**	**601**	**(2,1%)**	**28825**

*Other includes implants with less than 10 occurrences.

Figure 11: Time trend for fixation of primary hemiprostheses

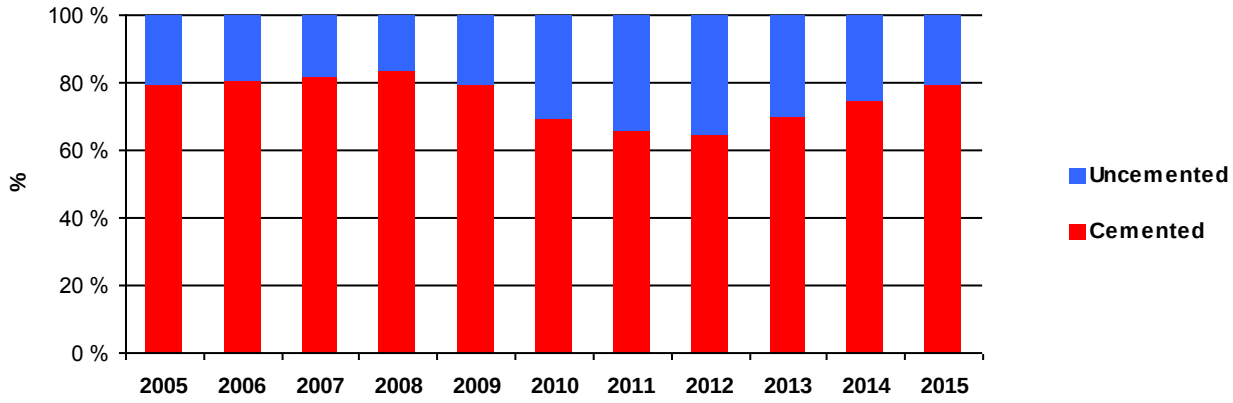


Table 23: Type of cement - primary operations

Product	Manufacturer	Total	2005-06	2007	2008	2009	2010	2011	2012	2013	2014	2015
Cemex System Genta FAST	Alere	**639**		22	58	101	102	83	74	84	86	29
Cemex w/gentamycin	Alere	**142**	21	24	4		1			11	10	71
Copal G+ V	Heraeus	**2**									1	1
Optipac Refobacin Bonecement R	Biomet	**5175**			42	223	518	718	790	725	911	1248
Optipac Refobacin Revision	Biomet	**128**						2	1	58	67	
Palacos R + G	Heraeus	**9868**	1024	1083	1285	1375	993	714	690	869	879	956
Palacos w/gentamicin	Heraeus	**353**	353									
Refobacin Bone Cement R	Biomet	**3938**	486	542	550	396	246	357	368	394	380	219
Refobacin Revision	Biomet	**1**										1
Refobacin-Palacos	Biomet	**314**	306	8								
Simplex unknown	Stryker	**75**	2	3	15	42	13					
Simplex w/Tobramycin	Stryker	**2**			1	1						
SmartSet GHV Genta. Smartmix	Ortomedic	**69**	1	32	29	4						3
Missing information		**269**	20	12	26	32	23	51	36	13	25	31
Total		**20975**	**2213**	**1726**	**2010**	**2174**	**1896**	**1925**	**1959**	**2154**	**2359**	**2559**

Table 24: Hydroxyapatite (HA) - uncemented prostheses

	With HA		Without HA		Missing		Total
2015	392	(58,8%)	5	(0,7%)	270	(40,5%)	**667**
2014	537	(66,2%)	9	(1,1%)	265	(32,7%)	**811**
2013	624	(67,8%)	0	(0,0%)	297	(32,2%)	**921**
2012	775	(72,8%)	2	(0,2%)	287	(27,0%)	**1064**
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	212	(65,6%)	42	(13,0%)	69	(21,4%)	**323**
2005	143	(61,4%)	29	(12,4%)	61	(26,2%)	**233**
Total	**5168**	**(71,8%)**	**222**	**(3,1%)**	**1807**	**(25,1%)**	**7197**

Pathological fractures

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

	No		Yes		Missing		Total
2015	7070	(87,5%)	117	(1,4%)	889	(11,0%)	**8076**
2014	6914	(87,7%)	80	(1,0%)	890	(11,3%)	**7884**
2013	6986	(87,2%)	133	(1,7%)	892	(11,1%)	**8011**
2012	7190	(87,4%)	106	(1,3%)	928	(11,3%)	**8224**
2011	7485	(89,0%)	135	(1,6%)	787	(9,4%)	**8407**
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	6653	(90,1%)	91	(1,2%)	637	(8,6%)	**7381**
2005	5135	(88,9%)	65	(1,1%)	574	(9,9%)	**5774**
Total	**76694**	**(89,2%)**	**1122**	**(1,3%)**	**8160**	**(9,5%)**	**85976**

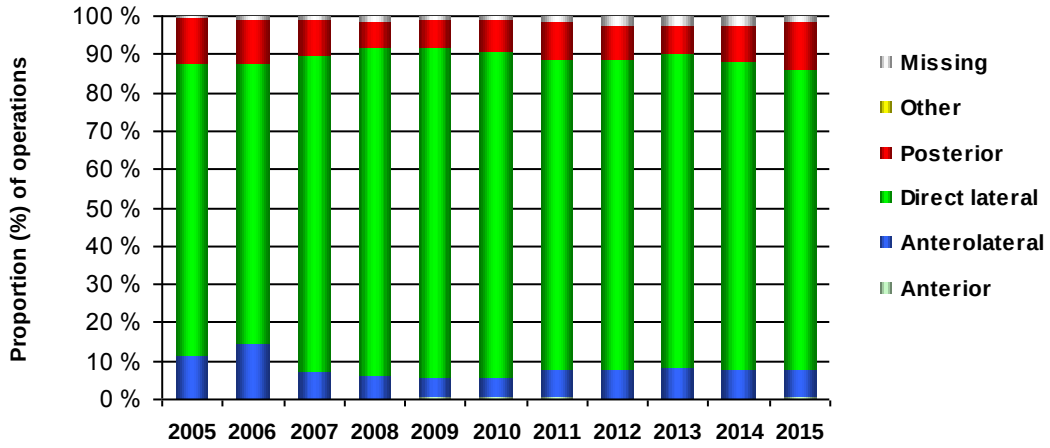
* Patients operated with total hip prostheses were excluded

Surgical approach used in hemiarthroplasty

Table 26: Surgical approach used in hemiarthroplasty

	Anterior		Anterolateral		Direct lateral		Posterior		Other		Missing		Total
2015	14	(0,4%)	232	(7,2%)	2542	(78,6%)	387	(12,0%)	1	(0,0%)	57	(1,8%)	**3233**
2014	3	(0,1%)	252	(7,9%)	2559	(80,2%)	291	(9,1%)	1	(0,0%)	83	(2,6%)	**3189**
2013	8	(0,3%)	255	(8,2%)	2538	(81,8%)	224	(7,2%)	0	(0,0%)	78	(2,5%)	**3103**
2012	6	(0,2%)	238	(7,6%)	2535	(80,6%)	278	(8,8%)	1	(0,0%)	86	(2,7%)	**3144**
2011	11	(0,4%)	228	(7,5%)	2443	(80,8%)	290	(9,6%)	0	(0,0%)	51	(1,7%)	**3023**
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%)	244	(14,5%)	1224	(73,0%)	189	(11,3%)	0	(0,0%)	19	(1,1%)	**1677**
2005	0	(0,0%)	131	(11,5%)	864	(76,1%)	136	(12,0%)	0	(0,0%)	5	(0,4%)	**1136**
Total	**72**	**(0,2%)**	**2186**	**(7,6%)**	**23457**	**(81,4%)**	**2602**	**(9,0%)**	**3**	**(0,0%)**	**505**	**(1,8%)**	**28825**

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
2015	305	(3,6%)	7802	(92,9%)	293	(3,5%)	**8400**
2014	308	(3,8%)	7578	(92,7%)	287	(3,5%)	**8173**
2013	306	(3,7%)	7743	(93,2%)	257	(3,1%)	**8306**
2012	340	(4,0%)	7770	(92,1%)	324	(3,8%)	**8434**
2011	353	(4,1%)	7959	(92,6%)	287	(3,3%)	**8599**
2010	322	(3,9%)	7761	(92,8%)	279	(3,3%)	**8362**
2009	302	(3,7%)	7683	(93,1%)	271	(3,3%)	**8256**
2008	365	(4,4%)	7726	(92,4%)	271	(3,2%)	**8362**
2007	273	(3,5%)	7359	(93,5%)	238	(3,0%)	**7870**
2006	244	(3,3%)	7020	(93,4%)	253	(3,4%)	**7517**
2005	188	(3,2%)	5557	(94,5%)	134	(2,3%)	**5879**
Total	**3306**	**(3,8%)**	**81958**	**(93,0%)**	**2894**	**(3,3%)**	**88158**

Antibiotic prophylaxis

Table 28: Screw - primary operations

	Yes		No		Missing		Total
2015	1164	(91,3%)	102	(8,0%)	9	(0,7%)	**1275**
2014	988	(85,3%)	162	(14,0%)	8	(0,7%)	**1158**
2013	1008	(76,3%)	307	(23,2%)	6	(0,5%)	**1321**
2012	1016	(68,6%)	455	(30,7%)	11	(0,7%)	**1482**
2011	1000	(58,9%)	682	(40,1%)	17	(1,0%)	**1699**
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	812	(32,1%)	1663	(65,8%)	51	(2,0%)	**2526**
2005	533	(24,2%)	1626	(73,7%)	47	(2,1%)	**2206**
Total	**10192**	**(52,6%)**	**8926**	**(46,1%)**	**253**	**(1,3%)**	**19371**

Table 29: Hemiprosthesis - primary operations

	Yes		No		Missing		Total
2015	3225	(99,8%)	2	(0,1%)	5	(0,2%)	**3232**
2014	3182	(99,8%)	0	(0,0%)	6	(0,2%)	**3188**
2013	3090	(99,6%)	4	(0,1%)	9	(0,3%)	**3103**
2012	3134	(99,7%)	6	(0,2%)	2	(0,1%)	**3142**
2011	3009	(99,6%)	4	(0,1%)	9	(0,3%)	**3022**
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	1665	(99,3%)	9	(0,5%)	3	(0,2%)	**1677**
2005	1129	(99,4%)	2	(0,2%)	5	(0,4%)	**1136**
Total	**28700**	**(99,6%)**	**59**	**(0,2%)**	**60**	**(0,2%)**	**28819**

Table 30: Hip compression screw and plate (including angle plate) - primary operations

	Yes		No		Missing		Total
2015	2153	(99,6%)	3	(0,1%)	5	(0,2%)	**2161**
2014	2227	(99,4%)	7	(0,3%)	6	(0,3%)	**2240**
2013	2239	(99,7%)	4	(0,2%)	2	(0,1%)	**2245**
2012	2462	(99,2%)	14	(0,6%)	5	(0,2%)	**2481**
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	2343	(93,0%)	161	(6,4%)	16	(0,6%)	**2520**
2005	1824	(92,9%)	121	(6,2%)	18	(0,9%)	**1963**
Total	**25587**	**(97,1%)**	**649**	**(2,5%)**	**115**	**(0,4%)**	**26351**

Table 31: Intramedullary nail - primary operations

	Yes		No		Missing		Total
2015	1277	(99,2%)	6	(0,5%)	4	(0,3%)	**1287**
2014	1154	(98,6%)	5	(0,4%)	11	(0,9%)	**1170**
2013	1180	(98,3%)	15	(1,3%)	5	(0,4%)	**1200**
2012	935	(94,1%)	53	(5,3%)	6	(0,6%)	**994**
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	**9038**	**(93,6%)**	**564**	**(5,8%)**	**59**	**(0,6%)**	**9661**

Table 32: All reoperations

	Yes		No		Missing		Total
2015	826	(92,5%)	56	(6,3%)	11	(1,2%)	**893**
2014	728	(94,3%)	42	(5,4%)	2	(0,3%)	**772**
2013	808	(91,4%)	66	(7,5%)	10	(1,1%)	**884**
2012	800	(90,7%)	76	(8,6%)	6	(0,7%)	**882**
2011	803	(88,4%)	91	(10,0%)	14	(1,5%)	**908**
2010	730	(85,7%)	111	(13,0%)	11	(1,3%)	**852**
2009	793	(82,4%)	151	(15,7%)	18	(1,9%)	**962**
2008	782	(84,2%)	131	(14,1%)	16	(1,7%)	**929**
2007	797	(85,7%)	125	(13,4%)	8	(0,9%)	**930**
2006	753	(84,6%)	120	(13,5%)	17	(1,9%)	**890**
2005	545	(82,5%)	108	(16,3%)	8	(1,2%)	**661**
Total	**8365**	**(87,5%)**	**1077**	**(11,3%)**	**121**	**(1,3%)**	**9563**

Table 33: Antibiotics used in primary operations (n=78269)

Antibiotics (generic name)	2005-06	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ampicillin (Pentrexyl, Pondocillin, Doktacilin)	0,33%	0,47%	0,28%	0,16%	0,25%	0,21%	0,16%	0,19%	0,22%	0,10%
Benzylpenicillin (Penicillin G)	0,15%	0,15%	0,13%	0,17%	0,05%	0,23%	0,28%	0,30%	0,28%	0,35%
Cefaleksin (Keflex, Cefalexin)	0,24%	0,08%	0,03%	0,01%	0,01%	0,03%	0,02%	0,02%	0,08%	
Cefalotin (Keflin)	72,98%	74,04%	75,38%	76,46%	77,41%	73,47%	73,29%	74,73%	77,72%	78,04%
Cefotaksim (Claforan)	0,26%	0,17%	0,14%	0,22%	0,20%	0,33%	0,31%	0,30%	0,26%	0,19%
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	5,16%	4,80%	4,55%	3,80%	3,61%	3,67%	4,31%	2,14%	0,97%	0,32%
Ciprofloksasin (Ciproxin)	0,05%	0,15%	0,05%	0,15%	0,14%	0,19%	0,19%	0,18%	0,07%	0,10%
Dikloksacillin (Diclocil, Dicillin)	5,29%	4,36%	4,92%	3,66%	1,59%	2,01%	2,25%	1,56%	0,20%	0,19%
Gentamicin (Garamycin, Gensumycin)	0,14%	0,30%	0,15%	0,06%	0,08%	0,13%	0,12%	0,04%	0,12%	0,13%
Klindamycin (Dalacin, Clindamycin)	1,59%	1,90%	2,23%	2,28%	2,49%	3,08%	3,23%	3,60%	3,79%	3,91%
Kloksacillin (Ekvacillin)	0,58%	0,65%	1,14%	2,13%	4,31%	5,69%	4,73%	5,68%	5,96%	5,46%
Mecillinam (Selexid)	0,05%	0,03%	0,03%	0,04%	0,02%	0,14%	0,09%	0,12%	0,12%	0,12%
Metronidasol (Flagyl, Metronidazol, Elyzol)	0,05%	0,03%	0,06%	0,06%	0,07%	0,10%	0,13%	0,09%	0,03%	0,06%
Other	0,24%	0,29%	0,14%	0,17%	0,20%	0,30%	0,36%	0,30%	0,31%	0,25%
Missing	0,47%	0,39%	0,34%	0,28%	0,31%	0,25%	0,21%	0,45%	0,43%	0,36%

Pharmacological antithrombotic prophylaxis

Table 34: Primary operation

	Yes		No		Missing		Total
2015	8196	(97,6%)	168	(1,8%)	34	(0,6%)	**8400**
2014	7958	(97,4%)	191	(1,9%)	24	(0,7%)	**8173**
2013	8159	(98,2%)	139	(1,3%)	8	(0,4%)	**8306**
2012	8307	(98,5%)	125	(1,1%)	2	(0,4%)	**8434**
2011	8488	(98,7%)	92	(1,0%)	19	(0,3%)	**8599**
2010	8237	(98,5%)	94	(1,1%)	31	(0,4%)	**8362**
2009	8148	(98,7%)	78	(0,9%)	30	(0,4%)	**8256**
2008	8218	(98,3%)	112	(1,3%)	32	(0,4%)	**8362**
2007	7707	(97,9%)	135	(1,7%)	28	(0,4%)	**7870**
2006	7274	(96,8%)	197	(2,6%)	46	(0,6%)	**7517**
2005	5736	(97,6%)	117	(2,0%)	26	(0,4%)	**5879**
Total	**86428**	**(98,0%)**	**1448**	**(1,6%)**	**280**	**(0,3%)**	**88158**

Table 35: Number of drugs in antithrombotic prophylaxis

	One drug		Two drugs		Total
2015	7950	(97,0%)	246	(3,0%)	**8196**
2014	7741	(97,3%)	217	(2,7%)	**7958**
2013	7899	(96,8%)	260	(3,2%)	**8159**
2012	8133	(97,9%)	174	(2,1%)	**8307**
2011	8402	(99,0%)	86	(1,0%)	**8488**
2010	8203	(99,6%)	34	(0,4%)	**8237**
2009	8130	(99,8%)	18	(0,2%)	**8148**
2008	8202	(99,8%)	16	(0,2%)	**8218**
2007	7692	(99,8%)	15	(0,2%)	**7707**
2006	7259	(99,8%)	15	(0,2%)	**7274**
2005	5715	(99,6%)	21	(0,4%)	**5736**
Total	**85326**	**(98,7%)**	**1102**	**(1,3%)**	**86428**

Table 36: Antithrombotic prophylaxis - one drug - primary operation (n=85326)

	2005-06	2007	2008	2009	2010	2011	2012	2013	2014	2015
Dalteparin (Fragmin)	51,10%	53,00%	63,72%	51,93%	61,32%	62,97%	62,94%	53,35%	51,03%	59,85%
Enoksaparin (Klexane)	48,54%	46,88%	35,98%	47,71%	38,38%	36,62%	36,32%	45,69%	48,04%	39,09%
Other	0,11%	0,04%	0,13%	0,18%	0,18%	0,09%	0,05%	0,26%	0,37%	0,45%
Missing	0,24%	0,12%	0,18%	0,17%	0,12%	0,31%	0,70%	0,68%	0,56%	0,62%

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

	Preoperatively		Postoperatively		Missing		Total
2015	2632	(32,1%)	4691	(57,2%)	875	(10,7%)	**8198**
2014	2617	(32,9%)	4473	(56,2%)	868	(10,9%)	**7958**
2013	2818	(34,6%)	4351	(53,3%)	990	(12,1%)	**8159**
2012	3108	(37,5%)	4132	(49,8%)	1067	(12,9%)	**8307**
2011	3322	(39,2%)	4060	(47,8%)	1106	(9,8%)	**8488**
2010	3308	(40,2%)	3585	(43,5%)	1344	(10,5%)	**8237**
2009	3759	(46,2%)	3045	(37,4%)	1344	(12,1%)	**8148**
2008	3509	(42,7%)	2973	(36,2%)	1736	(16,3%)	**8218**
2007	2925	(38,0%)	2968	(38,5%)	1814	(17,6%)	**7707**
2006	2931	(40,4%)	2058	(28,3%)	2285	(19,6%)	**7274**
2005	2188	(38,7%)	44	(0,8%)	3504	(26,7%)	**5736**
Total	**33117**	**(38,3%)**	**36380**	**(42,1%)**	**16933**	**(19,6%)**	**86430**

DURATION OF SURGERY

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

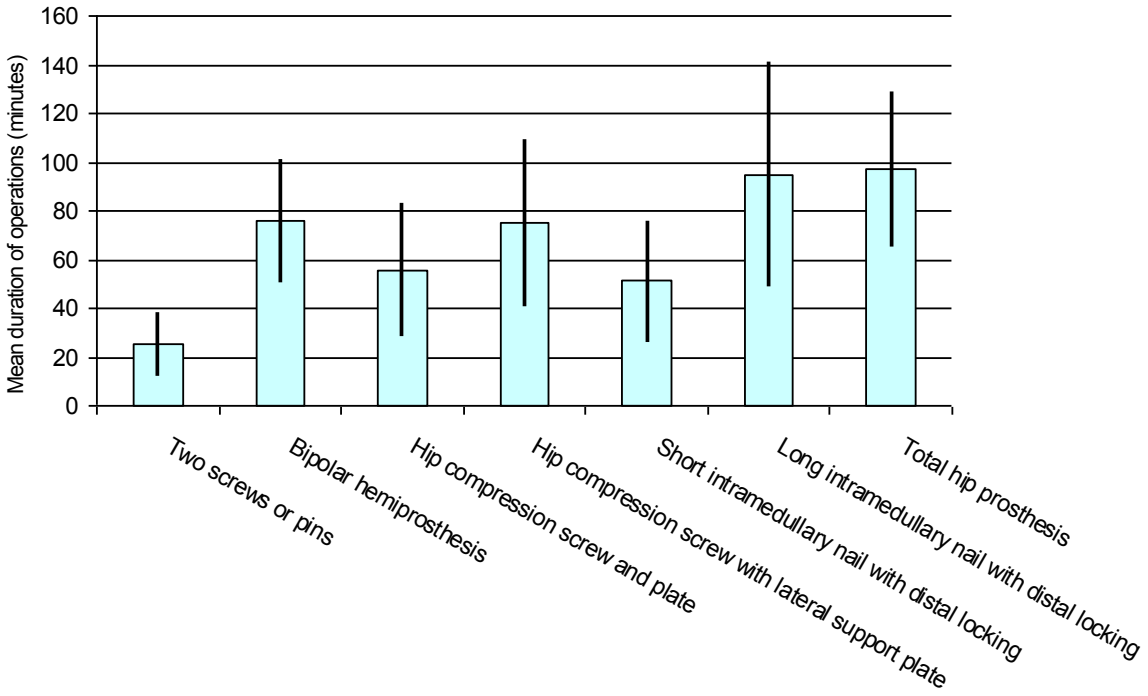


Table 38: Duration of surgery for the different types of operations

Type of operations	Total	Mean duration of operations (minutes)	Standard deviation
Two screws or pins	17918	26	13
Bipolar hemiprosthesis	27428	76	25
Hip compression screw and plate	17560	56	28
Hip compression screw with lateral support plate	7616	75	34
Short intramedullary nail with distal locking	5895	51	25
Long intramedullary nail with distal locking	2922	95	46
Total hip prosthesis	2122	97	32

Completeness analysis for the Hip Fracture Register, 2013-2014

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 implementation 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. Here we only present the completeness analysis for primary operations, as the compilation work on revisions has not been completed.

NCSP codes for combining data from NPR hospital stays and the Norwegian Hip Fracture Register, primary operations

Type/level/ coding system	Code	Description
ICD-10, both types	S72.0*	Fracture of head and neck of femur
	S72.1*	Pertrochanteric fracture (fractura pertrochanterica)
	S72.2*	Subtrochanteric fracture of femur (fractura subtrochanterica femoris)
Hemiarthroplasty, NCSP, Level 1	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, NCSP, Level 1	NFJ 0 (0,1,2,3)	Closed reduction of fracture of femur
	NFJ 1 (0,1,2,3)	Open reduction of fracture of femur
	NFJ 2 (0,1,2,3)	External fixation of fracture of femur
	NFJ 3 (0,1,2,3)	Internal fixation of fracture of femur using bioimplant
	NFJ 4 (0,1,2,3)	Internal fixation of fracture of femur using wire, rod, cerclage or pin
	NFJ 5 (0,1,2,3)	Internal fixation of fracture of femur using intramedullary nail
	NFJ 6 (0,1,2,3)	Internal fixation of fracture of femur using plate and screws
	NFJ 7 (0,1,2,3)	Internal fixation of fracture of femur using screws alone
	NFJ 8 (0,1,2,3)	Internal fixation of fracture of femur using other or combined methods
	NFJ 9 (0,1,2,3)	Other fracture surgery of femur
NCSP, Level 2, both types	NFB 01	Primary partial prosthetic replacement of hip joint, not using cement, single part - proximal
	NFB 11	Primary partial prosthetic replacement of hip joint using cement, single part - proximal
	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 59	Primary prosthetic interposition arthroplasty of hip joint
	NFB 62	Primary prosthetic replacement of joint surface of femoral head
	NFB 99	Other primary prosthetic replacement of hip joint

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

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

Completeness for the NPR was calculated in a similar way:

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

Primary hip fracture surgery should be reported to the NPR with the NCSP procedure codes and ICD-10 codes shown in the table.

From 2013 to 2014, 6 859 hemiarthroplasties were reported to one or both of the registers. 91.3% of these were reported to the NHFR, while 91.8% of these were reported to the NPR (Level 1).

In the same period, there were 11 671 reports of internal fixation for hip fracture; 79.7% of these were to the NHFR and 98.0% to the NPR (Level 1).

Completeness for primary operations is indicated in the tables below, for each health region of Norway and in total.

Type of operation	Only NHFR	Only NPR	Both	Total	Completeness NHFR (%)	Completeness NPR (%)
Hemiprosthesis, Level 1	563	596	5 700	6 859	91.3	91.8
Hemiprosthesis, Levels 1+2	197	596	6 066	6 859	91.3	97.1
Osteosynthesis, Level 1	238	2 374	9 059	11 671	79.7	98.0
Osteosynthesis, Levels 1+2	238	2 374	9 059	11 671	79.7	98.0

Type of operation	Register	South-East	West	Central	North	Private hospitals
Hemiprosthesis, Level 1	NHFR	91.1	91.6	91.3	92.1	-
	NPR	92.4	95.0	90.4	82.6	-
Hemiprosthesis, Levels 1+2	NHFR	91.1	91.6	91.3	92.1	-
	NPR	97.5	97.1	97.4	93.8	-
Osteosynthesis, Level 1	NHFR	80.3	83.4	77.8	71.9	-
	NPR	98.1	98.7	97.5	97.9	-
Osteosynthesis, Levels 1+2	NHFR	80.3	83.4	77.8	71.9	-
	NPR	98.1	98.7	97.5	97.9	-

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NATIONAL CRUCIATE LIGAMENT REGISTER
2016 ANNUAL REPORT

2015 was the year when the Interregional Steering Committee of the National Service Centre for Medical Quality Registers became more strongly involved in the Register, both with regard to funding and with a requirement for an annual report to be published on its website, with an overview of the results from the different hospitals. The Centre for Clinical Documentation and Evaluation (SKDE) is in charge of this work.

There has been a great deal of discussion about whether or not to publish results. Opinions have been divided, but the Steering Committee requires an annual report to be made public, together with an overview by hospital. There is as yet no agreement on the level of detail, but all indications are that the revision ratio, infection ratio and even the KOOS scores will need to be published.

At Haukeland University Hospital, we have begun electronic registration of the ACL form that is filled out by doctors. In order to enter the correct fixation devices, we use a scanning system that works very well. Authentication is also somewhat easier than we first thought. The person recording the data must always carry his/her mobile phone, and when logging in, a four-digit code appears which enables the data to be entered. This works well. When the data have been entered, they are collated, and the forms can be submitted to the database. We hope that electronic reporting can now be used in other hospitals.

We believe in hurrying slowly - we feel it would be a big disappointment if problems arise in entering the data.

In future, we would like to be authenticated in the same way as for e-prescriptions, with an ID card.

An extensive new research project being planned will compare non-operated and operated ACL ruptures. Guri Eikås of Oslo University Hospital Ullevål and Lars Engebretsen are the researchers involved. We will use the ACL form for data on the non-operated ACL ruptures and monitor them as we do for the operated ruptures. Using the electronic form, it is not difficult to include those who do not undergo surgery. This will be a multicentre study, with agreements primarily with various Norwegian institutions.

Lars-Petter Granan has left his 20% secretarial post. Helse Sør-Øst would not fund this position, and he had more than enough to do in another position in physical medicine. We would like to thank Lars-Petter for a brilliant job, and for having played a vital role with Professor Lars Engebretsen since we started in 2004.

Andreas Persson is cooperating with Tone Gifstad at St. Olav’s Hospital in Trondheim. We are continuing our cross-border cooperation, especially with the Scandinavian registers and Kaiser Permanente in the US. Professor Lars Engebretsen is heavily involved in a project run by ESSKA on paediatric ACL injuries.

In 2015, a total of 1743 primary ACL reconstructions and 223 revisions were performed. So-called “other procedures” are treatments after a primary reconstruction; there were 157 of these. There has obviously been underreporting here. The explanation is probably that this is

mostly simple post-operative surgery performed anywhere in the country, and those involved are not so dedicated in submitting the form. We do not believe this indicates ill will, but the importance of sending in the forms is not a high priority.

We are still waiting for the completeness analyses.

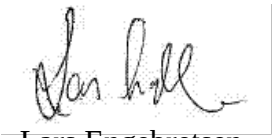
I believe that in future the forms will be linked to the operating system in such a way that "ACL form" will appear for certain procedure codes, and that it will be impossible to complete registration until the form has been filled out.

The requirement for consent to participate in this kind of research is important. The patient must complete the consent form, and the form must be kept in the patient record in the hospital. There is now an additional requirement that the operation forms must be submitted to the Register. Please refer to "bestillingsdokumentet" (ordering document) from the Ministry of Health and Care Services.

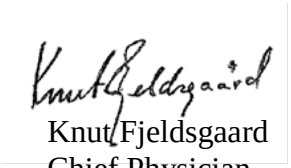
The Norwegian Orthopaedic Association has now acquired professional ownership of the registers - but the Association cannot own the registers.

This year we have seen how the data in the Register are becoming ever more important; an increasing number of patellar tendon ACL reconstructions are now being performed, and our data provide a basis for this. At the same time, certain fixation methods are clearly worse than others; please consult the articles from the Register in 2015.

We would like to thank all of you who submit forms regularly. Within a few years, it will all be computerised. Many thanks to Lars-Petter Granan for a brilliant job with the Cruciate Ligament Register.

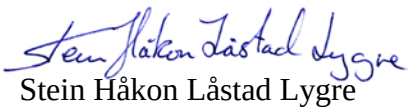


Lars Engebretsen
Chairman of the Steering Committee



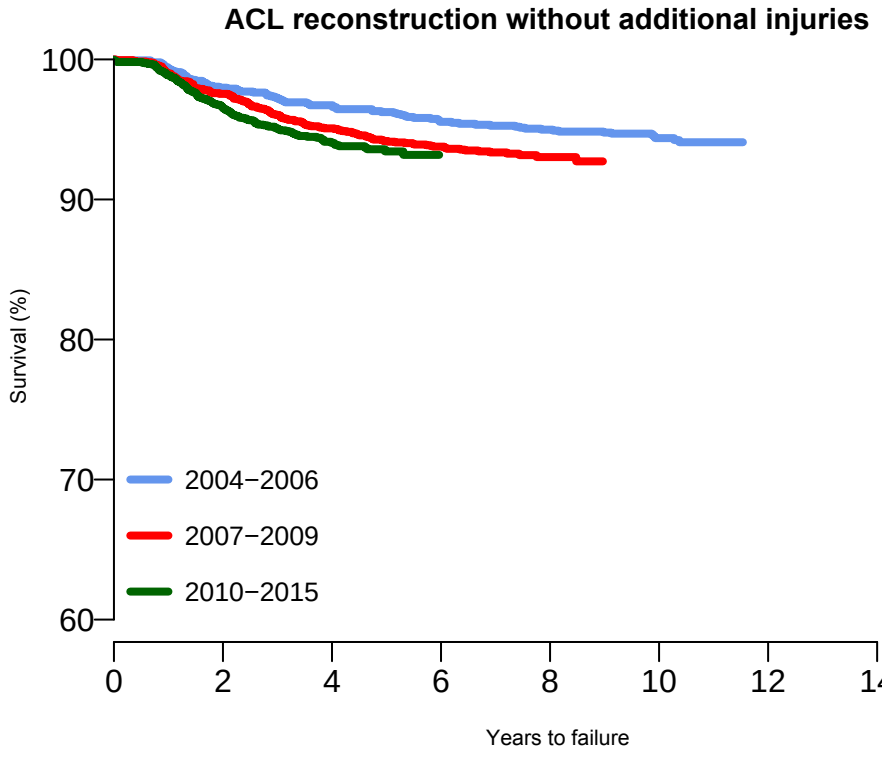
Knut Fjeldsgaard
Chief Physician

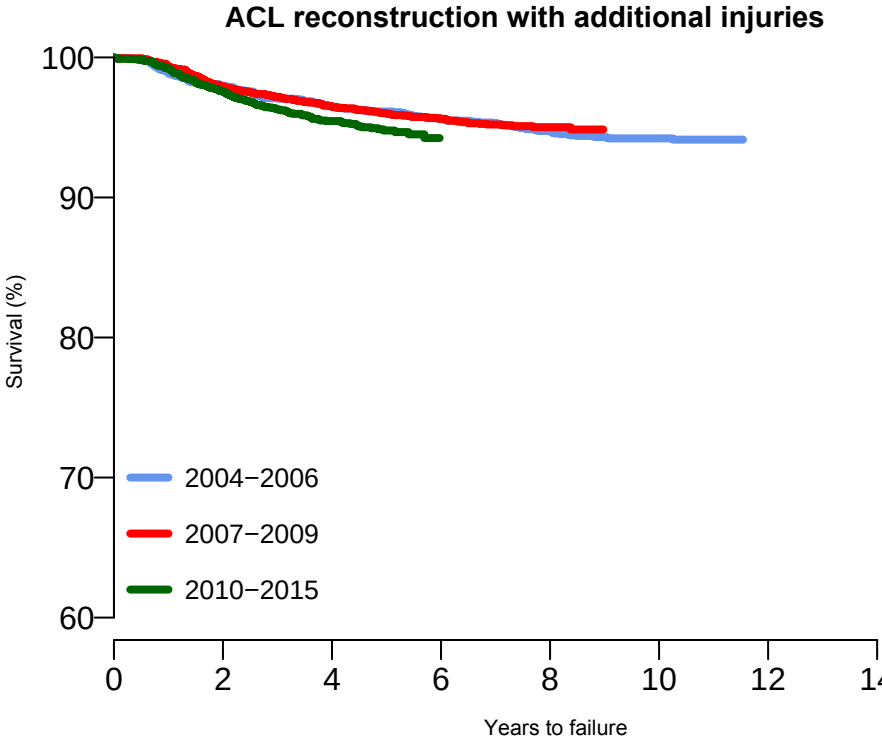
Irina Kvinnesland
IT Consultant



Stein Håkon Låstad Lygre
Biostatistician/researcher

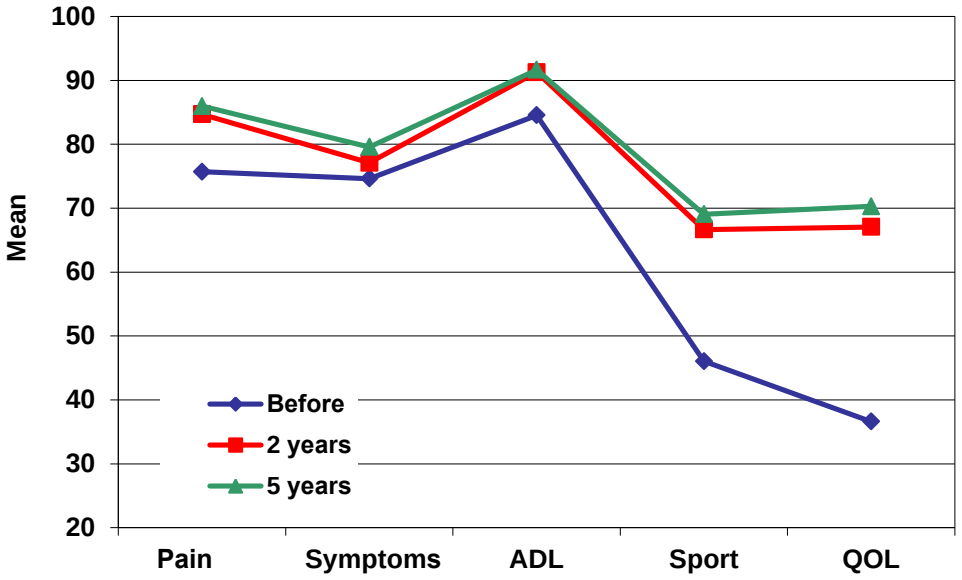
Survival for cruciate ligament operations



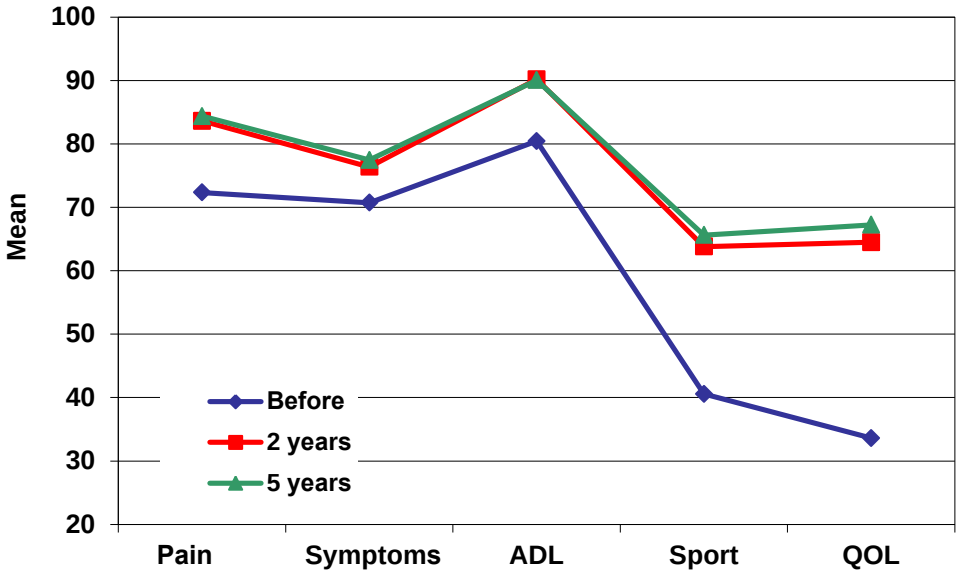


Survivalestimate is given as long as >20 reconstrucions remaines at risk.

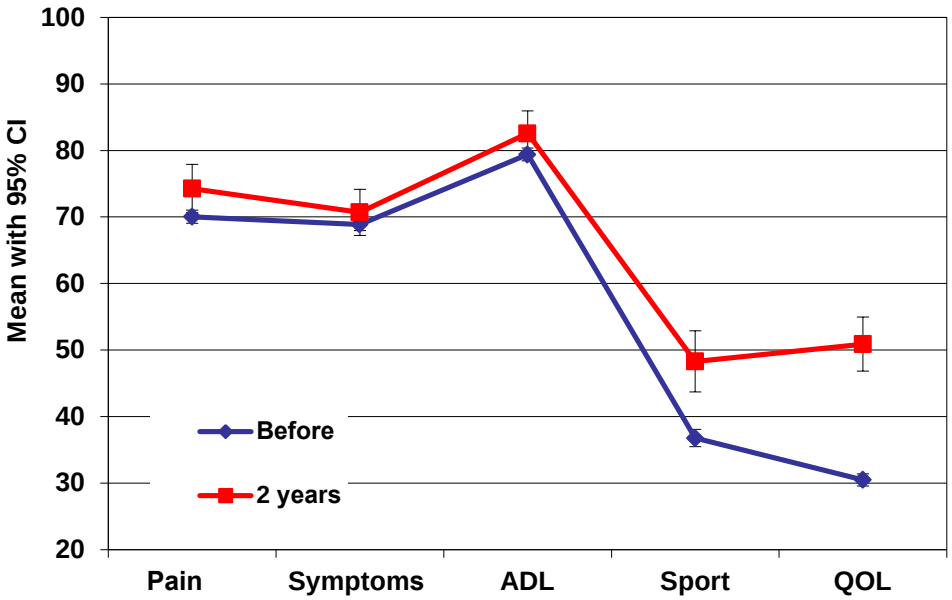
KOOS with primary ACL reconstruction without additional injury



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
2015	1743	(82,1%)	223	(10,5%)	157	(7,4%)	**2123**
2014	1732	(81,3%)	251	(11,8%)	147	(6,9%)	**2130**
2013	1769	(84,0%)	207	(9,8%)	129	(6,1%)	**2105**
2012	1783	(83,6%)	220	(10,3%)	130	(6,1%)	**2133**
2011	1859	(85,2%)	176	(8,1%)	148	(6,8%)	**2183**
2004-10	10696	(88,2%)	797	(6,6%)	635	(5,2%)	**12128**
Total	**19582**	**(85,9%)**	**1874**	**(8,2%)**	**1346**	**(5,9%)**	**22802**

Registration complete from 2005. 49,3% of the operations were performed on the right side. 43,7% of the operations were performed on females. 7,2% of the patients had a previous ACL/PCL-injury in the opposite knee. (12,5% was missing). Mean age was 28,7 years, 27,2 years for women and 29,8 years for men. Standard deviation of age was 10,5 years, 11,2 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

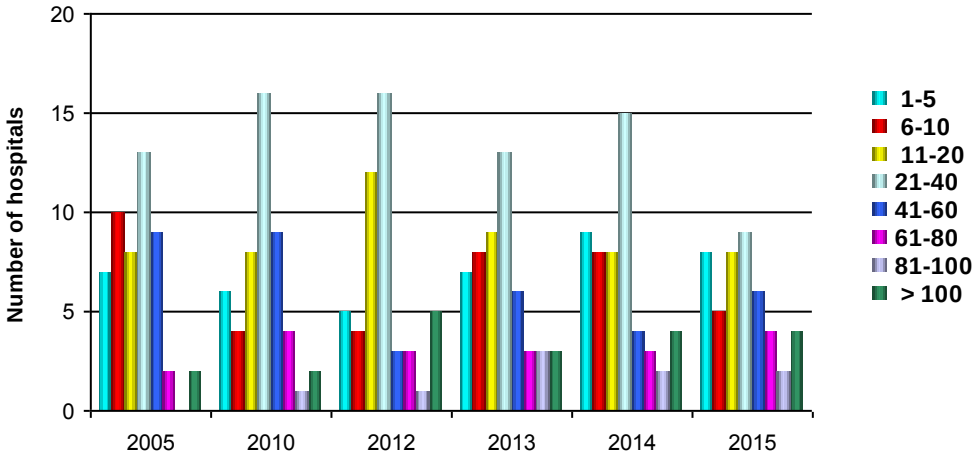


Figure 2: Distribution of hospitals by surgery volumes, revision reconstructions ACL

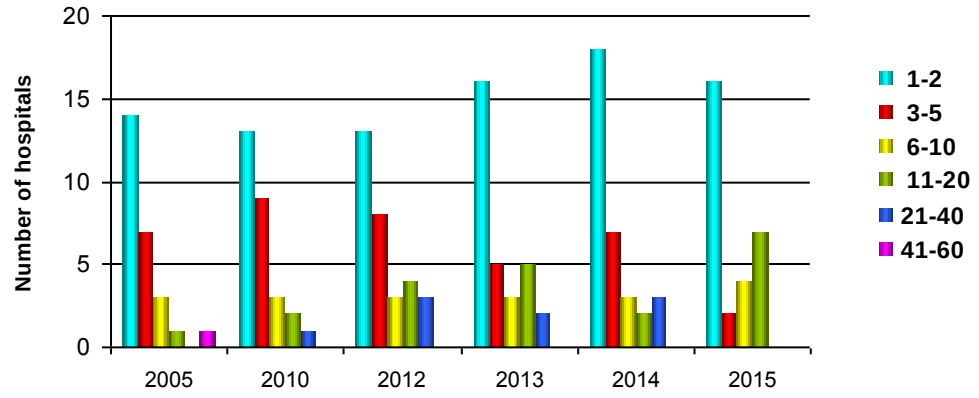
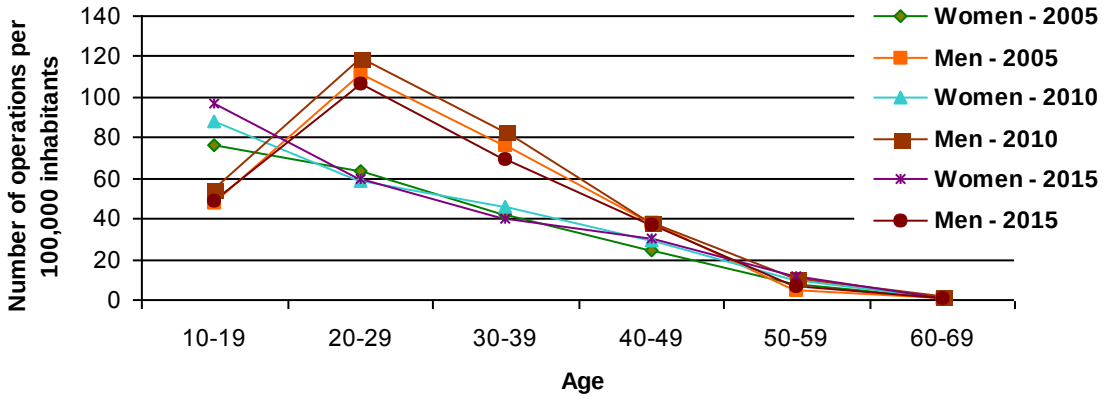


Figure 3: Incidence of primary reconstruction of cruciate ligament for 2005, 2010 and 2015



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	Artrodesis
2015	1006	63	42	63	6	4	48	31	5	30	4	0
2014	942	80	86	60	8	12	46	43	1	28	1	0
2013	878	103	45	66	6	10	40	31	2	16	4	0
2012	913	77	49	75	12	9	55	25	1	36	1	0
2011	920	77	41	69	10	10	43	24	0	40	0	0
2004-10	5048	527	149	375	39	23	250	128	13	387	17	0
Total	**9707**	**927**	**412**	**708**	**81**	**68**	**482**	**282**	**22**	**537**	**27**	**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)
7788	x					
382	x	x				
228		x				
155						x
136	x					x
77	x		x			
76				x		
71			x			
53	x			x		
28	x	x		x		
21				x		x
20					x	
18	x			x		x
14		x		x		
12		x				x
12						
11	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)
395	x				
88			x		
51				x	
40		x			
39			x	x	
33	x		x		
25	x			x	
25	x	x			
18					x
16	x		x	x	
16			x	x	
11	x				
11	x				x
11			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
437	x							
135				x				
69							x	
53		x						
44	x			x				
40			x					
34						x		
28				x	x			
22							x	x
20	x		x					
20	x	x						
16				x			x	x
14			x	x				
14				x			x	
13	x		x	x				
11								
10								x
10			x	x	x			
10		x		x				
10								
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.

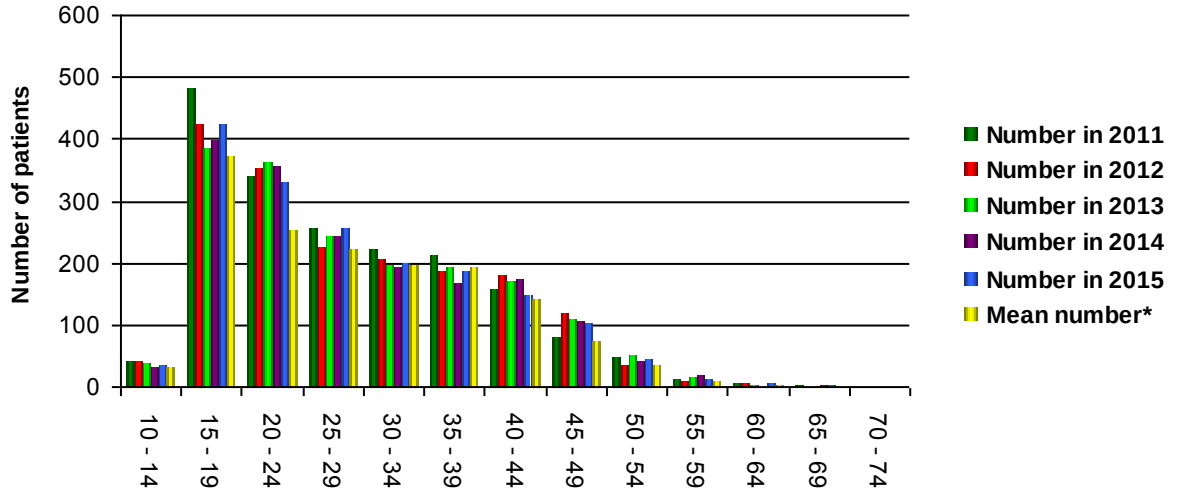
Intraoperative complications

Table 6: Intraoperative complications for all categories of surgeries

	Yes		No		Missing		Total
2015	62	(2,9%)	2001	(94,3%)	60	(2,8%)	**2123**
2014	59	(2,8%)	1989	(93,4%)	82	(3,8%)	**2130**
2013	60	(2,9%)	1961	(93,2%)	84	(4,0%)	**2105**
2012	44	(2,1%)	2046	(95,9%)	43	(2,0%)	**2133**
2011	63	(2,9%)	2084	(95,5%)	36	(1,6%)	**2183**
2004-10	404	(3,3%)	11492	(94,8%)	232	(1,9%)	**12128**
Total	**692**	**(3,0%)**	**21573**	**(94,6%)**	**537**	**(2,4%)**	**22802**

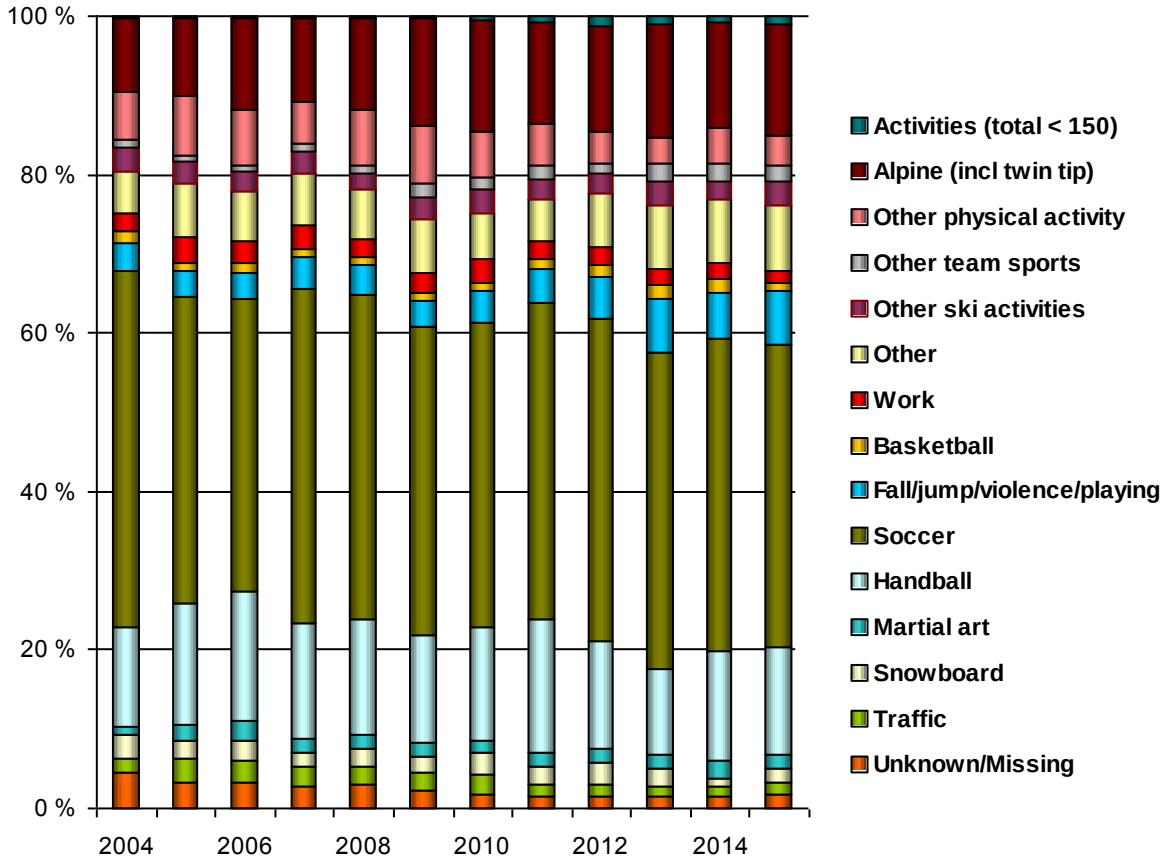
Primary reconstruction of cruciate ligament

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
2015	1719	54	163	36	23	349	980
2014	1707	58	170	35	20	367	930
2013	1751	38	169	54	23	379	867
2012	1762	36	152	32	14	379	938
2011	1845	41	136	24	18	436	965
2004-10	10591	295	662	155	125	2697	5158
Total	**19375**	**522**	**1452**	**336**	**223**	**4607**	**9838**

* 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
7203	x						
3676	x					x	
1619	x					x	x
1351	x						x
1290	x					x	
985	x					x	
525	x					x	x
489	x		x				
439	x					x	
249	x					x	x
233	x					x	x
159	x		x			x	
139	x		x				x
111	x		x			x	x
99	x		x			x	
72	x			x			
67	x	x	x				
56	x		x			x	
46	x		x			x	x
43	x			x	x		
39	x	x	x				x
38	x		x			x	
35	x		x			x	x
31	x		x			x	x
26	x	x					
21	x			x			x
20	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
89		x					
67	x	x	x				
39	x	x	x				x
34		x					x
26	x	x					
25	x	x	x			x	
20	x	x	x			x	x
18	x	x				x	
16	x	x		x	x		
14		x	x				
12	x	x			x		
12	x	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
2015	962	1	0	0	0
2014	732	1	0	0	0
2013	572	2	0	0	0
2012	465	1	0	0	0
2011	378	2	0	0	0
2004-10	3220	20	1	0	0
Total	**6329**	**27**	**1**	**0**	**0**

Table 11: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2015	711	29	17	5	3
2014	950	20	19	7	4
2013	1162	21	14	8	7
2012	1278	24	14	3	3
2011	1453	23	21	2	4
2004-10	7308	187	83	9	5
Total	**12862**	**304**	**168**	**34**	**26**

Table 12: ALLOGRAFT

	ACL	PCL	MCL	LCL	PLC
2015	5	20	6	6	12
2014	4	20	3	8	10
2013	7	8	1	8	5
2012	4	10	2	4	4
2011	5	3	0	5	5
2004-10	19	21	6	32	41
Total	**44**	**82**	**18**	**63**	**77**

Table 13: Suture

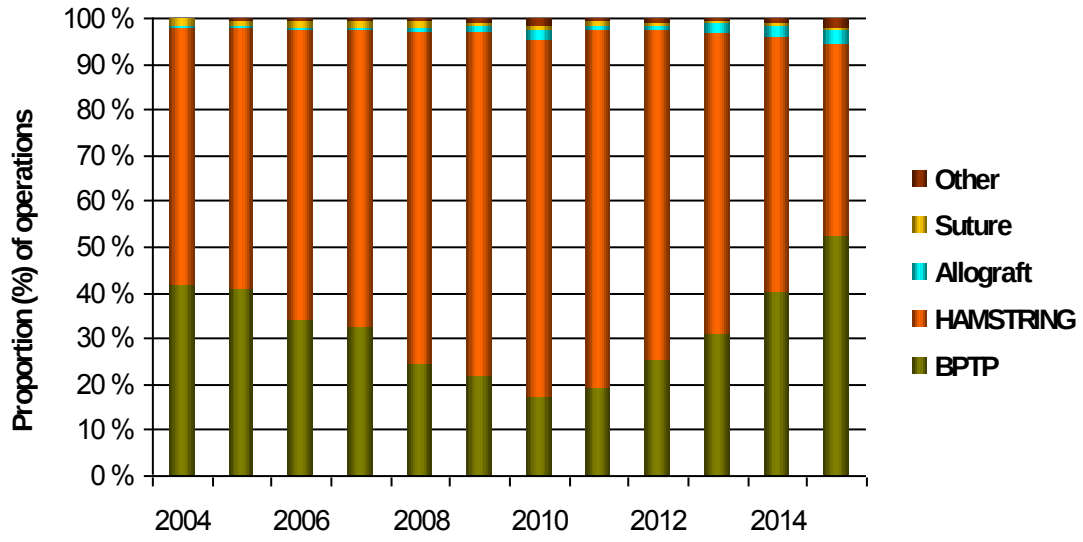
	ACL	PCL	MCL	LCL	PLC
2015	1	0	7	2	2
2014	1	1	4	2	1
2013	0	0	8	7	3
2012	0	0	6	3	2
2011	2	2	9	5	4
2004-10	1	5	59	42	37
Total	**5**	**8**	**93**	**61**	**49**

Table 14: Other

	ACL	PCL	MCL	LCL	PLC
2015	37	1	1	0	0
2014	17	5	0	0	0
2013	3	2	0	0	0
2012	14	1	1	0	0
2011	6	4	0	1	1
2004-10	35	23	6	7	4
Total	**112**	**36**	**8**	**8**	**5**

There are 20 forms where there are registered product for ACL and 23 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	2004-10	2011	2012	2013	2014	2015
Endobutton CL BTB	**536**	1		52	81	141	261
ToggleLoc	**636**	132	89	115	157	71	72
TunneLoc	**903**	594	67	44	77	72	49
SoftSilk	**2167**	1116	103	135	168	280	365
Endobutton CL Ultra	**6046**	1834	1099	994	884	724	511

Table 16: Tibia ACL (The 5 most common)

Product	Total	2004-10	2011	2012	2013	2014	2015
Biosure PK	**479**	32	85	76	133	102	51
Intrafix Screw	**1519**	948	174	153	97	79	68
Biosure HA Interferenc	**1785**	336	382	341	288	234	204
SoftSilk	**2428**	1088	94	168	235	343	500
RCI Screw	**3858**	2452	347	281	280	277	221

Table 17: Femur PCL (The 5 most common)

Product	Total	2004-10	2011	2012	2013	2014	2015
Xtendobutton	**7**	2	3	1		1	
Peek Interference Scre	**15**			3	5	3	4
RCI Screw	**24**	19					5
SoftSilk	**50**	19	4	4	2	7	14
Endobutton CL Ultra	**183**	78	17	18	19	28	23

Table 18: Tibia PCL (The 5 most common)

Product	Total	2004-10	2011	2012	2013	2014	2015
Biosure HA Interferenc	**21**	1	2	2	4	5	7
BioRCI-HA	**22**	3	2	3	4	6	4
SoftSilk	**24**	14	2	2	2	3	1
AO Skrue	**65**	44	6	7	1	5	2
RCI Screw	**224**	161	15	11	9	9	19

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

Femur	Tibia	Total	2004-10	2011	2012	2013	2014	2015
Endobutton CL Ultra	Biosure PK	**444**	31	79	74	114	99	47
Endobutton CL Ultra	Intrafix Screw	**603**	214	117	111	69	46	46
Endobutton CL Ultra	Biosure HA Interference screw	**1622**	288	371	316	273	214	160
Endobutton CL Ultra	RCI Screw	**1898**	692	307	245	241	239	174
SoftSilk	SoftSilk	**1919**	1023	89	116	148	248	295

Meniscal lesion

Table 20: Actual treatment of meniscal lesion

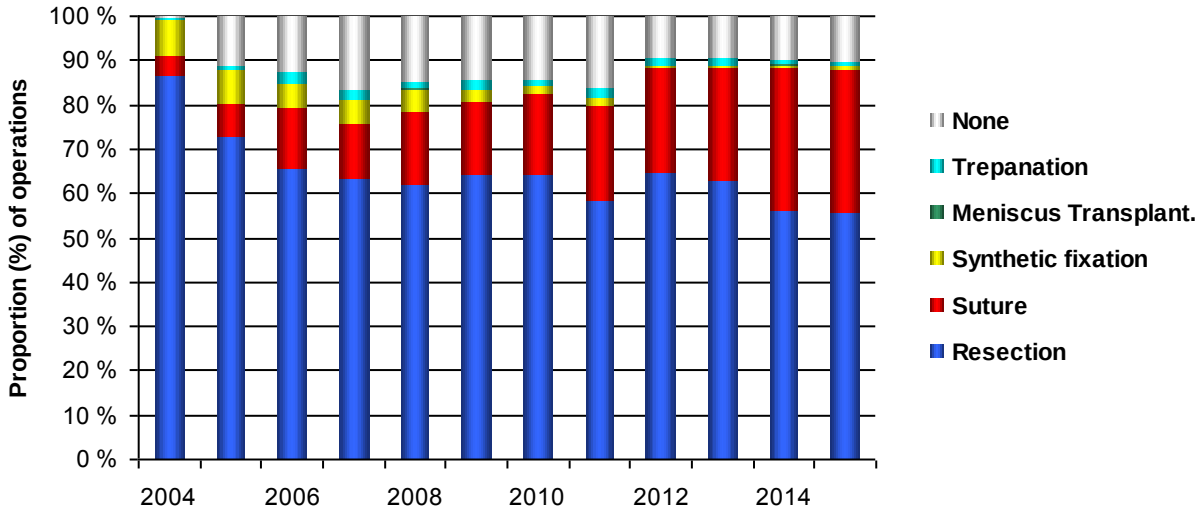
		Resection				Synthetic fixation	Meniscus Transplant.	Trepanation	None	Total
		OLD	Total	Partial	Suture					
2015	Lateral	0	3	338	143	3		7	67	**561**
2015	Medial	0	3	344	256	9		3	60	**675**
2014	Lateral	0	2	292	130	4	1	7	68	**504**
2014	Medial	0	7	323	232	4	1	4	42	**613**
2013	Lateral	0	2	293	99	2		11	49	**456**
2013	Medial	0	7	348	166	3		8	50	**582**
2012	Lateral	21	2	326	89	3	1	10	57	**509**
2012	Medial	18	9	338	176	4		9	46	**600**
2011	Lateral	181	1	139	82	6		20	98	**527**
2011	Medial	235	2	164	188	16		9	101	**715**
2004-10	Lateral	1838		6	274	57	1	48	410	**2634**
2004-10	Medial	2118		10	571	220	3	51	390	**3363**
Total		**4411**	**38**	**2921**	**2406**	**331**	**7**	**187**	**1438**	**11739**

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 registreded 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	2015
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	**53**	2	4	2	3	3	2		11	4	4	8	10
Total	**282**	**27**	**60**	**39**	**48**	**36**	**17**	**3**	**21**	**7**	**5**	**9**	**10**

Table 22: Suture

Product	Total	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
FAST-FIX	**1674**		28	45	61	99	118	127	192	208	203	280	313
Meniscal Dart Stick	**1**							1					
Meniscus arrow	**7**							3	4				
Rapidloc	**74**	9	10	19	24	8	2				2		
Unknown	**244**			2	1	1	3	3	48	40	43	49	54
Total	**2000**	**9**	**38**	**66**	**86**	**108**	**123**	**134**	**244**	**248**	**248**	**329**	**367**

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
2015	31,3%	43,6%	19,0%	5,8%	0,3%
2014	29,9%	45,5%	17,9%	5,0%	1,8%
2013	25,1%	50,0%	20,2%	4,4%	0,3%
2012	26,2%	47,3%	20,7%	5,1%	0,6%
2011	30,1%	44,4%	18,5%	5,9%	1,0%
2004-10	39,2%	40,5%	14,6%	4,1%	1,5%

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
2015	12,2%	3,5%	80,6%		3,7%
2014	13,3%	3,8%	77,7%	0,9%	4,2%
2013	19,7%	3,9%	73,1%	0,2%	3,2%
2012	18,5%	5,1%	72,8%	0,6%	2,9%
2011	14,9%	5,2%	75,3%	0,4%	4,2%
2004-10	9,6%	2,5%	55,9%	1,5%	30,5%

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)

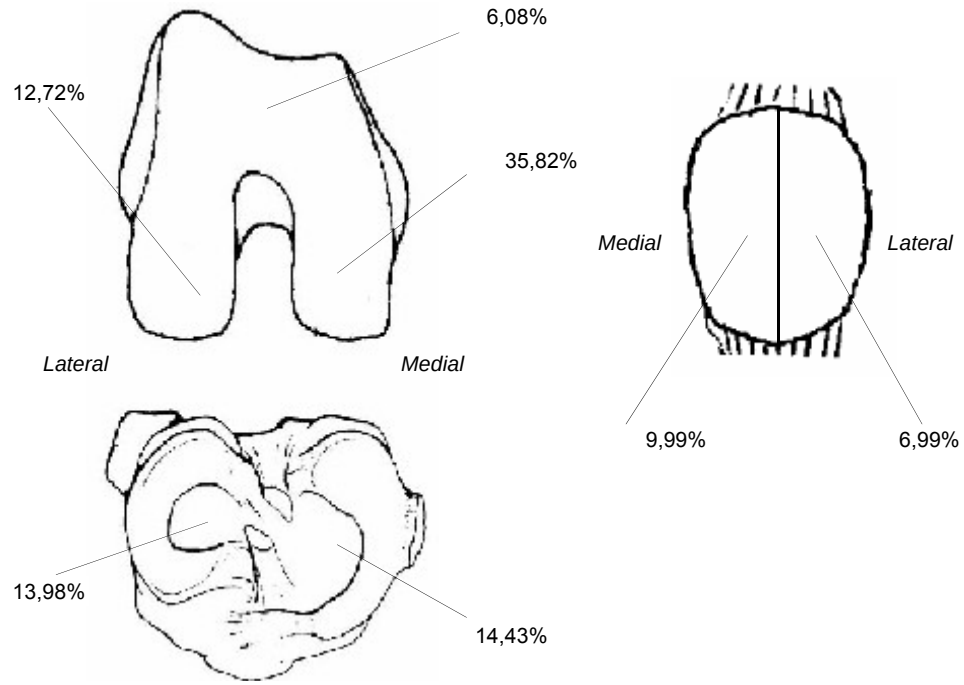
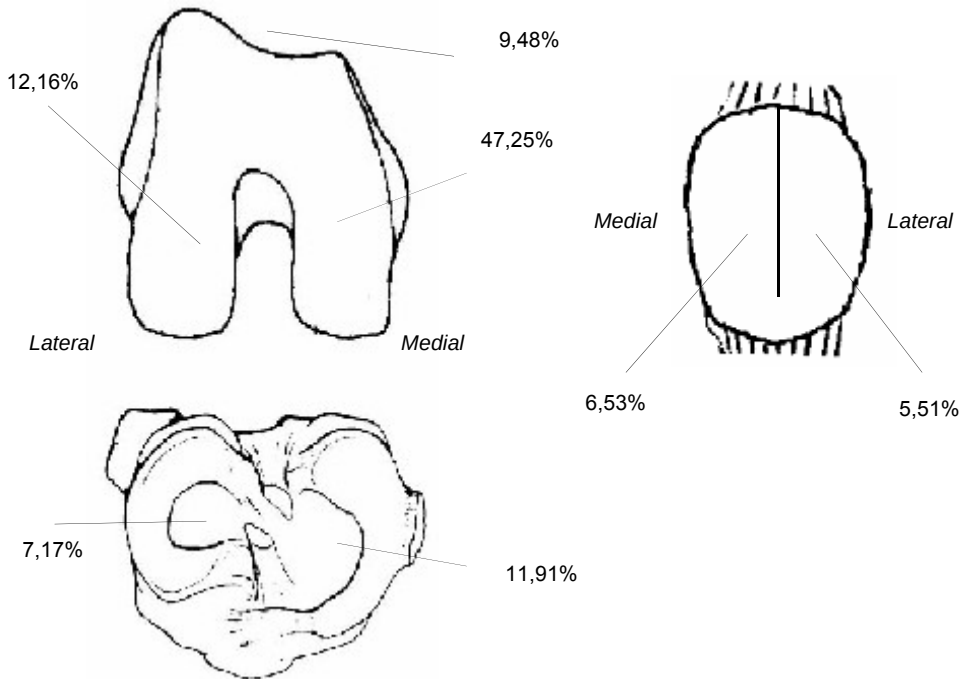


Figure 9: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 25: Outpatient surgery

	Yes		No		Missing		Total
2015	1233	(70,7%)	497	(28,5%)	13	(0,7%)	**1743**
2014	1161	(67,0%)	555	(32,0%)	16	(0,9%)	**1732**
2013	1140	(64,4%)	616	(34,8%)	13	(0,7%)	**1769**
2012	1228	(68,9%)	553	(31,0%)	2	(0,1%)	**1783**
2011	1183	(63,6%)	674	(36,3%)	2	(0,1%)	**1859**
2004-10	4594	(43,0%)	6044	(56,5%)	58	(0,5%)	**10696**
Total	**10539**	**(53,8%)**	**8939**	**(45,6%)**	**104**	**(0,5%)**	**19582**

Intraoperative complications

Table 26: Intraoperative complications

	Yes		No		Missing		Total
2015	54	(3,1%)	1644	(94,3%)	45	(2,6%)	**1743**
2014	55	(3,2%)	1616	(93,3%)	61	(3,5%)	**1732**
2013	53	(3,0%)	1653	(93,4%)	63	(3,6%)	**1769**
2012	39	(2,2%)	1711	(96,0%)	33	(1,9%)	**1783**
2011	60	(3,2%)	1769	(95,2%)	30	(1,6%)	**1859**
2004-10	363	(3,4%)	10141	(94,8%)	192	(1,8%)	**10696**
Total	**624**	**(3,2%)**	**18534**	**(94,6%)**	**424**	**(2,2%)**	**19582**

Systemic antibiotic prophylaxis

Table 27: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2015	1739	(99,8%)	1	(0,1%)	3	(0,2%)	**1743**
2014	1729	(99,8%)	1	(0,1%)	2	(0,1%)	**1732**
2013	1758	(99,4%)	2	(0,1%)	9	(0,5%)	**1769**
2012	1777	(99,7%)	5	(0,3%)	1	(0,1%)	**1783**
2011	1847	(99,4%)	7	(0,4%)	5	(0,3%)	**1859**
2004-10	10581	(98,9%)	86	(0,8%)	29	(0,3%)	**10696**
Total	**19431**	**(99,2%)**	**102**	**(0,5%)**	**49**	**(0,3%)**	**19582**

Table 28: Drug

	2004-10	2011	2012	2013	2014	2015
Benzylpenicillin (Penicillin G)				0,11%	0,06%	
Cefaleksin (Keflex, Cefalexin)	0,03%					
Cefalotin (Keflin)	89,59%	92,37%	92,52%	93,12%	92,37%	94,82%
Cefotaksim (Claforan)					0,17%	
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	2,23%	1,03%	0,56%	0,46%	0,23%	
Ciprofloksasin (Ciproxin)	0,01%				0,06%	
Dikloksacillin (Diclocil, Dicillin)	4,72%	0,54%	0,90%	0,91%	0,75%	0,06%
Doksysyklin (Vibramycin, Dumoxin, Doxylin)	0,01%					
Erytromycin (Ery-max, Abboticin)	0,02%				0,06%	
Gentamicin (Garamycin, Gensumycin)	0,02%					
Klindamycin (Dalacin, Clindamycin)	2,62%	2,92%	1,97%	1,93%	2,08%	1,32%
Kloksacillin (Ekvacillin)	0,63%	3,03%	4,05%	2,67%	3,30%	3,16%
Linkomycin (Lincocin)	0,01%					
Oxacillin (Unspecified)				0,17%	0,17%	
Tobramycin (Nebcina, Nebcin, Tobi)				0,11%		
Missing	0,12%	0,11%		0,51%	0,75%	0,63%

Thrombosis prophylaxis

Table 29: Thrombosis prophylaxis

	Yes		No		Missing		Total
2015	1503	(86,2%)	237	(13,6%)	3	(0,2%)	**1743**
2014	1422	(82,1%)	301	(17,4%)	9	(0,5%)	**1732**
2013	1485	(83,9%)	270	(15,3%)	14	(0,8%)	**1769**
2012	1473	(82,6%)	308	(17,3%)	2	(0,1%)	**1783**
2011	1512	(81,3%)	342	(18,4%)	5	(0,3%)	**1859**
2005-10	7923	(80,1%)	1787	(18,1%)	217	(2,2%)	**9927**
Total	**15318**	**(81,4%)**	**3245**	**(17,2%)**	**250**	**(1,3%)**	**18813**

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
2015	1494	(99,4%)	9	(0,6%)	**1503**
2014	1410	(99,2%)	12	(0,8%)	**1422**
2013	1464	(98,6%)	21	(1,4%)	**1485**
2012	1470	(99,8%)	3	(0,2%)	**1473**
2011	1507	(99,7%)	5	(0,3%)	**1512**
2005-10	7873	(99,4%)	50	(0,6%)	**7923**
Total	**15218**	**(99,3%)**	**100**	**(0,7%)**	**15318**

Table 31: Drug

	2005-10	2011	2012	2013	2014	2015
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)					0,07%	
Dabigatranetixalat (Re-Novate, Pradaxa)	0,01%		0,07%			
Dalteparin (Fragmin)	59,59%	62,50%	67,96%	65,05%	56,05%	58,48%
Dekstran (Macrodex, Dextran)	0,03%	0,07%	0,07%	0,27%	0,35%	0,20%
Enoksaparin (Klexane)	34,96%	35,52%	31,43%	32,05%	42,12%	40,05%
Heparin (Heparin)		0,07%				
Rivaroksaban (Xarelto)		0,07%	0,14%	0,27%		0,07%
Warfarin (Marevan)	0,01%				0,14%	
Ximelagatran (Exanta, Malagatran)	0,38%					
No drugs	4,19%	1,46%		0,61%		
Missing	0,20%		0,14%	0,34%	0,42%	0,60%
Two drugs	0,63%	0,33%	0,20%	1,41%	0,84%	0,60%

NSAID's

Table 32: NSAID's

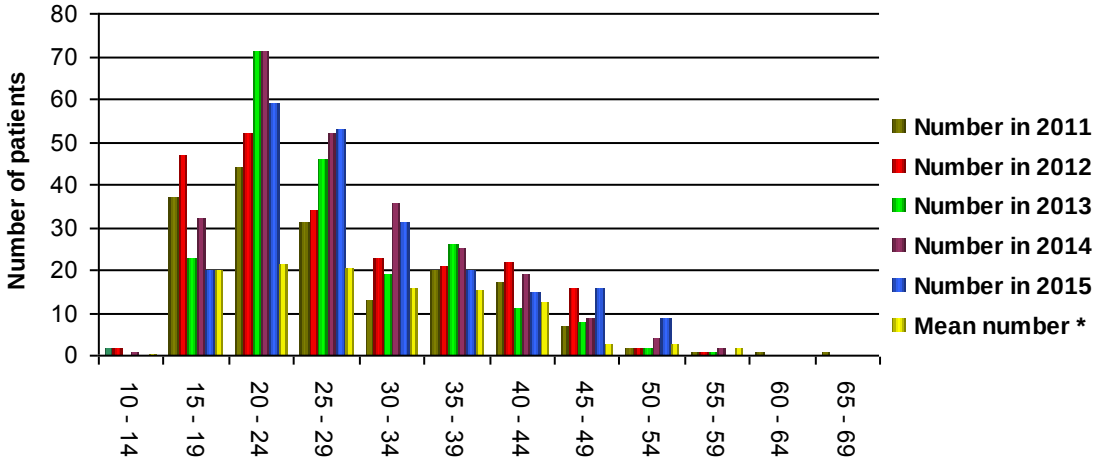
	Yes		No		Missing		Total
2015	810	(46,5%)	897	(51,5%)	36	(2,1%)	**1743**
2014	710	(41,0%)	975	(56,3%)	47	(2,7%)	**1732**
2013	753	(42,6%)	955	(54,0%)	61	(3,4%)	**1769**
2012	805	(45,1%)	926	(51,9%)	52	(2,9%)	**1783**
2011	894	(48,1%)	882	(47,4%)	83	(4,5%)	**1859**
2010	763	(43,6%)	809	(46,3%)	176	(10,1%)	**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	**6232**	**(39,4%)**	**6575**	**(41,6%)**	**3002**	**(19,0%)**	**15809**

Table 33: Drug

	2007-10	2011	2012	2013	2014	2015
Celecoksib (Celebra)	1,73%	1,34%	1,86%	5,05%	2,96%	0,74%
Diklofenak (Voltaren, Diclofenac, Cataflam)	92,74%	91,95%	93,17%	86,72%	68,59%	54,69%
Etoricoksib (Arcoxia)	0,09%	0,56%	0,37%	2,12%	21,55%	38,52%
Ibuprofen (Ibux, Ibumetin)	0,35%	2,80%	0,37%	0,80%	0,99%	1,73%
Ketorolak (Toradol)	2,70%	2,91%	3,73%	3,98%	4,37%	3,09%
Parecoksib (Dynastat)				0,27%	0,28%	
Piroxicam (Brexidol)	0,13%		0,12%			
Missing	2,26%	0,45%	0,37%	1,06%	1,41%	1,23%

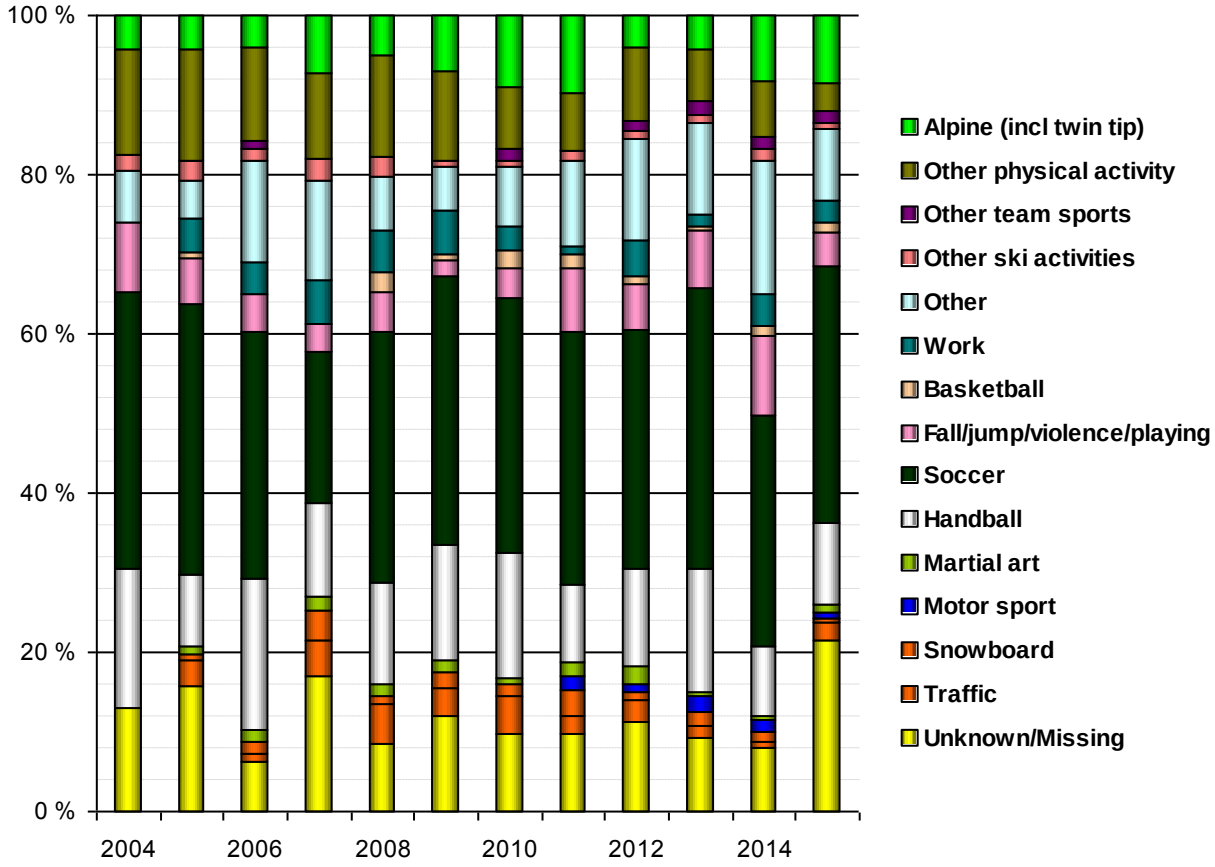
Revision reconstruction

Figure 10: Age by primary operation



* Mean number of primary operations for 2004 - 2010

Figure 11: Activity that lead to injury



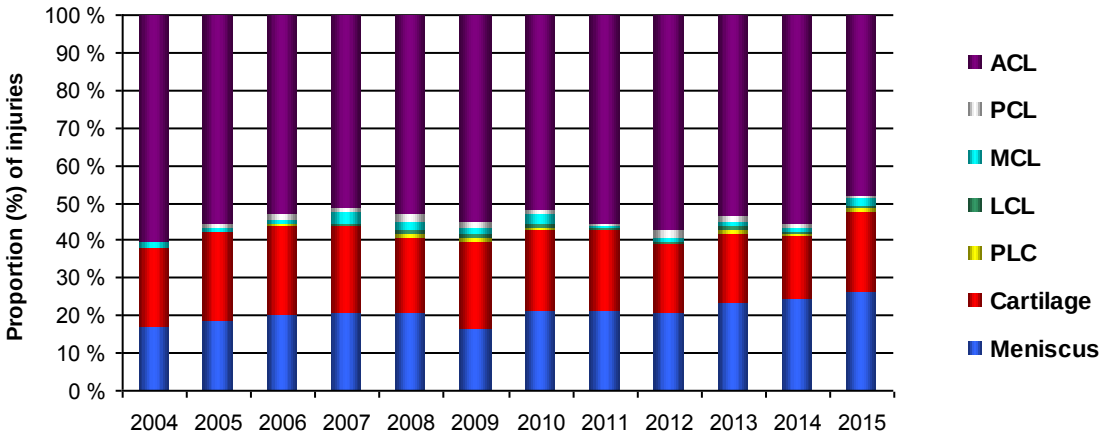
Actual injury

Table 34: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2015	165	2	7	2	3	73	91
2014	195	3	4	2	1	59	86
2013	184	6	4	3	5	63	81
2012	195	6	4	2		62	71
2011	154	2	2	1		60	59
2004-10	772	18	27	8	9	327	279
Total	**1665**	**37**	**48**	**18**	**18**	**644**	**667**

* 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						
264	x						
171	x						x
143	x					x	x
138	x					x	
125	x						
80	x					x	
72	x						x
53	x					x	x
39	x					x	
33	x						x
22	x					x	
21	x					x	
21	x					x	x
20	x					x	x
19	x					x	x
10	x					x	
8	x		x				
7	x					x	x
7	x					x	x
7	x					x	
6	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 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

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
2015	6	12	3	115	81	1	1	218
2014	3	4	1	109	120	6		237
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
2004-10	5	20	6	157	167	6	22	377
Total	**27**	**69**	**15**	**680**	**621**	**21**	**34**	**1467**

Cause 1: Infection
Cause 2: Fixation failure
Cause 3: Untreated ligamentinjury
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
2015	92	0	0	0	0
2014	120	0	0	0	0
2013	91	0	0	0	0
2012	101	0	0	0	0
2011	90	1	0	0	0
2004-10	263	1	0	0	0
Total	**757**	**2**	**0**	**0**	**0**

Table 39: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2015	50	0	0	1	1
2014	50	1	1	0	0
2013	50	1	1	0	0
2012	53	0	2	1	0
2011	50	0	0	1	0
2004-10	447	4	12	0	0
Total	**700**	**6**	**16**	**3**	**1**

Table 40: ALLOGRAFT

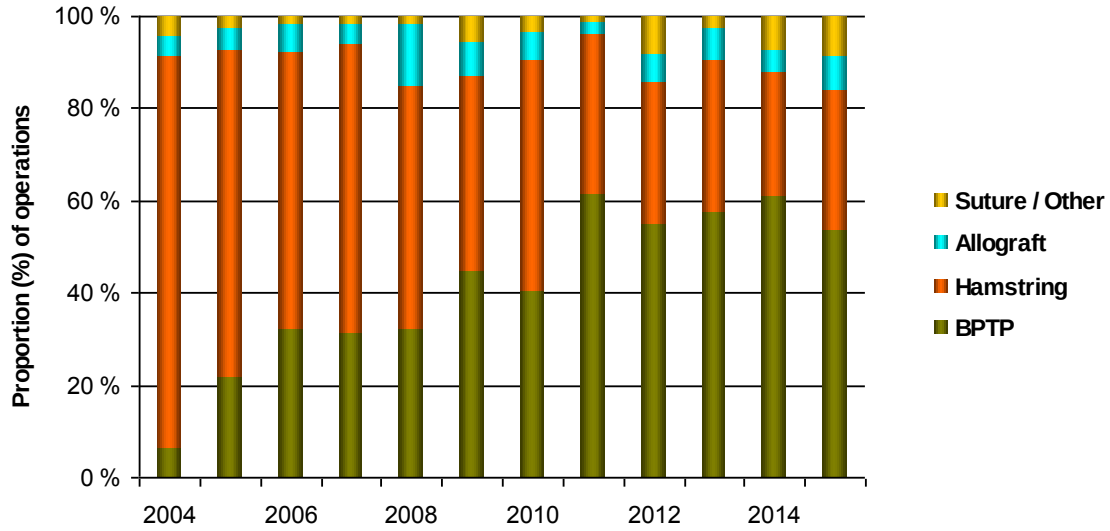
	ACL	PCL	MCL	LCL	PLC
2015	7	2	3	0	0
2014	7	1	0	1	1
2013	4	3	1	1	2
2012	5	6	0	0	0
2011	2	1	1	0	0
2004-10	28	9	4	6	8
Total	**53**	**22**	**9**	**8**	**11**

Table 41: Suture / Other

	ACL	PCL	MCL	LCL	PLC
2015	15	0	0	0	0
2014	13	0	0	1	0
2013	3	0	0	0	1
2012	15	0	0	0	0
2011	2	0	0	0	0
2004-10	17	4	3	0	0
Total	**65**	**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	2004-10	2011	2012	2013	2014	2015
Profile Interference Screw	**31**	7	3	4	5	8	4
Sheated Cannulated Interference Screw	**37**		1		13	10	13
Endobutton CL BTB	**67**			11	9	30	17
Endobutton CL Ultra	**333**	94	46	46	48	50	49
SoftSilk	**378**	125	51	53	44	61	44

Table 43: Femur PCL (The 5 most common)

Product	Total	2004-10	2011	2012	2013	2014	2015
ComposiTCP 30+60	**1**			1			
Propel Cannulated	**2**	1	1				
SoftSilk	**4**	2			1		1
RCI Screw	**11**	10		1			
Endobutton CL Ultra	**12**	2	1	4	3	2	

Table 44: Tibia ACL (The 5 most common)

Product	Total	2004-10	2011	2012	2013	2014	2015
Sheated Cannulated Interference Screw	**34**				12	11	11
Propel Cannulated	**81**	31	7	8	10	18	7
Biosure HA Interference screw	**167**	25	14	29	30	29	40
RCI Screw	**307**	216	20	21	18	21	11
SoftSilk	**341**	100	47	52	44	59	39

Table 45: Tibia PCL (The 5 most common)

Product	Total	2004-10	2011	2012	2013	2014	2015
BioRCI-HA	**1**			1			
Intrafix Screw	**1**					1	
Propel Cannulated	**3**	1	1	1			
AO Skrue	**4**	3		1			
RCI Screw	**22**	13	1	2	4	1	1

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

Femur	Tibia	Total	2004-10	2011	2012	2013	2014	2015
Sheated Cannulated Interference Screw	Sheated Cannulated Interference Screw	**33**				12	10	11
Endobutton CL Ultra	BioRCI-HA	**34**	6	12	12		3	1
Endobutton CL Ultra	RCI Screw	**111**	58	13	10	10	12	8
Endobutton CL Ultra	Biosure HA Interference screw	**116**	13	7	15	27	23	31
SoftSilk	SoftSilk	**309**	96	45	47	36	52	33

Meniscal lesion

Table 47: Actual treatment of meniscal lesion

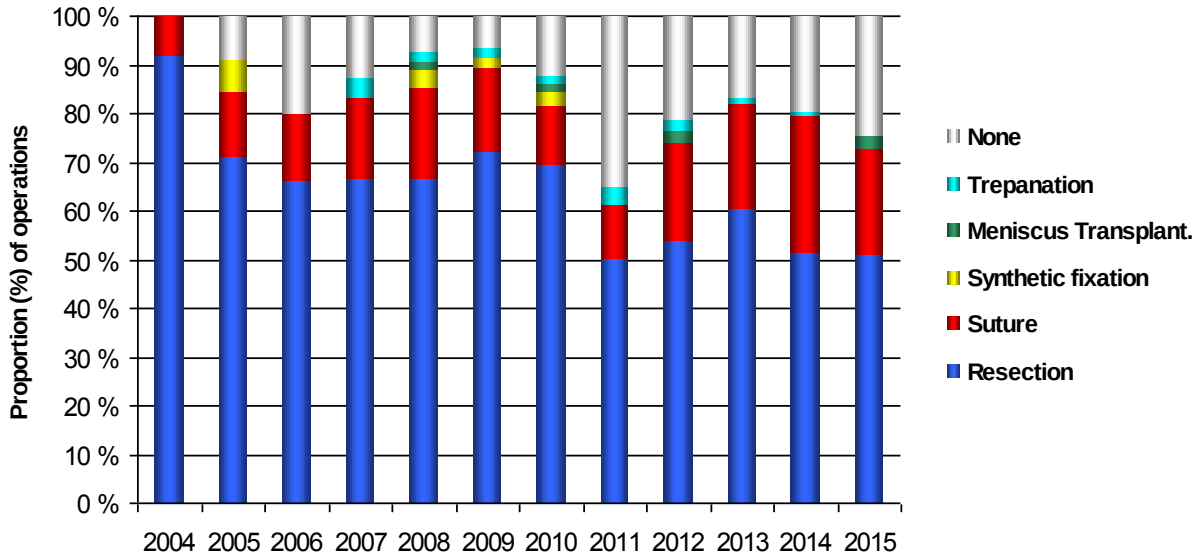
		Resection				Synthetic fixation	Meniscus Transplant.	Trepanation	None	Total
		OLD	Total	Partial	Suture					
2015	Lateral			19	8				16	**43**
2015	Medial			39	17		3		12	**71**
2014	Lateral			24	12				4	**40**
2014	Medial			29	17			1	16	**63**
2013	Lateral			29	4			1	7	**41**
2013	Medial			32	18				10	**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**
2004-10	Lateral	83			13	4		2	18	**120**
2004-10	Medial	138		2	35	4	2	3	17	**201**
Total		**234**	**5**	**239**	**149**	**8**	**7**	**12**	**145**	**799**

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 registreded 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	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Contour Meniscus arrow	**3**	2			1							
Meniscus arrow	**1**	1										
Unknown	**1**					1						
Total	**5**	**3**			**1**	**1**						

Table 49: Suture

Produktnavn	Total	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
FAST-FIX	**98**	3	4	6	6	5	4	5	14	16	19	16
Meniscus arrow	**1**						1					
Rapidloc	**4**	1	2	1								
Unknown	**26**					1		4	1	5	6	9
Total	**129**	**4**	**6**	**7**	**6**	**6**	**5**	**9**	**15**	**21**	**25**	**25**

Cartilage lesion all localizations

Table 50: ICRS Grade

Definitjon 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
2015	29,7%	42,3%	22,9%	4,0%	1,1%
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%	
2004-10	19,4%	53,8%	21,3%	4,1%	1,4%

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
2015	16,0%	0,6%	76,0%	1,7%	5,7%
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%
2004-10	5,0%	2,0%	65,5%	1,7%	25,8%

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)

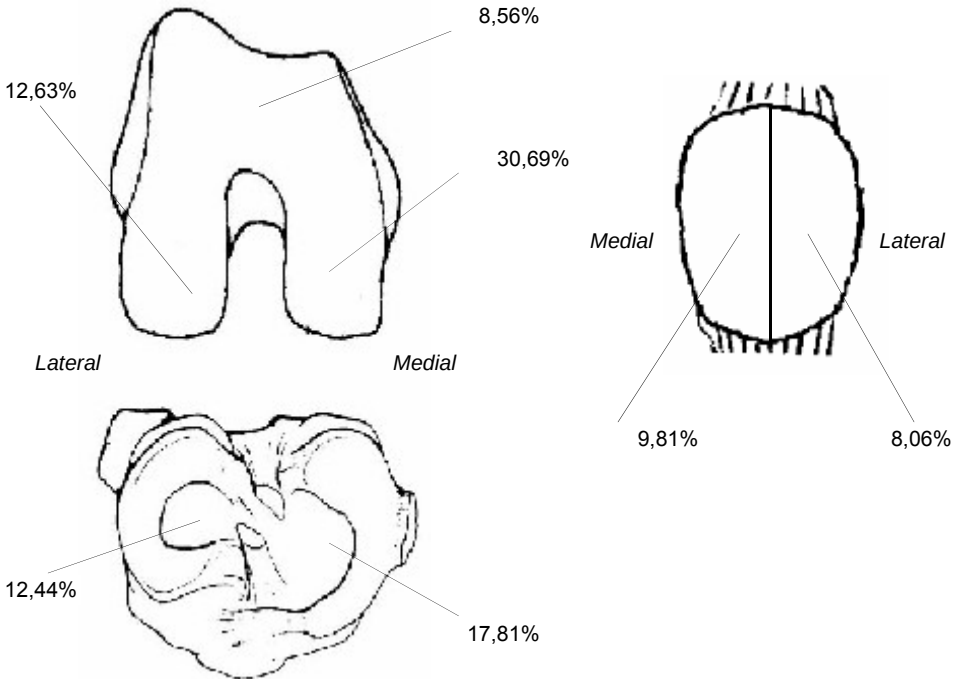


Figure 16: All Cartilage injuries with area greater than 2 cm² (total)

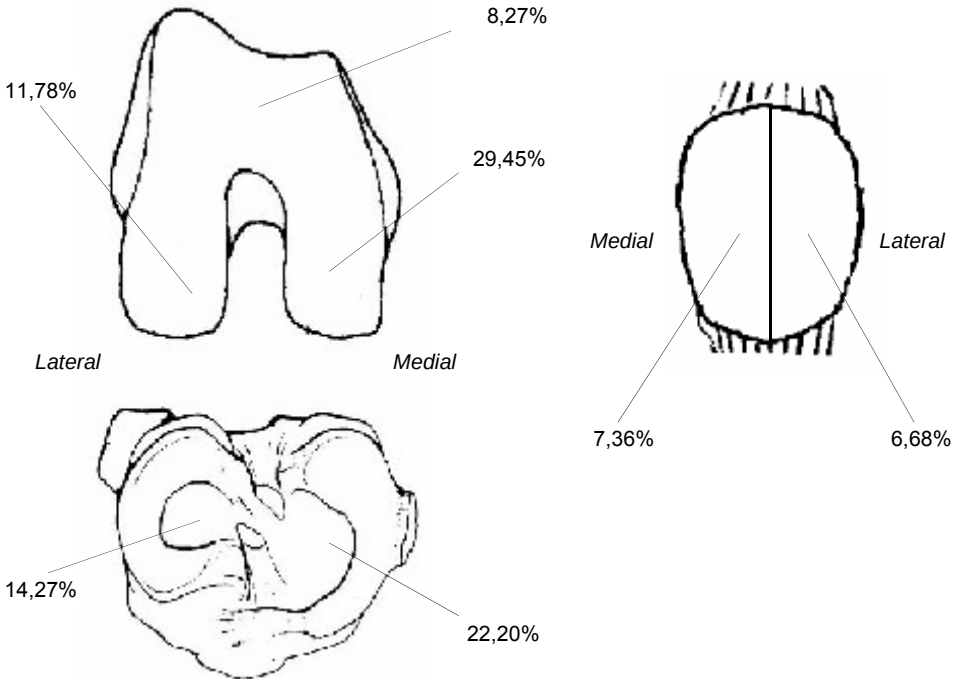
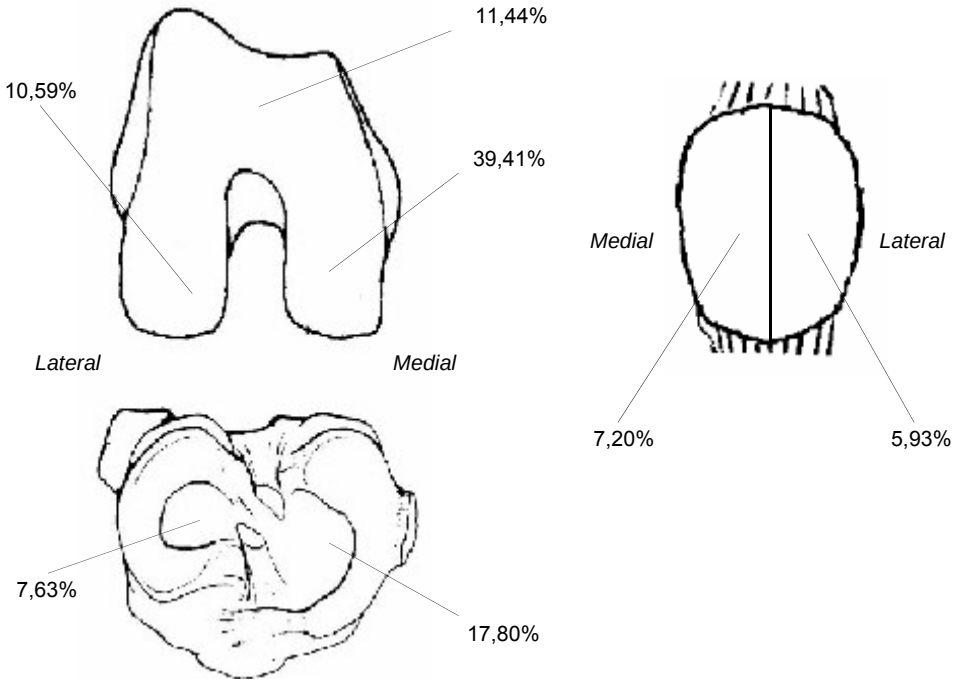


Figure 17: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 52: Outpatient surgery

	Yes		No		Missing		Total
2015	117	(52,5%)	100	(44,8%)	6	(2,7%)	**223**
2014	125	(49,8%)	124	(49,4%)	2	(0,8%)	**251**
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**
2004-10	274	(34,4%)	519	(65,1%)	4	(0,5%)	**797**
Total	**813**	**(43,4%)**	**1043**	**(55,7%)**	**18**	**(1,0%)**	**1874**

Intraoperative complications

Table 53 : Intraoperative complications

	Yes		No		Missing		Total
2015	8	(3,6%)	205	(91,9%)	10	(4,5%)	**223**
2014	3	(1,2%)	235	(93,6%)	13	(5,2%)	**251**
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**
2004-10	37	(4,6%)	740	(92,8%)	20	(2,5%)	**797**
Total	**63**	**(3,4%)**	**1748**	**(93,3%)**	**63**	**(3,4%)**	**1874**

Systemic antibiotic prophylaxis

Table 54: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2015	219	(98,2%)	3	(1,3%)	1	(0,4%)	**223**
2014	249	(99,2%)	2	(0,8%)			**251**
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**
2004-10	784	(98,4%)	10	(1,3%)	3	(0,4%)	**797**
Total	**1847**	**(98,6%)**	**21**	**(1,1%)**	**6**	**(0,3%)**	**1874**

Table 55: Drug

	2004-10	2011	2012	2013	2014	2015
Benzylpenicillin (Penicillin G)			0,46%			
Cefalotin (Keflin)	92,35%	96,00%	88,43%	91,67%	90,76%	92,69%
Ceftriakson (Rocefalin)					0,40%	
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	1,02%		0,46%			
Ciprofloksasin (Ciproxin)					0,40%	
Dikloksacillin (Diclocil, Dicillin)	2,81%	0,57%	0,93%	1,47%	0,40%	
Gentamicin (Garamycin, Gensumycin)			0,46%			
Klindamycin (Dalacin, Clindamycin)	2,55%	0,57%	4,17%	3,43%	3,21%	3,20%
Kloksacillin (Ekvacillin)	0,89%	2,29%	4,63%	2,45%	4,02%	2,28%
Oxacillin (Unspecified)					0,40%	
Vankomycin (Vancomycin, Vancocin)		0,57%				
Missing	0,38%		0,46%	0,98%	0,40%	1,83%

Thrombosis prophylaxis

Table 56: Thrombosis prophylaxis

	Yes		No		Missing		Total
2015	175	(78,5%)	47	(21,1%)	1	(0,4%)	**223**
2014	201	(80,1%)	49	(19,5%)	1	(0,4%)	**251**
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**
2005-10	596	(79,6%)	140	(18,7%)	15	(2,0%)	**751**
Total	**1473**	**(80,6%)**	**335**	**(18,3%)**	**20**	**(1,1%)**	**1828**

There are 2 old forms that are filled out so that thrombosis prophylaxis can not be registered. These are added to missing.
There are 6 forms with two drugs and 1467 forms with one drug.

Table 57: Drug

	2005-10	2011	2012	2013	2014	2015
Apixiban (Eliquis)					0,50%	
Dalteparin (Fragmin)	65,10%	64,83%	67,21%	73,41%	58,21%	56,00%
Dekstran (Macrodex, Dextran)		0,69%		0,58%		
Enoksaparin (Klexane)	31,38%	34,48%	32,79%	25,43%	39,30%	42,86%
Rivaroksaban (Xarelto)					0,50%	
Warfarin (Marevan)						0,57%
Ximelagatran (Exanta, Malagatran)	0,50%					
No drugs	2,35%					
Missing	0,17%				1,00%	
Two drugs	0,34%			0,58%	0,50%	0,57%

NSAID's

Table 58: NSAID's

	Yes		No		Missing		Total
2015	82	(36,8%)	134	(60,1%)	7	(3,1%)	**223**
2014	80	(31,9%)	167	(66,5%)	4	(1,6%)	**251**
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**
2007-10	124	(24,6%)	227	(45,0%)	153	(30,4%)	**504**
Total	**517**	**(32,7%)**	**880**	**(55,7%)**	**184**	**(11,6%)**	**1581**

Table 59: Drug

	2007-10	2011	2012	2013	2014	2015
Celecoksib (Celebra)	0,81%			2,38%		
Diklofenak (Voltaren, Diclofenac, Cataflam)	91,13%	95,24%	90,48%	73,81%	68,75%	56,10%
Etoricoksib (Arcoxia)	0,81%	3,17%		1,19%	17,50%	36,59%
Ibuprofen (Ibux, Ibumetin)						1,22%
Ketorolak (Toradol)	5,65%	1,59%	9,52%	19,05%	10,00%	4,88%
Parecoksib (Dynastat)				1,19%		
Piroxicam (Brexidol)	0,81%					
Missing	0,81%			2,38%	3,75%	1,22%

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PAEDIATRIC HIP REGISTER
2016 ANNUAL REPORT

The Paediatric Hip Register is now in its sixth year of operation, and we are very pleased to have obtained the status of a national quality register. This means that all hospitals that treat children with the relevant hip disorders are now required to report to our register. In addition, we are now ensured more funding for future operations, which also involves stricter requirements for good organisation and reporting in our register.

Anne Kristin Reve, PhD candidate and assistant doctor at the Orthopaedic Department of Stavanger University Hospital has completed a completness analysis in cooperation with the Norwegian Patient Register (NPR) of data in the register. Much effort has gone into this analysis, and it has been especially difficult to obtain reliable figures on patients who were only outpatients. The analysis therefore focused most strongly on operated patients. The figures show that we still need to get more reports in and we will therefore conduct a new analysis in two years' time.

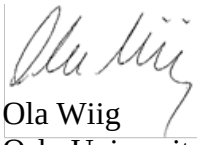
For the past two years, we have been cooperating with Swedish paediatric orthopaedists, who have now established their own paediatric orthopaedic register. We aim to use as similar parameters as possible in the two national registers to enable data to be compared and used in larger studies. In this regard, we will also cooperate on joint Patient-Recorded Outcome Measures (PROMs) to be used in both registers. We have started to translate PROMIS Ped into Norwegian; this is validated for children from 8-17 years, with a separate version for children as young as four.

With regard to open and arthroscopic hip surgery in young adults, a group has been formed to draft a new form for these operations, to ensure that the most useful parameters are recorded. For this part of the register, we plan to use IHOT 12, a questionnaire containing 12 questions which is a simplified version of IHOT 33. IHOT 12 has now been translated and is ready for use.

The collection of radiographs of children in the Register is functioning satisfactorily, and work is now well underway to clean the files and measure the radiographs. Ola Wiig has leave from his post as a chief physician this spring, specifically to undertake this work.

To improve reporting to the registry, we have started planning electronic registration forms. We have got the green light to begin this work, and hope to have completed it during 2017.

Trude Gundersen
Haukeland University Hospital
General Manager



Ola Wiig
Oslo University Hospital
Head of the Steering Committee

PAEDIATRIC HIP DISEASE

Hip Dysplasia

Table 1: HD - New cases per year

Year diagnosed	Unilateral	Bilateral	Missing	Total
2015	33	13	0	**46**
2014	54	22	1	**77**
2013	50	16	0	**66**
2012	74	31	0	**105**
2011	65	19	0	**84**
2010	89	18	0	**107**
2009	20	6	0	**26**
2008	6	2	0	**8**
2007	4	2	0	**6**
2006	1	0	0	**1**
2004	2	0	0	**2**
2001	2	0	0	**2**
2000	1	0	0	**1**
Ukjent	18	3	8	**29**
Total	**419**	**132**	**9**	**560**

Tabell 2: HD - Earlier treatment

Treatment year	None	Pillow / abd. orthosis	Other	Missing	Total
2015	34	21	15	28	**98**
2014	38	39	12	25	**114**
2013	22	16	9	39	**86**
2012	6	4	0	121	**131**
2011	0	1	0	96	**97**
2010	2	2	0	117	**121**
Unknown	1	0	2	14	**17**
Total	**103**	**83**	**38**	**440**	**664**

More than one form for patient per side is possible.

Table 3: HD - Hip status

Year treated	Located	Partially dislocated	Luksert	Missing	Total
2015	50	24	15	9	**98**
2014	64	15	33	2	**114**
2013	45	16	17	8	**86**
2012	66	20	34	11	**131**
2011	54	13	23	7	**97**
2010	63	23	28	7	**121**
Ukjent	7	2	4	4	**17**
Total	**349**	**113**	**154**	**48**	**664**

More than one form for patient per side is possible

Table 4: HD - Acetabular index

Year diagnosed	< 15°	< 20°	< 25°	< 30°	< 35°	< 40°	< 45°	>= 45°	Missing	Total
2015	0	0	1	3	12	4	5	15	6	**46**
2014	0	1	3	7	19	10	5	21	11	**77**
2013	0	0	0	8	15	10	8	11	14	**66**
2012	0	0	5	11	25	10	12	28	13	**105**
2011	0	1	3	11	24	11	6	20	8	**84**
2010	0	3	5	23	25	12	12	14	13	**107**
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	2	2	0	1	0	**6**
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	1	3	1	16	**29**
Total	**0**	**5**	**18**	**72**	**136**	**67**	**55**	**116**	**91**	**560**

Mean number used for both hips for bilateral HD,

Table 5: HD - Non-operative treatment

Treatment year	Pillow	Plaster	Abduction orthosis	Closed reduction	No treatment/ obs.	Missing	Total
2015	0	3	14	2	0	0	**19**
2014	0	6	8	6	1	0	**21**
2013	9	6	17	2	2	0	**36**
2012	35	27	39	6	10	4	**121**
2011	24	14	43	5	5	2	**93**
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	2	0	**11**
Total	**108**	**79**	**182**	**32**	**27**	**9**	**437**

Table 6: HD - Reduction - Surgical

Treatment year	Yes
2015	**10**
2014	**12**
2013	**10**
2012	**6**
2011	**12**
2010	**14**
Total	**64**

Table 7: HD - Femoral osteotomy

Treatment year	Varising	Rotation	Shortening	Total
2015	4	2	2	**8**
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	**16**	**13**	**7**	**36**

Table 8: HD - Pelvic osteotomy

Treatment year	Salter	Dega	Triple	Periacetab.	Periacetab. osteotomy	Other	Total
2015	5	6	0	0	0	3	**14**
2014	8	2	0	0	0	0	**10**
2013	8	0	0	0	1	0	**8**
2012	3	0	0	0	0	0	**3**
2011	2	1	0	2	0	0	**5**
2010	1	1	0	0	0	0	**2**
Total	**27**	**10**	**0**	**2**	**1**	**3**	**42**

Table 9: HD - Tenotomi

Treatment year	Psoas tenotomy	Adductor tenotomy	Total
2015	6	6	**12**
2014	8	14	**22**
2013	8	2	**10**
2012	5	5	**10**
2011	3	0	**3**
2010	8	5	**13**
Total	**38**	**32**	**70**

Epiphyseolysis Capitis Femoris

Table 10: ECF - New cases per year

Year diagnosed	Unilateral	Bilateral	Total
2015	15	7	**22**
2014	21	3	**24**
2013	18	11	**29**
2012	16	4	**20**
2011	26	8	**34**
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	12	11	**23**
Total	**141**	**52**	**193**

Table 11: ECF - Classification

Year diagnosed	Acute	Chronic	Acute on chronic	Stable (Able to bear weight)	Unstable (Unable to ambulate)
2015	6	15	2	18	5
2014	1	17	6	14	9
2013	3	17	5	20	5
2012	2	9	5	10	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	7	0	9	1
Total	**25**	**94**	**28**	**111**	**37**

Table 12: ECF - Symptoms duration

Year diagnosed	< 4 weeks	4 - 8 weeks	9 - 26 weeks	27-52 weeks	> 52 weeks	Total
2015	0	1	1	0	0	**2**
2014	0	2	1	0	1	**4**
2013	1	2	3	3	0	**9**
2012	3	4	3	1	0	**11**
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**	**20**	**22**	**10**	**5**	**71**

Table 13: ECF - Degree of slippage

Year diagnosed	< 30°	30 - 50°	> 50°	Total
2015	12	8	2	**22**
2014	9	6	8	**23**
2013	12	11	4	**27**
2012	7	3	5	**15**
2011	11	7	6	**24**
2010	15	4	7	**26**
2005	1	0	0	**1**
Unknown	5	3	2	**10**
Total	**72**	**42**	**34**	**148**

Table 14: ECF - Type of primary operation

Year treated	Screw osteosynthesis	Femoral osteotomy	Pin osteosynthesis	Total
2015	21	1	10	**33**
2014	28	0	4	**32**
2013	32	0	11	**43**
2012	14	0	7	**21**
2011	24	1	15	**40**
2010	22	1	13	**36**
2009	1	0	0	**1**
Unknown	0	0	2	**2**
Total	**142**	**3**	**62**	**207**

Table 15: ECF - Primary operation - Osteosynthesis with screws

Year treated	Number of screws			Brand		
	1 screw	2 screws	> 2 screws	Olmed	Richards	Smith+N.
2015	19	1	0	10	4	3
2014	23	5	0	10	6	3
2013	28	1	1	12	7	1
2012	10	3	0	7	0	0
2011	20	4	0	15	3	1
2010	19	3	0	13	4	0
2009	1	0	0	1	0	0
Total	**120**	**17**	**1**	**68**	**24**	**8**

Smith+N. = Smith and Nephew

Table 16: 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
2015	0	8	2	0	5	3	0	0	0
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**	**51**	**8**	**0**	**34**	**6**	**1**	**2**	**4**

Calvè-Legg-Perthes

Table 17: CLP - Number of new cases per year

Year diagnosed	Unilateral	Bilateral	Total
2015	22	3	**25**
2014	34	1	**35**
2013	38	1	**39**
2012	40	3	**43**
2011	23	4	**27**
2010	59	12	**71**
2009	4	0	**4**
2008	1	2	**3**
2007	3	0	**3**
2006	1	0	**1**
2005	2	0	**2**
2003	5	0	**5**
2002	4	0	**4**
2001	1	0	**1**
2000	1	0	**1**
Unknown	30	4	**34**
Total	**268**	**30**	**298**

Table 18: CLP - Catterall

Year diagnosed	I/II	III/IV	Missing	Total
2015	9	15	2	**26**
2014	7	23	5	**35**
2013	11	22	6	**39**
2012	14	24	5	**43**
2011	11	16	0	**27**
2010	22	42	7	**71**
2009	0	4	0	**4**
2008	0	2	1	**3**
2007	0	1	2	**3**
2006	0	0	1	**1**
2005	0	1	1	**2**
2003	0	1	4	**5**
2002	0	1	3	**4**
2001	0	0	1	**1**
2000	1	0	0	**1**
Unknown	1	12	26	**39**
Total	**76**	**164**	**64**	**304**

I/II = < 50 % caput necrosis III/IV = < 50 % caput necrosis

Table 19: CLP - Treatment

Year treated	None/ physiotherapy	Abduction orthosis	Femoral osteotomy	Salter	Dega	Periacetabular	Other pelvic osteotomy	Total
2015	29	0	12	0	0	0	1	**42**
2014	32	2	9	0	0	0	0	**43**
2013	30	0	13	0	0	0	0	**43**
2012	32	0	3	0	0	0	2	**37**
2011	29	0	15	0	0	0	0	**44**
2010	41	0	10	0	0	0	0	**51**
Unknown	10	0	0	0	0	0	0	**10**
Total	**203**	**2**	**62**	**0**	**0**	**0**	**3**	**270**

Table 20: CLP - Plates and screws

Year treated	Prebent plate	Angel plate	Special plate	Normal screws	Angle-stable screws
2015	1	2	8	2	8
2014	0	0	8	1	5
2013	2	1	9	3	12
2012	1	0	7	2	2
2011	0	0	19	5	9
2010	1	7	3	5	3
Total	**5**	**10**	**54**	**18**	**39**

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.

2. Espehaug B. Quality of total hip replacements in Norway 1987–1996. The Norwegian Arthroplasty Register [dissertation]. Bergen, Norway: University of Bergen, 1998.

3. Furnes O. Hip and knee replacement in Norway 1987–2000. The Norwegian Arthroplasty Register [dissertation]. Bergen, Norway: University of Bergen, 2002.

4. Lie SA. Survival studies of total hip replacements and postoperative mortality [dissertation]. Bergen, Norway: University of Bergen, 2002.

5. Flugsrud GB. Risk factors for disabling osteoarthritis of the hip and for revision hip surgery. An epidemiological investigation [dissertation]. Oslo, Norway: University of Oslo, 2005.

6. Hallan G. Wear, fixation, and revision of total hip prostheses [dissertation]. Bergen, Norway: University of Bergen, 2007.

7. Monstad K. Essays on the Economics of health and fertility [dissertation]. Bergen, Norway: The Norwegian school of economics and business administration, 2007.

8. Arthursson AJ. Surgical approach and muscle strength in total hip arthroplasty [dissertation]. Bergen, Norway: University of Bergen, 2008.

9. Lygre SH. Pain, function and risk of revision after primary knee arthroplasty [dissertation]. 2010 University of Bergen; Bergen, Norway.

10. Lehmann TG. Slipped capital femoral epiphysis. Diagnostics, treatment and long-term outcome [dissertation]. 2013 University of Bergen; Bergen, Norway.

11. Dale H. Infection after primary hip arthroplasty. Epidemiology, time trends and risk factors in data from national health registers [dissertation]. 2013 University of Bergen; Bergen, Norway.

12. Engesæter IØ. Hip dysplasia in young adults [dissertation]. 2013 University of Bergen; Bergen, Norway.

13. Gøthesen Ø. Computer navigation in total knee replacement surgery. Effect on outcome [dissertation]. 2013 University of Bergen; Bergen, Norway.

14. Lindalen E. Reverse hybrid total hip replacement: Wear, fixation and bone remodeling [dissertation]. 2013 University of Oslo; Oslo, Norway.

15. Gillam MH. Time to event analysis of arthroplasty registry data [dissertation]. 2013 The University of Adelaide; Australia.

16. Schrama JC. Infected hip and knee arthroplasties in rheumatoid arthritis [dissertation]. 2014 University of Bergen; Bergen, Norway.

17. Pankewitsch K. Modellierung eines Monitoringsystems zur Risikosteuerung in der Hűftendoprothetik [dissertation]. 2014 der Juristischen und Wirtschaftswissenschaftlichen Fakultät, der Martin-Luther-Universität; Halle-Wittenberg, Deutschland. ISBN 978-3-86386-772-0.

18. Dybvik E. Cancer and total hip replacement [dissertation]. 2015 University of Bergen; Bergen, Norway.

Norwegian Cruciate Ligament Register

19. Granan LP. Development of a national knee ligament registry [dissertation]. 2009 University of Oslo; Oslo, Norway.

20. Moksnes H. Functional and radiological outcomes following a non-operative treatment algorithm after ACL injuries in skeletally immature children [dissertation]. 2013 University of Oslo; Oslo, Norway.

21. Gifstad T. Results after ACL reconstruction - Clinical and registry-based studies [dissertation]. 2014 University of Trondheim; Trondheim, Norway.

22. Røtterud JH. Focal cartilage lesions in anterior cruciate ligament-injured knees. Incidence, risk, prognosis and treatment [dissertation]. 2015 University of Oslo; Oslo, Norway.

Norwegian Hip Fracture Register

23. Gjertsen JE. Surgical treatment of hip fractures in Norway [dissertation]. Bergen, Norway: University of Bergen, 2009.

24. Matre K. Treatment of trochanteric and subtrochanteric hip fractures. Sliding hip screw or intramedullary nail? [dissertation]. 2013 University of Bergen; Bergen, Norway.

25. Bakken M. Barriers for improving medication in older adults [dissertation]. 2015 University of Bergen; Bergen, Norway

26. Talsnes Ove. Femoral neck fractures treated with hemiprosthesis: Comorbidity, organ affection and bone cement. On the quest for factors affecting mortality [dissertation]. 2016 University of Oslo; Oslo, Norway.

Norwegian National Advisory Unit on Arthroplasty and Hip Fractures

27. Figved PW. Hemiarthroplasty and femoral neck fractures [dissertation]. 2010 University of Oslo; Oslo, Norway.

28. Laborie LB. Hip Dysplasia and femoroacetabular impingement. Studies in newborns and young adults with focus on radiology and clinical epidemiology [dissertation]. 2013 University of Bergen; Bergen, Norway.

29. Young S. Orthopaedic trauma surgery in low-income countries.
Follow-up, infections and HIV [dissertation]. 2014 University of Bergen; Bergen, Norway.

30. Kadar TK. Wear and migration in cemented total hip arthroplasty [dissertation].
2014 University of Bergen; Bergen, Norway.

31. Blomquist J. Surgical treatment of shoulder instability in Norway [dissertation].
2016 University of Bergen; Bergen, Norway.

Articles

Norwegian Arthroplasty Register

1. Engesæter LB, Havelin LI, Espehaug B, Vollset SE. [Artificial hip joints in Norway.
A national registry of total hip arthroplasties.] Tidsskr Nor Laegefor 1992;112:872–5.

2. Havelin LI, Espehaug B, Vollset SE, Engesæter LB, Langeland N.
The Norwegian Arthroplasty Register. A survey of 17,444 total hip replacements.
Acta Orthop Scand 1993;64:245–51.

3. Havelin LI, Espehaug B, Vollset SB, Engesæter LB. Early failures among 14,009 cemented and 1,326 uncemented prostheses for primary coxarthrosis.
The Norwegian Arthroplasty Register, 1987–1992. Acta Orthop Scand 1994;65:1–6.

4. Havelin LI, Espehaug B, Vollset SE, Engesæter LB. Early aseptic loosening of uncemented femoral components in primary total hip replacement. A review based on the Norwegian Arthroplasty Register. J Bone Joint Surg 1995;77-B:11–7.

5. Havelin LI, Espehaug B, Vollset SE, Engesaeter LB. The effect of cement type on early revision of Charnley total hip prostheses. A review of 8,579 primary arthroplasties from the Norwegian Arthroplasty Register. J Bone Joint Surg 1995;77-A:1543–50.

6. Havelin LI, Vollset SE, Engesæter LB. Revision for aseptic loosening of uncemented cups in 4.352 primary total hip prostheses. A report from the Norwegian Arthroplasty Register.
Acta Orthop Scand 1995;66:494–500.

7. Espehaug B, Havelin LI, Engesæter LB, Vollset SE, Langeland N. Early revision among 12,179 hip prostheses. A comparison of 10 different prosthesis brands reported to the Norwegian Arthroplasty Register, 1987–1993. Acta Orthop Scand 1995;66:487–93.

8. Engesæter LB, Furnes A, Havelin LI, Lie SA, Vollset SE. [The hip registry. Good economy for society.] Tidsskr Nor Lægefor 1996;116:3025–7.

9. Skeide BE, Lie SA, Havelin LI, Engesæter LB. [Total hip arthroplasty after femoral neck fractures. Results from the national registry on joint prostheses.]
Tidsskr Nor Lægefor 1996;116:1449–51.

10. Furnes A, Lie SA, Havelin LI, Engesæter LB, Vollset SE. The economic impact of failures in total hip replacement surgery. The Norwegian Arthroplasty Register 1987–1993.
Acta Orthop Scand 1996;67:115–21.

11. Furnes A, Lie SA, Havelin LI, Engesæter LB. [Quality control of prosthetic replacements of knee, ankle, toe, shoulder, elbow and finger joints in Norway 1994. A report after the first year of registration of joint prostheses in the national registry.] Tidsskr for Nor Lægefor 1996;116:1777–81.

12. Espehaug B, Havelin LI, Engesæter LB, Langeland N, Vollset SE. Patient-related risk factors for early revision of total hip replacements - A population register-based case-control study. Acta Orthop Scand 1997;68:207–15.

13. Espehaug B, Engesæter LB, Vollset SE, Havelin LI, Langeland N. Antibiotic prophylaxis in total hip arthroplasty. Review of 10,905 primary cemented total hip replacements reported to the Norwegian Arthroplasty Register, 1987–1995. J Bone Joint Surg 1997;79-B:590–5.

14. Furnes O, Lie SA, Havelin LI, Vollset SE, Engesæter LB. Exeter and Charnley arthroplasties with Boneloc or high viscosity cement. Comparison of 1127 arthroplasties followed for 5 years in the Norwegian Arthroplasty Register. Acta Orthop Scand 1997;68:515–20.

15. Espehaug B, Havelin LI, Engesæter LB, Langeland N, Vollset SE. Patient satisfaction and function after primary and revision total hip replacement. Clin Orthop 1998;351:135–48.

16. Espehaug B, Havelin LI, Engesæter LB, Vollset SE. The effect of hospital-type and operating volume on the survival of hip replacements. A review of 39,505 primary total hip replacements reported to the Norwegian Arthroplasty Register, 1988–1996. Acta Orthop Scand 1999;70:12-8.

17. Havelin LI. The Norwegian Joint Registry. Bull Hosp Jt Dis. 1999;58:139–48.

18. Havelin LI, Espehaug B, Lie SA, Engesæter LB, Furnes O, Vollset SE. The Norwegian Arthroplasty Register. 11 years and 73,000 arthroplasties. Acta Orthop Scand 2000;71:337–53.

19. Lie SA, Havelin LI, Engesæter LB, Gjessing HK, Vollset SE. Mortality after total hip replacement: 0–10 year follow-up of 39,543 patients in the Norwegian Arthroplasty Register. Acta Orthop Scand 2000;71:19–27.

20. Lie SA. [Mortality after total hip replacements]. Nordisk Geriatrik 2000;4:72.

21. Furnes O, Lie SA, Espehaug B, Vollset SE, Engesæter LB, Havelin LI. Hip disease and the prognosis of total hip replacements. A review of 53 698 primary total hip replacements reported to the Norwegian Arthroplasty Register 1987–1999. J Bone Joint Surg 2001;83-B:579–86.

22. Espehaug B, Furnes O, Havelin LI, Engesæter LB, Vollset SE. The type of cement and failure of total hip replacements. J Bone Joint Surg 2002;84-B:832–8.

23. Flugsrud GB, Nordsletten L, Espehaug B, Havelin LI, Meyer HE. Risk factors for total hip replacement due to primary osteoarthritis: a cohort study in 50,034 persons. Arthritis Rheum 2002;46:675–82.

24. Furnes O, Espehaug B, Lie SA, Vollset SE, Engesæter LB, Havelin LI. Early failures among 7174 primary total knee replacements. A follow-up study from The Norwegian Arthroplasty Register 1994–2000. Acta Orthop Scand 2002;73:117–29.

25. Lie SA, Engesæter LB, Havelin LI, Furnes O, Vollset SE. Early postoperative mortality after 67,548 total hip replacements. Causes of death and thromboprophylaxis in 68 hospitals in Norway from 1987 to 1999. Acta Orthop Scand 2002;73:392–9.

26. Havelin LI, Espehaug B, Engesæter LB. The performance of two hydroxyapatite- coated acetabular cups compared with Charnley cups. From the Norwegian Arthroplasty Register. J Bone Joint Surg 2002;84-B:839–45.¨

27. Lie SA. [Patients in the Norwegian Arthroplasty Register]. Revmatikeren 2003;5:18-9.

28. Flugsrud GB, Nordsletten L, Espehaug B, Havelin LI, Meyer HE. Weight change and the risk of total hip replacements. Epidemiology 2003;14:578–84.

29. Furnes O, Havelin LI, Espehaug B, Engesæter LB, Lie SA, Vollset SE. [The Norwegian registry of joint prostheses--15 beneficial years for both the patients and the health care]. Tidsskr Nor Lægeforen 2003;123:1367-9.

30. Engesæter LB, Lie SA, Espehaug B, Furnes O, Vollset SE, Havelin LI. Antibiotic prophylaxis in total hip arthroplasty: effects of antibiotic prophylaxis systemically and in bone cement on the revision rate of 22,170 primary hip replacements followed 0–14 years in the Norwegian Arthroplasty Register. Acta Orthop Scand 2003;74:644–51.

31. Byström S, Espehaug B, Furnes O, Havelin LI. Femoral head size is a risk factor for total hip luxation: a study of 42,987 primary hip arthroplasties from the Norwegian Arthroplasty Register. Acta Orthop Scand 2003;74:514–24.

32. Lie SA. Havelin LI, Engesæter LB, Furnes O, Vollset SE. Failure rates for 4762 revision total hip arthroplasties in the Norwegian Arthroplasty Register. J Bone Joint Surg 2004;86-B:504–9.

33. Lie SA, Furnes O, Havelin LI, Espehaug B, Engesæter LB, Vollset SE. [The Norwegian Arthroplasty Register. Beneficial for the patients and the Norwegian health care system]. The Norwegian Journal of Epidemiology 2004;14:57–63.

34. Lie SA, Havelin LI, Engesæter LB, Gjessing HK, Vollset SE. Dependency issues in survival analyses of 55782 primary hip replacements from 47355 patients. Stat Med 2004;23:3227–40.

35. Småbrekke A, Espehaug B, Havelin LI, Furnes O. Operating time and survival of primary total hip replacements. A review of 31,745 primary cemented and uncemented total hip replacements from local hospitals reported to the Norwegian Arthroplasty Register 1987–2001. Acta Orthop Scand 2004;75:524–32.

36. Furnes O. Hofteproteser og sementer. Tidsskr Nor Lægeforen 2004;124:2455.

37. Aamodt A, Nordsletten L, Havelin LI, Indrekvam K, Utvåg SE, Hviding K. Documentation of hip prostheses used in Norway. A critical review of the literature from 1996–2000. Acta Orthop Scand 2004;75:663–76.

38. Arthursson AJ, Furnes O, Espehaug B, Havelin LI, Søreide JA. Validation of data in the Norwegian Arthroplasty Register and the Norwegian Patient Register. 5134 primary total hip arthroplasties and revisions operated at a single hospital between 1987 and 2003. Acta Orthop 2005;76:823–828.

39. Espehaug B, Furnes O, Havelin LI, Engesæter LB, Vollset SE, Kindseth O. Registration completeness to the Norwegian Arthroplasty Register. Acta Orthop 2006;77:49–56.

40. Flugsrud GB, Nordsletten L, Espehaug B, Havelin LI, Engeland A, Meyer HE. The impact of body mass index on later osteoarthritis of the hip varies with age at screening. A cohort study in 1.2 million persons. Arthritis Rheum 2006;54:802–7.

41. Lie SA. Early mortality after elective hip surgery [guest editorial]. Acta Orthop 2006;77:345–6.

42. Engesæter LB, Espehaug B, Lie SA, Furnes O, Havelin LI. Does cement increase the risk for infection in primary total hip arthroplasty. Revision rates in 56275 cemented and uncemented primary THAs followed for 0–16 years in the Norwegian Arthroplasty register. Acta Orthop 2006; 77:351–8.

43. Lohmander LS, Engesæter LB, Herberts P, Ingvarsson T, Lucht U, Puolakka TJS. Standardized incidence rates of total hip replacement for primary hip osteoarthritis in the 5 Nordic countries:similarities and differences. Acta Orthop 2006;77:733–40

44. Slover J, Espehaug B, Havelin LI, Engesæter LB, Furnes O, Tomek I, Tosteson A. Cost-effectiveness of unicompartmental and total knee arthroplasty in elderly low-demand patients. J Bone Joint Surg 2006;88-A:2348–55.

45. Furnes O, Espehaug B, Lie SA, Vollset SE, Engesæter LB, Havelin LI. Failure mechanisms after unicompartmental and tricompartmental primary knee replacement with cement. J Bone Joint Surg 2007;89-A:519–525.

46. Fevang BT, Lie SA, Havelin LI, Engesæter LB, Furnes O. Reduction in orthopedic surgery among patients with chronic inflammatory joint disease in Norway, 1994–2004. Arthritis Rheum 2007;57:529–32.

47. Flugsrud GB, Nordsletten L, Espehaug B, Havelin LI, Meyer HE. The effect of middle-age body weight and physical activity on the risk for early revision hip arthroplasty. A cohort study in 1535 persons. Acta Orthop 2007;78:99–107.

48. Lie SA, Hallan G, Engesæter LB, Havelin LI, Furnes O. Isolated acetabular liner exchange compared with complete acetabular component revision in revision of primary uncemented acetabular components. A study of 1649 revisions from the Norwegian Arthroplasty register. J Bone Joint Surg 2007;89-B:591–4.

49. Kurtz S, Ong K, Scheimer J, Mowat F, Kaled S, Dybvik E, Kärrholm J, Garellick G, Havelin LI, Furnes O, Malchaug H, Lau E. Future clinical and economic impact of revision THA and TKA. J Bone Joint Surg 2007;89-B(Suppl 3):144–51.

50. Fevang BT, Lie SA, Havelin LI, Brun JG, Skredderstuen A, Furnes O. 257 ankle arthroplasties performed in Norway between 1994 to 2005. Acta Orthop 2007;78:575–83.

51. Figved W, Dybvik E, Frihagen F, Furnes O, Madsen JE, Havelin LI, Nordsletten L. Conversion from failed hemiarthroplasties to total hip arthroplasty. A Norwegian Arthroplasty Register analysis of 595 hips with previous femoral neck fractures. Acta Orthop 2007;78:711–8.

52. Arthursson A, Furnes O, Espehaug B, Havelin LI, Søreide JA. Prosthesis survival after total hip arthroplasty - does surgical approach matter? Analysis of 19304 Charnley and 6002 Exeter primary total hip arthroplasties reported to the Norwegian Arthroplasty Register. Acta Orthop 2007;78:719–29.

53. Hallan G, Furnes O, Lie SA, Engesæter LB, Havelin LI. Medium and long-term performance of 11 516 uncemented primary femoral stems from the Norwegian Arthroplasty register. J Bone Joint Surg 2007;89-B:1574–80.

54. Engesæter LB, Furnes O, Havelin LI. Developmental dysplasia of the hip - good results of later total hip Arthroplasty: 7135 primary total hip arthroplasties after developmental dysplasia of the hip compared with 59774 total hip arthroplasties in idiopathic coxarthrosis followed for 0 to 15 years in the Norwegian Arthroplasty Register. J Arthroplasty 2008;23:235–40.

55. Reigstad O, Siewers P, Røkkum M, Espehaug B. Excellent long-term survival of an uncemented press-fit stem and screw cup in young patients. Follow-up of 75 hips for 15–18 years. Acta Orthop 2008;79:194–202.

56. Engesæter IØ, Lie SA, Lehmann TG, Furnes O, Vollset SE, Engesæter LB. Neonatal hip instability and risk of total hip replacement in younger adulthood. Follow-up of 2,218,596 newborns from the Medical Birth Registry of Norway in the Norwegian Arthroplasty Register. Acta Orthop 2008 Jun;79(3):321–26.

57. Hulleberg G, Aamodt A, Espehaug B, Benum P. A clinical and radiographic 13-year follow-up study of 138 Charnley hip arthroplasties in patients 50–70 years old. Comparison of university hospital data and registry data. Acta Orthop 2008; 79:1–9.

58. Fevang BT, Lie SA, Havelin LI, Skredderstuen A, Furnes O. Risk factors for revision after shoulder arthroplasty. 1825 shoulder arthroplasties from the Norwegian Arthroplasty Register. Acta Orthop 2009;80:1,83–91.

59. Fevang BT, Lie SA, Havelin LI, Skredderstuen A, Furnes O. Results after 562 total elbow replacements: A report from the Norwegian Arthroplasty Register. J Shoulder Elbow Surg. 2009 May–June;18(3):449–56.

60. Cummins JS, Tomek IM, KantorSR, Furnes O, Engesæter LB, Finlayson SR. Cost-effectiveness of antibiotic-impregnated bone cement used in primary total hip arthroplasty. J Bone Joint Surg Am. 2009;91(3):634–41.

61. Espehaug B, Furnes O, Engesæter LB, Havelin LI. 18 years of results with cemented primary hip prostheses in the Norwegian Arthroplasty Register: concerns about some newer implants. Acta Orthop 2009;80:4,402–12.

62. Havelin LI, Fenstad AM, Salomonsson R, Mehnert F, Furnes O, Overgaard S, Pedersen AB, Herberts P, Kärrholm J, Garellick G. The Nordic Arthroplasty Register Association. A unique collaboration between 3 national hip arthroplasty registries with 280, 201 THRs. Acta Orthop 2009;80:4,393–401.

63. Dybvik E, Furnes O, Fosså SD, Trovik C, Lie SA. Long-term risk of receiving a total hip replacement in cancer patients. Cancer Epidemiol 2009 Oct;33(3–4):235–41.

64. Dale H, Hallan G, Espehaug B, Havelin LI, Engesæter LB. Increasing risk of revision due to deep infection after hip Arthroplasty. Acta Orthop 2009;80(6):639–45

65. Lie SA, Pratt N, Ryan P, Engesæter LB, Havelin LI, Furnes O, Graves S. Duration of the increase in early postoperative mortality after elective hip and knee replacement. J Bone Joint Surg Am 2010;92(1):58–63

66. Hallan G, Dybvik E, Furnes O, Havelin LI. Metal-backed acetabular components with conventional polyethylene: A review of 9113 primary components with a follow-up of 20 years. J Bone Joint Surg Br 2010 Feb;92(2):196–201

67. Lygre SH, Espehaug B, Havelin LI, Vollset SE, Furnes O. Does patella resurfacing really matter? Pain and function in 972 patients after primary total knee arthoplasty. An observational study from the Norwegian Arthroplasty Register. Acta Orthop 2010 Feb;81(1):99–107.

68. Robertsson O, Bizjajeva S. Fenstad AM, Furnes O, Lidgren L, Mehnert F, Odgaard A, Pedersen AB, Havelin LI. Knee arthroplasty in Denmark, Norway and Sweden. Acta Orthop 2010;81(1):82–89.

69. Schrama JC, Espehaug B, Hallan G, Engesæter LB, Furnes O, Havelin LI, Fevang BT. Risk of revision for infection in primary total hip and knee arthroplasty in patients with rheumatoid arthritis: A prospective, population-based study on 108,786 hip and knee joint arthroplasties from the Norwegian Arthroplasty Register. Arthritis Care & Research 2010 April;62(4):473–79.

70. Johanson P-E, Fenstad AM, Furnes O, Garellick G, Havelin LI, Overgaard S, Pedersen AB, Kärrholm. Inferior outcome after hip resurfacing arthroplasty than after conventional arthroplasty. Evidence from the Nordic Arthroplasty Register Association (NARA) database, 1995 to 2007. Acta Orthop 2010;81(5):535–41.

71. Jämsen E, Furnes O, Engesæter LB, Konttinen YT, Odgaard A, Stefánsdóttir A, Lidgren L. Prevention of deep infection in joint replacement surgery. Acta Orthop 2010;81(6):660–66.

72. Fevang BT, Lie SA, Havelin LI, Engesæter LB, Furnes O. Improved results of primary total hip replacement. Results from the Norwegian Arthroplasty Register, 1987–2007. Acta Orthop 2010;81(6):649–59.

73. Lygre SH, Espehaug B, Havelin LI, Furnes O, Vollset SE. Pain and function in patients after primary unicompartmental and knee arthroplasty. J Bone Joint Surg Am 2010;92:2890–97.

74. Engesæter IØ, Lehmann T, Laborie LB, Lie SA, Rosendahl K, Engesæter LB. Total hip replacement in young adults with hip dysplasia. Age at diagnosis, previous treatment, quality of life, and validation of diagnoses reported to the Norwegian Arthroplasty Register between 1987 and 2007. Acta Orthop 2011 Apr;82(2):149–54.

75. Gøthesen Ø, Espehaug B, Havelin LI, Petursson G, Furnes O. Short-term outcome of 1,465 computer-navigated primary total knee replacements 2005–2008. Acta Orthop 2011 May;82(3):293–300.

76. Apold H, Meyer HE, Espehaug B, Nordsletten B, Havelin LI, Flugsrud GB. Weight gain and the risk of total hip replacement. A population-based prospective cohort study of 265,725 individuals. Osteoarthritis Cartilage 2011 Jul;19(7):809–15.

77. Engesæter LB, Dale H, Schrama JC, Hallan G, Lie SA. Surgical procedures in the treatment of 784 infected THAs reported to the Norwegian Arthroplasty Register. Best survival with 2-stage exchange revision, but also good results with debridement and retention of the fixed implant. Acta Orthop 2011;82(5):530–37.

78. Ranstam J, Kärrholm J, Pulkkinen P, Mäkelä K, Espehaug, B, Pedersen AB, Mehnert F, Furnes O. Statistical analysis of artrhoplasty data. I. Introduction and background. Acta Orthop 2011 May;82(3):253–57.

79. Ranstam J, Kärrholm J, Pulkkinen P, Mäkelä K, Espehaug, B, Pedersen AB, Mehnert F, Furnes O. Statistical analysis of arthroplasty data. II. Guidelines. Acta Orthop 2011 May;82(3):258–67.

80. Lygre SH, Espehaug B, Havelin LI, Vollset SE, Furnes O. Failure of total knee arthroplasty with or without patella resurfacing. A study from the Norwegian Arthroplasy Register with 0–15 years of follow-up. Acta Orthop 2011 Jun;82(3):282–92.

81. Krukhaug Y, Lie SA, Havelin LI, Furnes O, Hove LM. Results of 189 wrist replacements. A report from the Norwegian Arthroplasty Register. Acta Orthop 2011 June;82(4):405–9.

82. Espehaug B, Furnes O, Engesæter LB, Havelin LI. Hip arthroplasty in Norway 1989–2008. Tidsskr Nor Legeforen 2011 Aug;131(16):1543-8.

83. Engesæter LB, Dale H, Schrama JC, Hallan G, Lie SA. Surgical procedures in the treatment of 784 infected THAs reported to the Norwegian Arthroplasty Register. Best survival with 2-stage exchange revision, but also good results with debridement and retention of the fixed implant. Acta Orthop 2011;(5):530–37.

84. Lindalen E, Havelin LI, Nordsletten L, Dybvik E, Fenstad AM, Hallan G, Furnes O, Høvik Ø, Röhrl SM. Is reverse hybrid hip replacement the solution? 3,963 primary hip replacements with cemented cup and uncemented stem, from the Norwegian Arthroplasty Register. Acta Orthop 2011 Dec;82(6):639–45.

85. Dale H, Skråmm I, Løwer HL, Eriksen HM, Espehaug B, Furnes O, Skjeldestad FE, Havelin LI, Engesæter LB. Infection after primary hip arthroplasty. A comparison of 3 Norwegian health registers. Acta Orthop 2011 Dec;82(6):646–54.

86. Lehmann T, Engesæter IØ, Laborie LB, Lie SA, Rosendahl K, Engesæter LB. Total hip arthroplasty in young adults, with focus on Perthes` disease and slipped capital femoral epiphysis. Acta Orthop 2011;83(2):159–64.

87. Paxton EW, Furnes O, Namba RS, Inacio MCS, Fenstad AM, Havelin LI. Comparison of the Norwegian Knee Arthroplasty Register and a United States Arthroplasty Registry. J Bone Joint Surg Am 2011;93:Suppl 3(E):20–30.

88. Havelin LI, Robertsson O, Fenstad AM, Overgaard S, Garellick G, Furnes O. A Scandinavian experience of register collaboration: The Nordic Arthroplasty Register Assosiation (NARA). J Bone Joint Surg Am 2011;93:Suppl 3(E):13–9.

89. Hallan G, Espehaug B, Furnes O, Wangen H, Høl PJ, Ellison P, Havelin LI. Is there still a place for the cemented titanium femoral stem? 10,108 cases from the Norwegian Arthroplasty Register. Acta Orthop 2012;83(1):1–6.

90. Ellison P, Hallan G, Høl PJ, Gjerdet NR, Havelin LI. Coordinating retrieval and register studies improves postmarket surveillance. Clin Orthop Relat Res. 2012 Nov;470(11):2995–3002.

91. Rasmussen JV, Olsen BS, Fevang BT, Furnes O, Skytta ET, Rahme H, Salomonsen B, Mohammed KD, Page RS, Carr AJ. A review of national shoulder and elbow joint replacement registries. J Shoulder Elbow Surg 2012 Oct;21(10):1328–35.

92. Kadar T, Dybvik E, Hallan G, Furnes O, Havelin LI. Head material influences of a cemented total hip prosthesis in the Norwegian Arhthroplasty Register. Clin Orthop Relat Res. 2012 Nov;470(11):3007–13.

93. Fevang BT, Lygre SH, Bertelsen G, Skredderstuen A, Havelin LI, Furnes O. Good function after shoulder arthroplasty. 1,107 patients with 4 different diagnoses from the Norwegian Arthroplasty Register. Acta Orthop 2012;83(5):467–73.

94. Engesæter LB, Engesæter IØ, Fenstad AM, Havelin LI, Kärrholm J, Garellick G, Pedersen AB, Overgaard S. Low revision rate after total hip arthroplasty in patients with pediatric hip diseases. Evaluation of 14,403 THAs due to DDH, SCFE or Perthes` disease and 288,435 THAs due to primary osteoarthritis in the Danish, Norwegian and Swedish Hip Arthroplasty Registers (NARA). Acta Orthop 2012;83(5):436–41.

95. Dale H, Fenstad AM, Hallan G, Havelin LI, Furnes O, Overgaard S, Pedersen AB, Kärrholm J, Garellick G, Pulkkinen P, Eskelinen A, Mäkelä K, Engesæter LB. Increasing risk of prosthetic joint infection after total hip arthroplasty. 2,778 revisions due to infection after 432,168 primary THAs in the Nordic Arthroplasty Register Association (NARA). Acta Orthop 2012;83(5):449–458.

96. Schrama JC, Lutro O, Langvatn H, Hallan G, Espehaug B, Sjursen H, Engesæter LB, Fevang BT. Bacterial findings in infected hip joint replacements in patients with rheumatoid arthritis and osteoarthritis: A study of 318 revisions for infection reported to the Norwegian Arthroplasty Register. International Scholarly Research Network Vol. 2012; 6 pages.

97. Fevang BT, Lygre SH, Bertelsen G, Skreddertstuen A, Havelin LI, Furnes O. Pain and function in eight hundred and fifty nine patients comparing shoulder hemiprostheses, resurfacing prostheses, reversed total and conventional total prostheses. Int Orthop 2013 Jan;37(1):59–66.

98. Gilliam MH, Lie SA, Salter A, Furnes O, Graves SE, Havelin LI, Ryan P. The progression of end-stage osteoarthritis: analysis of data from the Australian and Norwegian joint replacements registries using a multi-state model. Osteoarthritis Cartilage. 2013 Mar;21(3):405–12.

99. Monstad K, Engesæter LB, Espehaug B. Waiting time and socioeconomic status - an individual-level analysis. Health Econ 2013:1–16.

100. Gøthesen Ø. Espehaug B, Havelin LI, Petursson G, Lygre SH, Ellison P, Hallan G, Furnes O. Survival rates and causes of revision in cemented primary total knee replacement. A report from the Norwegian Arthroplasty Register 1994–2009. Bone Joint J 2013;95-B:636–42.

101. Gøthesen Ø, Slover J, Havelin LI, Askildsen JE, Malchau H, Furnes O. An economic model to evaluate the cost-effectiveness of computer assisted knee replacement surgery in Norway. BMC Musculoskeletal Disord. 2013;14:202.

102. Badawy M, Espehaug B, Indrekvam K, Engesæter LB, Havelin LI, Furnes O. Influence of hospital volum on revision rate after total knee arthroplasty with cement. J Bone Joint Surg Am 2013;95:e131:1–6.

103. Nystad TW, Furnes O, Havelin LI, Skreddertsuen AK, Lie SA, Fevang BT. Hip replacement surgery in patients with ankylosing spondylitis. Ann Rheum Dis. 2014 Jun;73(6):1194–7.

104. Bergh C, Fenstad AM, Furnes O, Garellick G, Havelin LI, Overgaard S, Pedersen AB, Mäkelä K, Pulkkinen P, Mohaddes M, Kärrholm J. Increased risk of revision in patients with non-traumatic femoral head necrosis. Acta Orthop. 2014 Feb;85(1):11-7.

105. 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. BMJ 2014 Jan 13;348:f7592.

106. Mäkelä K, Matilainen M, Pulkinnen P, Fenstad AM, Havelin LI, Engesæter LB, 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. Acta Orthop 2014 Apr;85(2):107–116.

107. Apold H, Meyer HE, Nordsletten L, Furnes O, Baste V, Flugsrud GB. Weight gain and the risk of knee replacement due to primary osteoarthritis. - a population based, prospective cohort study of 225,908 individuals. Osteoarthritis Cartilage;2014 May;22(5):652-8.

108. Krukhaug Y, Lie SA, Havelin LI, Furnes O, Hove LM, Hallan G. The result of 479 thumb carpometacarpal joint replacements reported in the Norwegian Arthroplasty Register. The Journal of Hand Surgery 2014 Oct;39(8):819–25.

109. Pedersen AB, Mehnert F, Havelin LI, Furnes O, Herberts P, Kärrholm J, Garellick G, Mäkela, Eskelinen A, Overgaard S. Association between fixation technique and revision risk in total hip arthroplasty patients younger than 55 years of age. Results from the Nordic Arthroplasty Register Association. Osteoarthitis Cartilage. 2014 May;22(5):659–67.

110. 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. Acta Orthop. 2014;85(4):342-7.

111. Apold H, Meyer HE, Nordsletten L, Furnes O, Baste V, Flugsrud GB. Risk factors for knee replacement due to primary osteoarthritis, a population based prospective cohort study of 315,495 individuals. BMC Musculoskeletal Disord. 2014;15:217.

112. Borgquist L, Dahl AW, Dale H, Lidgren L, Stefánsdóttir A. Prosthetic joint infections a need for health economy studies. Guest editorial. Acta Orthop. 2014;85(3)218–220.

113. Amlie E, Havelin LI, Furnes O, Baste V, Nordsletten L, Høvik Ø, Dimmen S. Worse patient-reported outcome after lateral approach than after anterior and posterolateral approach in primary hip arthroplasty. A cross-sectional questionnaire study of 1,476 patients 1–3 years after surgery. Acta Orthop. 2014;85(5):463–9.

114. Dybvik E, Furnes O, Fosså SD, Trovik C, Lie SA. Pelvic irradiation does not increase the risk of hip replacement in patients with gynecological cancer. A cohort study based on 8,507 patients. Acta Orthop. 2014 Dec;85(6):652-6.

115. Thien TM, Chatziagorou G, Garellick G, Furnes O, Havelin LI, Mäkelä K, Overgaard S, Pedersen A, Eskelinen A, Pulkkinen P, Kärrholm J. Periprosthetic femoral fracture within two years after total hip replacement. Analysis of 437,629 operations in the Nordic Arthroplasty Register Assosiation database. J Bone Joint Surg Am. 2014 Oct 1;96(19):e167.

116. Comfort T, Baste V, Froufe MA, Namba R, Bordini B, Robertsson O, Cafri G, Paxton E, Sedrakyan A, Graves S. International comparative evaluation of fixed-bearing non-posterior- stabilized and posterior-stabilized total knee replacements. J Bone Joint Surg Am. 2014 Dec 17;96 Suppl 1:65–72.

117. Graves S, Sedrakyan A, Baste V, Gioe TJ, Namba R, Cruz OM, Paxton E, Banerjee S, Isaacs AJ, Robertsson O. International comparative evaluation of knee replacement with fixed or mobile-bearing posterior-stabilized prostheses.
J Bone Joint Surg Am. 2014 Dec 17;96 Suppl 1:59–64.

118. Namba R, Graves S, Robertsson O, Furnes O, Stea S, Puig-Verdié L, Hoeffel D, Cafri F, Paxton E, Sedrakyan A. International comparative evaluation of knee replacement with fixed or mobile non-posterior-stabilized implants. J Bone Joint Surg Am. 2014 Dec 17;96 Suppl 1:52–8.

119. Stea S, Comfort T, Sedrakyan A, Havelin LI, Marinelli M, Barber T, Paxton E, Isaacs AJ, Graves S. Multinational comprehensive evaluation of the fixation method used in hip replacement: interaction with age in context. J Bone Joint Surg Am. 2014 Dec 17;96 Suppl 1:42–51.

120. Furnes O, Paxton E, Cafri G, Graves S, Bordini B, Comfort T, Rivas MC, Banerjee S, Sedrakyan. Distributed analysis of hip implants using six national and regional registries: comparing metal-on-metal with metal-on-highly crossed-linked polyethylene bearings in cementless total hip arthroplasty in young patients.
J Bone Joint Surg Am. 2014 Dec 17;96 Suppl 1:25–33.

121. Sedrakyan A, Graves S, Bordini B, Pons M, Havelin LI, Mehle S, Paxton E, Barber T, Cafri G. Comparative effectiveness of ceramic-on-ceramic implants in stemmed hip replacement. J Bone Joint Surg Am. 2014 Dec 17;96 Suppl 1:34–41.

122. Allepuz A, Havelin LI, Barber T, Sedrakyan A, Graves S, Bordini B, Hoeffel D, Cafri G, Paxton E. Effect of femoral head size on metal-on-HXLPE hip arthroplasty outcome in a combined analysis of six national and regional registries. J Bone Joint Surg Am. 2014 Dec 17;96 Suppl 1:12-8.

123. Paxton E, Cafri G, Havelin L, Stea S, Palliso F, Graves S, Hoeffel D, Sedrakyan A. Risk of revision following total hip arthroplasty: Metal-on-conventional polyethylene compared with metal-on-highly cross-linked polyethylene bearing surfaces. J Bone Joint Surg Am. 2014 Dec 17;96 Suppl 1:19–24.

124. Lutro O, Langvatn H, Dale H, Schrama JC, Hallan G, Espehaug B, Sjursen H, Engesæter LB. Increasing resistance of coagulase-negative staphylococci in total hip arthroplasty infections: 278 THA-revisions due to infection reported to the Norwegian Arthroplasty Register from 1993 to 2007. Adv Orthop. 2014;1–7.

125. Hailer NP, Lazarinis S, Mäkelä KT, Eskelinen A, Fenstad AM, Hallan G, Havelin LI, Overgaard S, Pedersen AB, Mehnert F, Kärrholm J. Hydroxyapatite coating does not improve uncemented stem survival after total hip arthroplasty! An analysis of 116,069 THAs in the Nordic Arthroplasty Register Association (NARA) database. Acta Orthop. 2015;86(1):18–25.

126. Fevang BT, Nystad TW, Skredderstuen A, Furnes O, Havelin LI. Improved survival for anatomic total shoulder prostheses. Results of 4,173 shoulder arthroplasties reported to the Norwegian Arthroplasty Register from 1994 through 2012. Acta Ortop. 2015 Feb;86(1):63–70.

127. Lie SA, Havelin LI, Fenstad AM, Espehaug B, Dybvik E, Baste V, Engesæter LB, Skredderstuen A, Dale H, Fevang JM, Fevang BT, Hallan G, Gjertsen JE, Furnes O. Re: a statistical analysis of ankle prosthesis from the Norwegian Arthroplasty Register. Arch Orthop Trauma Surg. 2015 Jan;135(1):17–8.

128. Leta TH, Lygre SHL, Skredderstuen A, Hallan G, Furnes O. Failure of aseptic revision total knee arthroplasties. 145 revision failures from the Norwegian Arthroplasty Register, 1994–2011. Acta Orthop. 2015 Feb;86(1):48–57.

129. Varnum C, Pedersen AB, Mäkelä K, Eskelinen A, Havelin LI, Furnes O, Kärrholm G, Garellick G, Overgaard S. Increased risk of revision of cementless stemmed total hip arthroplasty with metal-on-metal bearings. Data from the Nordic Arthroplasty Register Association. Acta Orthop. 2015;86(4):491–97.

130. Schrama JC, Fenstad AM, Dale H, Havelin LI, Hallan G, Overgaard S, Pedersen AB, Kärrholm G, Garellick G, Pulkkinen P, Eskelinen A, Mäkelä K, Engesæter LB, Fevang BT. Increased risk of revision for infection in rheumatoid arthritis patients with total hip replacement. A study of 390,671 primary arthroplasties from the Nordic-Arthroplasty Register Association. Acta Ortop. 2015;86(4):491–497.

131. 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 follow-up of 32,476 total knee arthroplasties in the Norwegian Arthroplasty Register. Acta Orthop. 2015 Jun 10:1–6.

132. Cafri G, Banerjee S, Sedrakyan A, Paxton L, Furnes O, Graves S, Marinac-Dabic D. Meta-analysis of survival curve data using distributed health data networks: application to hip arthroplasty studies of the International Consortium of Orthopaedic Registries. Res Synth Methods. 2015 June 29: 1–10.

133. Nystad TW, Fenstad AM, Furnes O, Havelin LI, Skredderstuen AK, Fevang BT. Reduction in orthopaedic surgery in patients with rheumatoid arthritis: a Norwegian register-based study. Scand J Rheumatol. 2015 Aug 25:1–7 [Epub ahead of print]

134. Langvatn H, Lutro O, Dale H, Schrama JC, Hallan G, Espehaug B, Sjursen H, Engesæter LB. Bacterial and hematological findings in infected total hip arthroplasties in Norway assessment of 278 revisions due to infection in the Norwegian arthroplasty register. 2015 sep 30;9:445–449

135. Glassou EN, Hansen TB, Mäkelä K, Havelin LI, Furnes O, Badawy M, Kärrholm J, Garrelic G, Eskelinen A, 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. Osteoarthritis Cartilage. 2015 Oct 21;24(3):419–26

136. Leta TH, Lygre SH, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. Secondary patella resurfacing in painful non-resurfaced total knee arthroplasties: A study of survival and clinical outcome from the Norwegian Arthroplasty Register (1994–2011). Int Orthop (SICOT). 2015 Oct 23;40(4):715–22

137. Blågestad T, Nordhus IH, Grønli J, Engesæter LB, Ruths S, Ranhoff AH, Bjorvatn B, Pallesen S. Prescription trajectories and effect of total hip arthroplasty on the use of analgesics, hypnotics, antidepressants and anxiolytics: Results from a population of total hip arthroplasty patients. Pain. 2015 Nov 14;157(3):643–51

138. Petursson G, Fenstad AM, Havelin LI, Gøthesen Ø, Lygre SH, Röhrl SM, Furnes O. Better survival of hybrid knee arthroplasty compared to cemented arthroplasty. A report from the Norwegian Arthroplasty Register 1999–2012. Acta Orthop. 2015 Dec;86(6):714–20

139. Busch VJ, Verschueren J, Adang EM, Lie SA, Havelin LI, Schreurs BW. A cementeted cup with acetabular impaction bone grafting is more cost-effective than an uncemented cup in patientes under 50 years. Hip Int. 2015 Dec;26(1):43–9

140. Johnsen MB, Hellevik AI, Baste V, Furnes O, Langhammer A, Flugsrud G, Nordsletten L, Zwart JA, Storheim K. Leisure time physical activity and the risk of hip or knee replacement due to primary osteoarthritis: a population based cohort study (The HUNT study). BMC Musculoskelet Disord. 2016 Feb 16;17(1):86

141. Leta TH, Lygre SH, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. Outcomes of unicompartmental knee arthroplasty after aseptic revision to total knee arthroplasty: A comparative study of 768 TKAs and 578 UKAs revised to TKAs from the Norwegian arthroplasty register (1994 to 2011). JBJS. 2016 Mar 16;98(6):431-40

142. Rasmussen JV, Brorson S, Hallan G, Dale H, Äärimaa V, Mokka J, Jensen SL, Fenstad AM, Salomonsson B. Is it feasible to merge data from national shoulder registries? A new collaboration within the Nordic arthroplasty register association. J shoulder elbow surg. 2016 Apr 20;S1058-2746(16)00142-7:[Epub ahead of print]

Norwegian Cruciate Ligament Register

143. Granan LP, Engebretsen L, Bahr R. Kirurgi ved fremre korsbåndskader i Norge. Tidsskr Nor Legeforen 2004;124:928-30.

144. Granan LP, Engebretsen L, Bahr R. Kirurgi ved fremre korsbåndskader i Norge - sett fra et idrettsmedisinsk perspektiv. Norsk Idrettsmedisin 2004;4:3–4.

145. Solumshengslet K, Granan LP, Furnes O, Steindal K, Engebretsen L. Registreringsgrad i Nasjonalt Korsbåndregister. Norsk Idrettsmedisin 2007;2:7,9–11.

146. Granan LP, Bahr R, Steindal K, Furnes O, Engebretsen L. Development of a national cruciate ligament surgery registry - the Norwegian National Knee Ligament registry. Am J Sports Med 2008;36:308–15.

147. Moksnes H, Engebretsen L, Risberg MA. Performance-baced functional outcome for children 12 years or younger following anterior cruciate ligament injury: a two to nine-year follow-up study. Knee Surg Sports Traumatol Arthrosc, 2008 Mar;16(3):214–223.

148. Årøen A, Hjermundrud V, Kvist T, Engebretsen L, Risberg MA. Preoperatively no significant difference in functional scoring (KOOS) in anterior cruciate ligament-injured knees with and without a full-thickness cartilage lesion. BJSM The Journal of Sport and Exercise Medicine, June 2008; Vol. 42, No.6.

149. Engebretsen L, Forssblad M. Why knee ligament registries are important. Kne Surg Sports Traumatol Arthrosc 2009 Feb;17(2):115-6.

150. Granan LP, Bahr R, Lie SA, Engebretsen L. Timing of anterior cruciate ligament reconstructive surgery and risk of cartilage lesions and meniscal tears: a cohort study based on the Norwegian National Knee Ligament Registry. Am J Sports Med 2009 May;37(5):955-61.

151. Granan LP, Forssblad M, Lind M, Engebretsen L. The Scandinavian ACL registries 2004–2007: baseline epidemiology. Acta Orthop 2009 Oct;80(5):563-7.

152. Magnussen RA, Granan LP, Dunn WR, Amendola A, Andrish JT, Brophy R, Carey JL,Flanigan D, Huston LJ, Jones M, Kaeding CC, McCarty EC, Marx RG, Matava MJ, Parker RD, Vidal A, Wolcott M, Wolf BR, Wright RW, Spindler KP, Engebretsen L. Cross-cultural comparison of patients undergoing ACL reconstruction in the United States and Norway. Knee Surg Sports Traumatol Arthrosc 2010 Jan;18(1):98–105.

153. Heir S, Nerhus TK, Røtterud JH, Løken S, Ekeland A, Engebretsen L, Årøen A. Focal cartilage defects in the knee impair quality of life as much as severe osteoarthritis: a comparison of knee injury and osteoarthritis outcome score in 4 patient categories scheduled for knee surgery. Am J Sports Med 2010 Feb; 38(2);231-7.

154. Hjermundrud V, Bjune TK, Risberg MA, Engebretsen L, Arøen A. Full-thickness cartilage lesion do not affect knee function in patients with ACL injury. Knee Surg Sports Traumatol Arthrosc 2010 Mar;18(3):298–303.

155. Ytterstad K, Granan LP, Engebretsen L. The Norwegian Cruciate Ligament Registry has a high degree of completeness. Tidsskr Nor Legeforen 2011 Feb;131(3):248–50.

156. Maletis GB, Granan LP, Inacio MCS, Funahashi TT, Engebretsen L. Comparison of community-based ACL Reconstruction Registries in the U.S and Norway. J Bone Joint Surg Am 2011;93:Suppl 3(E):31-6.

157. Røtterud JH, Sivertsen EA, Forssblad M, Engebretsen L, Årøen A. Effect of gender and sports on the risk of full-thickness articular cartilage lesions in anterior cruciate ligament -injured knees: a nationwide cohort study from Sweden and Norway of 15 783 patients. Am J Sports Med. 2011 Jul;39(7):1387–94.

158. Røtterud JH, Risberg MA, Engebretsen L, Arøen A. Patients with focal full-thickness cartilage lesions benefit less from ACL reconstruction at 2–5 years follow-up. Knee Surg Sports Traumatol Arthrosc. 2012 Aug;20(8):1533-9.

159. Ytterstad K, Granan LP, Ytterstad B, Steindal K, Fjeldsgaard K, Furnes O, Engebretsen L. Registration rate in the Norwegian Cruciate Ligament Register: large-volume hospitals perform better. Acta Orthop. 2012 Apr;83(2):174-8.

160. Granan LP, Inacio MC, Maletis GB, Funahashi TT, Engebretsen L. Intraoperative findings and procedures in culturally and geographically different patient and surgeon populations: an anterior cruciate ligament reconstruction registry comparison between Norway and the USA. Acta Orthop. 2012 Dec;83(6):577–82.

161. Getgood A, Collins B, Slynarski K, Kurowska E, Parker D, Engebretsen L, MacDonald PB, Litchfield R. Short-term safety and efficacy of a novel high tibial osteotomy system: a case controlled study. Knee Surg Sports Traumatol Arthrosc. 2013 Jan;21(1):260-9.

162. Røtterud JH, Sivertsen E, Forssblad M, Engebretsen L, Årøen A. Effect of meniscal and focal cartilage lesions on patient-reported outcome after anterior cruciate ligament reconstruction : A aationwide cohort study from Norway and Sweden of 8476 patients with 2-Year follow-up. Am J Sports Med. 2013 Mar;41(3):535–43.

163. Øiestad BE, Holm I, Engebretsen L, Aune AK, Gunderson R, Risberg MA. The prevalence of patellofemoral osteoarthritis 12 years after anterior cruciate ligament reconstruction. Knee Surg Sports Traumatol Arthrosc. 2013 Apr;21(4):942-9.

164. Aga C, Rasmussen MT, Smith SD, Jansson KS, LaPrade RF, Engebretsen L, Wijdicks CA. Biomechanical comparison of interference screws and combination screw and sheath devices for soft tissue anterior cruciate ligament reconstruction on the tibial side. Am J Sports med. 2013 Apr;41(4):841-8.

165. Arøen A, Sivertsen EA, Owesen C, Engebretsen L, Granan LP. An isolated rupture of the posterior cruciate ligament results in reduced preoperative knee function in comparison with an anterior cruciate ligament injury. Knee Surg Sports Traumatol Arthrosc. 2013 May;21(5):1017–22.

166. Moksnes H, Engebretsen L, Eitzen I, Risberg MA. Functional outcomes following a non-operative treatment algorithm for anterior cruciate ligament injuries in skeletally immature children 12 years and younger : A prospective cohort with 2 years follow-up. Br J Sports Med. 2013 May;47(8):488–94.

167. Goldsmith MT, Jansson KS, Smith SD, Engebretsen L, LaPrade RF, Wijdicks CA. Biomechanical comparison of anatomic single- and double-bundle anterior cruciate ligament reconstructions: an in vitro study. Am J Sports Med. 2013 Jul;41(7):1595-604.

168. Moksnes H, Engebretsen L, Risberg MA. Prevalence and incidence of new meniscus and cartilage injuries after a nonoperative treatment algorithm for ACL tears in skeletally immature children : A prospective MRI study. Am J Sports Med. 2013 Aug;41(8):1771-9.

169. Andersen CA, Clarsen B, Johansen TV, Engebretsen L. High prevalence of overuse injury among iron-distance triathletes. Br J Sports Med. 2013 Sep;47(13):857–61.

170. Ekeland, AE, Engebretsen L, Heir S. Sekundær ACL rekonstruksjon hos fotballspillere, håndballspillere og alpine skiløpere. Norsk idrettsmedisin 2013 (3):21.

171. Granan LP, Inacio MC, Maletis GB, Funahashi TT, Engebretsen L. Sport-spesific injury pattern recorded during anterior cruciate ligament reconstruction. Am J Sports Med. 2013 Dec;41(12):2814-8.

172. Kennedy NI, Wijdicks CA, Goldsmith MT, Michalski MP, Devitt BM, Årøen A, Engebretsen L, LaPrade RF. Kinematic analysis of the posterior cruciate ligament, part 1: The individual and collective function of the anterolateral and posteromedial bundles. Am J Sports Med. 2013 Dec;41(12):2828–38.

173. Wijdicks CA, Kennedy NI, Goldsmith MT, Devitt BM, Michalski MP, Årøen A, Engebretsen L, LaPrade RF. Kinematic analysis of the posterior cruciate ligament, part 2: A comparison of anatomic single- versus double-bundle reconstruction.
Am J Sports Med. 2013 Dec;41(12):2839–48.

174. Wijdicks CA, Michalski MP, Rasmussen MT, Goldsmith MT, Kennedy NI, Lind M, Engebretsen L, LaPrade RF. Superficial medial collateral ligament anatomic augmented repair versus anatomic reconstruction: an in vitro biomechanical analysis.
Am J Sports Med. 2013 Dec;41(12):2858–66.

175. Engebretsen L. ACL surgery is not for all patients, nor for all surgeons.
Knee Surg Sports Traumatol Arthrosc. 2014 Jan;22(1):1–2.

176. Persson A, Fjeldsgaard K, Gjertsen JE, Kjellsen AB, Engebretsen L, Hole RM, Fevang JM. Increased risk of revision with hamstring tendon grafts compared with patellar tendon grafts after anterior cruciate ligament reconstruction. A study of 12,643 patients from the Norwegian Cruciate Ligament Registry, 2004–2012.
Am J Sports Med. 2014 Feb;42(2):285–91.

177. Gifstad T, Foss OA, Engebretsen L, Lind M, Forssblad M, Albrektsen G, Drogset JO. Lower risk of revision with patellar tendon autografts compared with hamstring autografts: a registry study based on 45,998 primary ACL reconstructions in Scandinavia.
Am J Sports Med. 2014 Oct;42(10):2319–28.

178. Grindem H, Granan LP, Risberg MA, Engebretsen L, Snyder-Mackler L, Eitzen I. How does a combined preoperative and postoperative rehabilitation programme influence the outcome of ACL reconstruction 2 years after surgery? A comparison between patients in the Deleware-Oslo ACL Cohort and the Norwegian National Knee Ligament Registry.
Br J Sports Med. 2015 Mar;49(6):385–9.

179. Lynch AD, Logerstedt D, Grindem H, Eitzen I, Hicks GE, Axe MJ, Engebretsen L, Risberg MA, Snyder-Mackler L. Consensus criteria for defining ‘successful outcome’ after ACL injury and reconstruction: a Delaware-Oslo ACL cohort investigation.
Br J Sports Med. 2015 Mar;49(5):335–42.

180. Granan LP, Baste V, Engebretsen L, Inacio MC. Associations between inadequate knee function detected by KOOS and prospective graft failure in an anterior cruciate ligament-reconstructed knee. Knee Surg Sports Traumatol Arthrosc. 2015 Apr;23(4):1135–40.

181. Engebretsen L, Forssblad M, Lind M. Why registries analysing cruciate ligament surgery are important. Br J Sports Med. 2015 May;49(10):636–8.

182. LaPrade CM, Dornan GJ, Granan LP, LaPrade RF, Engebretsen L. Outcomes after anterior cruciate ligament reconstruction using the Norwegian knee ligament registry of 4691 patients: How does meniscal repair or resection affect short-term outcomes?
Am J Sports Med. 2015 Jul;43(7):1591-7.

183. Ingelsrud LH, Granan LP, Engebretsen L, Roos E. Proportion of patients reporting acceptable symptoms or treatment failure and their associated KOOS values at 6 to 24 months after anterior cruciate ligament reconstruction.
Am J Sports Med. 2015 Aug;43(8):1902-7.

184. Owesen C, Sivertsen EA, Engebretsen L, Granan LP, Årøen A. Patients with isolated PCL injuries improve from surgery as much as patients with ACL injuries after 2 years.
Ortop J Sports Med. 2015 Aug 19;3(8):2325967115599539.

185. Magnussen RA, Trojani C, Granan LP, Neyret P, Colombet P, Engebretsen L, Wright RW, Kaeding CC, MARS Group, SFA Revision ACL Group. Patient demographics and surgical characteristics in ACL revision: a comparison of French, Norwegian and North American cohorts. Knee Surg Sports Traumatol Arthrosc. 2015 Aug;23(8):2339-48.

186. Persson A, Kjellsen AB, Fjeldsgaard K, Engebretsen L, Espehaug B, Fevang JM. Registry data highlight increased revision rates for endobutton/biosure HA in ACL reconstruction with hamstring tendon autograft. A nationwide cohort study from the Norwegian Knee Ligament Registry, 2004–2013. Am J Sports Med. 2015 Sep;43(9):2182-8.

187. Moksnes H, Engebretsen L, Seil R. The ESSKA paediatric anterior cruciate ligament monitoring initiative. Knee Surg Sports Traumatol Arthrosc. 2016 Mar;24(3):680-7.

Norwegian Hip Fracture Register

188. Gjertsen JE, Fevang J, Vinje T, Engesæter LB, Steindal K, Furnes O. Nasjonalt hoftebruddregister. Norsk Epidemiologi 2006;16:89–94.

189. Gjertsen JE, Lie SA, Fevang J, Vinje T, Engesæter LB, Havelin LI, Furnes O. Total hip replacement after femoral neck fractures in elderly patients: results of 8,577 fractures reported to the Norwegian Arthroplasty Register. Acta Orthop 2007;78:491-7.

190. Gjertsen JE, Engesæter LB, Furnes O, Havelin LI, Steindal K, Vinje T, Fevang J. The Norwegian Hip Fracture Register. Experiences after the first 2 years and 15 576 reported operations. Acta Orthop. 2008;79:583–593

191. Gjertsen JE, Vinje T, Lie SA, Engesæter LB, Havelin LI, Furnes O, Fevang J. Patient satisfaction, pain and quality of life 4 months after displaced femoral neck fracture. Acta Orthop 2008;79:594–601

192. Gjertsen JE, Vinje T, Engesæter LB, Lie SA, Havelin LI, Furnes O, Fevang JM. Internal screw fixation compared with bipolar hemiarthroplasty for treatment of displaced femoral neck fractures in elderly patients. A national register based study on 1,031 patients. J Bone Joint Surg Am 2010 Mar;92-A(3):619–628.

193. Gjertsen JE, Fevang JM, Matre K, Vinje T, Engesæter LB. Clinical outcome after undisplaced femoral neck fractures. A prospective comparison of 14,757 undisplaced and displaced fractures reported to the Norwegian Hip Fracture Register. Acta Orthop 2011;82(3):268–74.

194. Gjertsen JE, Vinje T, Engesæter LB, Hallan G, Furnes O, Lie SA. More re-operations after uncemented than cemented hemiarthroplasty used in the treatment of displaced fractures of the femoral neck. An observational study of 11 116 hemiarthroplasties from a national register. J Bone Joint Surg Br 2012;94-A:1113–19.

195. Matre K, Havelin LI, Gjertsen JE, Espehaug B, Fevang JM. Intramedullary nails result in more reoperations than sliding hip screws in two-part intertrochanteric fractures. Clin Orthop Relat Res. 2013 Apr;471(4):1379–86.

196. Matre K, Havelin LI, Gjertsen Jan-Erik, Vinje T, Espehaug B, Fevang JM. Sliding hip screw versus IM nail reverse oblique trochanteric and subtrochanteric fractures. A study of 2716 patients in the Norwegian Hip Fracture Register. Injury, Int. J. Care Injur. 2013 Jun;44(6)735–42.

197. Matre K, Havelin LI, Gjertsen JE, Espehaug B, Fevang JM. Reply to letter to the editor: Intramedullary nails result in more reoperations than sliding hip screws in two-part interochanteric fractures. Clin Orthop Relat Res. 2013 Mar. 5.

198. Bakken MS, Engeland A, Engesæter LB, Ranhoff AH, Hunskaar S, Ruths S. Increased risk of hip fracture among older people using antidepressant drugs: data from the Norwegian Prescription Database and the Norwegian Hip Fracture Registry. Age and Ageing 2013 Jul;42(4):514–20.

199. Talsnes O, Vinje T, Gjertsen JE, Dahl OE, Engesæter LB, Baste V, Pripp AH, Reikerås O. Perioperative mortality in hip fracture patients treated with cemented and uncemented hemiprosthesis: a register study of 11,210 patients. Int Orthop. 2013 Jun;37(6)1135–40.

200. Gjertsen JE, Lie SA, Vinje T, Engesæter LB, Hallan G, Matre K, Furnes O. Authors` reply Cobb correspondence: J-E Gjertsen, SA. Lie , T. Vinje, et al. More re-operations after uncemented than cemented hemiarthroplasty used in the treatment of displaced fractures of the femoral neck: An observational study of 11 116 hemiarthroplasties from a national register. Bone Joint J. 2013 Jun;95-B(6):862.

201. Rogmark C, Fenstad AM, Leonardsson O, Engesæter LB, Kärrholm J, Furnes O, Garellick G, Gjertsen JE. Posterior approach and uncemented stems increases the risk of reoperations after hemiarthroplasties in elderly hip fracture patients. An analysis of 33,205 procedures in the Norwegian and Swedish national registries. Acta Orthop. 2014;85(1):18–25.

202. Gjertsen JE, Fenstad AM, Leonardsson O, Engesæter LB, Kärrholm J, Furnes O, Garellick G, Rogmark C. Hemiarthroplasties after hip fractures in Norway and Sweden: a collaboration between the Norwegian and Swedish national registries. Hip Int 2014 May–Jun;24(3):223–30.

203. Bakken MS, Engeland A, Engesæter LB, Ranhoff AH, Hunskaar S, Ruths S. Risk of hip fracture among older people using anxiolytic and hypnotic drugs: a nationwide prospective cohort study. Eur J Clin Pharmacol. 2014;70:873–880.

204. Ruths S, Bakken MS, Ranhoff AH, Hunskaar S, Engesæter LB, Engeland A. Risk of hip fracture among older people using antihypertensive drugs: a nationwide cohort study. BMC Geriatr. 2015 Dec 1;15:153.

Clinical trials related to the Norwegian National Advisory Unit on Arthroplasty and Hip Fractures

205. Hallan G, Lie SA, Havelin LI. High wear rates and extensive osteolysis in 3 types of uncemented total hip arthroplasty: a review of the PCA, the Harris Galante and the Profile/ Tri-Lock Plus arthroplasties with a minimum of 12 years median follow-up in 96 hips. Acta Orthop 2006;77:575–84.

206. Hallan G, Aamodt A, Furnes O, Skredderstuen A, Haugan K, Havelin LI. Palamed G compared with Palacos R with gentamicin in Charnley total hip replacement. A randomised, radiostereometric study of 60 hips. J Bone Joint Surg 2006;88-B:1143–8.

207. Kadar T, Hallan G, Aamodt A, Indrekvam K, Badawy M, Skredderstuen A, Havelin LI, Stokke T, Haugan K, Espehaug B, Furnes O. Wear and migration of highly crossed-linked and conventional cemented polyethylene cups with cobalt chrome or Oxinum femoral heads: a randomized radiostereometric study of 150 patients. J Orthop Res 2011 Aug;29(8):1222-9.

208. Ravnskog FA, Espehaug B, Indrekvam K. Randomised clinical trial comparing Hydrofiber and alginate dressings post-hip replacement. J Wound Care. 2011 Mar;20(3):136–42.

209. Laborie LB, Lehmann TG, Engesæter IØ, Eastwood, DM, Engesæter LB, Rosendahl K. Prevalence of radiographic findings thought to be associated with femoroacetabular impingement in a population-based cohort of 2081 healthy young adults. Radiology 2011 Aug;260(2):494–502.

210. Engesæter IØ, Laborie LB, Lehmann TG, Sera F, Fevang JM, Pedersen D, Morcuende J, Lie SA, Engesæter LB, Rosendahl K. Radiological findings for hip dysplasia at skeletal maturity. Validation of digital and manual measurement techniques. Skeletal Radiol 2011;41(7):8–85.

211. Young S, Lie SA, Hallan G, Lewis GZ, Engesæter LB, Havelin LI. Low infection rates after 34,361 intramedullary nail operations in 55 low- and middle-income countries. Validation of the Surgical Implant Generation Network (SIGN) Online Surgical Database. Acta Orthop 2011;82(6):737–743.

212. Kadar T, Hallan G, Aamodt A, Indrekvam K, Badawy M, Havelin LI, Stokke T, Haugan K, Espehaug B, Furnes O. A randomized study on migration of the Spectron EF and the Charnley flanged 40 cemented femoral components using radiostereometric analysis at 2 years. Acta Orthop 2011 Oct;82(5):538–44.

213. Kadar T, Furnes O, Aamodt A, Indrekvam K, Havelin LI, Haugan K, Espehaug B, Hallan G. The influence of acetabular inclination angle on the penetration of polyethylene and migration of the acetabular component. A prospective, radiostereometric study on cemented acetabular components. J Bone Joint Surg Br 2012;94-B:302–7.

214. Blomquist J, Solheim E, Liavaag S, Schroeder CP, Espehaug B, Havelin LI. Shoulder instability surgery in Norway. The first report from a multicentre register, with 1-year follow-up. Acta Orthop 2012;83(2):165–170.

215. Engesæter IØ, Laborie LB, Lehmann TG, Fevang JM, Lie SA, Engesæter LB, Rosendahl K. Prevalence of radiographic findings associated with hip dysplasia in a population-based cohort of 208119-year-old Norwegians. Bone Joint J 2013 Feb;95-B(2):279–85.

216. Lehmann TG, Vetti N, Laborie LB, Engesæter IØ, Engesæter LB, Rosendahl K. Intra- and inter-observer repeatability of radiographic measurements for previously slipped capital femoral epiphysis at skeletal maturity. Acta Radiol 2013 Feb:1–5.

217. Young S, Lie SA, Hallan G, Zirkle LG, Engesæter LB, Havelin LI. Risk factors for infection after 46,113 intramedullary nail operations in low- and middle-income countries. World J Surg. 2013 Feb;37(2):349–55.

218. Lehmann TG, Engesæter IØ, Laborie LB, Lie SA, Rosendahl K, Engesæter LB. Radiological findings that may indicate a prior silent slipped capital femoral epiphysis in a cohort of 2072 young adults. Bone Joint J. 2013 Apr;95-B(4):452–8.

219. Matre K, Vinje T, Havelin LI, Gjertsen JE, Furnes O, Espehaug B, Kjellevold SH, Fevang JM. Trigen intertan intramedullary nail versus sliding hip screw. A prospective, randomized multicenter study on pain, function and complications in 684 patients with an intertrochanteric or subtrochanteric fracture and one year of follow-up. J Bone Joint Surg A. 2013;95:200–8.

220. Østerås N, Risberg MA, Kvien TK, Engebretsen L, Nordsletten L, Bruusgaard D, Skjervheim UB, Haugen IK, Hammer HB, Provan SA, Øiestad BE, Semb AG, Rollefstad SCG, Hagen KB, Uhlig T, Slatkowsky-Christensen B, Flugsrud GB, Kjeken I, Grotle M, Sessing S, Edvardsen H, Natvig B. Hand, hip and knee osteoarthritis in a Norwegian population-based study - The MUST protocol. BMC Musculoskelet Disord. 2013 Jul 5;14:201.

221. Laborie LB, Engesæter IØ, Lehmann TG, Sera F, Dezateux C, Engesæter LB, Rosendahl K. Radiographic measurements of hip dysplasia at skeletal maturity-new reference intervals based on 2,038 19-year-old Norwegians. Skeletal Radiol 2013 Jul;42(7):925–35.

222. Laborie LB, Lehmann TG. Engesæter IØ, Engesæter LB, Rosendahl K. Is a positive femoroacetabular impingement test a common finding in healthy young adults? Clin Orthop Relat Res.2013 Jul;471(7):2267–77.

223. Young S, Banza LN, Hallan G, Beniyasi F, Kumbukani GM, Munthali BS, Dybvik E, Engesæter LB, Havelin LI. Complications after intramedullary nailing of femoral fractures in low-income country. A prospective study of follow-up, HIV infection, and microbial infection rates after IM nailing of 141 femoral fractures at a central hospital in Malawi. Acta Orthop. 2013;84(5):460–467.

224. Dyrhovden GS, Gøthesen Ø, Lygre SH, Fenstad AM, Sørås TE, Halvorsen S, Jellestad T, Furnes O. Is the use of computer navigation in total knee arthroplasty improving implant positioning and function? A comparative study of 198 knees operated at a Norwegian district hospital. BMC musculoskeletal Disord. 2013;14:321.

225. Laborie LB, Engesæter IØ, Lehmann TG, Eastwood DM, Engesæter LB, Rosendahl K. Screening strategies for hip dysplasia: long-term outcome of a randomized controlled trial. Pediatrics. 2013 Sept;132(3):492–501.

226. Laborie LB, Markestad TJ, Davidsen H, Brurås KR, Aukland SM, Bjørlykke JA, Reigstad H, Indrekvem K, Lehmann TG, Engesæter IØ, Engesæter LB, Rosendahl K. Selective ultrasound screening for developmental hip dysplasia: effect on management and late detected cases. A prospective survey during 1991–2006. Pediatr Radiol. 2014 Apr;44(4):410–24.

227. Gøthesen Ø, Espehaug B, Havelin LI, Petursson G, Hallan G, Strøm E, Dyrhovden G, Furnes O. Functional outcome and alignment in computer-assisted and conventionally operated total knee replacement. Bone Joint J 2014;96-B:609–18.

228. Laborie LB, Lehmann TG, Engesæter IØ, Engesæter LB, Rosendahl K. The alpha angle in cam-type femoroacetabular impingement - New reference intervals based on 2038 healthy young adults. Bone Joint J. 2014 Apr;96-B(4):449–54.

229. Hermansen E, Moen G, Fenstad AM, Birketvedt R, Indrekvam K. Spinous process osteotomy to facilitate the access to the spinal canal when decompressing the spinal canal in patients with lumbar spinal stenosis. Asian spine J 2014;8(2):138–144.

230. Grosse S, Haugland HK, Lilleng P, Ellison P, Hallan G, Høl PJ. Wear particles and ions from cemented and uncemented titanium-based hip prostheses - a histological and chemical analysis of retrieval material. J Biomed Mater Res B Appl Biomater. 2015 Apr;103(3):709-17.

231. Løwer HL, Dale H, Eriksen HM, Aavitsland P, Skjeldestad FE. Surgical site infections after hip arthroplasty in Norway, 2005–2011: Influence of duration and intensity of postdischarge surveillance. American journal of infection control 2015;43:323–8.

232. Løwer HL, Dale H, Eriksen HM, Aavitsland P, Skjeldestad FE. Response to letter to the editor regarding: «Surgical site infections after hip arthroplastry in Norway, 2005–2011: Influence of duration and intensity of postdischarge surveillance». American journal of infection control 2015;43:1022-5.

233. Nygard H, Matre K, Fevang JM. Evaluation of timed up and go test as a tool to measure postoperative function and prediction of one year walking ability for patients with hip fracture. Clin Rehabil. 2015 Jun 24;30(5):472–80.

234. Jonsson BA, Kadar T, Havelin LI, Haugan K, Espehaug B, Indrekvam K, Furnes O, Hallan G. Oxinium modular femoral heads do not reduce polyethylene wear in cemented total hip arthroplasty at five years: a randomised trial of 120 hips using radiostereometric analysis. Bone Joint J.2015 Nov;97-B(11):1463-9.

235. Strand LI, Olsen AL, Nygard H, Furnes O, Magnussen LH, Lygren H, Sundal MA, Skjaerven LH. Basic body awareness therapy and patient education in hip osteoarthritis: a multiple case study. European journal of physiotherapy. 2016 Feb 3 [epub ahead of print]

Text books and book chapters related to the Norwegian National Advisory Unit on Arthroplasty and Hip Fractures

236. Havelin LI. The Norwegian Arthroplasty Register. In: Jacob RP, Fulford P, Horan F, editors. European Instructional Course Lectures, Volume 4, 1999. London: The British Society of Bone and Joint Surgery, 1999:88–95.

237. Furnes O, Havelin LI, Espehaug B. Effect of type of bone cement and antibiotic prophylaxis on early revision of cemented total hip replacement. Presentation from the Norwegian Arthroplasty Register 1987–1996. In: Walenkamp GHIM, Murray DW, editors. Bone Cements and Cementing Technique. Heidelberg, Germany: Springer Verlag, 2001.

238. Havelin LI, Espehaug B, Furnes O, Engesæter LB, Lie SA, Vollset SE. Register studies. In: Pynset P, Fairbank J, Carr A, editors. Outcome Measures in Orthopaedics and Orthopaedic Trauma. London, England: Edward Arnold ltd., 2004;41–53.

239. Furnes O, Havelin LI, Espehaug B. Which cement should we choose for primary THA? In: The well-cemented total hip arthroplasty (eds. Breusch S J, Malchau H). Heidelberg, Germany. Springer Verlag 2005.

240. Furnes O, Havelin LI, Espehaug B. Femoral components: Cemented stems for everybody? In: The well-cemented total hip arthroplasty (eds. Breusch S J, Malchau H). Heidelberg, Germany. Springer Verlag 2005.

241. Engesæter LB. The Norwegian Hip register - The influence of cement and antibiotics on the clinical results of primary prostheses. Chapter 16 in: Local Antibiotics in Arthroplasty. State of the art from an interdisciplinary point of view. Geert H.I.M Walenkamp (editor), Georg Thieme Verlag, Stuttgart, Germany 2007.

242. Witsø E, Engesæter LB. Revision of infected total hip prostheses in Norway and Sweden. Chapter 15 in: Local Antibiotics in Arthroplasty. State of the art from an interdisciplinary point of view. Geert H.I.M Walenkamp (editor), Georg Thieme Verlag, Stuttgart, Germany 2007.

243. Havelin LI, Nordsletten L, Furnes O. Status og utfordringer for protesekirurgien i Norge 2007; 33–41. in ed. Hole K. Norsk Ortopedisk Forening 60 år. ISBN 978-82-8070-062-9. Utgiver Tidsskr Nor Lægeforen 2007.

244. Furnes O. Primære hofteproteser. Standard protese - sementert eller usementert. Kap 1.10 s.82–86 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

245. Havelin LI. Primære hofteproteser. Resurfacing. Kap 1.12 s.92–95 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

246. Havelin LI. Primære hofteproteser. Finnes det dårlige proteser? Kap 1.13 s.96–104 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

247. Furnes O. Primære kneleddsproteser. Anatomi og biomekanikk i kneleddet. Kap 3.1 s.168–175 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

248. Furnes O. Primære kneleddsproteser. Skåringssystemer for kneleddsfunksjon. Kap 3.2 s.176–183 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

249. Furnes O. Primære kneleddsproteser. Indikasjon for kneprotese. Kap 3.3 s.184–190 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

250. Furnes O. Primære kneleddsproteser. Designprinsipper for kneproteser. Kap 3.5 s.198–209 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

251. Furnes O. Primære kneleddsproteser. Valg av totalprotese i kne. Kap 3.6 s.210–211 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

252. Furnes O. Primære kneleddsproteser. Nye teknikker: MIS og navigasjon. Kap 3.12 s.238–243 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

253. Furnes O. Nasjonalt Register for Leddproteser. Historikk og organisering. Kap 5.1 s.260–273 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

254. Havelin LI. Nasjonalt Register for Leddproteser. Resultater etter primære hofteproteser. Kap 5.2 s.274–280 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

255. Havelin LI. Nasjonalt Register for Leddproteser. Resultater av sekundære hofteproteser. Kap 5.3 s.282–285 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

256. Furnes O. Nasjonalt Register for Leddproteser. Resultater etter primære kneproteser. Kap 5.4 s.286–289 i Aamodt A, Furnes O, Lønne G (ed) protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

257. Furnes O. Nasjonalt Register for Leddproteser. Resultater etter sekundære kneproteser. Kap 5.5 s.290–293 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

258. Havelin LI. Implantatlære. Artikulasjoner, overflatestruktur og coating. Kap 7.4 s.356–363 i Aamodt A, Furnes O, Lønne G (ed) Protesekirurgi i hofte og kne. Legeforlaget 2007. ISBN 978-82-993568-4-8.

259. Engesæter LB. Increasing incidence of infected THA in Norway despite improved antibiotic prophylaxis. Chapter 2 in: The Infected Implant (eds. Kienapfel H, Kühn K-D). Heidelberg, Germany. Springer Medizin Verlag 2009.

260. Skredderstuen A, Furnes O, Fevang BT. Elbow arthroplasty in Norway, trends and results. The Norwegian register. Chapter in: Arthroplasties du Coude. Actualités thérapeutiques. Sous la direction de Y. Allieu (ed. Sauramps Medical). ISBN 13:9782840239741.

261. Havelin L. Artikulasjoner, overflatestruktur og coating. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

262. Furnes O, Havelin L. Historikk og organisering av nasjonalt register for leddproteser. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

263. Havelin L. Resultater fra nasjonalt register for leddproteser, primære hofteproteser. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

264. Havelin L. Sekundære hofteproteser, resultater av fra nasjonalt register for leddproteser. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

265. Hallan Geir. Klinikk og diagnostikk ved proteseinfeksjoner. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

266. Hallan Geir. Proteseinfeksjoner; Profylakse og behandling. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

267. Furnes O. Operasjonsstuehygiene. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

268. Havelin L. Finnes det dårlige proteser? Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

269. Hallan G. Protesekirurgi hos revmatikere. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

270. Furnes O. Designprinsipper for kneprotese. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

271. Furnes O. Sementeringsteknikk ved kneprotesekirurgi. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

272. Furnes O. Oppfølging og klinisk skåring av kneproteser. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

273. Furnes O. Plassering av protesekomponenter ved kneprotesekirurgi. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

274. Furnes O. Resultater etter primære kneproteser. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

275. Furnes O. Resultater etter revisjons kneproteser. Røroskurset 2015. Kurshefte: Implantatlære og protesekirurgi - Ortopediske infeksjoner.

Text books and book chapters related to the Norwegian Cruciate Ligament Register

1. Myklebust G, Engebretsen L, Braekken IH, Skjolberg A, Olsen OEl, Bahr R. Prevention of noncontact anterior cruciate ligament injuries in elite and adolescent female team handball athletes. AAOS Instructional Course Lectures, Volume 56, 2007. ISBN 10: 0-89203-393-2.

2. Takeda H, Engebretsen L. Prevention and management of cartilage injury and osteoarthritis from sports. I: EFORT - European instructional lectures. S. 227–235. Springer 2013. ISBN 978-3-642-36148-7.

3. Yamazaki, J, Engebretsen L. Anterior Cruciate Ligament Surgery: Risk Factors for Development of Osteoarthritis: What Can We Do to Prevent It? I: The ACL-deficient knee: a problem solving approach. S. 41–48. Springer 2013 ISBN 978-1-4471-4269-0.

Scienti ic exhibitions

Norwegian Arthroplasty Register

4. 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.

5. 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 2015–June 2016

Norwegian Arthroplasty Register

1. Engesæter LB. Hvordan monitorere datakvalitet i praksis? Erfaringer fra Nasjonalt hoftebruddregister. Konferanse for Nasjonale Medisinske Kvalitetsregistre; 2015 15. januar; Oslo.

2. Havelin LI. Hva kan dekningsgradanalysene brukes til? Erfaringer fra Nasjonalt register for leddproteser. Konferanse for Nasjonale Medisinske Kvalitetsregistre; 2015 15. januar; Oslo.

3. Furnes O. The Norwegian Arhroplasty Register. Update. International Society of Arthroplasty Registries (ISAR) meeting during AAOS. 2015 March 26; Las Vegas, USA.

4. Furnes O. Highlights of the Scandinavian Registry Knees. ICJR, World arthroplasty congress; 2015 April 17; Paris, France.

5. Lie SA, Furnes O, Havelin LI. Co-occuring 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.

6. 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.

7. Furnes O. Knee revisions in Norway. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.

8. 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.

9. 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.

10. 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.

11. 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 arthrpplasties in the NAR. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.

12. 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.

13. Tsukanaka M, Röhrl S, Engesæter IØ, Engesæter LB, Nordsletten L, Halvorsen V. Outcome of total hip replacement in young patiants under 20 years of age. Presented at the 4th Congress of International Society of Arthroplasty Registries (ISAR); 2015 May 23–25; Gothenburg, Sweden.

14. Rasmussen JV, Brorson S, Hallan G, Dale H, Fenstad AM, Äärima 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.

15. Badawy M. The risk of revision in total knee arthroplasty is not affected by previous high tibial osteotomy. Poster presented at the 16th Effort Congress; 2015 May 27–29; Prague, Czech Republic.

16. Engesæter L. Femoral hip fractures in Norway - experiences after 10 years with a nationwide register. Presented at the 53rd Annual academic meeting. The Girdlestone Orthopaedic Society; 2015 June 21–24; Oxford, UK.

17. Leta TH, Lygre SHL, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. The outcome of unicompatmental knee arthroplasties after aseptic revision into total knee arthroplasties. A comparative study of 768 total knees and 578 uni-knees revised to total knees reported to the Norwegian arthroplasty register (1994–2011). 21st Annual conference Australian and New Zealand orthopaedic research society; 2015 02–04 October; Auckland, New Zealand.

18. Badawy M, Fenstad AM, Indrekvam K, Havelin LI, Furnes O. Oxford III Unikondylær kneprotese; Effekt av sykehus volum på revisjonsraten i en nordisk studie fra 2000–2012. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

19. Badawy M, Espehaug B, Dale H, Indrekvam K, Havelin LI, Furnes O. Økt risiko for revisjon på grunn av dyp proteseinfeksjon ved økt operasjonstid etter totalprotese kne? Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

20. Bartz-Johannessen C, Furnes O, Fenstad AM, Havelin LI, Lie SA, Wilkinson JM. Hjelper det å ta med data fra flere land når man skal lage en Risk-kalkulatormodell for totale hofteproteser i Norge? Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

21. Tangerud K, Rossi P, Apold H, Bartz-Johannessen C, Havelin LI. Fraktur av Exeter femurkoponent. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

22. Hellevik AI, Johnsen MB, Langhammer A, Baste V, Furnes O, Storheim K, Zwart JA, Flugsrud G, Nordsletten L. Metabolsk syndrom som risikofaktor for hofte eller kneprotese på grunn av primær artrose: En prospektiv kohortstudie fra Hunt-studien. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

23. Furnes O, Baste V, Havelin LI. Resultat av kneproteser fra international consortium of orthopaedic regitries (ICOR). Internasjonalt samarbeid mellom 6 registre. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

24. Havelin LI, Furnes O, Baste V. Resultat av hofteproteser fra international consortium of orthopaedic registries (ICOR). Et internasjonalt samarbeid mellom 6 registre. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.– 23. oktober; Oslo

25. Birkeland Ø, Furnes O, Espehaug B. Beinsement - er ulike produkt avgjerande for overleving av totale kneproteser? Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

26. Brüggermann H, Hallan G, Fenstad AM, Fosse L. Insidens og risikofaktorer for intraoperative proksimale femurfrakturer (IPFF) ved implantasjon av primære hofteproteser: 1728 IPFF var rapportert til Nasjonalt Register for Leddproteser (NRL) i perioden 1987–2014. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

27. Langvatn H, Dale H, Engesæter LB, Schrama JC. Ventilasjon av operasjonsstuer og revisjonsrisiko på grunn av infeksjon etter total hofteprotesekirurgi. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

28. Dybvik E, Furnes O, Havelin LI, Fosså SD, Trovik C, Lie SA. Økt kreftrisiko for usementerte hofteproteser. En studie med 90,586 pasienter i Nasjonalt Register for Leddproteser koblet til Kreftregisteret. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

29. Dyrhovden GS, Fenstad AM, Hallan G, Furnes O, Gøthesen Ø. Langtidsoppfølging av Computernavigerte kneproteser 2005–2014. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

30. Tsukanaka M, Röhrl SM, Engesæter IØ, Engesæter LB, Nordsletten L, Halvorsen V. Survival of total hip replacement in young patients under 20 years of age: The primary surgery and their revisions. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

31. Nilsen JS, Espehaug B, Gøthesen Ø, Furnes O. Overlevelse av LCS kneproteser i Norge - Data fra Nasjonalt Register for Leddproteser. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

32. Småbrekke A, Olsen B, Fossum V, Winge JF, m.fl., Fenstad AM. Primære usementerte totalproteser i Tromsø 1997–2014 - Resultater etter mer enn 15 års oppfølging i Nasjonalt Register for Leddproteser (NRL). Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

33. Leta TH, Lygre SHL, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. Sammenligning av 768 total- og 578 UNI-kne-proteser reviderte til total kneproteser fra Nasjonalt Register for Leddproteser (1994–2011). Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

34. Furnes O. Nytte og begrensninger ved registerdata. Resultater fra LCS retrival studien. Forskjell på PS/CR protesene i de ulike registrene. Sementert/ikke sementerte kneprotese. Cementing technique in TKA. Ortomedic Brukermøte kne; 2015 26–27. november; Tampere, Finland.

35. Bartz-Johannessen C, Furnes O, Havelin L, Fenstad AM, Lie SA, Pedersen A, Overgaard S, Kärrholm J, Garrellick G, Malchau H, Mäkelä KT, Eskelinen A, Wilkinson JM. Riskkalkulator for norske hofteprotesepasienter. Poster presentert på Kvalitetsregisterkonferansen; 2016 21–23. Oktober, Oslo

36. Leta TH, Lygre SHL, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. The outcome of unicompatmental knee arthroplasties after aseptic revision into total knee arthroplasties. 4th International Conference on orthopedics & rheumatology; 2015 26–28 October; Baltimore, Maryland, USA.

37. Leta TH, Lygre SHL, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. The outcome of unicompartmental knee arthroplasties after aseptic revision into total knee arthroplasties. A comparative study of 768 total knees and 578 uni knees revised to total knees reported to the Norwegian arthroplasty register (1994–2011). 58th Nordic orthopaedic federation congress; 2016 27–29 April; Linköping, Sweden.

38. Furnes O, Dybvik E, Småbrekke A, Fenstad AM, Hallan G, Havelin L. Ceramic on ceramic articulation in 4926 uncemented total hip replacements with up to 15 years follow up reported to the Norwegian arthroplasty register. Poster presented at the 58th Nordic Orthopaedic Federation Congress; 2016 27–29 April; Linköping, Sweden.

39. Furnes O. Report from Norwegian shoulder arthroplasty registry. The 7th Triennial Nordic shoulder and elbow conference; 2016 12–13. May; Odense, Denmark

40. Furnes O. The learning curve of surgical procedures - Influence on education. The 7th Triennial Nordic shoulder and elbow conference; 2016 12–13 may; Odense, Denmark.

41. Dyrhovden G, Furnes O, Gøthesen Ø, Badawy M, Lygre SH. Time trends in causes of revision in unicompartmental and total knee replacement 1994–2014. Poster presented at the 5th International Congress of Arthroplasty Registries (ISAR); 2016 28–30 May; Manchester, UK.

42. Junnila M, Laaksonen I, Eskelinen A, Pulkkinen P, Havelin L, Furnes O, Fenstad AM, Pedersen AB, Overgaard S, Kärrholm J, Garellick G, Malchau H, Mäkelä K. Implant survival of the most common cemented total hip devices from the Nordic arthroplasty register association (ISAR). 5th International Congress of Arthroplasty registries; 2016 28–30 May; Manchester, UK.

43. Ackerman IN, Bohensky MA, Brand CA, Eskelinen A, Fenstad AM, Furnes O, Garellick G, Graves SE, Haapakoski J, Havelin L, Mäkelä K, Mehnert F, Pedersen AB, Robertsson O, Steiger RD. Using international registry data to quantify the lifetime risk of primary total knee replacement surgery (ISAR). 5th International Congress of Arthroplasty registries; 2016 28–30 May; Manchester, UK.

44. Leta TH, Lygre SHL, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. The outcome of unicompartmental knee arthroplasties after aseptic revision into total knee arthroplasties. A comparative study of 768 total knees and 578 uni knees revised to total knees reported to the Norwegian arthroplasty register (1994–2011) (ISAR). 5th International Congress of Arthroplasty registries; 2016 28–30 May; Manchester, UK.

45. Furnes O, Dybvik E, Småbrekke A, Fenstad AM, Hallan G, Havelin L. Ceramic on ceramic articulation in 4926 uncemented total hip replacements with up to 15 years follow up reported to the Norwegian arthroplasty register (ISAR). 5th International Congress of Arthroplasty registries; 2016 28–30 May; Manchester, UK.

46. Dyrhovden GS, Fenstad AM, Furnes O, Gøthesen Ø. Eight years survivorship of computer navigated total knee replacement reported to the Norwegian arthroplasty register (ISAR). 5th International Congress of Arthoplasty registries; 2016 28–30 May; Manchester, UK.

47. Johansson PE, Furnes O, Havelin L, Fenstad AM, Pedersen A, Overgaard S, Garellic G, Mäkelä K, Kärrholm J. Mixed outcome in a design-specific comparison between highly cross-linked and conventional polyethylene in total hip arthroplasty, 163368 THR in the Nordic arthroplasty register association database with 5–11 years follow up (ISAR). 5th International Congress of Arthroplasty registries; 2016 28–30 May; Manchester, UK.

48. Kreipke R, Pedersen AB, Rogmark C, Kärrholm J, Hallan G, Havelin L, Mäkelä K, Overgaard S. Revision risks of dual mobility cups in total hip arthroplasty - A matched register-based study from the Nordic arthroplasty register association (ISAR). 5th International Congress of Arthoplasty registries; 2016 28–30 May; Manchester, UK.

49. Niemeläinen M, Mäkelä K, Pulkkinen P, Robertsson O, Dahl AW, Furnes O, Fenstad AM, Pedersen AB, Troelsen A, Schrøder H, Eskelinen A. Ageing generation responsible for high incidences of knee arthroplasties. A population based study from Nordic arthroplasty register association (ISAR). 5th Congress of Arthroplasty registries; 2016 28–30 May; Manchester, UK.

50. Niemeläinen M, Mäkelä K, Pulkkinen P, Robertsson O, Dahl AW, Furnes O, Fenstad AM, Pedersen AB, Troelsen A, Schrøder H, Eskelinen A. Failure rate of cemented and uncemented total knee replacement in working-age population: A register study of combined Nordic database of four nations (ISAR). 5th Congress of Arthroplasty registries; 2016 28–30 May; Manchester, UK.

51. Furnes O, Dybvik E, Småbrekke A, Fenstad AM, Hallan G, Havelin L. Ceramic on ceramic articulation in 4926 uncemented total hip replacements with up to 15 years follow up reported to the Norwegian arthroplasty register. 17th EFORT Congress; 2016 1–3 June; Geneva, Switzerland.

52. Leta TH, Lygre SH, Skredderstuen A, Hallan G, Gjertsen JE, Rokne B, Furnes O. The outcome of unicompartmental knee arthroplasties after aseptic revision into total knee arthroplasties. A comparative study of 768 total knees and 578 uni knees revised to total knees reported to the Norwegian arthroplastry register (1994–2011). 17th EFORT Congress; 2016 1–3 June; Geneva, Switzerland.

53. Brüggermann H, Hallan G, Fenstad AM, Havelin LI, Fosse L. Risk factors for intraoperative proximal femoral fractures (IPFF) during primary hip arthroplasty: 1728 IPFFs were reported to the Norwegian arthroplasty register (NRL) between 1987 to 2014. 17th EFORT Congress; 2016 1–3 June; Geneva, Switzerland.

54. Havelin LI. The truth of cemented versus uncemented. 17th EFORT Congress; 2016 1–3 June; Geneva, Switzerland.

55. Brorson S, Salomonsson B, Jensen SL, Fenstad AM, Demir Y, Rasmussen J. Risk of revision and reasons for revision after shoulder replacement for acute fracture of the proximal humerus: A Nordic registry-based study of 6,744 cases. 17th EFORT Congress; 2016 1–3 June; Geneva, Switzerland.

Norwegian Cruciate Ligament Register

1. 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; June 7–11, 2015; Lyon, France.

2. Persson A, Gifstad T, Kjellsen B. A, Fjeldsgaard K, Espehaug B, Drogset J O, Engebretsen L, Forssblad M, Lind M, Fevang M.J. The impact of fixation methods on the risk of revision in ACL reconstruction - A study from the Schandinavian ACL registries, 2004–2011. 4TH Jahreskongress der Deutschen Kniegesellschaft; 2015 20–21 November; München, Germany.

Norwegian Hip Fracture Register

1. Gjersten JE. It needs a nail. Edinburgh International Trauma symposium; 2015 19–21 August; Edinburgh, Scotland.

2. Gjertsen JE. Femoral neck fractures. Edinburgh International Trauma symposium; 2015 19–21 August; Edinburgh, Scotland.

3. Kristoffersen MH, Engesæter LB, Gjertsen JE. Treatment of hip frectures in patients with cognitive impairment. Fragility Fracture Network 4th Global Congress; 2015 4–6 Sep; Rotterdam, Netherlands

4. Kristoffersen MH, Steihaug OM, Martinsen MI, Dybvik E, Bartz-Johannessen CH, Ranhoff AH, Engesæter LB, Gjertsen JE. Validering av demensdata i Nasjonalt Hoftebruddregister. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

5. Engesæter LB, Gjertsen LE. Nasjonalt hoftebruddregister- Erfaringer etter 10 års drift. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

6. Authen AL, Engesæter LB, Gjertsen JE. Har kirurgens erfaring noe å si for resultatet etter hoftebruddkirurgi? Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

7. Nygard H, Matre K, Fevang JM. Er tidleg postoprerativ «timed up and og» test (TUG) eigna for hoftebrudd pasientar. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

8. Solberg LB, Basso T, Hübschle LM, Gjertsen JE, Frihagen F. Ett brudd er nok! Behandlingsveileder for sekundærforebygging av brudd. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

Norwegian Paediatric Hip Register

1. Reve AK, Engesæter LB, Gundersen T, Wensaas A, Wiig O, Wiik R. Nasjonalt Barnehofteregister- Validering mot Norsk pasientregister. Høstmøtet i Norsk Ortopedisk Forening; 2015 21.–23. oktober; Oslo.

Clinical trials

1. 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.

2. Furnes O. Randomized study on highly crossedlinked poly- and oxinium versus cobolt 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, Postboks 1400
Møllendalsbakken 11, 5021 BERGEN
Tlf 55973742/55973743

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

Navn:.....

(Skriv tydelig ev. pasientklistrelapp – **spesifiser sykehus**.)

Sykehus:.....

HOFTEPROTESER

Alle totale hofteproteseoperasjoner og hemiproteser på annen indikasjon enn fraktur/fraktursekvele registreres her (hemiprotese for fraktur/fraktursekvele registreres på Hoftebruddskjema). Alle reoperasjoner skal registreres: skifte/fjerning av protesedeler, kantplastikk, bløtdelsdebridement, og operasjoner for protesenær fraktur eller gluteal svikt.

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 .....

AKTUELLE OPERASJON (ett kryss)
☐1 Primæroperasjon (også hvis hemiprotese tidligere)
☐2 Reoperasjon (totalprotese tidligere)
☐3 Primær hemiprotese for annen indikasjon enn fraktur/fraktursekvele

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

AKTUELLE SIDE (ett kryss) (Bilateral opr.= 2 skjema)
☐1 Høyre ☐2 Venstre

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

A. Primæroper. pga (ev. 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
☐10 Annet.....
(f.eks caputnekrose, tidl. artrodese o.l)

B. Reoper. pga (ev. flere kryss)
☐1 Løs acetabularkomponent
☐2 Løs femurkomponent
☐3 Luksasjon
☐4 Dyp infeksjon
☐5 Fraktur i acetabulum
☐6 Fraktur av femur
Vancouverklassifikasjon, se bakside.
☐A ☐B1 ☐B2 ☐ B3 ☐C
☐7 Smerter
☐8 Osteolyse i acetab. uten løsning
☐9 Osteolyse i femur uten løsning
☐10 Implantatfraktur femurdel
☐11 Implantatfraktur caput
☐12 Implantatfraktur kopp
☐13 Implantatfraktur liner
☐14 Implantatfraktur annet: .....
.....
☐15 Gluteal svikt
☐16 Annet.....
(f.eks Girdlestone etter tidl. infisert protese)

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
☐10 Ny protese etter Girdlestone
☐11 Resutur av muskel
☐12 Transposisjon av muskel
☐13 Osteosyntese for fraktur
☐14 Konvertering til hemiprotese
☐15 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
TROCHANTEROSTEOTOMI ☐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 skriv REF.NR.)

Acetabulum
Navn/Type .....
ev. REF.NR. .....
☐ Med hydroksylapatitt ☐ Uten hydroksylapatitt
☐1 Sement med antibiotika – Navn .....
☐2 Sement uten antibiotika – Navn .....
☐3 Usementert

Femur (+ ev. trokanterdel)
Navn/Type .....
ev. REF.NR. .....
☐ Med hydroksylapatitt ☐ Uten hydroksylapatitt
☐1 Sement med antibiotika – Navn .....
☐2 Sement uten antibiotika – Navn .....
☐3 Usementert

Caput (+ ev. halsdel)
☐1 Fastsittende caput
☐2 Separat caput - Navn/Type .....
ev. REF. NR. .....
Diameter .....

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

	Navn	*Dosering*	*Varighet i timer*
Medikament 1	.....	.....	.....timer
Medikament 2	.....	.....	.....timer
Medikament 3	.....	.....	.....timer

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 TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja, type: .....

FIBRINOLYSEHEMMER
☐0 Nei ☐1 Ja, medikament: ..... Dosering.....

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

OPERASJONSTID (hud til hud) .....min

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 hemiproteser 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

Primæroperasjoner: Første totalproteseoperasjon, og første hemiprotese hvis denne settes inn på annen indikasjon enn fraktur. Hemiprotese for fraktur/fraktursekvele registreres på Hoftebruddskjema.

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

ÅRSAK TIL AKTUELLE OPERASJON

Kryss av under A ved primæroperasjoner 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), bløtdelsrevisjoner for infeksjon, osteosyntese, resutur av muskel og muskeltransposisjon registreres selv om protesedeler ikke skiftes.

BENTRANSPLANTASJON Benpropp som sementstopper regnes ikke som bentransplantat. Vi skiller mellom benpakking og transplantasjon.

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

Bruk klistrelappene som følger med protesen. Lim disse på baksiden av skjema. Alternativt, skriv inn protesenavn + REF.NR., materiale, overflatebelegg og design. Sementnavn må anføres (bruk klistrelapp).

KOMPLIKASJONER Også operasjoner hvor pasienter dør på operasjonsbordet eller rett etter operasjon skal meldes. Ved 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**)** når det er brukt spesialinstrument laget for MIS.

ANTIBIOTIKAPROFYLAKSE Før på antibiotikum som er benyttet i forbindelse med operasjonen, f.eks.: Medikament 1: Keflin 2g x 4, med varighet 4,5 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 tromboseprofylakse (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER Her føres det på om en benytter blødningsreduserende 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 superiort.

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

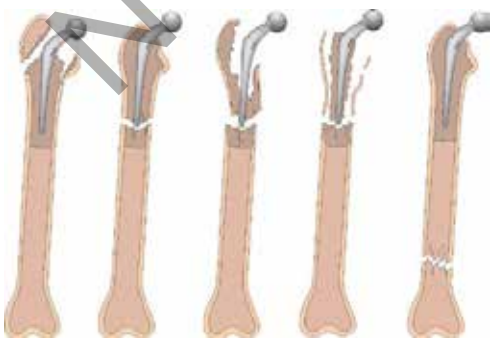
Type IIIA: Betydelig komponentvandring, osteolyse og bentap. Bentap fra kl.10 til 2.

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

Kopi beholdes til pasientjournalen, originalen sendes Haukeland universitetssjukehus.

PROTESENÆR FRAKTUR

Vancouverklassifikasjon



Type A Type B1 Type B2 Type B3 Type C

Kontaktpersoner vedrørende registreringsskjema er

Seksjonsoverlege Leif Ivar Havelin, tlf. 55 97 56 87 og overlege Ove Furnes, tlf. 55 97 56 90
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 Merete Husøy, tlf. 55 97 82 53
Epost nrl@helse-bergen.no Internett: http://nrlweb.ihelse.net/

Skjema revidert i november 2015.

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 hemiproteser 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
☐10 Implantatfraktur femurdel
☐11 Implantatfraktur caput
☐12 Implantatfraktur kopp
☐13 Implantatfraktur liner
☐14 Implantatfraktur annet: .....
☐ Annet .....
(f.eks Girdlestonesituasjon etter tidl. infisert protese)

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 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 .....

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

OPERASJONSTID (hud til hud) .....min

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 hemiproteser 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

Primæroperasjoner: 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.

ÅRSAK TIL AKTUELLE OPERASJON

Kryss av under A ved primæroperasjoner 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 Laegeforen. 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 oprerasjonsdagen og senere. Det skal også oppgis om pasienten står fast på antikoagulantia (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER

Her føres det på om en benytter blødningsreduserende 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 superiort.

Type IIC: Hemisfærisk acetabulum uten store kantdefekter, intakt bakre og fremre kollonne, 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 registreringsskjema 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, Postboks 1400
Møllendalsbakken 11, 5021 BERGEN
Tlf 55973742/55973743

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

Navn:.....

(Skriv tydelig ev. pasientklistrelapp – **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
☐2 Ankel
☐3 Tær (angi ledd) ……..
☐4 Skulder
☐5 Albue
☐6 Håndledd
☐7 Fingre (angi ledd) ……
☐8 Annet ……..
☐9 Rygg (angi nivå)……..……

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 leddbåndsop.)……

AKTUELLE OPERASJON (ett kryss)
☐1 Primæroperasjon ☐ 2 Reoperasjon (protese tidligere)

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

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

A. Primæroper. pga (ev. flere kryss)
☐1 Idiopatisk artrose
☐2 Rheumatoid artritt
☐3 Fraktursequele……
☐4 Mb. Bechterew
☐5 Sequele ligamentskade
☐6 Sequele meniskskade
☐7 Akutt fraktur
☐8 Infeksjonssequele
☐9 Spondylose
☐10 Sequele prolaps kirurgi
☐11 Degenerativ skivesykdom
☐12 Rotarcuff artropati
☐13 Annet ……

B. Reoper. pga (ev. flere kryss)
☐1 Løs prox.protesedel
☐2 Løs distal protesedel
☐3 Løs patellaprotese
☐4 Luksasjon av patella
☐5 Luksasjon (ikke patella)
☐6 Instabilitet
☐7 Aksefeil
☐8 Dyp infeksjon
☐9 Fraktur av bein (nær protesen)
☐10 Smerter
☐11 Slitt eller defekt plastforing
Hvilken……
☐12 Progresjon av artrose
☐13 Annet (f.eks tidl fjernet protese)
……

REOPERASJONSTYPE (ev. flere kryss)
☐1 Bytte el. innsetting av distal komponent
☐2 Bytte el. innsetting av proximal protesedel
☐3 Bytte el. innsetting av hele protesen
☐4 Innsetting av patellakomp.
☐5 Bytte av patellaprotese
☐6 Bytte av plastforing
☐7 Artrodese
☐8 Amputasjon
☐9 Fjernet protesedeler (inkl. sementspacer)
Angi hvilke deler ……..
……
☐10 Bløtdelsdebridement for infisert protese
☐11 Annet……

BENTRANSPLANTASJON (ev. flere kryss)
Proximalt ☐0 Nei ☐1 Ja ☐2 Benpakking
Distalt ☐0 Nei ☐1 Ja ☐2 Benpakking

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

	Navn	*Dosering*	*Varighet i timer*
Medikament 1	.....	.....	.....timer
Medikament 2	.....	.....	.....timer
Medikament 3	.....	.....	.....timer

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 TROMBOSEPROFYLAKSE
☐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): .....

MINI INVASIV 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 ☐7 Annet ……

FEMURKOMPONENT
Navn/Type/Str ……
ev. katalognummer ……
Sentral stamme ☐0 Nei ☐1 Ja, ev. lengde ……mm
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 (metallplatå)
Navn/Type/Str ……
ev. katalognummer ……
Forlenget sentral stamme ☐0 Nei ☐1 Ja, ev. lengde ……mm
Metallforing ☐0 Nei ☐1 Ja
☐1 Sement med antibiotika – Navn ……
☐2 Sement uten antibiotika – Navn ……
☐3 Usementert

TIBIAKOMPONENT (plastkomponent)
Navn/Type/Str ……
ev. katalognummer. ……
Tykkelse …….. mm
Stabilisering ☐0 Nei ☐1 Ja, bakre ☐2 Ja, annen

PATELLAKOMPONENT
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 ☐4 Annet .....

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.
På eget Samtykkeskjema skal pasienten gi samtykke til rapportering til Leddregisteret. Samtykkeskjemaet skal lagres i pasientjournal.

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.

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

BENTRANSPLANTASJON
Påsmøring av benvev rundt protesen regnes ikke som bentransplantat.

ANTIBIOTIKAPROFYLAKSE
Medikament, dose og varighet av profylaksen skal angis f.eks. slik: Medikament: Keflin, Dosering: 2g x 4, med varighet 4,5 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 tromboseprofylakse (AlbyIE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER
Her føres det på om en benytter blødningsreduserende 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 REOPERASJONSTYPE 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 tibiakomponent 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 tibiakomponent (metallplatå) 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
Overlege Ove Furnes, tlf. 55 97 56 90 og seksjonsoverlege 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:
Randi Furnes, tlf. 55 97 37 42 og Ingunn Vindenes, tlf. 55 97 37 43.
Epost: nrl@helse-bergen.no Internett: http://nrlweb.ihelse.net/
Skjema revidert i november 2015.

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 leddbåndsop.).....

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

AKTUELLE OPERASJON (ett kryss)
☐1 Primæroperasjon ☐2 Reoperasjon (protese tidligere)

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

A . Primæroper. pga (ev. flere kryss)
☐1 Idiopatisk artrose
☐2 Rheumatoid artritt
☐3 Frakturesequele
☐4 Mb. Bechterew
☐5 Sequele ligamentskade
☐6 Sequele meniskskade
☐7 Akutt fraktur
☐8 Infeksjonssequele
☐9 Spondylose
☐10 Sequele prolaps kirurgi
☐11 Degenerativ skivesykdom
☐12 Annet .....

B . Reoper. pga (ev. flere kryss)
☐1 Løs prox.protesedel
☐2 Løs distal protesedel
☐3 Løs patellaprotese
☐4 Luksasjon av patella
☐5 Luksasjon (ikke patella)
☐6 Instabilitet
☐7 Aksefeil
☐8 Dyp infeksjon
☐9 Fraktur av bein (nær protesen)
☐10 Smerter
☐11 Slitt eller defekt plastforing
Hvilken.....
☐12 Progresjon av artrose
☐13 Annet (f.eks tidl fjernet protese)
.....

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

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
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. lengde .....mm
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 (metallplatå)
Navn/Type/Str .....
ev. katalognummer .....
Stabiliseringsplugger ☐0 Nei ☐1 Ja,plast ☐2 Ja,metall ☐3 Ja,1 + 2
Forlenget sentral stamme ☐0 Nei ☐1 Ja, ev. lengde .....mm
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.

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

BENTRANSPLANTASJON
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 (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER
Her føres det på om en benytter blødningsreduserende 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 REOPERASJONSTYPE 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 tibiakomponent (metallplatå) 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. pasientklistrelapp – **spesifiser sykehus**.)

Sykehus:.....

HOFTEBRUDD

PRIMÆRE OPERASJONER PÅ BRUDD I PROKSIMALE FEMURENDE og ALLE REOPERASJONER, inkludert lukket reponering av hemiproteser. Ved primæroperasjon med totalprotese og ved reoperasjon til totalprotese brukes kun hofteproteseskjema. Alle produktklistrelapper settes i merket felt på baksiden av skjemaet.

AKTUELLE OPERASJON
☐1 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 TIMER
☐1 0-6 ☐2 >6-12 ☐3 >12-24 ☐4 >24-48 ☐5 >48

KOGNITIV SVIKT
☐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 (ÅRSAK 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)
☐9 Intertrokantært (AO klassifikasjon A3)
☐6 Subtrokantært
☐7 Annet, spesifiser……

TYPE PRIMÆROPERASJON (Kun ett kryss)
(Fylles ut bare ved primæroperasjon - eget skjema for totalproteser)
(Fest produktklistrelapp 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……

ÅRSAK 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 prominerende 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 produktklistrelapp 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……

ANESTESITYPE
☐1 Narkose ☐2 Spinal ☐3 Annet, spesifiser……

PEROPERATIVE KOMPLIKASJONER
☐0 Nei ☐1 Ja, hvilke(n)……

OPERASJONSTID (hud til hud).....minutter.

ANTIBIOTIKAPROFYLAKSE ☐0 Nei ☐1 Ja

	Navn	Dosering	Varighet i timer
Medikament 1	.....	.....	……..timer
Medikament 2	.....	.....	……..timer
Medikament 3	.....	.....	……..timer

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 TROMBOSEPROFYLAKSE
☐0 Nei ☐1 Ja, type: .....

FIBRINOLYSEHEMMER
☐0 Nei ☐1 Ja, medikament : ..... Dosering ……..

OPERATØRERFARING
Har en av operatørene mer enn 3 års erfaring i hoftebruddkirurgi? ☐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 reposisjoner, 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.

KOGNITIV SVIKT
Kognitiv svikt kan eventuelt testes ved å be pasienten tegne klokken når den er 10 over 11. En pasient med kognitiv svikt 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: Komplett lårhalsbrudd uten dislokasjon
Garden 3: Komplett lårhalsbrudd med delvis dislokasjon. Fragmentene er fortsatt i kontakt, men det er feilstilling av lårhalsens trabekler. Caputfragmentet ligger uanatomisk i acetabulum.
Garden 4: Komplett lårhalsbrudd med full dislokasjon. Caputfragmentet er fritt og ligger korrekt i acetabulum slik at trabeklene er normalt orientert.

AO KLASSIFIKASJON 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.

REOPERASJONSÅRSAK
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.

ANTIBIOTIKAPROFYLAKSE
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 4,5 timer.

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

FIBRINOLYSEHEMMER
Her føres det på om en benytter blødningsreduserende 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://nrlweb.ihelse.net/

PRODUKTKLISTRELAPPER:

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. pasientklistrelapp – **spesifiser sykehus**.)

Sykehus:.....

HOFTEBRUDD

PRIMÆRE OPERASJONER PÅ BRUDD I PROKSIMALE FEMURENDE og ALLE REOPERASJONER, inkludert lukket reponering av hemiproteser. Ved primæroperasjon med totalprotese og ved reoperasjon til totalprotese brukes kun hofteproteseskjema. Alle produktklistrelapper settes i merket felt på baksiden av skjemaet.

AKTUELLE OPERASJON
☐1 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 TIMER
☐1 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 (ÅRSAK 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)
☐9 Intertrokantært (AO klassifikasjon A3)
☐6 Subtrokantært
☐7 Annet, spesifiser.....

TYPE PRIMÆROPERASJON (Kun ett kryss)
(Fylles ut bare ved primæroperasjon - eget skjema for totalproteser)
(Fest produktklistrelapp 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.....

ÅRSAK 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 prominerende 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 produktklistrelapp 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.....

ANESTESITYPE
☐1 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)

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 ANTIKOAGUALASJON
☐0 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 reposisjoner, 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: Komplett lårhalsbrudd uten dislokasjon
Garden 3: Komplett lårhalsbrudd med delvis dislokasjon. Fragmentene er fortsatt i kontakt, men det er feilstilling av lårhalsens trabekler. Caputfragmentet ligger uanatomisk i acetabulum.
Garden 4: Komplett lårhalsbrudd med full dislokasjon. Caputfragmentet er fritt og ligger korrekt i acetabulum slik at trabeklene er normalt orientert.

AO KLASSIFIKASJON 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.

REOPERASJONSÅRSAK
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 oprerasjonsdagen og senere. Det skal også oppgis om pasienten står fast på antikoagulantia (AlbylE, Marevan, Plavix ol).

FIBRINOLYSEHEMMER
Her føres det på om en benytter blødningsreduserende 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. pasientklistrelapp – **spesifiser sykehus**.)

KORSBÅND

KORSBÅNDSOPERASJONER OG ALLE REOPERASJONER på pasienter som tidligere er korsbåndsoperert.

Alle klistrelapper (med unntak av pasientklistrelapp) 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

SKADEDATO FOR AKTUELL SKADE (mm.åå) |__|__| |__|__|

AKTIVITET SOM FØRTE TIL AKTUELLE SKADE

☐0 Fotball
☐1 Håndball
☐2 Snowboard
☐3 Alpint (inkl. twin tip)
☐4 Annen skiaktivitet
☐5 Kampsport
☐6 Basketball
☐7 Annen lagidrett
☐8 Motor- og bilsport
☐9 Annen fysisk aktivitet
☐10 Arbeid
☐11 Trafikk
☐12 Fall/hopp/vold/lek
☐98 Annet.....

AKTUELLE SKADE (Registrer **alle** skader – også de som ikke opereres)
☐ ACL ☐ MCL ☐ PLC ☐ Med. menisk
☐ PCL ☐ LCL ☐ Brusk ☐ Lat. menisk
☐ Annet.....

YTTERLIGERE SKADER (evt. flere kryss) ☐ Nei, hvis ja spesifiser under

☐ Karskade	Hvilken: .....
☐ Nerveskade	☐ 0N. tibialis ☐ 1N. peroneus
☐ Fraktur	☐ 0Femur ☐ 1Tibia ☐ 2Fibula ☐ 3Patella ☐ 4Usikker
☐ Ruptur i ekstensorapparatet	☐ 0Quadricepssenen ☐ 1Patellarsenen

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)
☐ Infeksjon
☐ Fiksasjonssvikt
☐ Ubehandlede andre ligamentskader
☐ Graftsvikt
☐ Nytt traume
☐ Smerte
☐ Annet .....

ANDRE PROSEDYRER (evt. flere kryss) ☐ Nei, hvis ja spesifiser under
☐ Meniskoperasjon
☐ Synovektomi
☐ Mobilisering i narkose
☐ Fjerning av implantat
☐ Benreseksjon (Notch plastikk)
☐ Osteotomi
☐ Annet .....
☐ Osteosyntese
☐ Bruskoperasjon
☐ Artroskopisk debridement
☐ Operasjon pga infeksjon
☐ Bentransplantasjon
☐ Artrodese

GRAFTVALG

	ACL	PCL	MCL	LCL	PLC
☐ BPTB					
☐ Hamstring					
☐ Allograft					
☐ Direkte sutur					
☐ Annet					

GRAFTDIAMETER (oppgi største diameter på graftet) .. ..mm

Ved bruk av double bundle-teknikk: AM:.....mm PL:.....mm

TILGANG FOR FEMURKANAL
☐1 Anteromedial ☐2Transtibial ☐3 Annet .....

FIKSASJON
Sett klistrelapp 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	☐	☐	☐	☐	☐	☐	☐
Lateral	☐	☐	☐	☐	☐	☐	☐

* Sett klistrelapp på merket felt på baksiden

BRUSKLESJON (evt. flere kryss)

	Areal (cm^2) ≤2	Areal (cm^2) >2	ICRS Grade* 1 2 3 4	Artrose Ja	Artrose Nei	Behandlings-kode** 1 2 3 4	Spesifiser annet
Patella MF	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	.....
Patella LF	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	.....
Trochlea fem.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	.....
Med.fem. cond.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	.....
Med. tib. plat.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	.....
Lat.fem. cond.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	.....
Lat. tib. plat.	☐	☐	☐☐☐☐	☐	☐	☐☐☐☐	.....

***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 …….. Varighet ……timer

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……

HØYDE .....cm

VEKT .....kg

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 korsbåndsoperasjoner.
- Registreringen gjelder ALLE kneoperasjoner på pasienter som tidligere er korsbåndsoperert.
- 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 klistrelapp på baksiden.
Husk å skille mellom femur og tibia for graftfiksasjon, 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 Korsbåndsregister.

Kontaktpersoner vedrørende registreringsskjema er
Professor Lars Engebretsen, Ortopedisk avdeling, Oslo
Universitetssykehus e-post: lars.engebretsen@medisin.uio.no
Overlege Knut Andreas Fjeldsgaard, Haukeland universitetssjukehus
e-post: knut.andreas.fjeldsgaard@helse-bergen.no
Sekretær i Nasjonalt Korsbåndsregister, Ortopedisk avd., Helse Bergen
Merete Husøy, tlf.: 55 97 64 50, faks: 55 97 37 49
e-post: korsband@helse-bergen.no

GRAFTFIKSASJON		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
☐[0]	☐[1]	☐[2]	☐[3]	☐[4]

S2. Har du følt knirking, hørt klikking eller andre lyder fra kneet?

Aldri	Sjelden	I blant	Ofte	Alltid
☐[0]	☐[1]	☐[2]	☐[3]	☐[4]

S3. Har kneet haket seg opp eller låst seg?

Aldri	Sjelden	I blant	Ofte	Alltid
☐[0]	☐[1]	☐[2]	☐[3]	☐[4]

S4. Har du kunnet rette kneet helt ut?

Alltid	Ofte	I blant	Sjelden	Aldri
☐[0]	☐[1]	☐[2]	☐[3]	☐[4]

S5. Har du kunnet bøye kneet helt?

Alltid	Ofte	I blant	Sjelden	Aldri
☐[0]	☐[1]	☐[2]	☐[3]	☐[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
☐[0]	☐[1]	☐[2]	☐[3]	☐[4]

S7. Hvor stivt er kneet ditt senere på dagen etter å ha sittet, ligget eller hvilt?

Ikke noe	Litt	Moderat	Betydelig	Ekstremt
☐[0]	☐[1]	☐[2]	☐[3]	☐[4]

Smerte

P1. Hvor ofte har du vondt i kneet?

Aldri	Månedlig	Ukentlig	Daglig	Hele tiden
☐0	☐1	☐2	☐3	☐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
☐0	☐1	☐2	☐3	☐4

P3. Rette kneet helt ut

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P4. Bøye kneet helt

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P5.Gå på flatt underlag

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P6. Gå opp eller ned trapper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P7. Om natten (smerter som forstyrrer søvnen)

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P8. Sittende eller liggende

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

P9. Stående

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐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
☐0	☐1	☐2	☐3	☐4

A2. Gå opp trapper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A3. Reise deg fra sittende stilling

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

Angi graden av **vanskeligheter** du har opplevd ved hver aktivitet den **siste uken.**

A4. Stå stille

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A5. Bøye deg, f.eks. for å plukke opp en gjenstand fra gulvet

Ingen	Lett	Moderat	Betydelig	Svært sto
☐0	☐1	☐2	☐3	☐4

A6. Gå på flatt underlag

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A7. Gå inn/ut av bil

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A8. Handle/gjøre innkjøp

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A9. Ta på sokker/strømper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A10. Stå opp fra sengen

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A11. Ta av sokker/strømper

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A12. Ligge i sengen (snu deg, holde kneet i samme stilling i lengre tid)

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A13. Gå inn/ut av badekar/dusj

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A14. Sitte

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A15. Sette deg og reise deg fra toalettet

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A16. Gjøre tungt husarbeid (måke snø, vaske gulv, støvsuge osv.)

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

A17. Gjør lett husarbeid (lage mat, tørke støv osv.)

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐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
☐0	☐1	☐2	☐3	☐4

SP2. Løpe

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

SP3. Hoppe

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

SP4. Snu/vende på belastet kne

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

SP5. Stå på kne

Ingen	Lett	Moderat	Betydelig	Svært stor
☐0	☐1	☐2	☐3	☐4

Livskvalitet

Q1. Hvor ofte gjør ditt kneproblem seg bemerket?

Aldri	Månedlig	Ukentlig	Daglig	Alltid
☐0	☐1	☐2	☐3	☐4

Q2. Har du forandret levesett for å unngå å overbelaste kneet?

Ingenting	Noe	Moderat	Betydelig	Fullstendig
☐0	☐1	☐2	☐3	☐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
☐0	☐1	☐2	☐3	☐4

Q4. Generelt sett, hvor store problemer har du med kneet ditt?

Ingen	Lette	Moderate	Betydelige	Svært store
☐0	☐1	☐2	☐3	☐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

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)

BEHANDLINGSDATO ...../..... 20..... **SIDE** Hø 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
HOFTE 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 Adduktortenotomi
FEMUROSTEOTOMI Varisering Rotasjon Forkortning
PLATE Forbøyd plate Vinkelplate Spesialplate, fabrikat: .....
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 .....
REOPERASJONSTYPE Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.
Annen: .....
REOPERASJONSÅRSAK Osteosyntesesvikt Infeksjon Pseudartrose
Blødning Annen: .....
ANNEN OPERASJON N J Spesifiser: .....
KNIVTID FOR OPERATIV BEHANDLING: ..... min.

EPIFYSIOLYSIS CAPITIS FEMORIS

OPERASJONSDATO ...../..... 20..... **SIDE** Hø 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
PRIMÆROPERASJONSTYPE Fiksasjon in-situ: N J Peroperativ reposisjon: N J
Kirurgisk hofte-dislokasjon: N J Collumosteotomi: N J
Femurosteotomi: N J Spesifiser: .....
Skrueosteosyntese: N J Antall skruer: ..... Fabrikat: .....
Pinnefiskasjon: N J Antall pinner: ..... Diameter: ..... mm
Platefiksasjon: N J Spesifiser: .....
Annen operasjon: N J Spesifiser: .....
REOPERASJONSTYPE Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.
Annen, spesifiser: .....
REOPERASJONSÅRSAK Feilplass. av osteosynt. Osteosyntesesvikt Infeksjon
Blødning Annen: .....
KNIVTID FOR OPERATIV BEHANDLING: ..... min.

Ved operativ behandling (artroskopisk eller åpen) for impingement etter SCFE: fyll ut rubrikken ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

Dato: ..... Lege: .....
Legen som har fylt ut skjemaet (Navnet registreres ikke i databasen)

CALVÉ-LEGG-PERTHES

BEHANDLINGSDATO ...../..... 20..... **SIDE** Hø 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, fabrikat: .....
SKRUER Vanlige skruer Vinkelstabile skruer
BEKKENOSTEOTOMI Salter Dega Takplastikk
Annen, spesifiser: .....
ANNEN OPERATIV BEHANDLING Trochanter transposisjon Trochanter apofysiodese
Annen, spesifiser: .....
REOPERASJONSTYPE Reosteosyntese Bløtdelsrevisjon Fjerne ostemat.
Annen: .....
REOPERASJONSÅRSAK Osteosyntesesvikt Blødning Infeksjon
Pseudartrose Annen: .....
KNIVTID FOR OPERATIV BEHANDLING: ..... min.
Ved artroskopi eller hoftedislokasjon for sequele etter CLP: fyll ut rubrikken ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

ÅPNE OG ARTROSKOPISKE HOFTEOPERASJONER

BEHANDLINGSDATO ...../..... 20..... **SIDE** Hø 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 kompartment først Sentrale kompartment først
PEROPERATIVE FUNN
Labrum: Normal Degen. forandret Forbenet 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: ..... mm^2 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 forbening av labrum Som del av leddflaten Synovitt: N J
KIRURGISK BEHANDLING Labrumruptur: Debridement Sutur. Antall ankre: .....
Type ankre: ..... *(Klistrelapp på baksiden)* 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 Fiksering Annen: .....
Frie legemer fjernet: N J Synovectomi: N J Knivtid ..... min.
Reoperasjonsårsak, spesifiser: .....

202 5023 Bergen Grafisk as - 03.2013

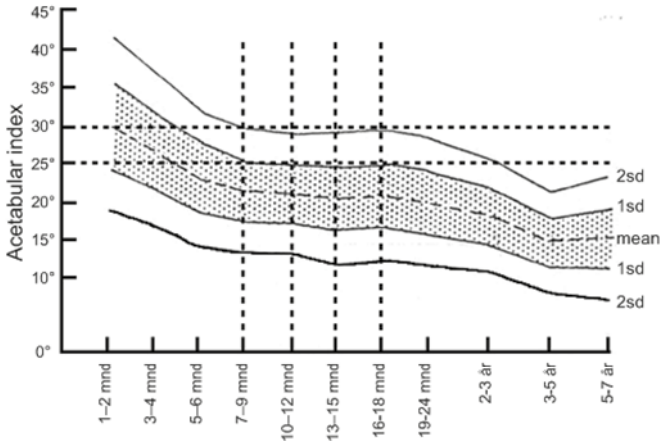
RETTLEDNING

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 (putebehandlet) registreres hvis de fortsatt har dysplasi på røntgen bekken på kontroll etter 3 måneders alder. Barn med nevroortopediske 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: I/II = <50 % caputnekrose. **III/IV** = >50 % caputnekrose

3. EPIFYSIOLYSIS CAPITIS FEMORIS

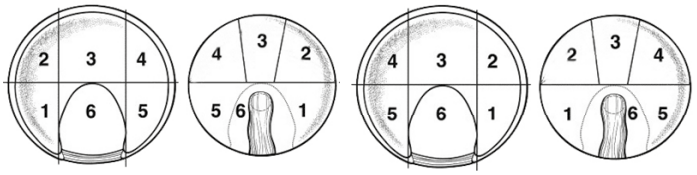
- **Registreres første gang ved diagnose/primærbehandling**
- **Registreres ved senere behandling som krever anestesi** Osteosyntese, femurosteotomier, reoperasjoner.

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 occuring 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: Baktil



Venstre hofte Høyre hofte

Bruskskade på caput femoris – Dybde (ICRS):
1=Nearly normal: Superficial lesions, soft identation 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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