Nasjonalt Register for Leddproteser

Nasjonalt Hoftebruddregister

Nasjonalt Korsbåndregister

Nasjonalt Barnehofteregister

NASJONAL KOMPETANSETJENESTE for leddproteser og hoftebrudd

REPORT

June 2018

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
2017 ANNUAL REPORT

This annual report presents results and descriptive statistics from our four registers. Results aimed at the general public are published in November of each year on the website of the National Service Centre for Medical Quality Registers (http://www.kvalitetsregistre.no/resultater/). Some of the results are included in this annual report.

This annual report is sent electronically to all orthopaedic surgeons in Norway. Paper copies can be obtained by contacting the Norwegian Arthroplasty Register (NRL). The National Advisory Unit website http://nrlweb.ihelse.net/ contains all our annual reports and references to our scientific papers and presentations. Most of the papers are also available electronically from this website. We publish most of our findings from implants and surgical methods in scientific journals. Here, we can account for materials and methods and discuss strengths and weaknesses and the significance of our findings (see the reference lists at the end of this annual report). We present percentages of three- and ten-year durability (i.e. the proportion not reoperated) of the most commonly used hip and knee prostheses in Norway. This information is also available on the website of the National Service Centre.

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

A coverage analysis is published for each of the registers. These analyses were conducted in cooperation with the National Service Centre and the Norwegian Patient Register (NPR). Hospitals with low reporting need to review their reporting procedures. Some hospitals have low reporting of revisions. We are working on an analysis of patients reported as revisions to the NPR, but not to the NRL and the Hip Fracture Register. Each contact person will be contacted later this year to check the hospital figures.

The Cruciate Ligament Register has developed an electronic medical registration system (MRS) for the electronic recording of information on implants and surgeons, which is now being used at Haukeland University Hospital and Oslo University Hospital. A bar code scanner is used to read information on implants. More hospitals will be contacted this year with a view to using the MRS. A corresponding system is now being developed for shoulder prostheses and for the Paediatric Hip Register. Electronic registration of patient-reported outcome measures (PROM) for total hip arthroplasty has been used at Haukeland University Hospital since autumn 2017 and is currently being tested at two other hospitals. It is planned to be used at other hospitals in 2018. PROM will be commenced for knee arthroplasty in 2018.

Please remember that the Norwegian Data Protection Authority requires statements of consent to be signed by patients before operations are reported to the registers, and the statements must be stored in a secure archiving system.

We would like to thank Lars B. (Lasse) Engesæter for his thirty-five years' work for the registers. He established the Hip Arthroplasty Register in collaboration with Einar Sudmann. He retired on 1 September 2017, from which date Jan-Erik Gjertsen took over as head of the Hip Fracture Register.

We would like to thank everyone who attended the Hip Arthroplasty Register's 30-year anniversary celebration held in Bergen on 28-29 September 2017.

The National Advisory Unit now has its own Facebook page, which we hope you will visit. There is a QR code with a link to the page on the back of this year's report.

We would like to thank all orthopaedic surgeons in Norway for good reporting. We are also grateful for good cooperation with the Reference Group, the Norwegian Orthopaedic Association, Helse Bergen, Helse Vest, the Centre for Clinical Documentation and Evaluation (SKDE) via the National Service Centre for Medical Quality Registers, the equipment suppliers, the University of Bergen, the Norwegian Patient Register (NPR), the Norwegian Knowledge Centre for the Health Services, the Norwegian Institute of Public Health, the Office of the Auditor General, the Norwegian Board of Health Supervision, the Directorate of Health and the Ministry of Health and Care Services.

Bergen, 06.06.18

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Norwegian Arthroplasty Register

Total Hip Replacement

THE HIP ARTHROPLASTY REGISTER 2017 ANNUAL REPORT

This year's annual report contains data from *221 899 hip replacement operations*, including those performed in 2017 (9086 primary operations, 1432 revisions and 52 reoperations where the prosthetic parts were not changed). This was 142 more operations than in 2016. As we pointed out in the introduction to last year's report, an increasing number of forms are incompletely filled out. In particular, information on bone loss and bone transplants in revisions is missing. One of the great advantages of the NAR over other registries is the amount of detail, and it is therefore important to have good reporting of details. We ask surgeons to be as accurate as possible when filling out the forms. Electronic registration is gradually being developed and we hope that this will make it simple and intuitive to record all the details.

We have begun *electronic registration of patient-reported outcome measures* (PROM). For hip arthroplasty, we include HOOS, EQ-5D, Charnley score, UCLA activity score and information on BMI, smoking, alcohol consumption, marital status and educational level. The registration started at Haukeland University Hospital in September 2017, and will gradually be expanded to the whole country, following adjustments based on experiences from pilot hospitals. The plan is to collect PROM data preoperatively and after 1, 6 and 10 years postoperatively for primary operations and revisions. The technical solution seems to be working and the registration will be expanded to knee arthroplasties this year. We present some preliminary preoperative PROM findings on page 29.

The report from the Register on the website of the National Service Centre for Medical Quality Registers, SKDE (https://kvalitetsregistre.no/registers/nasjonaltregister-leddprotester) includes publication of prosthetic results as well as results at hospital level. These results must be seen in conjunction with levels of reporting of revisions. Results from hospitals with less than 80% coverage for revisions are excluded from these analyses. We have been asked to measure whether hospitals operate according to 'best professional practice', and last year's SKDE report presented our data on the extent to which hospitals followed guidelines on antibiotic and thrombosis prophylaxis, and used wear-resistant joint surfaces in prostheses and cemented stems in women over 75 years, measured in patient percentages. These findings have been updated this year and are included in this report. We also plan to measure the extent to which hospitals use well-documented prostheses.

Surgical approach has changed in recent years. Anterior approaches now account for about 20% of primary operations but are used in fewer than 5% of revisions. The direct lateral approach is used less and less, having decreased from more than 70% 10-12 years ago to 8% in 2017. In revision operations, this approach is also used less than previously, but still accounts for 27%. The posterior approach is becoming increasingly popular and was recorded for 68% of primary operations in 2017. These changes are thought to be beneficial, since patient experience of direct lateral access is inferior to that of other approaches (Amlie et al. 2014). Revisions also show an increase in the use of the posterior approach (60%). In patients operated since 2008, we find no difference in prosthetic survival between the approaches (Figure r). Mjaaland et al. (2017) showed that overall prosthetic survival is similar in the different approaches, but that a lateral approach increased the chance of revision due to infection, while a posterior approach was associated with more luxation (Mjaaland KE et al. 2017).

Fixation: In this year's report we present unadjusted KM survival curves with 0-15 years follow-up for the various fixation techniques by age group and gender. Reverse hybrid fixation seems to work well in patients under 65 of both genders. For patients aged 65-75, there is no difference between the different fixation methods, but women over 75 years have a 54-60% greater risk of revision with uncemented stems (see Figure 1-q). These are unadjusted figures with relatively short follow-up time. Our register and all other registers have repeatedly shown poorer results with uncemented stems than with cemented stems in the oldest patients, especially in women. Many hospitals use cemented stems for all these patients, some differentiate between patients, using both cemented and uncemented stems, and some only use uncemented stems (Figure AA). There are signs of increased use of cemented femoral stems over the last couple of years, especially in the form of classical hybrid fixation. Over 60% of patients above 75 years now receive cemented stems (Figure 8d, and for women over 75, Figure y), and we think that this proportion should be further increased. In revisions, there has been a gradual increase in the use of uncemented fixation since around the year 2003. Both in the acetabulum and in the femur, three out of every four revisions are uncemented. Bone packing with cement in the femur was performed in every third cemented revision ten years ago, but today this technique is only occasionally recorded. Also in the acetabulum, there is less bone packing with cement than previously.

The use of *32mm heads* is increasing steadily (2017: about 76%) and there has been a slight increase in the use of 36mm heads over the last 10 years (2017: about 10%). Heads >36mm are no longer used, which we view as beneficial because it appears from other registers that the larger heads lead to poorer prosthetic survival. Cross-linked polyethylene used with metal or ceramic heads predominates in the articulations (>90%) and we find good support for this in the literature.

Metal-on-metal (MoM) prostheses are no longer used in Norway. Survival rates for the 485 patients operated with these prostheses and heads >36mm in Norway are somewhat worse than with conventional prostheses, see Figure s. However, the main problem with this prosthesis is the risk of developing a pseudotumour, which can be a very serious complication. Please remember therefore that hospitals have a duty to monitor all patients with an MoM prosthesis for the rest of their lives. Recommendations for monitoring are available here: http://nrlweb.ihelse.net.

PUBLICATIONS SINCE 1 JANUARY 2017

Magnusson K et al. explored genetic predisposition to hip and knee surgery in studies of twins and found that genetic factors were more important for hip than for knee arthroplasty.

Johnsen MB et al. studied the relationship between smoking and the risk of hip or knee arthroplasty in the Health Survey in Nord-Trøndelag (HUNT). They found an inverse correlation between number of cigarettes smoked and risk of joint arthroplasty.

Wangen H et al. studied reverse hybrid hip replacements and compared these to cemented ones, using data from the Nordic Arthroplasty Register Association (NARA). There was a 40% greater risk of revision with a reverse hybrid hip replacement, and the risk was particularly high for periprosthetic fractures.

Magnusson K et al. investigated whether the relationship between obesity and hip arthroplasty for osteoarthritis could be explained by genetic confounding, linking the NAR and the Twin Register. They found a probable causal relationship between BMI and osteoarthritis in women, while in men, the relationship could be explained by familial confounding.

Hellevik AI et al. examined whether metabolic syndrome (abdominal and general obesity, hypertension, dyslipidaemia, insulin resistance) were risk factors for hip or knee arthroplasty for osteoarthritis, linking the NAR and the HUNT study. They found that men <50 years with hypertension and people <70 years with abdominal obesity had a higher risk of knee arthroplasty. Otherwise, no increased risk of osteoarthritis requiring arthroplasty was found in people with metabolic syndrome.

Johnsen MB et al. studied the effect of smoking on the risk of hip and knee arthroplasty and the indirect effect of smoking in relation to BMI, linking the NAR and the HUNT study. They found that BMI explained little of the effect of smoking.

Ackerman IN et al. compared the lifetime risk of hip arthroplasty in the Nordic countries and Australia. The risk of receiving a hip prosthesis during lifetime was highest for Norwegian women (15.9%) and lowest for Danish men (6.3%).

Borgen PO et al. compared clinical outcomes in patients receiving the first dose of thrombosis prophylaxis before and after surgery. They found no difference in bleeding complications, thromboembolism or other complications, but a somewhat higher rate of readmission among those starting prophylaxis preoperatively.

Lazarinis S et al. studied cups with and without hydroxyapatite in data from NARA and found no difference in prosthetic survival with and without HA. However, they found a 40% higher risk of revision for infection in patients with HA-coated cups.

Hellevik AI et al. studied whether thyroid function affected the risk of arthroplasty due to osteoarthritis (HUNT and NAR). No association between thyroid function and arthroplasty risk was found.

Mjaaland KE et al. compared implant survival after mini-invasive surgery or anterolateral surgical approach with posterior or direct lateral approach. Results from the NAR show that overall prosthetic survival is similar in the different approaches, but there are more luxations in the posterior approach and more infections in the lateral approach.

Johanson PE et al. compared cups with conventional and cross-linked plastic for up to ten years. They found that some types of cups (Reflection and ZCA) showed more revisions with conventional plastic, while for other types there was no difference.

Please also consult the list of publications in this report and on our website http://nrlweb.ihelse.net/

Thank you for good reporting, and we would be pleased to receive suggestions for research projects.

Bergen, 6.6.2018

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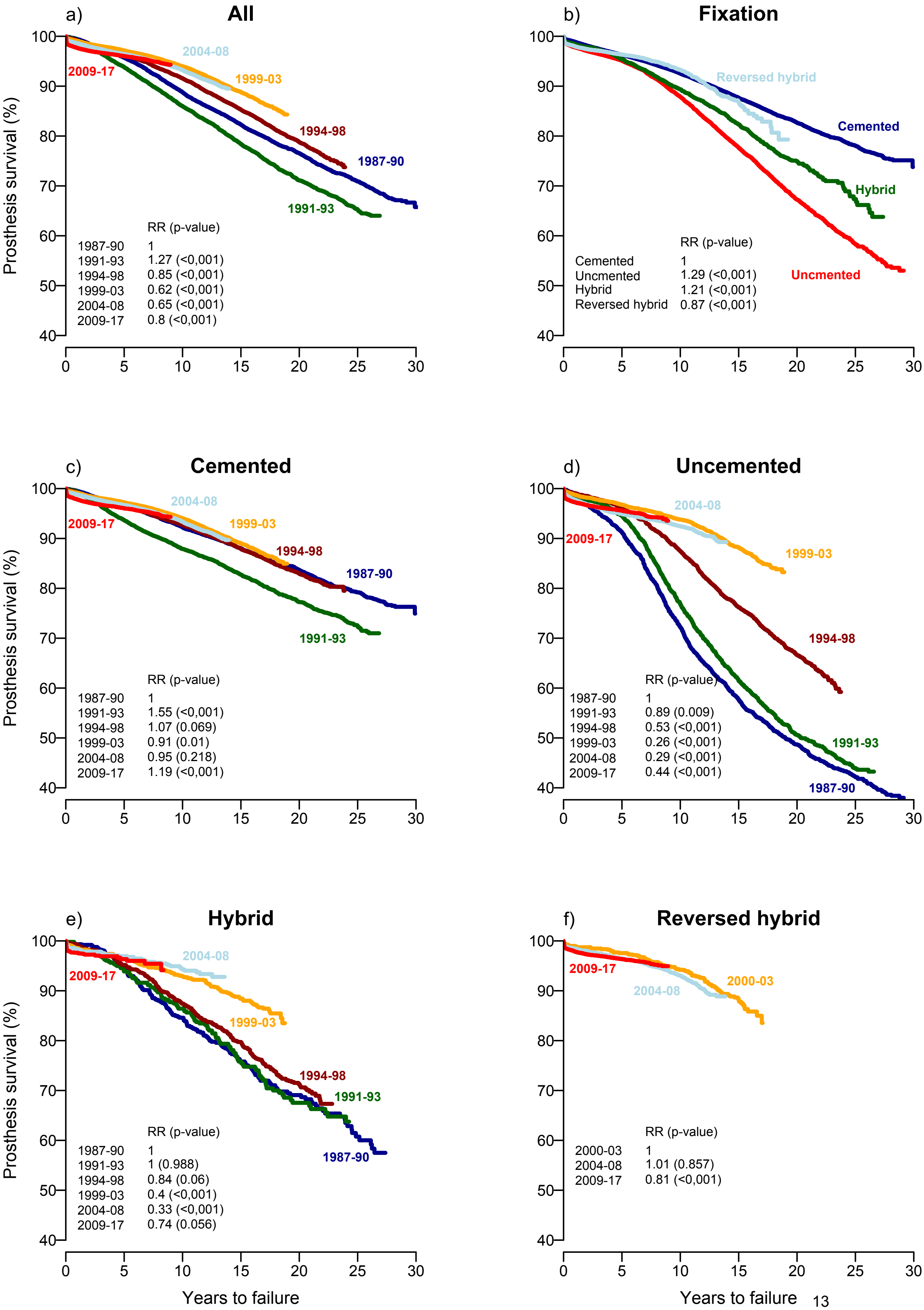
Biostatistician

Irina Kvinnesland
IT Consultant

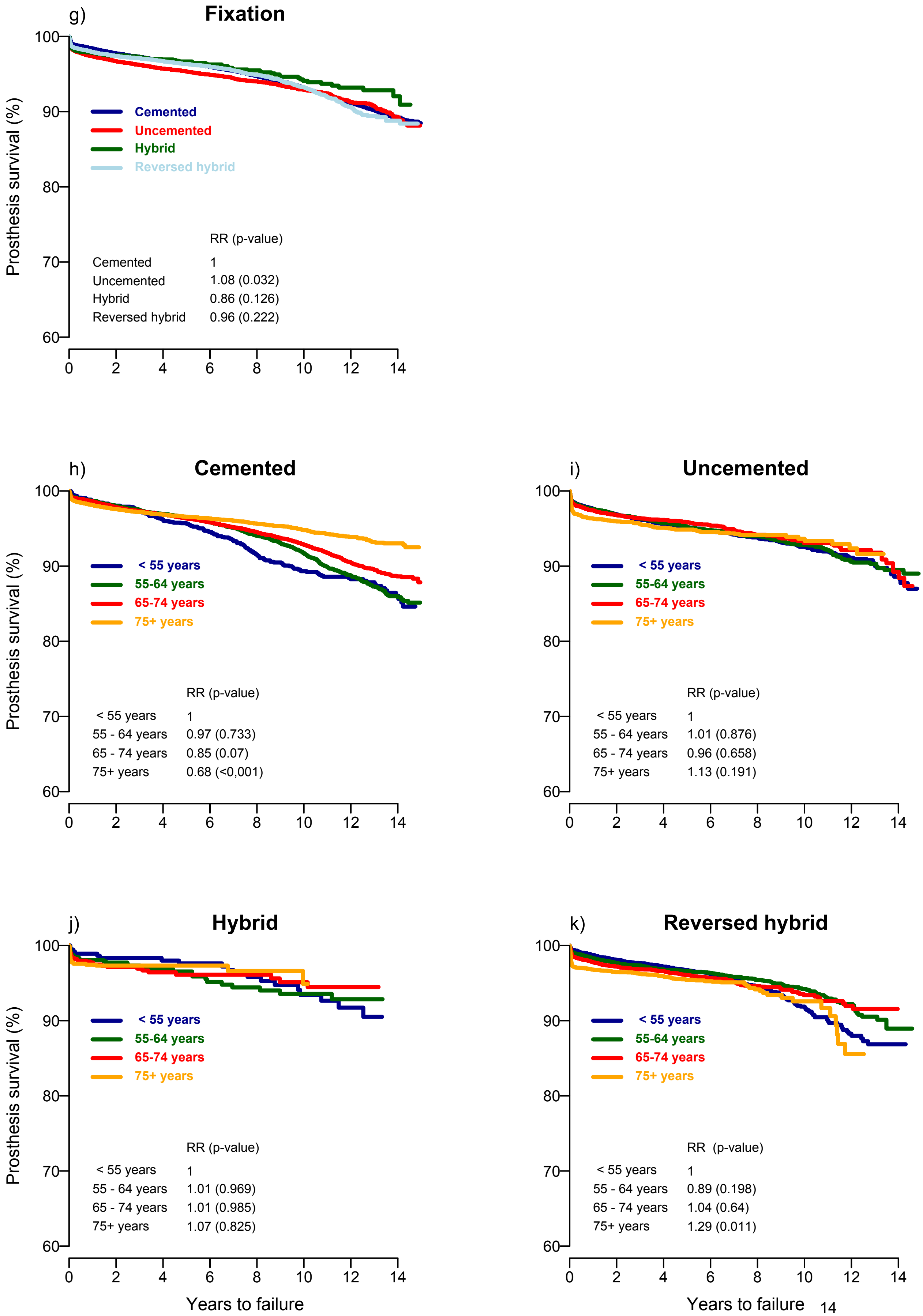
Christoffer Bartz-Johannessen
Biostatistician

Survival of total hip prosthesis
1987-2017



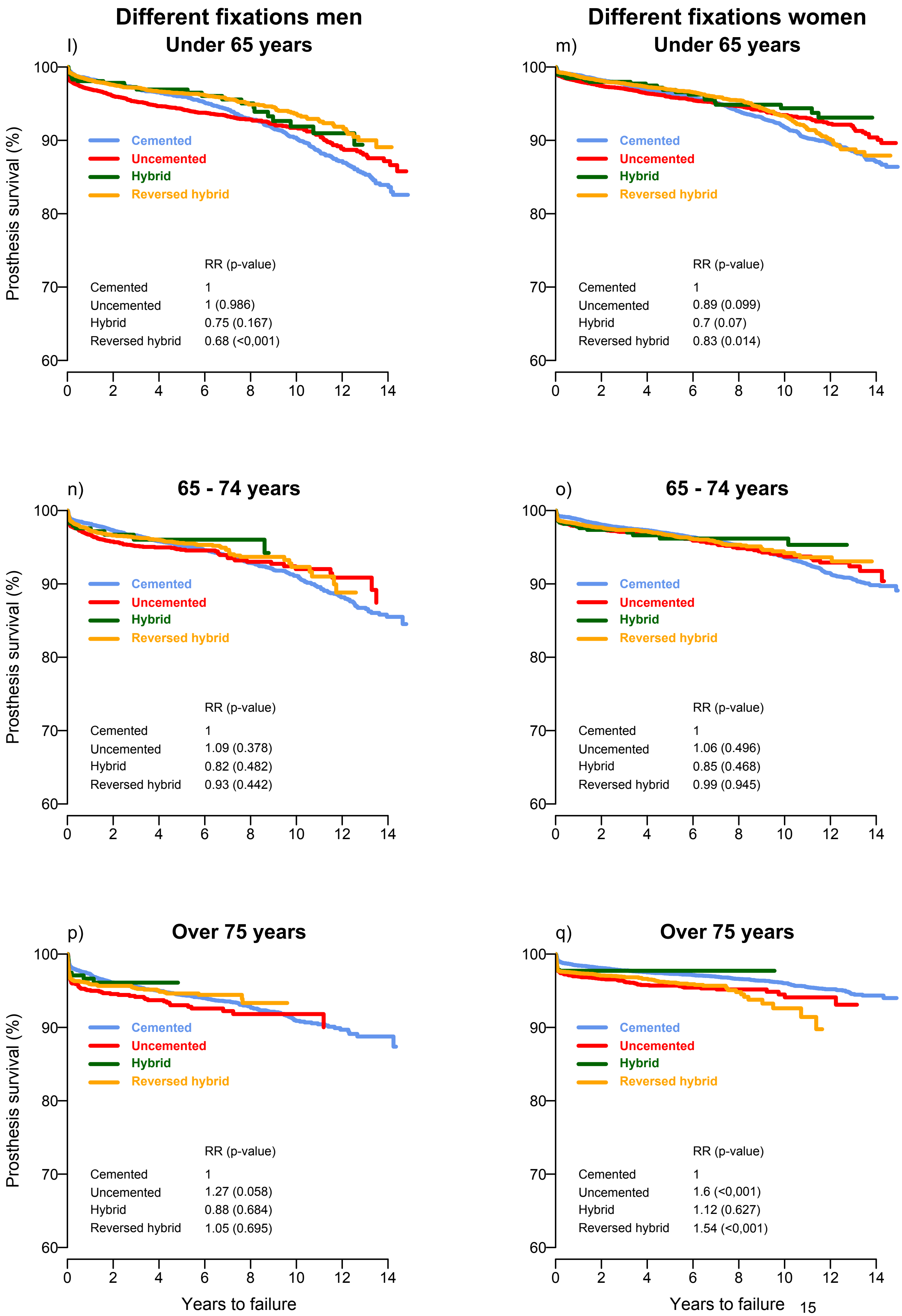
Kaplan-Meier survival curves. Rate ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheses are at risk.

Survival of total hip prosthesis
2003-2017



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 are at risk.

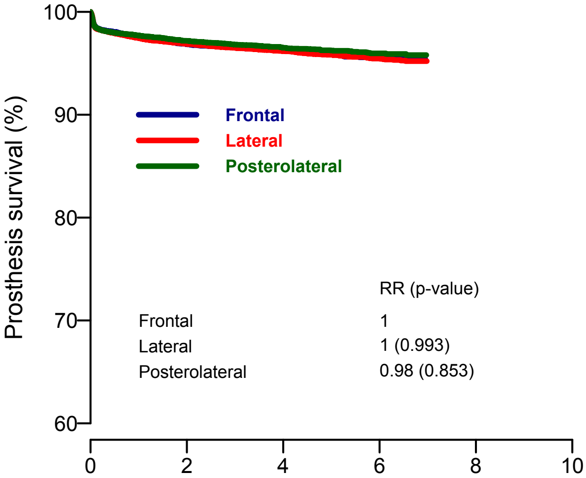
Survival of total hip prosthesis 2003-2017



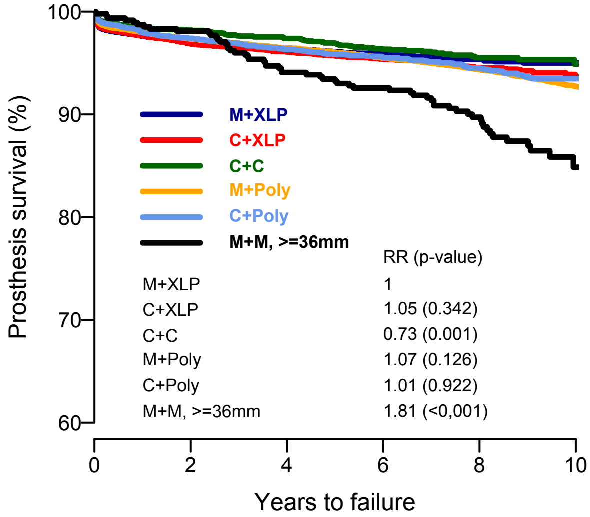
Kaplan-Meier survival curves. Rate ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheses are at risk.

Survival of total hip prosthesis, 2007-2017

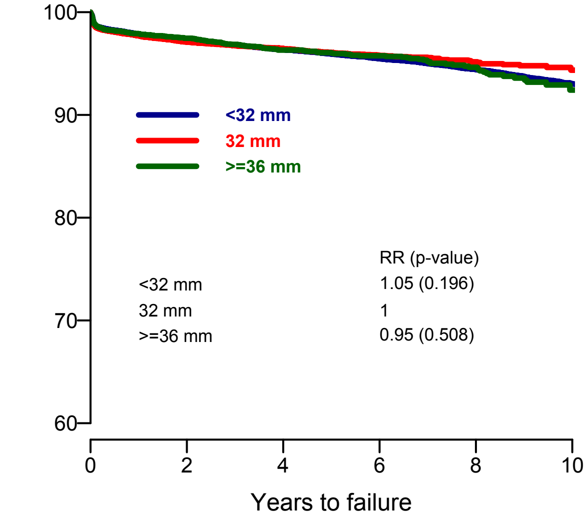
r) **Access (from 2011)**



s) **Articulation (without dual mobility)**

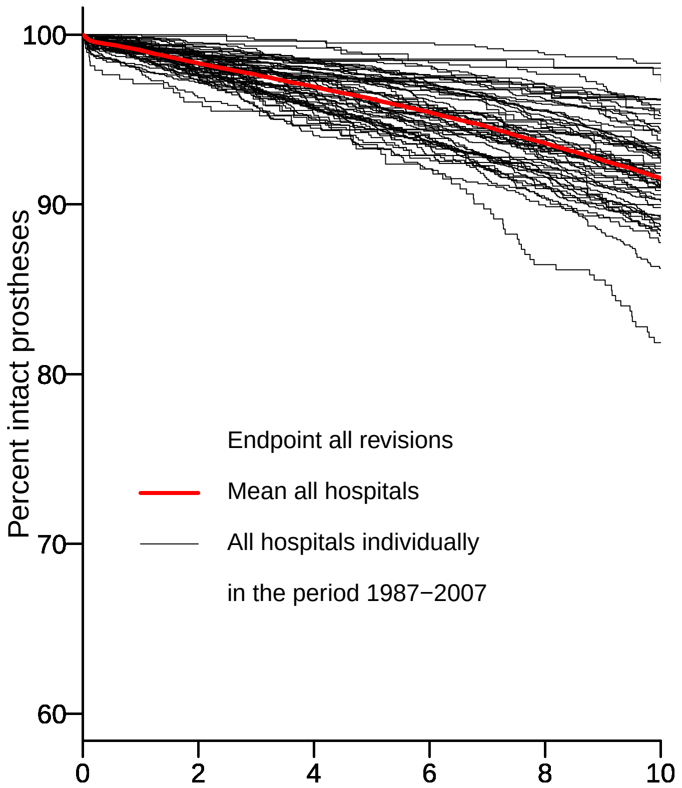


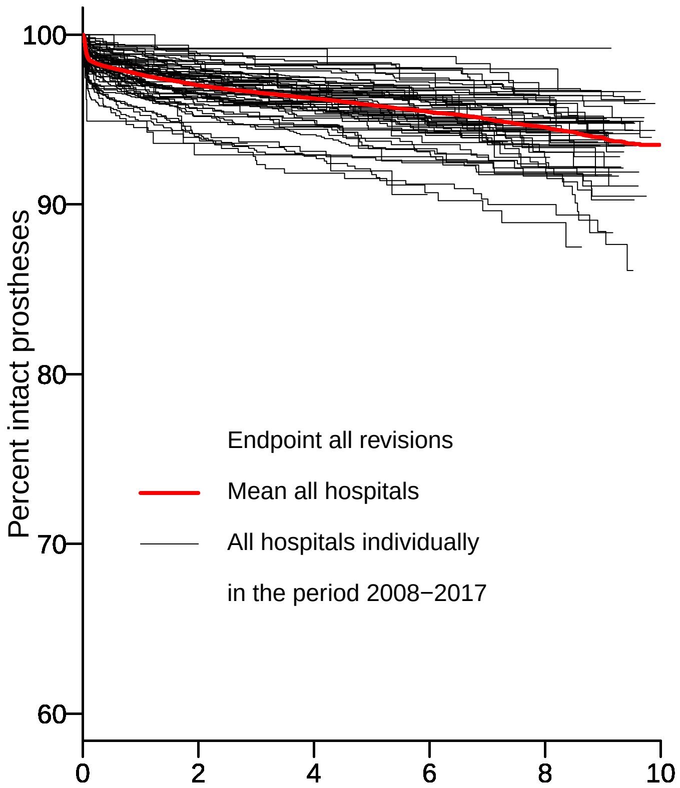
t) **Head size (without dual mobility and metal on metal)**

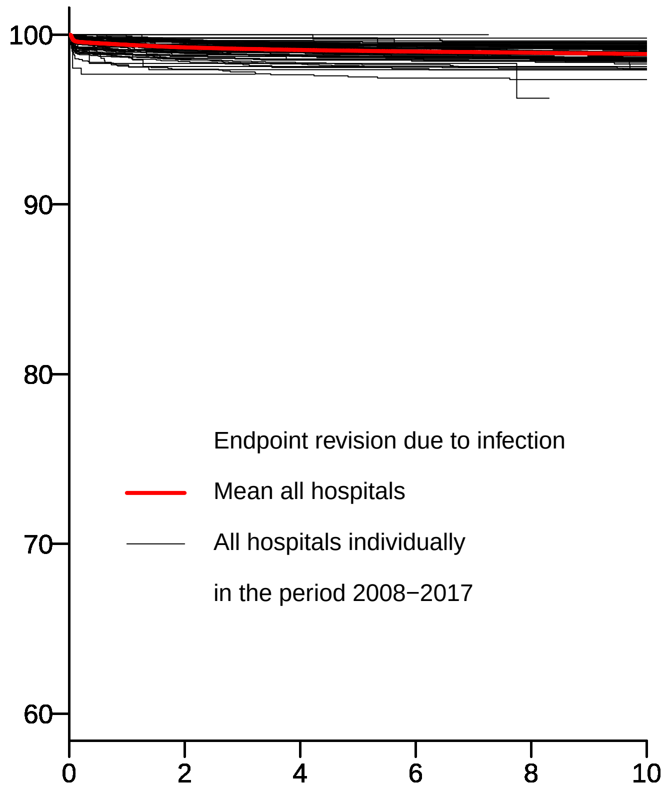


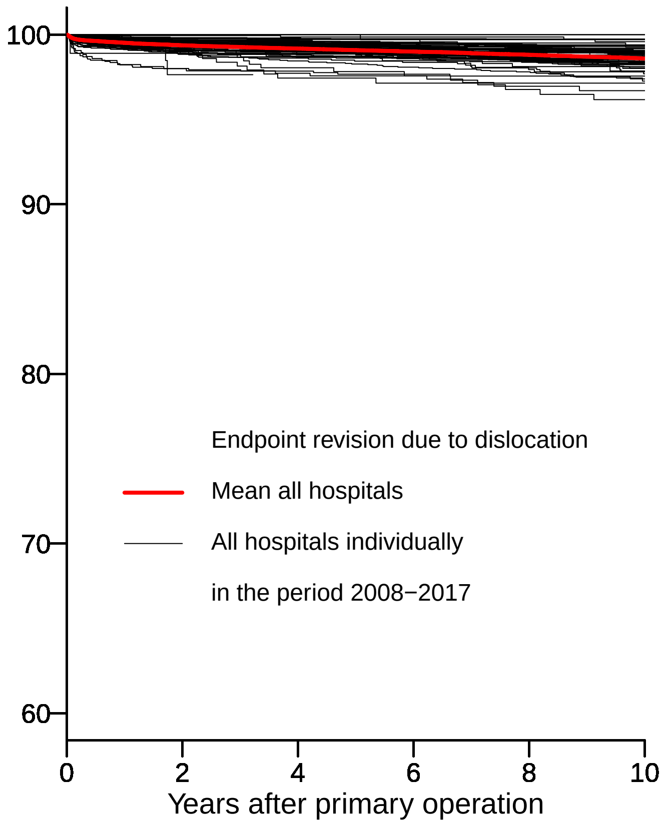
Kaplan-Meier survival curves. Rate ratio (RR) is adjusted for age, gender and diagnosis.
Survival estimate is given as long as more than 50 prostheis remains in the risk set.

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









One stage bilateral hip prosthesis operations

Year	1987-2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Sum:
Number of patients	147	12	15	13	19	15	15	18	26	23	22	28	32	46	431

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.

Figure y: Fixation for women over 75 years, 1987 to 2017:

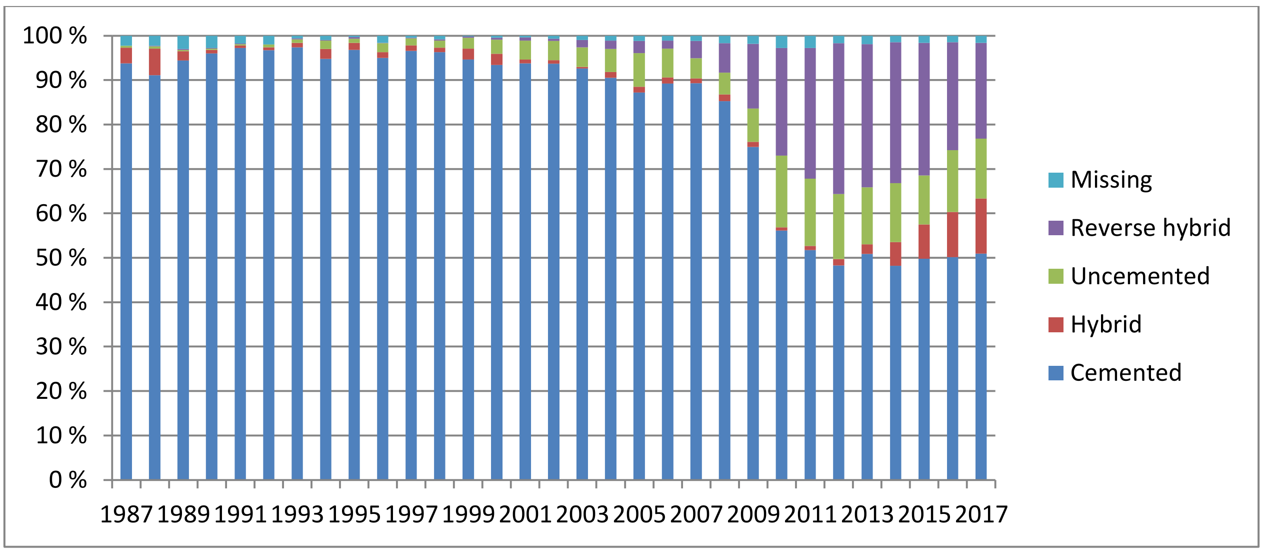


Figure z: Number of primary THA operations, 2017:

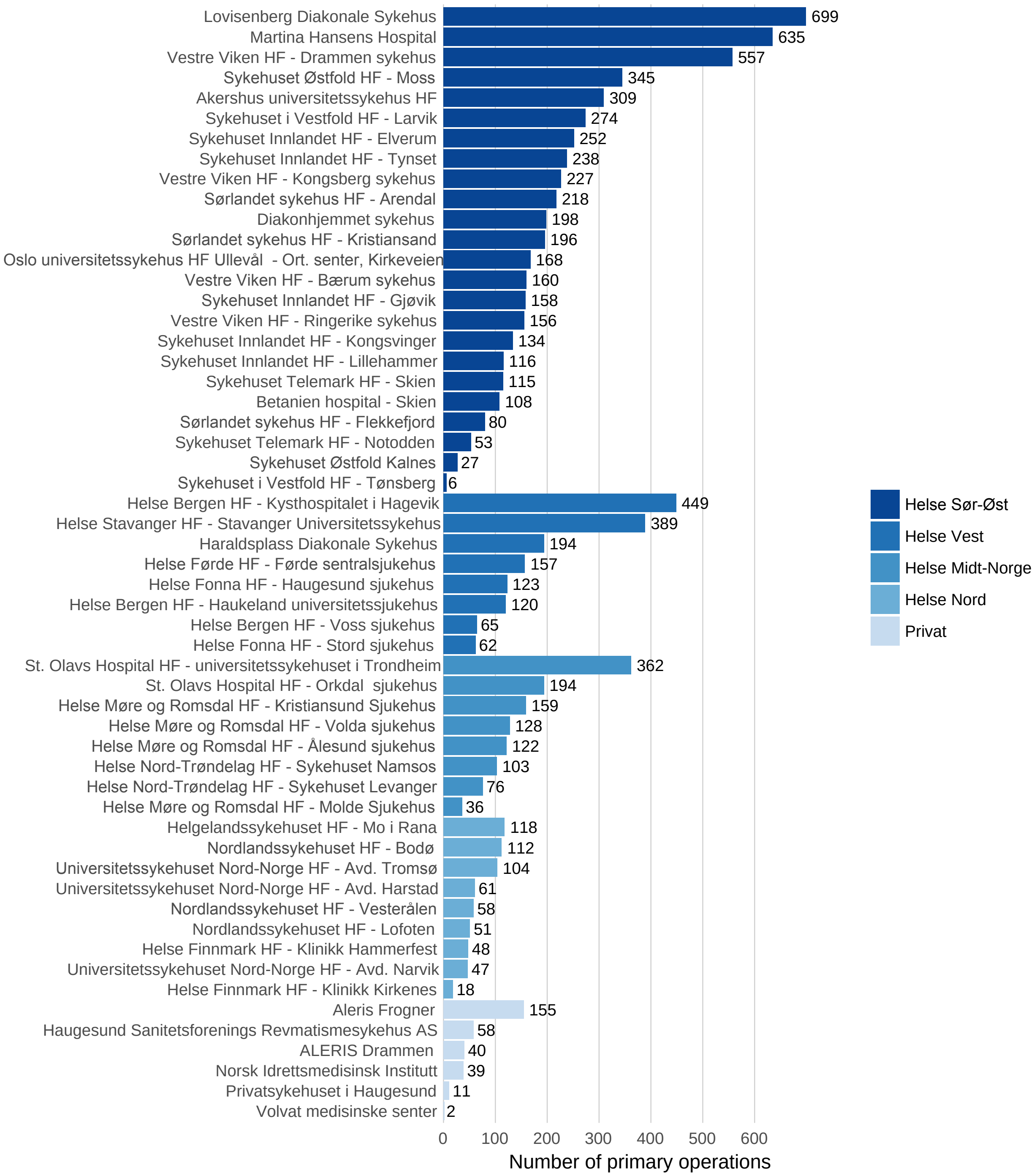
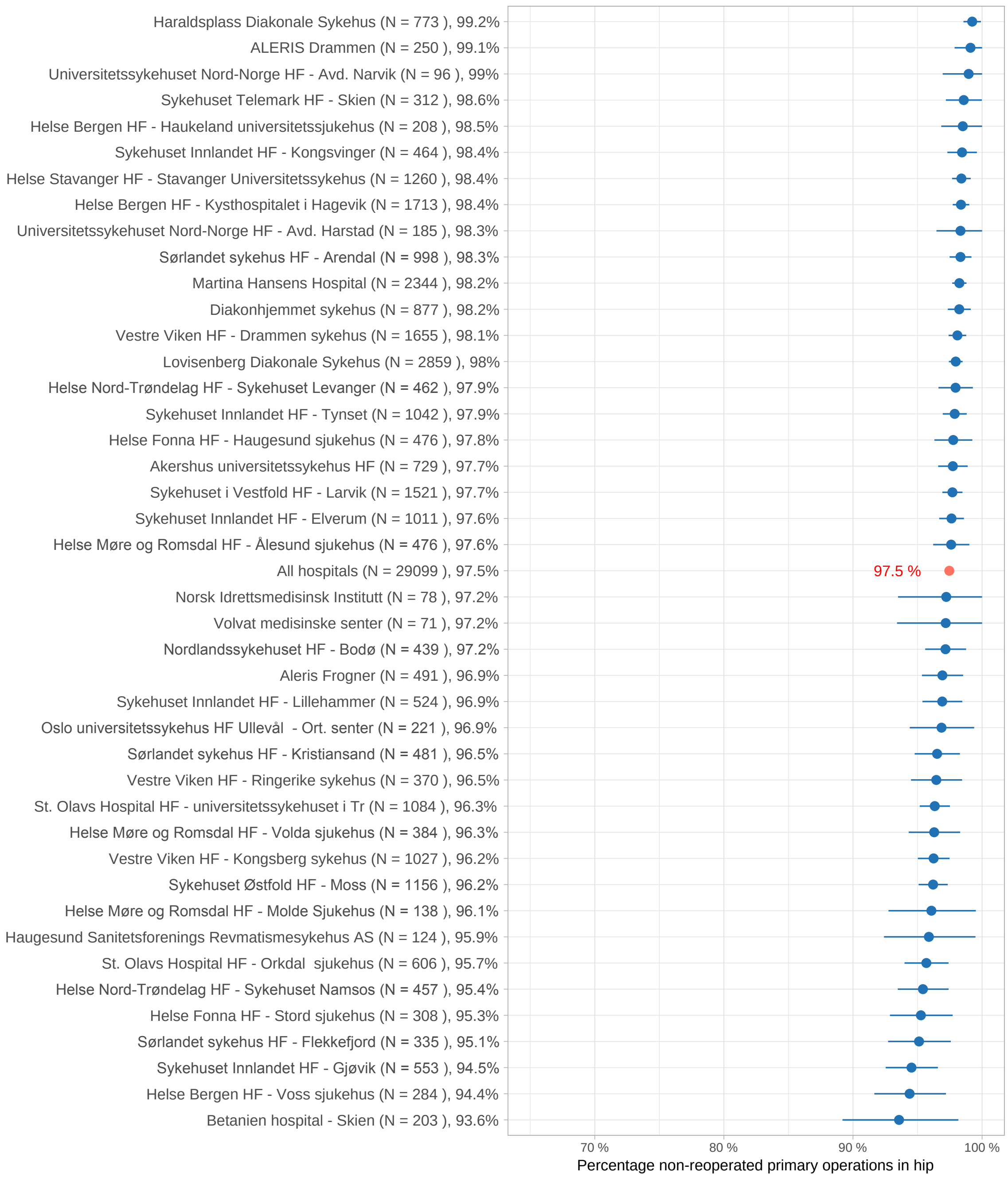
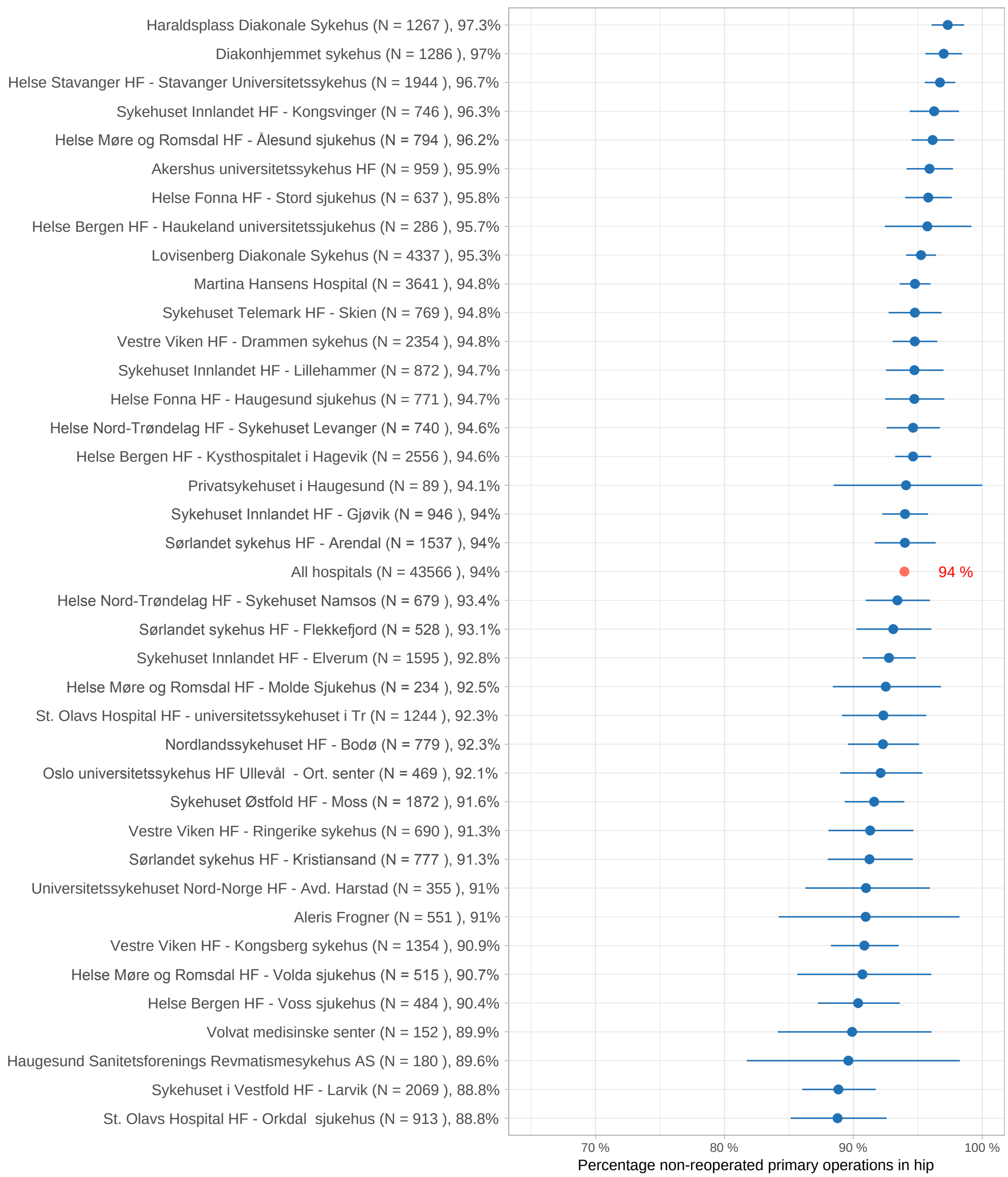


Figure æ: Percentage non-revised standard patients two years after operations in 2011-2017



Kaplan-Meier estimates of percentage non-revised standard patients after two years with 95% confidence interval. Endpoint is all revisions. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2 and with idiopathic cox arthrosis at primary operation. Reoperations, i.e. revision operations without insertion, removal or replacement of the prosthesis, are excluded. Included are all patients operated on in the years 2011 to 2017. Only hospitals with operations in 2017 and with more than 50 operations from 2011 to 2017 are included. A further requirement is that the hospital must have at least 30 patients followed up for more than two years. Only hospitals with coverage of at least 80% for revisions from 2011 to 2016 are included.

Figure ø: Percentage non-revised standard patients ten years after operations in 2006-2017



Kaplan-Meier estimates of percentage non-revised standard patients after ten years with 95% confidence interval. Endpoint is all revisions. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2 and with idiopathic cox arthrosis at primary operation. Reoperations, i.e. revision operations without insertion, removal or replacement of the prosthesis, are excluded. Included are all patients operated on in the years 2006 to 2017. Only hospitals with operations in 2017 and with more than 50 operations from 2006 to 2017 are included. A further requirement is that the hospital must have at least 30 patients followed up for more than ten years. Only hospitals with coverage of at least 80% for revisions from 2008 to 2016 are included.

How to interpret the hospital-based results:

When hospitals are ranked by percentage of revisions, results must be interpreted with caution, as there may be many reasons for different revision percentages:

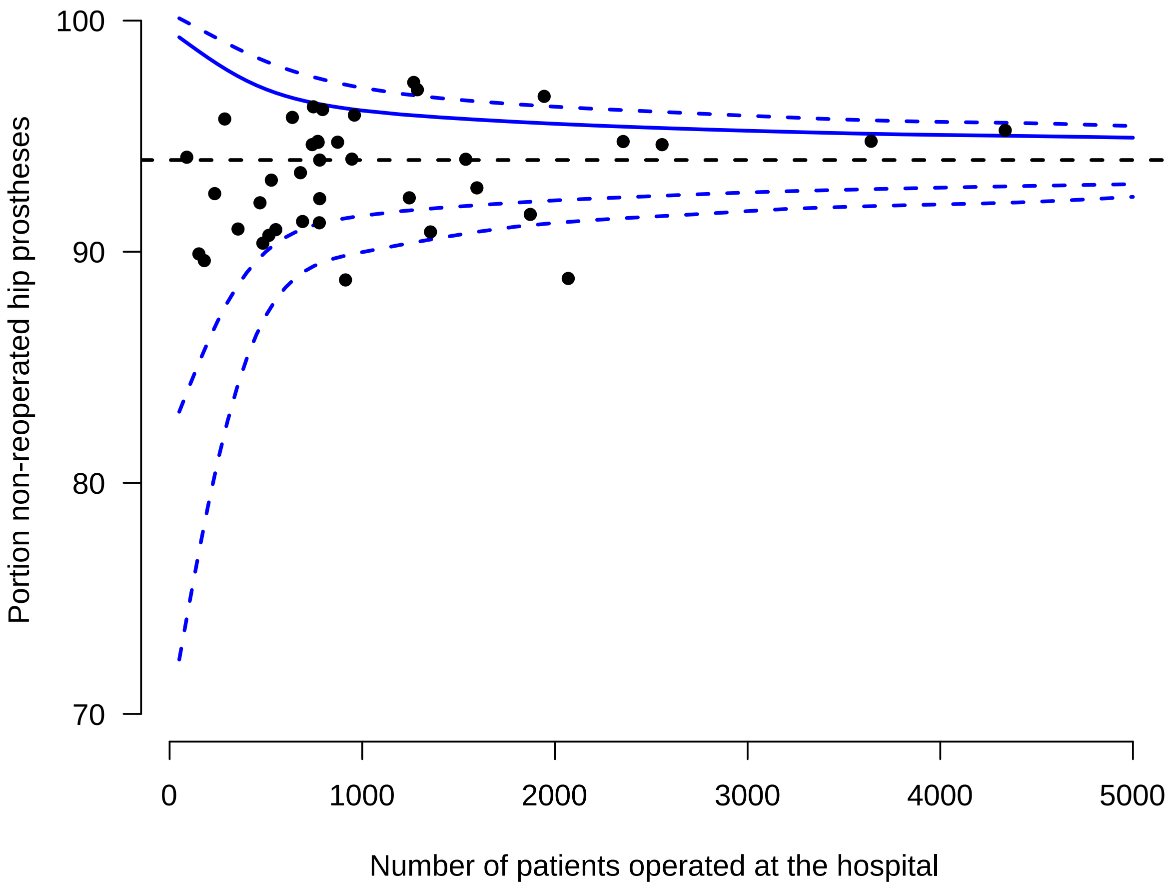
1. Hospitals that are more rigorous in reporting their complications and reoperations to the Register could have unfairly negative results in the analyses.
2. If surgeons at one hospital are more diligent in facilitating check-ups for patients than at other hospitals, and thus discover more complications,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

There is also a statistical uncertainty in the ranking lists because the data from the NRL are poorly suited for such calculations. The NRL was designed to compare the results of implants and surgical procedures nationwide. To compare quality in hospitals is a complex matter, because some hospitals operate on more patients with poor prognosis than other hospitals, and because many hospitals, especially the small ones, have so few reoperations that the statistics are too weak, and are further weakened by the fact that the hospitals' coverage (reporting rate) of reoperations varies from 16.7% to 100%. This issue is explained in detail in the following articles: Ranstam J, Wagner P, Robertsson O, Lidgren L. "Health-care quality register outcome-orientated ranking of hospitals is unreliable." J Bone Joint Surg Br. 2008 and Ranstam J, Wagner P, Robertsson O, Lidgren L. "Ranking in health care results in wrong conclusions". Läkartidningen. 2008 Aug 27-Sep 2;105(35):2313-4.

Moreover, it is a well-known phenomenon in quality assurance that if those who report their complications and errors the most accurately receive a lower ranking because of this, the reporting may eventually deteriorate.

If league tables of hospitals are publicised, there is thus a danger that hospitals' reporting of revisions may become poorer, leading to inferior quality of the registers. In order to achieve complete reporting of reoperations (revisions), reporting to the Register should be linked to performance-based financing, reporting should be made mandatory, and the requirement for the patient's written consent to reporting of the operation to the Register should be waived and replaced by presumed consent.

Figure å: Funnel plot, percentage non-revised standard patients ten years after operations in 2006-2017



Each point shows the percentage non-revised prostheses after 10 years for standard patients operated from 2006 to 2017 at Norwegian hospitals. Some hospitals are excluded. This can be due to low completeness of reporting of revisions (<80% from 2008 to 2016), that less than 50 hip prostheses have been operated in the period, that fewer than 10 patients have been followed up for more than 10 years, or that the hospital don't have any operations in 2017. The solid blue lines show the interval where 95% of the Norwegian patients will be. The dotted blue lines show the interval where 99.8% of the patients will be. Points to the right represents hospitals with many operations (see the x-axis). Points above or below the dotted lines are regarded as outliers with exceptionally good or exceptionally bad results respectively.

All of the points in the funnel plot correspond to a hospital in figure ø. By choosing any point, and using the corresponding values for "Number of patients" and "Portion non-reoperated" on the x and y axis respectively, the hospital belonging to the point can be found in figure ø. The two hospitals with points below the dotted lines have used prostheses that have been shown to have inferior results (Titan/Titan cemented or Reflection all poly/Spectron EF cemented). The hospitals have now stopped using these implants.

Figure aa: Durability of hip replacements 2006-2017

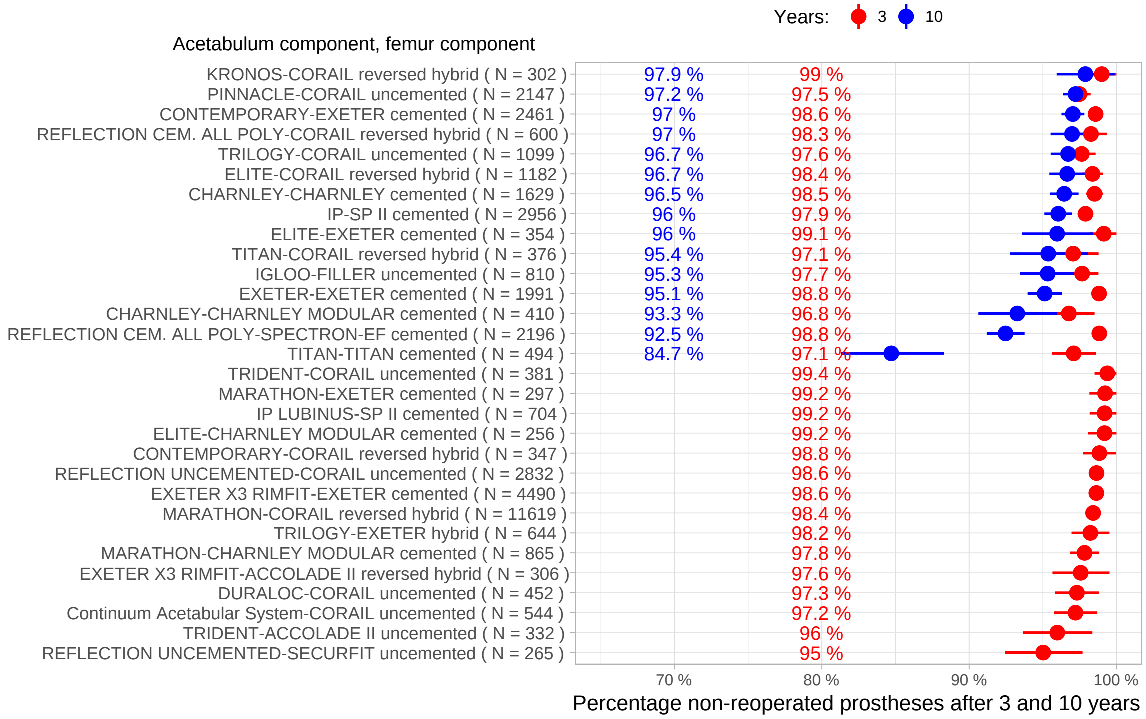


Figure aa shows the estimated Kaplan-Meier percentage at three and ten years for different combinations of hip prostheses. We have only included combinations used in 500 or more operations in 2006-2017. A further requirement for inclusion in the figure is that there must still be at least 50 examples of the combination at three and ten years respectively. Only standard patients from 2006 to 2017 have been included, and the number of prostheses will therefore be below 500 in some cases. A standard patient is aged 55-85 years, has ASA class 1 or 2 and was diagnosed with idiopathic osteoarthritis at primary surgery. Using standard patients provides a more homogenous group of patients, and we believe that this makes the results more comparable.

Endpoint is all revision operations, except infections and reoperations without insertion, removal or replacement of the prosthesis. As recommended in Report No. 6/2002 from the Norwegian Centre for Health Technology Assessment (SMM), "Choice of Implants in Primary Total Arthroplasty in Norway", most health trusts will require ten-year documentation on the prosthesis. The combinations Reflection All Poly/Spectron EF (cemented) and Titan/Titan (cemented) are no longer in use. This is based on results in studies published by the Register (Espehaug B 2009, Hallan G 2007, Hallan G 2010, Hallan G 2012 and Kadar T 2011), see our list of publications in the annual report http://nrlweb.ihelse.net/
The results in this report must be compared with results in our publications, where we can account for materials and methods and discuss strengths and weaknesses and the significance of the findings.

How to interpret the prosthesis results

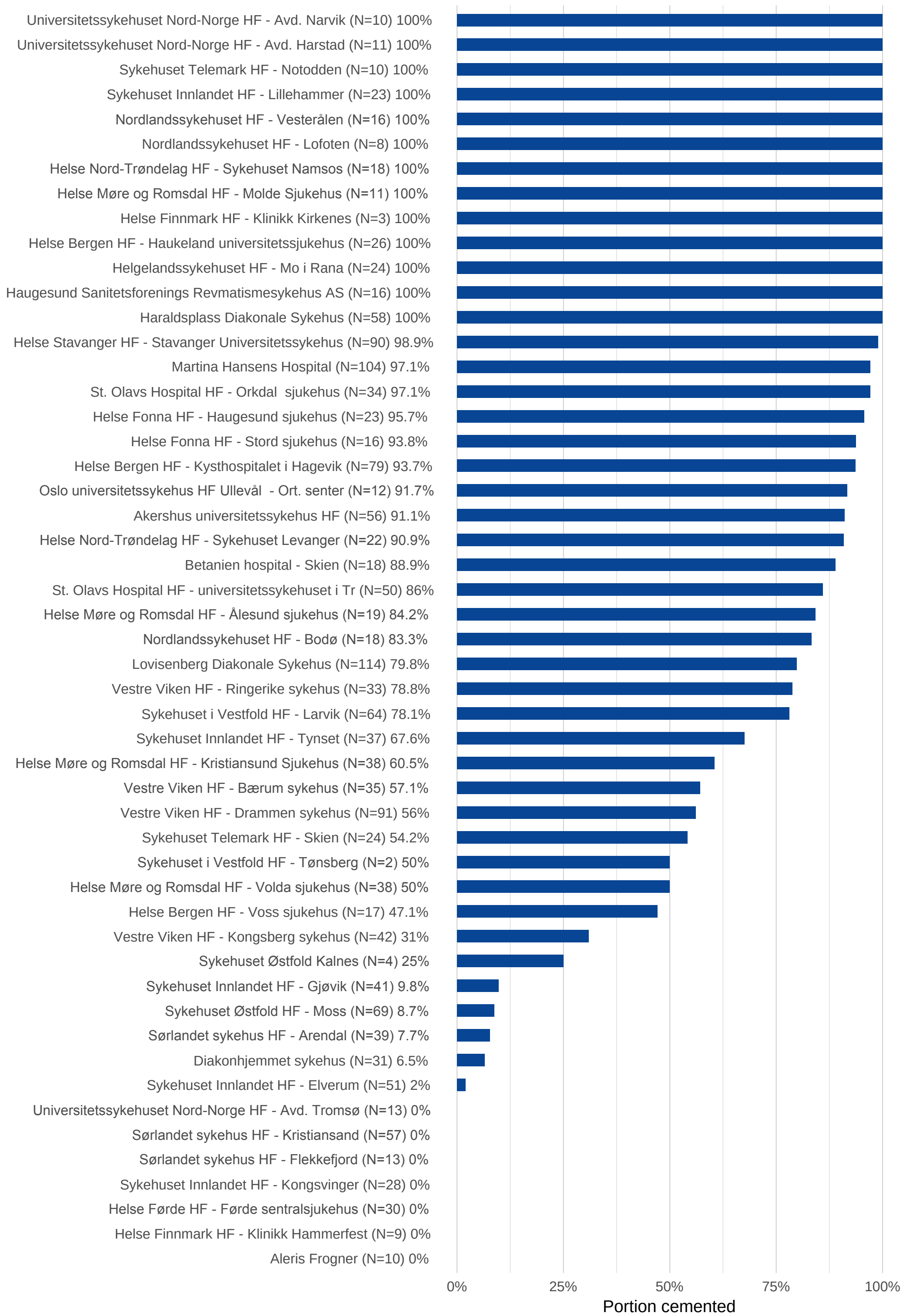
When prostheses are ranked by percentage of revisions, results must be interpreted with caution, as there may be many reasons for different revision percentages. We mainly publish prosthesis results in scientific journals and presentations where we account for materials and methods and discuss strengths and weaknesses and the significance of the findings (see the reference list in http://nrlweb.ihelse.net/Rapporter/Rapport2017.pdf).

In general, we can state the following:

1. A poor result for a particular prosthesis may be caused by a learning curve for its use, which means that some patients will be revised due to the lack of experience with the particular implant.
2. In our papers, we adjust for differences in patient groups such as age, gender, diagnosis, joint surface material and fixation. Some prostheses and materials tend to be used in younger and more active patients. Such patients may wear out the prosthesis faster. A prosthesis used in many such patients may have poorer results than a prosthesis used in older and less active patients. The degree of activity is not recorded in the registers.
3. A prosthesis may be used at few hospitals and in small numbers, which may mean that the revision percentage reflects the skill of the surgeon or the threshold for revision rather than the qualities of the prosthesis.
4. If a prosthesis is used in a large number of patients (>3000) and in several hospitals (>5), we consider the results more reliable.
5. Scientific papers discuss the reason for revision of the prosthesis. If there is a natural biological or mechanical reason, we have more faith in the results, i.e. we consider a high revision rate to be due to qualities of the prosthesis rather than the surgeon.
6. National registers are observational studies and cannot normally explain the reasons for the results of a particular group of prostheses. The results must be compared with those of experimental studies and randomised controlled trials. Furthermore, the results must be reproduced in other studies and registers before being considered valid.

Results of hip and knee arthroplasty in Norway are generally good and comparable to results in the other Nordic countries (Mäkelä K 2014, Junnila M 2016 and Robertsson O 2010), see the reference list in our annual report. The two hip prostheses with poorest ten-year results (Titan/Titan and Reflection cemented/Spectron EF) have been discontinued in Norway on the basis of results in our earlier publications (Espehaug B 2010, Hallan 2012 and Kadar T 2011). This also applies to the Duracon knee prosthesis (Gøthesen 2013).

Figure ab: Portion of women over 75 years with cemented stem in 2017



The figure shows that some hospitals use cemented femoral prostheses in all women over 75 years, others differentiate and some choose uncemented femoral prostheses for all these patients. The Register recommends using a cemented prosthesis for this patient group.

Figure ac: Portion of patients with strong cup materials (kryssbundet polyetylen/keramikk) in 2017

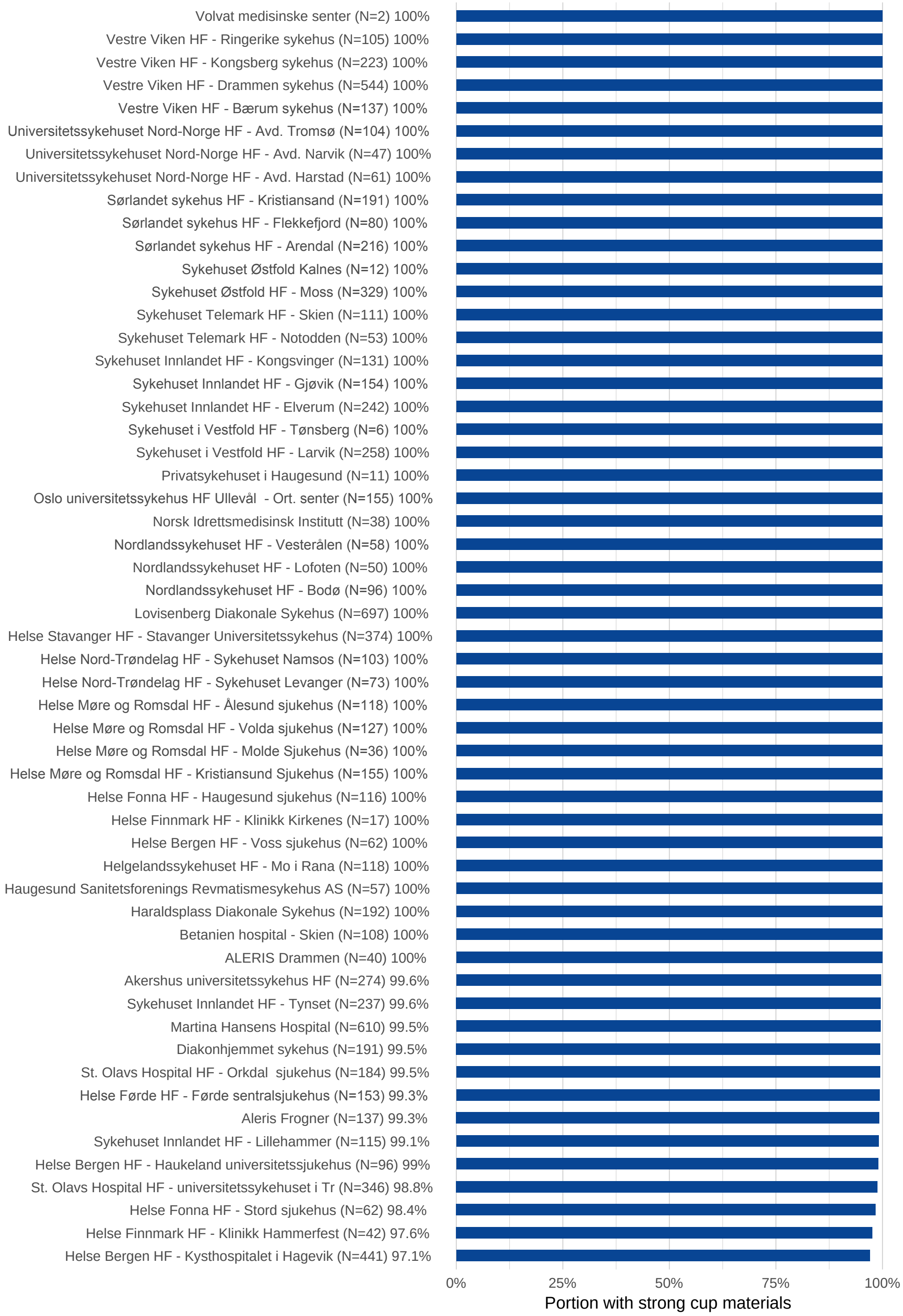


Figure ac shows that most patients at all hospitals receive hip prostheses with wear-resistant joint surfaces (cross-linked polyethylene or ceramic acetabular components). The use of ordinary polyethylene is justified in certain patients who do not need a prosthesis lasting longer than 10-15 years.

Figure ad: Portion of patients with atibiotica prophylaxis as given by the guidelines in 2017

A low score (at the bottom of the figure) does not mean that patients have not received antibiotics; it generally means that they were given antibiotics in a manner contrary to the guidelines.

PROM in the Hip Arthroplasty Register

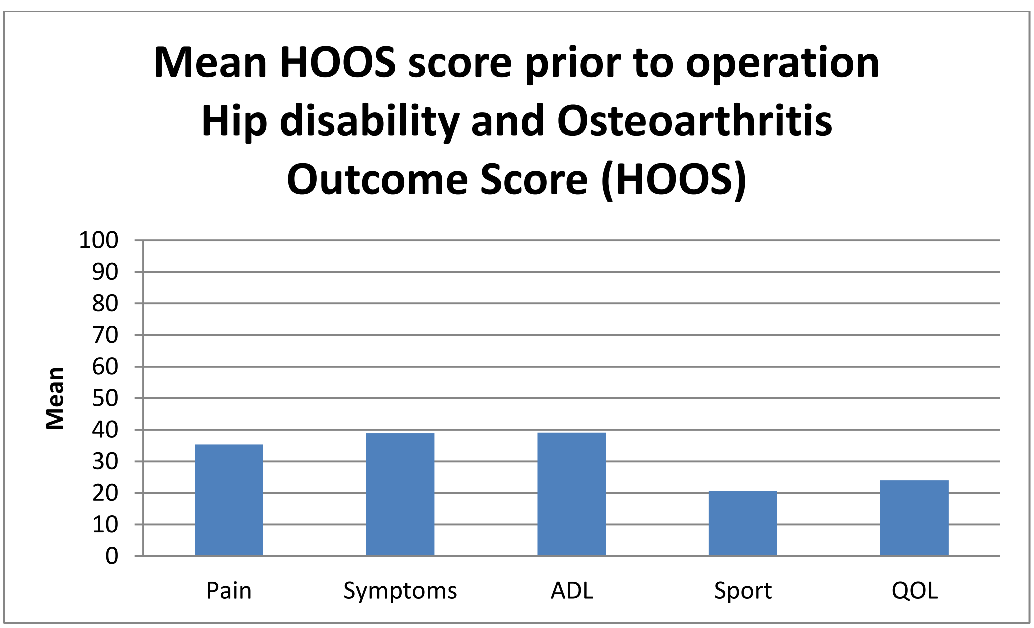
In August 2017, the Hip Arthroplasty Register started electronic collection of PROM data. At the request of the health authorities, we wish to focus more on patients' perceived quality of life and joint function before and after surgery. We now collect information on height, weight, activity level, educational level, alcohol consumption and smoking. Patients complete an electronic questionnaire before surgery and 1, 6 and 10 years after surgery.

We will compare the data we collect from patients with the data reported by surgeons for the same patient group. This will allow us to focus on function and quality of life in addition to a possible revision of the prosthesis.

Thus far, we only have preoperative data (29 patients in 2017). In September 2018, we will receive the first responses from patients one year postoperatively. Below we show some examples of the results to come.

Patient demography	Women	Men
Antall (%)	15 (52)	14 (48)
Age median (min-max)	71.0 (15-87)	68.5 (52-87)
Weight in kg mean (SD)	81.7 (25.9)	90 (10.5)
Height in cm mean (SD)	166 (10.4)	180 (8.7)
BMI mean (SD)	29.3 (7.6)	27.7 (3.4)
Use of alcohol n (%)	8 (53)	11 (79)
Smoking n (%)	1 (6)	1 (7)
Education more than 10 years n (%)	7 (47)	4 (29)
Working n (%)	1 (6)	2 (14)
Living alone n (%)	7 (47)	12 (86)
Charnley score (%) A/B/C	40/53/7	57/43/0
UCLA activity* mean (SD)	4.4 (2.1)	4.6 (2.1)
VAS Health condition** mean (SD)	47 (22)	49 (24)
VAS Pain*** mean (SD)	67 (20)	63 (14)

*Best possible score 10 **, 100 best possible health, ***100 maximum pain



TOTAL HIP ARTHROPLASTY

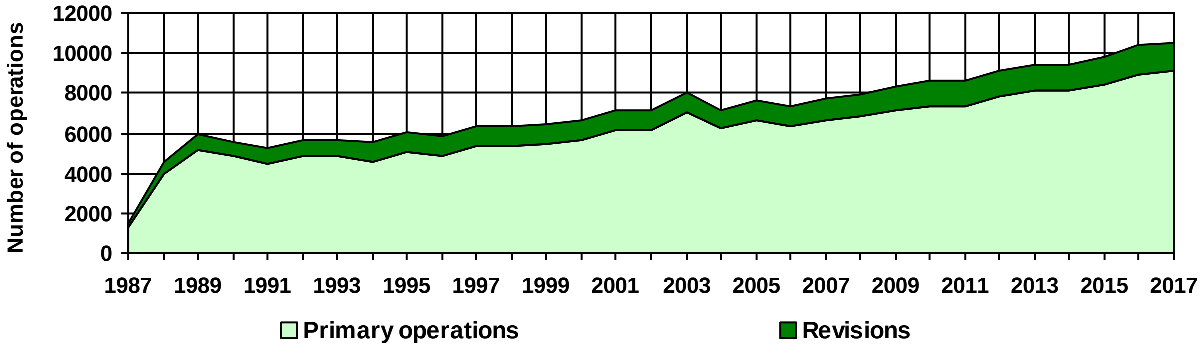
Table 1: Annual numbers of operations (Hemi prosthesis operations for hip fracture are not included here. These are found in tables of The Norwegian Hip Fracture Register)

Year	Primary operations *		Reoperations **		Revisions		Total
2017	9 097	(86,0%)	52	(0,5%)	1 434	(13,6%)	10 583
2016	8 931	(85,6%)	42	(0,4%)	1 455	(14,0%)	10 428
2015	8 442	(85,7%)	16	(0,2%)	1 392	(14,1%)	9 850
2014	8 132	(86,3%)	23	(0,2%)	1 270	(13,5%)	9 425
2013	8 098	(85,9%)	16	(0,2%)	1 311	(13,9%)	9 425
2012	7 847	(85,6%)	24	(0,3%)	1 291	(14,1%)	9 162
2011	7 360	(85,1%)	13	(0,2%)	1 274	(14,7%)	8 647
2010	7 330	(85,3%)	1	(0,0%)	1 258	(14,6%)	8 589
2009	7 115	(85,5%)			1 209	(14,5%)	8 324
2008	6 848	(85,9%)			1 122	(14,1%)	7 970
2007	6 660	(86,4%)			1 052	(13,6%)	7 712
2006	6 319	(86,3%)			1 007	(13,7%)	7 326
2005	6 597	(86,2%)	1	(0,0%)	1 056	(13,8%)	7 654
2004	6 218	(86,9%)			940	(13,1%)	7 158
1999-03	30 550	(86,5%)	1	(0,0%)	4 785	(13,5%)	35 336
1994-98	25 182	(83,5%)	1	(0,0%)	4 959	(16,5%)	30 142
1987-93	29 482	(86,3%)			4 700	(13,7%)	34 182
Total	**190 208**	**(85,7%)**	**190**	**(0,1%)**	**31 515**	**(14,2%)**	**221 913**

* In addition, there were reports155 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.).

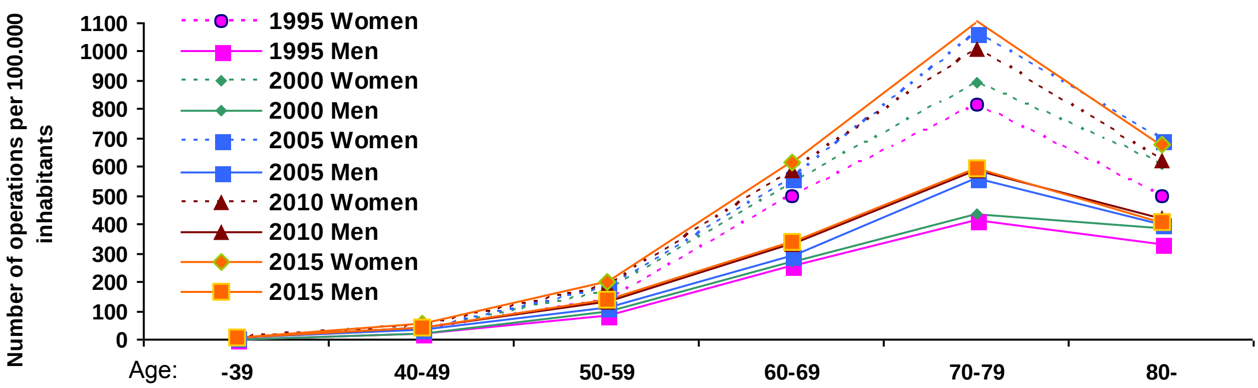
Figure 1: Annual numbers of operations



54,9 % of all operations were performed on the right side. 66,9 % performed in women.

Mean age at primary surgery was 68,9 years, 69,8 years for women and 67 years for men.

Figure 2: Incidence of primary hip prostheses



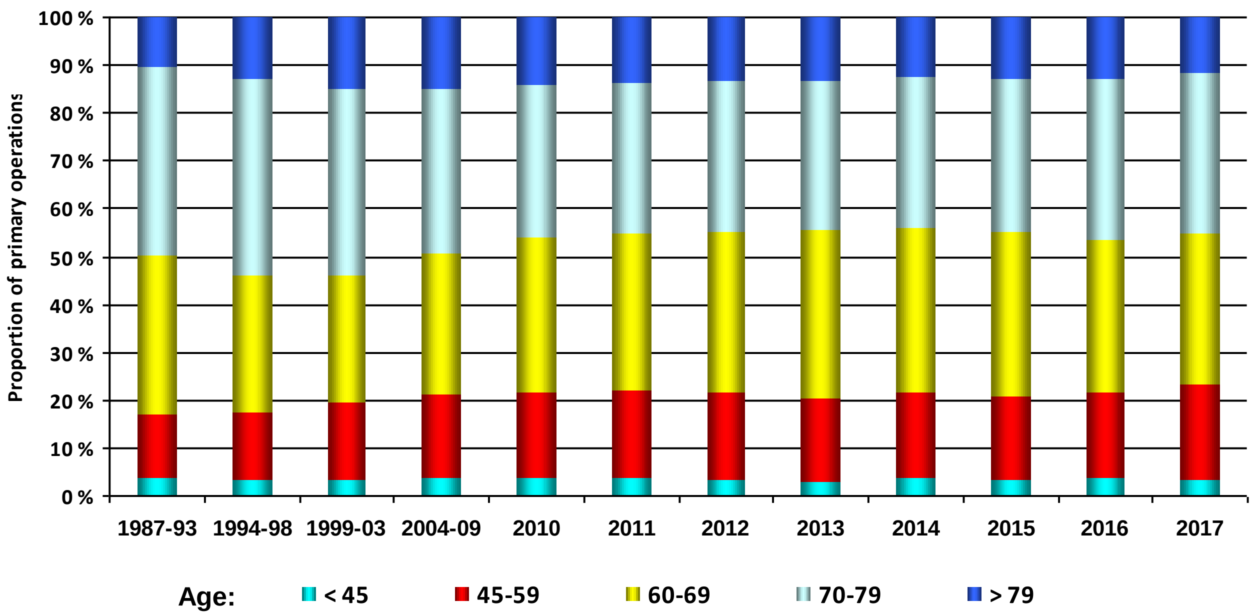
Reasons for primary operations

Table 2:

Year	Primary osteoarthritis	Rheumatoid arthritis	Sequelae after hip fracture	Congenital dysplasia	Cong. dysplasia with dislocation	Epiphysiol./Perthes' disease	Spondyloarthropathy	Acute fracture of the femoral neck	Avascular necrosis of the femoral head	Sequelae after acetabular fracture	Other	Missing information
2017	7240	108	298	671	19	103	26	400	268	34	276	19
2016	7089	137	355	685	11	106	19	342	228	33	246	10
2015	6787	108	331	587	11	106	21	322	181	26	200	20
2014	6405	115	356	648	18	86	28	288	250	22	176	19
2013	6410	125	351	610	10	115	31	288	172	29	192	30
2012	6218	157	366	615	12	92	45	206	186	16	203	14
2011	5787	132	373	573	24	96	26	189	138	21	187	30
2010	5734	130	355	594	36	88	20	161	151	16	191	50
2009	5515	131	390	560	26	127	24	151	174	11	165	32
2008	5359	144	443	498	25	99	21	149	145	19	144	6
2007	5166	146	475	457	21	80	22	159	174	22	110	15
2006	4819	147	486	445	17	83	24	131	172	19	126	13
2005	5097	166	550	437	29	87	22	102	143	14	107	14
2004	4680	141	534	414	17	85	20	97	118	18	102	3
1999	22539	857	2820	2186	140	388	145	294	332	60	471	182
1994	17589	898	3154	1774	187	327	115	127	198	71	520	202
1987	19915	1111	3937	2421	468	392	131	77	98	99	532	303
Total	**142349**	**4753**	**15574**	**14175**	**1071**	**2460**	**740**	**3483**	**3128**	**530**	**3948**	**962**

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

Figure 3: Age by year of operation



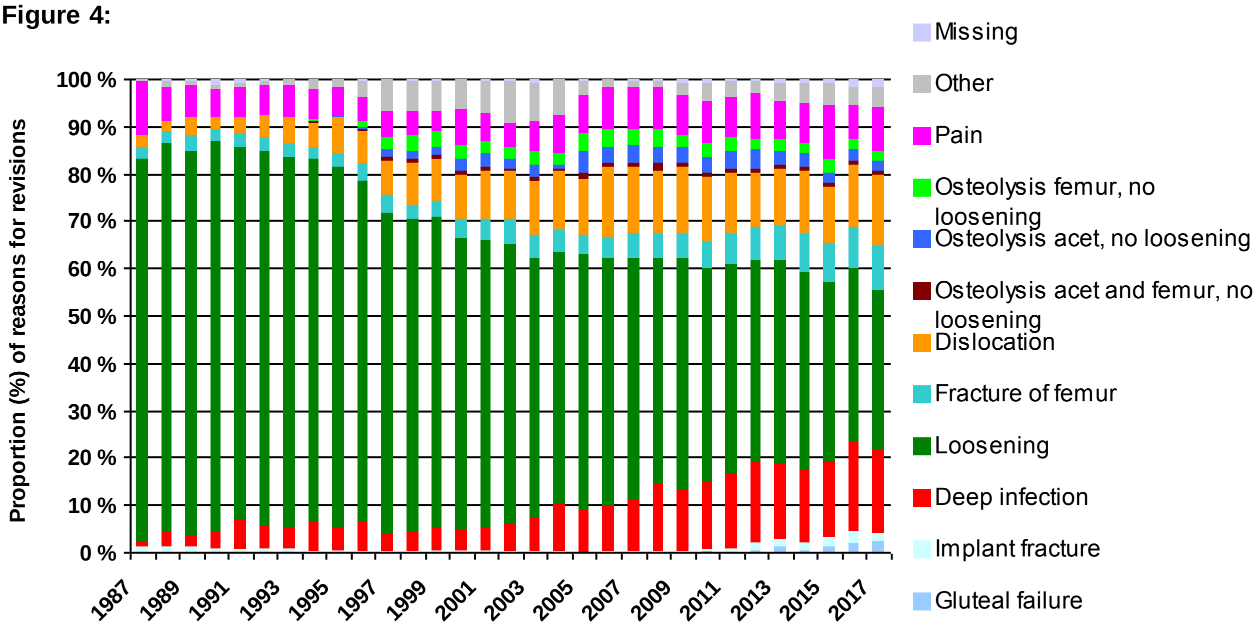
Reasons for revisions

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	Implant fracture	Gluteal failure	Other	Missing information
2017	412	236	284	335	185	175	41	43	37	10	37	48	116	35
2016	455	268	259	374	176	145	51	40	30	11	48	45	129	30
2015	433	292	228	313	153	211	46	56	49	9	34	28	133	18
2014	424	281	217	267	140	147	50	36	48	18	24	10	99	11
2013	450	323	213	292	137	146	53	43	55	13	30	24	101	18
2012	445	318	203	310	123	168	70	42	49	18	31	5	83	8
2011	443	323	220	274	114	146	63	52	66	22	13	3	75	5
2010	444	319	229	240	96	154	55	50	55	45	8	7	78	12
2009	443	316	215	203	82	131	52	41	80	29	4	3	47	10
2008	399	305	192	211	79	131	54	53	63	47	6	0	31	5
2007	409	282	187	149	72	120	53	48	66	28	3	1	26	3
2006	399	295	198	126	61	119	45	46	48	22	8	0	32	2
2005	423	337	164	129	59	113	63	57	65	29	1	0	44	3
2004	371	297	152	124	60	101	11	32	78	44	6	0	104	1
1999-03	2004	1970	656	371	288	380	155	188	383	158	26	0	508	33
1994-98	2307	2683	504	353	209	376	58	120	119	199	28	0	325	15
1987-93	2531	2886	240	287	192	446	0	0	31	65	63	0	141	40
Total	**12792**	**11731**	**4361**	**4358**	**2226**	**3209**	**920**	**947**	**1322**	**767**	**370**	**174**	**2072**	**249**

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

Figure 4:



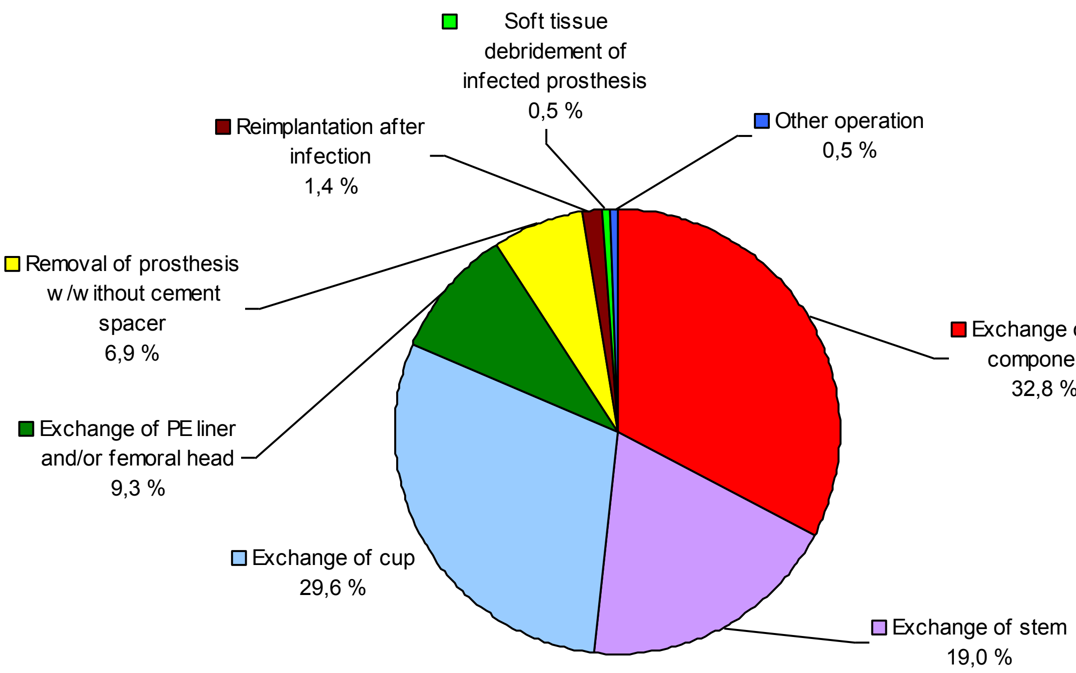
The graph is hierarchical, i.e. if a revision is marked both "Deep infection" and "Loosening", only "Deep infection" is counted.

Type of revision

Table 4:

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	Muscle resonance and transposition	Osteosynthesis for fracture	Other operation	Missing information	Total
2017	168	20	224	124	250	253	7	109	19	28	103		25	30	46	72	8	**1486**
2016	144	19	174	135	291	296	3	93	6	17	138	4	26	22	35	87	7	**1497**
2015	178	18	210	116	254	289	11	97	10	44	96	5	18		1	56	5	**1408**
2014	158	21	205	95	240	272	8	80	8	38	92	1	25		1	43	6	**1293**
2013	175	11	174	110	254	309	4	75	9	29	102	5	17			47	6	**1327**
2012	169	11	188	103	228	320	6	66	7	38	106	2	25			36	10	**1315**
2011	177	7	199	111	246	306	6	70	14	57	34	3	19			32	6	**1287**
2010	182	8	201	109	251	321	2	49	6	74	6	13	7			13	17	**1259**
2004-09	855	62	861	355	1486	1773	42	308	36	451	10	71	2			48	29	**6389**
1999-03	946	64	616	118	779	1522	35	271	17	247	0	124	1			16	30	**4786**
1994-98	1168	37	607	41	498	2030	22	100	10	238	0	183	1			20	5	**4960**
1987-93	1157		728	11	37	2489	3	4	3	182	0	28				15	43	**4700**
Total	**5477**	**278**	**4387**	**1428**	**4814**	**10180**	**149**	**1322**	**145**	**1443**	**687**	**439**	**166**	**52**	**83**	**485**	**172**	**31707**

Figure 5:



Bone transplantation in revisions

Table 5: Acetabular cup

Year	Yes		No		Bone impaction[1]		Missing		Total
2017	65	(4,4 %)	955	(64,3 %)	82	(5,5 %)	384	(25,8 %)	**1 486**
2016	72	(4,8 %)	942	(62,9 %)	96	(6,4 %)	387	(25,9 %)	**1 497**
2015	102	(7,2 %)	969	(68,8 %)	92	(6,5 %)	245	(17,4 %)	**1 408**
2014	112	(8,7 %)	855	(66,1 %)	94	(7,3 %)	232	(17,9 %)	**1 293**
2013	89	(6,7 %)	854	(64,4 %)	131	(9,9 %)	253	(19,1 %)	**1 327**
2012	105	(8 %)	832	(63,3 %)	143	(10,9 %)	235	(17,9 %)	**1 315**
2011	112	(8,7 %)	807	(62,7 %)	181	(14,1 %)	187	(14,5 %)	**1 287**
2010	131	(10,4 %)	787	(62,5 %)	189	(15 %)	152	(12,1 %)	**1 259**
2009	111	(9,2 %)	715	(59,1 %)	245	(20,3 %)	138	(11,4 %)	**1 209**
2008	110	(9,8 %)	668	(59,5 %)	211	(18,8 %)	133	(11,9 %)	**1 122**
2007	132	(12,5 %)	594	(56,5 %)	193	(18,3 %)	133	(12,6 %)	**1 052**
2006	115	(11,4 %)	554	(55 %)	201	(20 %)	137	(13,6 %)	**1 007**
2005	161	(15,2 %)	526	(49,8 %)	230	(21,8 %)	140	(13,2 %)	**1 057**
2004	161	(17,1 %)	570	(60,6 %)	162	(17,2 %)	47	(5 %)	**940**
1999-03	962	(20,1 %)	3 044	(63,6 %)	642	(13,4 %)	138	(2,9 %)	**4 786**
1994-98	1 298	(26,2 %)	3 165	(63,8 %)	380	(7,7 %)	117	(2,4 %)	**4 960**
1987-93	1 292	(27,5 %)	3 316	(70,6 %)	0	(0 %)	92	(2 %)	**4 700**
Total	**5 130**	**(16,2 %)**	**20 153**	**(63,6 %)**	**3 272**	**(10,3 %)**	**3 150**	**(9,9 %)**	**31 705**

Table 6: Femoral stem

Year	Yes		No		Bone impaction[1]		Missing		Total
2017	44	(3 %)	950	(63,9 %)	7	(0,5 %)	485	(32,6 %)	**1 486**
2016	43	(2,9 %)	964	(64,4 %)	3	(0,2 %)	487	(32,5 %)	**1 497**
2015	70	(5 %)	980	(69,6 %)	11	(0,8 %)	347	(24,6 %)	**1 408**
2014	63	(4,9 %)	879	(68 %)	3	(0,2 %)	348	(26,9 %)	**1 293**
2013	84	(6,3 %)	886	(66,8 %)	8	(0,6 %)	349	(26,3 %)	**1 327**
2012	81	(6,2 %)	838	(63,7 %)	21	(1,6 %)	375	(28,5 %)	**1 315**
2011	116	(9 %)	818	(63,6 %)	29	(2,3 %)	324	(25,2 %)	**1 287**
2010	119	(9,5 %)	798	(63,4 %)	44	(3,5 %)	298	(23,7 %)	**1 259**
2009	129	(10,7 %)	752	(62,2 %)	45	(3,7 %)	283	(23,4 %)	**1 209**
2008	144	(12,8 %)	677	(60,3 %)	69	(6,1 %)	232	(20,7 %)	**1 122**
2007	125	(11,9 %)	601	(57,1 %)	70	(6,7 %)	256	(24,3 %)	**1 052**
2006	145	(14,4 %)	598	(59,4 %)	81	(8 %)	183	(18,2 %)	**1 007**
2005	181	(17,1 %)	570	(53,9 %)	86	(8,1 %)	220	(20,8 %)	**1 057**
2004	125	(13,3 %)	647	(68,8 %)	119	(12,7 %)	49	(5,2 %)	**940**
1999-03	889	(18,6 %)	3 061	(64 %)	698	(14,6 %)	138	(2,9 %)	**4 786**
1994-98	1 314	(26,5 %)	3 004	(60,6 %)	525	(10,6 %)	117	(2,4 %)	**4 960**
1987-93	826	(17,6 %)	3 782	(80,5 %)	0	(0 %)	92	(2 %)	**4 700**
Total	**4 498**	**(14,2 %)**	**20 805**	**(65,6 %)**	**1 819**	**(5,7 %)**	**4 583**	**(14,5 %)**	**31 705**

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
2017	306	164	99	62	54	9	792	**1 486**
2016	267	219	103	82	54	29	743	**1 497**
2015	241	180	108	51	59	20	749	**1 408**
2014	197	171	93	70	41	31	690	**1 293**
2013	253	186	85	78	61	25	639	**1 327**
2012	209	238	111	88	73	18	578	**1 315**
2011	227	183	116	87	66	20	588	**1 287**
2010	236	176	103	77	62	20	585	**1 259**
2009	210	165	92	78	76	27	561	**1 209**
2008	196	181	83	96	67	27	472	**1 122**
2007	185	142	88	73	55	30	479	**1 052**
2006	210	136	78	65	59	24	435	**1 007**
2005	240	137	87	74	59	23	437	**1 057**

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
2017	269	138	51	13	8	1 007	**1 486**
2016	253	153	70	24	4	993	**1 497**
2015	200	134	87	17	10	960	**1 408**
2014	162	149	67	13	3	899	**1 293**
2013	234	154	67	24	4	844	**1 327**
2012	205	190	70	18	6	826	**1 315**
2011	177	165	77	21	7	840	**1 287**
2010	196	150	70	18	8	817	**1 259**
2009	155	141	68	20	9	816	**1 209**
2008	156	177	81	11	10	687	**1 122**
2007	144	129	60	18	10	691	**1 052**
2006	167	151	58	22	5	604	**1 007**
2005	210	152	72	23	10	590	**1 057**

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
2017	692	(7,6 %)	1 162	(12,8 %)	743	(8,2 %)	6 139	(67,5 %)	5	(0,1 %)	356	(3,9 %)	**9 097**
2016	713	(8 %)	1 162	(13 %)	1 432	(16 %)	5 160	(57,8 %)	5	(0,1 %)	459	(5,1 %)	**8 931**
2015	520	(6,2 %)	1 147	(13,6 %)	2 234	(26,5 %)	4 080	(48,3 %)	3	(0 %)	458	(5,4 %)	**8 442**
2014	337	(4,1 %)	1 059	(13 %)	3 174	(39 %)	3 015	(37,1 %)	17	(0,2 %)	530	(6,5 %)	**8 132**
2013	342	(4,2 %)	1 081	(13,3 %)	3 626	(44,8 %)	2 472	(30,5 %)	24	(0,3 %)	553	(6,8 %)	**8 098**
2012	438	(5,6 %)	1 023	(13 %)	3 919	(49,9 %)	2 192	(27,9 %)	12	(0,2 %)	263	(3,4 %)	**7 847**
2011	429	(5,8 %)	748	(10,2 %)	3 897	(52,9 %)	2 081	(28,3 %)	30	(0,4 %)	175	(2,4 %)	**7 360**
2010	625	(8,5 %)	470	(6,4 %)	3 918	(53,5 %)	2 154	(29,4 %)	48	(0,7 %)	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 %)	1 927	(28,1 %)	8	(0,1 %)	98	(1,4 %)	**6 848**
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 %)	4 285	(68,9 %)	1 437	(23,1 %)	6	(0,1 %)	20	(0,3 %)	**6 218**
1999-03	52	(0,2 %)	2 312	(7,6 %)	0 925	(68,5 %)	7 112	(23,3 %)	36	(0,1 %)	113	(0,4 %)	**30 550**
1994-98	33	(0,1 %)	1 633	(6,5 %)	7 117	(68 %)	6 306	(25 %)	15	(0,1 %)	78	(0,3 %)	**25 182**
1987-93	104	(0,4 %)	1 853	(6,3 %)	9 632	(66,6 %)	7 628	(25,9 %)	25	(0,1 %)	240	(0,8 %)	**29 482**
Total	**4 710**	**(2,5 %)**	**16 216**	**(8,5 %)**	**06 725**	**(56,1 %)**	**58 393**	**(30,7 %)**	**262**	**(0,1 %)**	**3 902**	**(2,1 %)**	**190 208**

Figure 6: In primary operations *

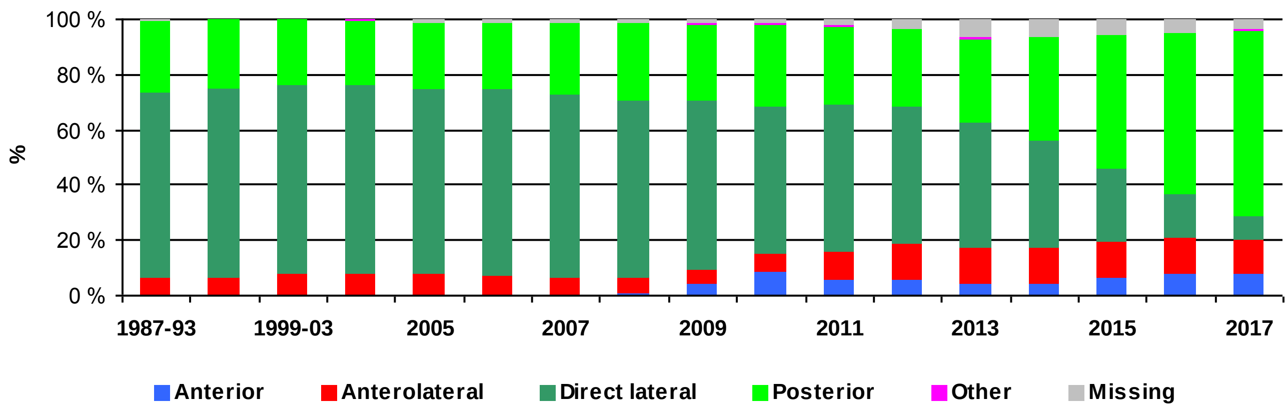


Table 10: Mini invasive surgery in primary surgery

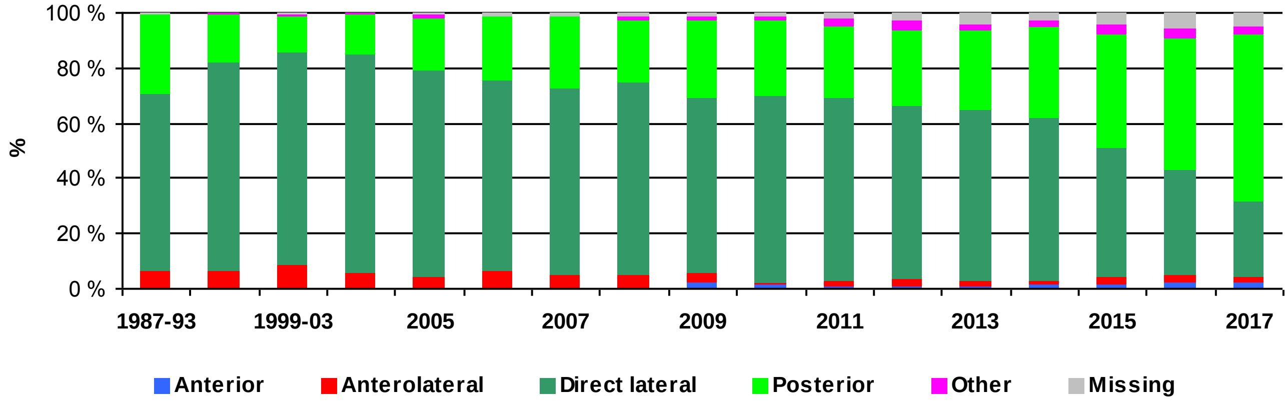
Year	Yes		No		Missing		Total
2017	1 914	(21,0%)	6 834	(75,1%)	349	(3,8%)	**9 097**
2016	1 812	(20,3%)	6 884	(77,1%)	235	(2,6%)	**8 931**
2015	1 593	(18,9%)	6 536	(77,4%)	313	(3,7%)	**8 442**
2014	1 337	(16,4%)	6 524	(80,2%)	271	(3,3%)	**8 132**
2013	1 407	(17,4%)	6 319	(78,0%)	372	(4,6%)	**8 098**
2012	1 327	(16,9%)	5 861	(74,7%)	659	(8,4%)	**7 847**
2011	1 000	(13,6%)	6 005	(81,6%)	355	(4,8%)	**7 360**
2010	934	(12,7%)	6 171	(84,2%)	225	(3,1%)	**7 330**
2009	398	(5,6%)	6 671	(93,8%)	46	(0,6%)	**7 115**
2008	65	(0,9%)	6 755	(98,6%)	28	(0,4%)	**6 848**
2007	4	(0,1%)	6 567	(98,6%)	89	(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
2017	29	(2 %)	35	(2,4 %)	403	(27,1 %)	891	(60 %)	40	(2,7 %)	88	(5,9 %)	**1 486**
2016	27	(1,8 %)	45	(3 %)	571	(38,1 %)	712	(47,6 %)	54	(3,6 %)	88	(5,9 %)	**1 497**
2015	24	(1,7 %)	35	(2,5 %)	661	(46,9 %)	572	(40,6 %)	50	(3,6 %)	66	(4,7 %)	**1 408**
2014	16	(1,2 %)	25	(1,9 %)	762	(58,9 %)	426	(32,9 %)	23	(1,8 %)	41	(3,2 %)	**1 293**
2013	7	(0,5 %)	31	(2,3 %)	822	(61,9 %)	380	(28,6 %)	34	(2,6 %)	53	(4 %)	**1 327**
2012	11	(0,8 %)	35	(2,7 %)	828	(63 %)	353	(26,8 %)	46	(3,5 %)	42	(3,2 %)	**1 315**
2011	9	(0,7 %)	26	(2 %)	851	(66,1 %)	335	(26 %)	30	(2,3 %)	36	(2,8 %)	**1 287**
2010	14	(1,1 %)	17	(1,4 %)	844	(67 %)	347	(27,6 %)	19	(1,5 %)	18	(1,4 %)	**1 259**
2009	24	(2 %)	42	(3,5 %)	770	(63,7 %)	341	(28,2 %)	12	(1 %)	20	(1,7 %)	**1 209**
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 %)	706	(67,1 %)	273	(26 %)	2	(0,2 %)	15	(1,4 %)	**1 052**
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 %)	789	(74,6 %)	198	(18,7 %)	14	(1,3 %)	9	(0,9 %)	**1 057**
2004	2	(0,2 %)	52	(5,5 %)	731	(77,8 %)	134	(14,3 %)	2	(0,2 %)	19	(2 %)	**940**
1999-03	14	(0,3 %)	408	(8,5 %)	3 603	(75,3 %)	624	(13 %)	40	(0,8 %)	97	(2 %)	**4 786**
1994-98	6	(0,1 %)	309	(6,2 %)	3 740	(75,4 %)	859	(17,3 %)	21	(0,4 %)	25	(0,5 %)	**4 960**
1987-93	16	(0,3 %)	282	(6 %)	3 010	(64 %)	1 352	(28,8 %)	11	(0,2 %)	29	(0,6 %)	**4 700**
Total	**207**	**(0,7 %)**	**1 554**	**(4,9 %)**	**20 577**	**(64,9 %)**	**8 279**	**(26,1 %)**	**410**	**(1,3 %)**	**678**	**(2,1 %)**	**31 705**

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:

Year	Primary operations						Revisions						Total
	No		Yes		Missing		No		Yes		Missing		
2017	8 500	(93,4 %)	20	(0,2 %)	577	(6,3 %)	1 292	(86,9 %)	68	(4,6 %)	126	(8,5 %)	**10 583**
2016	8 438	(94,5 %)	25	(0,3 %)	468	(5,2 %)	1 306	(87,2 %)	91	(6,1 %)	100	(6,7 %)	**10 428**
2015	7 600	(90 %)	29	(0,3 %)	813	(9,6 %)	1 201	(85,3 %)	96	(6,8 %)	111	(7,9 %)	**9 850**
2014	7 393	(90,9 %)	21	(0,3 %)	718	(8,8 %)	1 111	(85,9 %)	66	(5,1 %)	116	(9 %)	**9 425**
2013	7 227	(89,2 %)	58	(0,7 %)	813	(10 %)	1 163	(87,6 %)	65	(4,9 %)	99	(7,5 %)	**9 425**
2012	7 043	(89,8 %)	37	(0,5 %)	767	(9,8 %)	1 078	(82 %)	111	(8,4 %)	126	(9,6 %)	**9 162**
2011	6 624	(90 %)	29	(0,4 %)	707	(9,6 %)	1 064	(82,7 %)	123	(9,6 %)	100	(7,8 %)	**8 647**
2010	6 690	(91,3 %)	38	(0,5 %)	602	(8,2 %)	1 062	(84,4 %)	106	(8,4 %)	91	(7,2 %)	**8 589**
2009	6 584	(92,5 %)	59	(0,8 %)	472	(6,6 %)	1 013	(83,8 %)	121	(10 %)	75	(6,2 %)	**8 324**
2008	6 248	(91,2 %)	59	(0,9 %)	541	(7,9 %)	954	(85 %)	106	(9,4 %)	62	(5,5 %)	**7 970**
2007	6 105	(91,7 %)	75	(1,1 %)	480	(7,2 %)	867	(82,4 %)	112	(10,6 %)	73	(6,9 %)	**7 712**
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 %)	864	(81,7 %)	102	(9,6 %)	91	(8,6 %)	**7 654**
2004	5 998	(96,5 %)	130	(2,1 %)	90	(1,4 %)	808	(86 %)	99	(10,5 %)	33	(3,5 %)	**7 158**
1999-03	29 316	(96 %)	861	(2,8 %)	373	(1,2 %)	4 116	(86 %)	559	(11,7 %)	111	(2,3 %)	**35 336**
1994-98	23 142	(91,9 %)	1 881	(7,5 %)	159	(0,6 %)	4 275	(86,2 %)	618	(12,5 %)	67	(1,4 %)	**30 142**
1987-93	23 529	(79,8 %)	5 579	(18,9 %)	374	(1,3 %)	3 657	(77,8 %)	986	(21 %)	57	(1,2 %)	**34 182**
Total	**172 140**	**(90,5 %)**	**9 100**	**(4,8 %)**	**8 968**	**(4,7 %)**	**26 667**	**(84,1 %)**	**3 533**	**(11,1 %)**	**1 505**	**(4,7 %)**	**221 913**

Antibiotic prophylaxis

Table 13:

Year	Primary operations						Revisions						Total
	No		Yes		Missing		No		Yes		Missing		
2017	4	(0 %)	9 039	(99,4 %)	54	(0,6 %)	91	(6,1 %)	1 361	(91,6 %)	34	(2,3 %)	**10 583**
2016	3	(0 %)	8 876	(99,4 %)	52	(0,6 %)	83	(5,5 %)	1 386	(92,6 %)	28	(1,9 %)	**10 428**
2015	0	(0 %)	8 403	(99,5 %)	39	(0,5 %)	9	(0,6 %)	1 378	(97,9 %)	21	(1,5 %)	**9 850**
2014	2	(0 %)	8 092	(99,5 %)	38	(0,5 %)	9	(0,7 %)	1 276	(98,7 %)	8	(0,6 %)	**9 425**
2013	2	(0 %)	8 059	(99,5 %)	37	(0,5 %)	8	(0,6 %)	1 301	(98 %)	18	(1,4 %)	**9 425**
2012	2	(0 %)	7 811	(99,5 %)	34	(0,4 %)	11	(0,8 %)	1 291	(98,2 %)	13	(1 %)	**9 162**
2011	6	(0,1 %)	7 332	(99,6 %)	22	(0,3 %)	43	(3,3 %)	1 236	(96 %)	8	(0,6 %)	**8 647**
2010	6	(0,1 %)	7 297	(99,5 %)	27	(0,4 %)	46	(3,7 %)	1 203	(95,6 %)	10	(0,8 %)	**8 589**
2009	32	(0,4 %)	7 082	(99,5 %)	1	(0 %)	37	(3,1 %)	1 170	(96,8 %)	2	(0,2 %)	**8 324**
2008	39	(0,6 %)	6 804	(99,4 %)	5	(0,1 %)	38	(3,4 %)	1 077	(96 %)	7	(0,6 %)	**7 970**
2007	27	(0,4 %)	6 626	(99,5 %)	7	(0,1 %)	30	(2,9 %)	1 015	(96,5 %)	7	(0,7 %)	**7 712**
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 %)	1 039	(98,3 %)	0	(0 %)	**7 654**
2004	1	(0 %)	6 217	(100 %)	0	(0 %)	6	(0,6 %)	929	(98,8 %)	5	(0,5 %)	**7 158**
1999-03	34	(0,1 %)	30 509	(99,9 %)	7	(0 %)	31	(0,6 %)	4 741	(99,1 %)	14	(0,3 %)	**35 336**
1994-98	61	(0,2 %)	25 118	(99,7 %)	3	(0 %)	36	(0,7 %)	4 921	(99,2 %)	3	(0,1 %)	**30 142**
1987-93	1 762	(6 %)	27 675	(93,9 %)	45	(0,2 %)	164	(3,5 %)	4 513	(96 %)	23	(0,5 %)	**34 182**
Total	**2 043**	**(1,1 %)**	**187 794**	**(98,7 %)**	**371**	**(0,2 %)**	**688**	**(2,2 %)**	**30 816**	**(97,2 %)**	**201**	**(0,6 %)**	**221 913**

Fixation in primary operations

Figure 8a: All patients

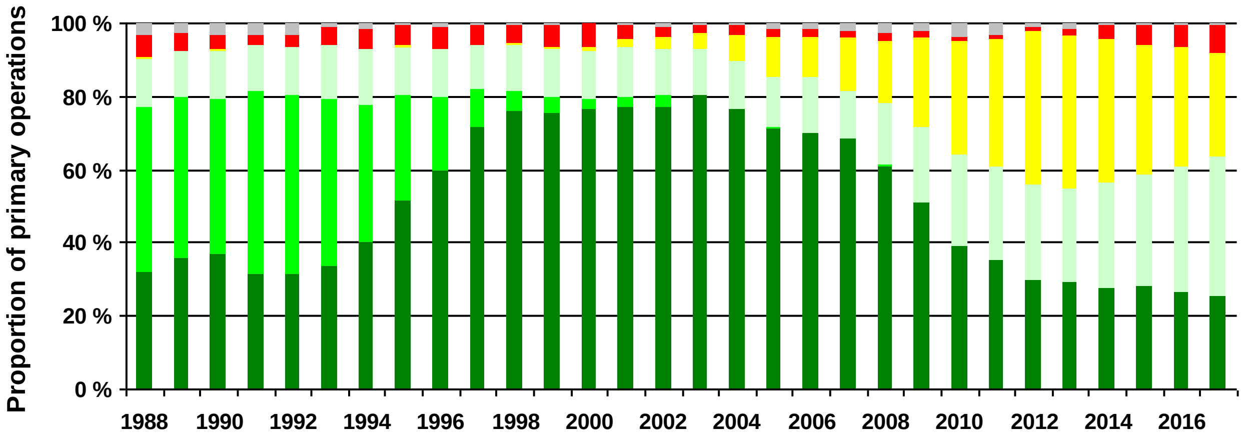
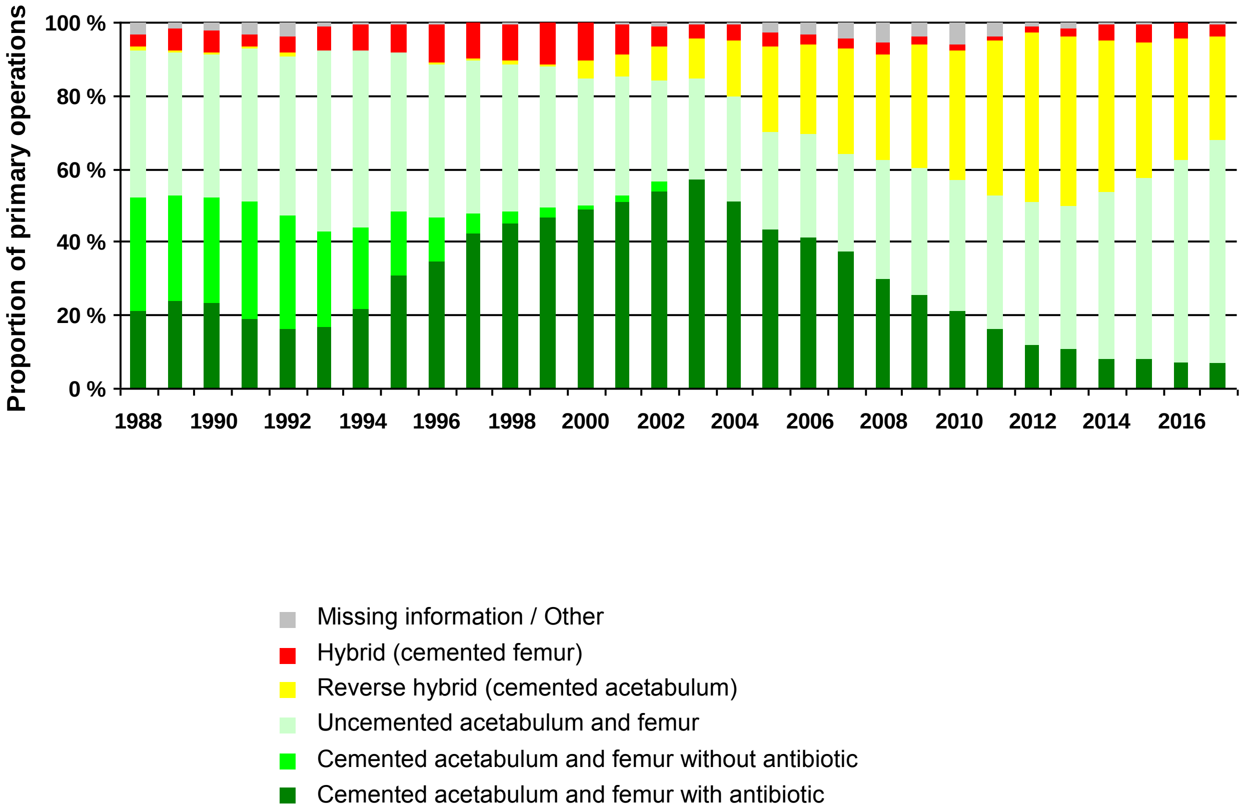


Figure 8b: Patients under 65 years old



Fixation in primary operations (cont.)

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

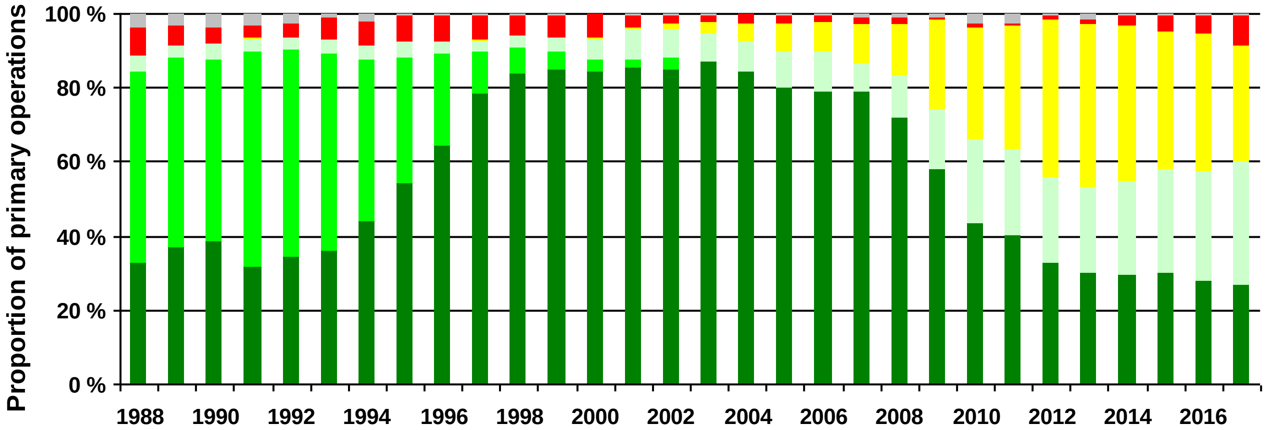
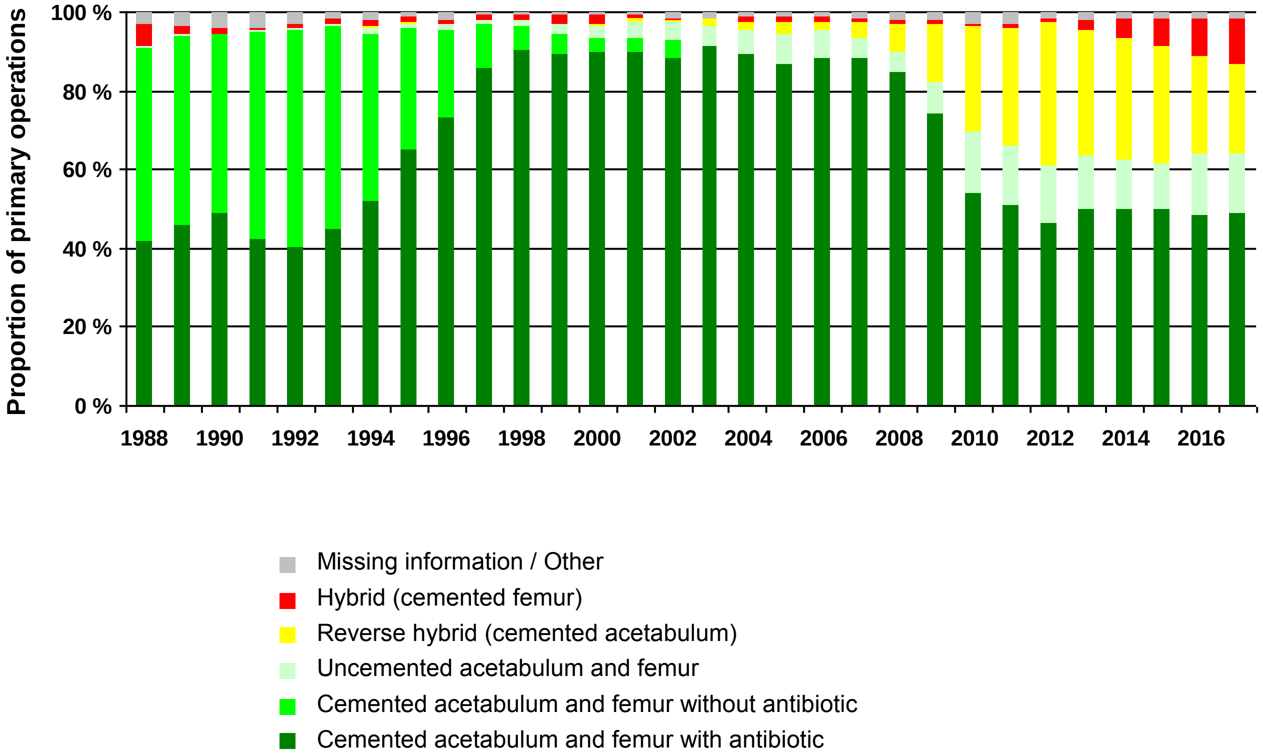


Figure 8d: Patients over 75 years old



Fixation in revisions

Figure 9: Acetabular cup - All patients

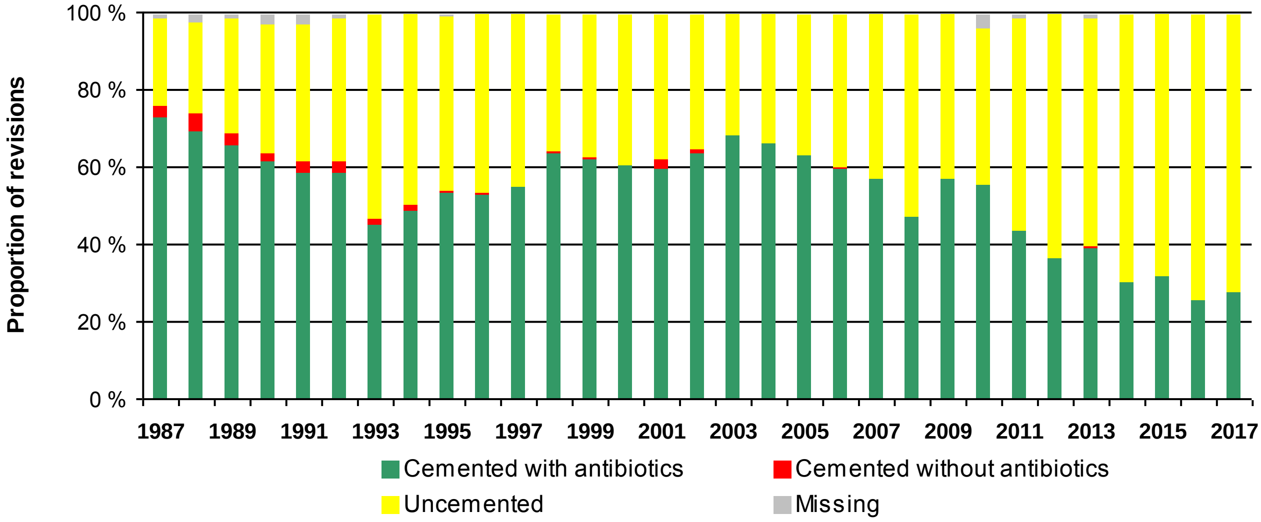
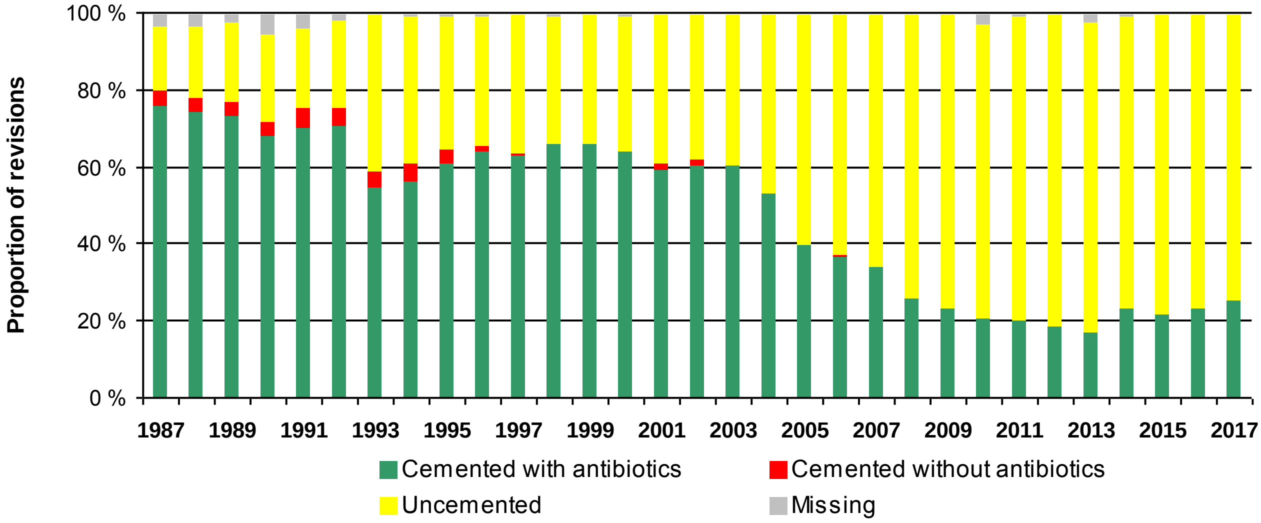


Figure 10: Femoral stem - All patients



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
2017	16%	7%	56%	20%	254	5%	7%	73%	16%	651
2016	16%	7%	58%	20%	234	6%	8%	70%	17%	698
2015	21%	9%	63%	7%	300	5%	12%	69%	15%	638
2014	26%	10%	56%	8%	259	4%	14%	67%	14%	593
2013	31%	7%	50%	12%	347	4%	11%	71%	13%	523
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%	478	3%	23%	66%	8%	347
2004-09	43%	10%	42%	5%	2 531	8%	26%	60%	6%	1 805
1999-03	28%	22%	49%	1%	1 977	6%	43%	50%	1%	1 119
1994-98	16%	26%	57%	1%	1 851	5%	54%	39%	1%	1 463
1987-93	0%	24%	75%	1%	2 113	0%	65%	34%	2%	1 175
Total	**25%**	**17%**	**54%**	**4%**	**11 037**	**5%**	**30%**	**57%**	**8%**	**10 038**

Table 15: Femoral stem

	Cemented					Uncemented				
	Bone impaction	Bone transpl.	No	Missing	Total	Bone impaction	Bone transpl.	No	Missing	Total
2017	3%	3%	77%	17%	128	0%	7%	74%	19%	391
2016	0%	1%	77%	22%	126	1%	7%	75%	17%	412
2015	2%	4%	82%	12%	117	2%	9%	76%	14%	427
2014	3%	3%	63%	32%	114	0%	13%	74%	14%	376
2013	6%	4%	62%	27%	95	0%	14%	72%	14%	458
2012	13%	4%	60%	23%	100	1%	15%	71%	13%	430
2011	20%	4%	56%	20%	100	2%	22%	65%	11%	389
2010	29%	5%	58%	8%	106	2%	24%	66%	8%	398
2004-09	37%	7%	50%	7%	989	3%	32%	57%	7%	1 811
1999-03	34%	14%	52%	1%	1 667	11%	50%	37%	1%	984
1994-98	18%	24%	57%	1%	2 194	10%	60%	28%	1%	1 197
1987-93	0%	7%	91%	2%	2 739	0%	65%	34%	1%	909
Total	**17%**	**12%**	**67%**	**4%**	**8 475**	**4%**	**35%**	**54%**	**8%**	**8 182**

Registration of "Bone impaction" started in 1996

Cements used in the acetabulum

Table 16: In primary- and revision surgeries

Cements	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
Boneloc	1266	0	0	0	0	0	0	0	0	**1266**
Cemex System Genta FAST	492	212	220	212	209	114	80	0	0	**1539**
Cemex system genta ID green	0	0	0	0	0	0	0	17	193	**210**
Cemex w/gentamicin	381	0	0	10	43	126	144	233	0	**937**
CMW I	4787	0	0	0	0	0	0	0	0	**4787**
CMW I w/gentamicin	3067	0	0	0	0	0	0	0	0	**3067**
CMW II	9	1	0	0	0	0	0	0	0	**10**
CMW III	951	0	0	0	0	0	0	0	0	**951**
CMW III w/gentamicin	64	0	0	0	0	0	0	0	0	**64**
Copal G+ V	0	0	0	0	3	6	7	7	17	**40**
Copal w/gentamicin+clindamycin	8	2	0	0	2	2	4	2	9	**29**
Optipac Refobacin Bonecement R	1046	1365	1703	1923	1898	2080	2420	2157	1571	**16163**
Optipac Refobacin Revision	0	0	1	9	13	6	20	15	9	**73**
Palacos	6226	1	1	1	0	0	0	0	0	**6229**
Palacos E-Flow (low viscosity)	75	0	0	0	0	0	0	0	0	**75**
Palacos R + G	13394	2592	2228	2185	2543	2350	2335	2120	1580	**31327**
Palacos R+G pro	0	0	0	0	1	2	0	50	630	**683**
Palacos w/gentamicin	57175	2	0	0	1	0	1	0	0	**57179**
Refobacin Bone Cement R	5620	816	912	1118	980	680	348	528	796	**11798**
Refobacin Revision	59	49	77	79	33	32	28	17	54	**428**
Refobacin-Palacos	2222	0	0	0	0	0	0	0	0	**2222**
Simplex	6459	1	0	0	0	0	0	0	0	**6460**
Simplex unknown	724	30	0	0	0	1	0	0	0	**755**
Simplex w/erythr.+colistin	2033	0	0	0	0	0	0	0	0	**2033**
Simplex w/Tobramycin	4102	579	470	445	395	287	288	288	208	**7062**
SmartSet GHV	157	0	0	0	0	0	0	0	0	**157**
SmartSet GHV Genta. Smartmix	183	0	0	0	2	2	5	97	79	**368**
SmartSet HV	13	0	0	0	0	0	0	0	0	**13**
Vancogenx	0	0	0	3	1	2	1	1	3	**11**
Other (n<10)	18	0	0	0	1	0	0	0	0	**19**
Missing information	86	49	20	7	9	6	8	14	25	**224**

Cements used in the femur

Table 17: In primary- and revision surgeries

Cements	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
Boneloc	1325	0	1	0	0	0	0	0	0	**1326**
Cemex System Genta FAST	457	200	219	194	162	94	58	0	0	**1384**
Cemex system genta ID green	0	0	0	0	0	0	0	17	90	**107**
Cemex w/gentamicin	286	0	0	8	36	97	66	99	0	**592**
CMW I	4396	0	0	0	0	0	0	0	0	**4396**
CMW I w/gentamicin	3183	0	0	0	0	0	0	1	0	**3184**
CMW II	9	3	0	0	0	0	0	0	0	**12**
CMW III	1933	0	0	0	0	0	0	0	0	**1933**
CMW III w/gentamicin	184	0	0	0	0	0	0	0	0	**184**
Copal G+ V	0	0	0	0	1	5	9	5	11	**31**
Copal w/gentamicin+clindamycin	3	1	1	0	1	1	4	1	7	**19**
Optipac Refobacin Bonecement R	571	648	694	653	570	559	798	682	537	**5712**
Optipac Refobacin Revision	0	0	2	4	3	4	5	3	4	**25**
Palacos	5890	3	0	1	0	0	1	0	0	**5895**
Palacos E-Flow (low viscosity)	83	0	0	0	0	0	0	0	0	**83**
Palacos R + G	10445	1511	1224	977	1220	1208	1372	1377	946	**20280**
Palacos R+G pro	0	0	0	0	1	1	0	45	621	**668**
Palacos w/gentamicin	58048	1	0	0	2	0	0	0	0	**58051**
Refobacin Bone Cement R	4409	230	166	192	170	211	112	218	317	**6025**
Refobacin Revision	13	11	14	21	14	12	14	10	20	**129**
Refobacin-Palacos	2062	0	0	0	0	0	0	0	0	**2062**
Simplex	6990	3	0	0	0	0	0	0	0	**6993**
Simplex unknown	698	9	0	0	0	1	0	0	0	**708**
Simplex w/erythr.+colistin	2407	0	0	0	0	0	0	0	0	**2407**
Simplex w/Tobramycin	3512	443	466	470	452	482	511	511	468	**7315**
SmartSet GHV	132	0	0	0	0	0	0	0	0	**132**
SmartSet GHV Genta. Smartmix	163	0	0	0	0	0	23	88	115	**389**
Vancogenx	0	0	0	3	1	1	1	0	4	**10**
Other (n<10)	25	0	0	0	0	1	1	0	0	**27**
Missing information	112	2	14	5	2	3	4	13	17	**172**

Cemented primary prostheses

Table 18: (The 45 most common combinations of cup and stem)

Cup	Stem	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
CHARNLEY	CHARNLEY	39824	223	115	112	65	39				**40378**
EXETER	EXETER	12184	496	155	80	25					**12940**
REFLECTION CEM. ALL POLY	SPECTRON-EF	9369	134	112	85	33	1				**9734**
EXETER X3 RIMFIT	EXETER		54	604	982	1173	1157	1353	1306	970	**7599**
TITAN	TITAN	6948	7								**6955**
IP	LUBINUS SP II	2949	627	525	471	415	279	303	263	217	**6049**
CONTEMPORARY	EXETER	3015	734	627	188	104	56	15	3	1	**4743**
SPECTRON	ITH	2405									**2405**
MARATHON	CHARNLEY MODULAR	190	323	282	203	196	225	135	45	25	**1624**
KRONOS	TITAN	1467	16								**1483**
ELITE	TITAN	1224									**1224**
LUBINUS	LUBINUS SP II	13				125	167	251	212	213	**981**
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	813									**813**
MARATHON	EXETER	22	17	18	70	82	91	120	186	193	**799**
ELITE	EXETER	746	31		1						**778**
ZCA	CPT	756									**756**
CHARNLEY	CHARNLEY MODULAR	657		1	1		1				**660**
IP	LUBINUS	587									**587**
ELITE	ELITE	578	1								**579**
CHARNLEY	EXETER	571									**571**
TITAN	FJORD	523									**523**
ELITE	CHARNLEY MODULAR	305	53	57	48	30	21				**514**
SPECTRON	SP I	432									**432**
MODULAR HIP SYSTEM	BIO-FIT	430									**430**
SPECTRON	TITAN	411									**411**
CHARNLEY	C-STEM	378									**378**
CHARNLEY	ELITE	375									**375**
OPERA	SPECTRON-EF	356									**356**
AVANTAGE	EXETER	21	29	37	41	47	61	37	37	32	**342**
ELITE	MS-30	331									**331**
MARATHON	C-STEM	25	9					41	127	117	**319**
MARATHON	LUBINUS SP II	1	11	8	11	20	44	65	110	40	**310**
PEARL	TITAN	285									**285**
MODULAR HIP SYSTEM	ITH	277									**277**
SPECTRON	BIO-FIT	226									**226**
IP	SP I	214									**214**
LMT	LMT	191									**191**
ELITE	CPT	165	16	1							**182**
ZCA	CPS-PLUS	168									**168**
MÜLLER TYPE	MÜLLER TYPE	166									**166**
PE-PLUS	CPS-PLUS	164									**164**
Durasul	CPT									127	**127**
Other	Other	2284	83	52	43	65	106	78	98	398	**3207**

Uncemented primary prostheses

Table 19: (The 45 most common combinations of cup and stem)

Cup	Stem	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
REFLECTION UNCEMENTED	CORAIL	703	520	529	674	745	822	542	169	217	**4921**
PINNACLE	CORAIL	328	116	296	455	357	319	383	489	1234	**3977**
IGLOO	FILLER	2001	208	228	249	210	171	123	165	105	**3460**
TRILOGY	CORAIL	1172	182	128	182	217	272	248	331	270	**3002**
TROPIC	CORAIL	2659									**2659**
ATOLL	CORAIL	1280									**1280**
R3	CORAIL			1	1			120	491	568	**1181**
DURALOC	CORAIL	503	188	238	72	62					**1063**
Continuum Acetabular System	CORAIL						187	302	331	86	**906**
TRIDENT	CORAIL	21	24	3	17	26	72	113	268	231	**775**
BICON-PLUS	ZWEYMÜLLER	586									**586**
TRIDENT	ACCOLADE II					42	75	174	127	116	**534**
REFLECTION UNCEMENTED	SECURFIT	116	128	146	91	32					**513**
TRILOGY	SCP/UNIQUE	505	3			1					**509**
REFLECTION UNCEMENTED	HACTIV	1				9	3	117	185	187	**502**
TRILOGY	HACTIV	387	38	4	12	7					**448**
R3	POLARSTEM		21	68	56	80	50	49	69	41	**434**
GEMINI	PROFILE	407									**407**
BICON-PLUS	HACTIV	386									**386**
DURALOC	PROFILE	332									**332**
R3	FILLER						30	89	90	112	**321**
REFLECTION UNCEMENTED	OMNIFIT	225	47	22	6						**300**
DURALOC	SCP/UNIQUE	267									**267**
TRILOGY	FILLER	118	45	40	38	18		2			**261**
ENDLER	ZWEYMÜLLER	247									**247**
REFLECTION UNCEMENTED	SCP/UNIQUE	158	13	6	1	14	25	13	10	2	**242**
EUROPEAN CUP SYSTEM	TAPERLOC	240									**240**
PLASMACUP	BICONTACT	232									**232**
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**
TRIDENT	POLARSTEM						43	58	21	43	**165**
HARRIS/GALANTE	HARRIS/GALANTE	158									**158**
ABG II	ABG II	155									**155**
COXA	FEMORA	155									**155**
PARHOFER	PARHOFER	152									**152**
BICON-PLUS	CORAIL	146		2			1	1			**150**
AVANTAGE	CORAIL	53	19	12	16	4	2	2	30	10	**148**
REFLECTION UNCEMENTED	PROFEMUR GLADIATOR		3	37	60	37	1				**138**
TRILOGY	OMNIFIT	125	9								**134**
TRIDENT	HACTIV						3	18	65	44	**130**
TRABECULAR METAL	CORAIL	1	2	1	11	7	19	21	36	25	**123**
Other	Other	2607	108	86	69	152	176	178	180	172	**3728**

Hybrid primary prostheses

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

Cup (uncemented)	Stem (cemented)	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
TRILOGY	EXETER	327	29	53	44	88	201	232	236	249	**1459**
TROPIC	TITAN	869									**869**
MORSCHER	MS-30	642	25								**667**
TRILOGY	CHARNLEY	382									**382**
ENDLER	TITAN	336									**336**
R3	LUBINUS SP II							41	140	134	**315**
REFLECTION UNCEMENTED	C-STEM						1	24	61	96	**182**
REFLECTION UNCEMENTED	LUBINUS SP II	4		1	2	32	62	78	1		**180**
TRIDENT	EXETER	86	1	1		1	10	22	30	12	**163**
DURALOC	CHARNLEY	153									**153**
REFLECTION UNCEMENTED	BIO-FIT	142									**142**
AVANTAGE	EXETER	19	2	8	20	7	10	15	32	26	**139**
TRILOGY	CPT	89								40	**129**
REFLECTION UNCEMENTED	SPECTRON-EF	120			1	1					**122**
ATOLL	TITAN	105									**105**
IP	SP I	101									**101**
HG II	ANATOMIC CC	80									**80**
GEMINI	CHARNLEY	77									**77**
TI-FIT	BIO-FIT	53									**53**
TROPIC	EXETER	47									**47**
Other	Other	981	13	20	16	18	24	43	46	120	**1281**

Table 21: Reverse hybrid primary prostheses. (The 20 most common)

Cup (cemented)	Stem (uncemened)	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
MARATHON	CORAIL	397	1127	1757	2736	2935	2763	2606	2386	2195	**18902**
ELITE	CORAIL	1785	249	227	205	86	71	3	2		**2628**
REFLECTION CEM. ALL POLY	CORAIL	942	193	15	25	21	22	30	29	31	**1308**
TITAN	CORAIL	749	132	48	1						**930**
CONTEMPORARY	CORAIL	234	202	236	6	2	1				**681**
KRONOS	CORAIL	528	98	7							**633**
EXETER X3 RIMFIT	ACCOLADE II					59	49	119	157	119	**503**
EXETER X3 RIMFIT	CORAIL	1	2	58	42	70	88	46	129	54	**490**
REFLECTION CEM. ALL POLY	HACTIV	288	26	49	91	20	1				**475**
REFLECTION CEM. ALL POLY	FILLER	142	10	12	23	26	19	1		2	**235**
IP	CORAIL	122	43	16	4	11	3	2	5	1	**207**
EXETER	CORAIL	145	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**
AVANTAGE	CORAIL	11	15	23	11	15	20	13	14	14	**136**
EXETER X3 RIMFIT	FILLER			1		23	37	35	25	7	**128**
CHARNLEY	CORAIL	114	2			1					**117**
ELITE	SCP/UNIQUE	88	2	3	2	2	1	1			**99**
MARATHON	ACCOLADE II							15	48	28	**91**
Other	Other	802	135	71	93	86	85	88	87	95	**1542**

Acetabular cups in primary operations

Table 22: (The 45 most common)

Cup	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
CHARNLEY	42642	230	117	114	66	40				**43209**
MARATHON	691	1556	2139	3088	3317	3190	3045	2993	2751	**22770**
REFLECTION CEM. ALL POLY	13099	387	193	234	108	53	36	33	34	**14177**
EXETER	12730	522	156	84	26	1				**13519**
EXETER X3 RIMFIT	1	71	745	1103	1370	1362	1570	1632	1170	**9024**
TITAN	8606	161	48	1						**8816**
REFLECTION UNCEMENTED	2048	907	767	848	933	970	798	435	517	**8223**
ELITE	6680	391	304	261	118	95	5	2		**7856**
IP	4047	715	559	488	441	286	312	268	220	**7336**
TRILOGY	3715	340	243	292	350	509	517	582	576	**7124**
CONTEMPORARY	3291	957	889	195	110	58	15	3	1	**5519**
PINNACLE	387	158	326	468	385	331	397	518	1279	**4249**
TROPIC	3823									**3823**
IGLOO	2223	211	230	249	211	174	123	169	107	**3697**
SPECTRON	3652									**3652**
R3		22	75	57	80	82	307	821	874	**2318**
TRIDENT	162	36	33	53	161	346	441	544	517	**2293**
KRONOS	2067	119	7							**2193**
DURALOC	1397	207	245	72	62					**1983**
ATOLL	1491									**1491**
AVANTAGE	337	104	109	119	103	119	98	157	186	**1332**
BICON-PLUS	1209		2			1	1			**1213**
ZCA	1056	6								**1062**
LUBINUS	31			1	125	168	252	213	214	**1004**
Continuum Acetabular System						191	319	346	96	**952**
MODULAR HIP SYSTEM	878									**878**
MORSCHER	800	37	6							**843**
WEBER ALLO PRO	830									**830**
ENDLER	662									**662**
BIRMINGHAM HIP RESURFACING	377	78	42	21	2					**520**
GEMINI	510									**510**
POLARCUP	3	5	46	58	79	66	64	49	91	**461**
OPERA	457									**457**
EXCEED ABT RINGLOC-X	43	7	7	8	20	39	66	37	205	**432**
EUROPEAN CUP SYSTEM	332									**332**
TI-FIT	312									**312**
PEARL	287									**287**
PLASMACUP	283									**283**
LMT (Uncemented)	275									**275**
HARRIS/GALANTE	252									**252**
PE-PLUS	247									**247**
MÜLLER TYPE	242									**242**
ABG II	236									**236**
COXA	220									**220**
LMT (Cemented)	208									**208**
Other	1868	80	38	18	17	39	66	120	235	**2481**

Acetabular cups in revisions

Table 23: (The 45 most common)

Cup	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
CHARNLEY	2830	17	9	5	3				1	**2865**
TROPIC	1885									**1885**
AVANTAGE	711	169	149	126	105	86	86	77	91	**1600**
ELITE	1475	55	33	19	12	6				**1600**
TRILOGY	1074	83	70	50	51	56	65	59	45	**1553**
TRABECULAR METAL	58	50	97	118	161	214	160	203	158	**1219**
PINNACLE	305	93	86	97	82	117	97	111	114	**1102**
EXETER	928	12	1	3						**944**
MARATHON	69	136	130	164	138	65	94	66	59	**921**
REFLECTION CEM. ALL POLY	852	32	11	7	4	3	4	2		**915**
POLARCUP	12	41	50	84	122	116	133	117	129	**804**
REFLECTION UNCEMENTED	117	48	62	78	94	83	74	35	39	**630**
IGLOO	382	22	28	24	18	15	15	25	17	**546**
TITAN	516	11								**527**
TRIDENT	43	9	22	38	40	44	94	88	111	**489**
ATOLL	396									**396**
IP	224	10	7	10	4	3	4	3	4	**269**
CONTEMPORARY	139	42	45	9	3					**238**
KRONOS	219	6								**225**
CHRISTIANSEN	196									**196**
SPECTRON	189									**189**
R3				7	6	6	20	61	79	**179**
EXETER X3 RIMFIT		2	23	24	30	25	29	29	9	**171**
Continuum Acetabular System						13	51	66	37	**167**
DURALOC	86	8	16	10	5	11	9	2	6	**153**
OPERA	101									**101**
HARRIS/GALANTE	99									**99**
ZCA	96									**96**
MODULAR HIP SYSTEM	95									**95**
CAPTIV	71							7		**78**
EUROPEAN CUP SYSTEM	73									**73**
LMT (Uncemented)	67									**67**
ENDLER	66									**66**
BICON-PLUS	48		1	2	3		2	1	5	**62**
HG II	53									**53**
MORSCHER	44	4	3							**51**
GEMINI	47									**47**
SECURFIT	45									**45**
OCTOPUS	40									**40**
REGENEREX RINGLOC	8	9	13	7	2					**39**
TI-FIT	36									**36**
PARHOFER	35									**35**
PCA	33			1						**34**
S-ROM	27									**27**
COXA	25									**25**
Other	317	3	7	2	3	5	4	7	17	**365**

Femoral stems in primary operations

Table 24: (The 45 most common)

Stem	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
CORAIL	12778	3257	3681	4493	4632	4707	4459	4747	5004	**47758**
CHARNLEY	41973	233	117	116	67	43				**42549**
EXETER	17282	1455	1558	1461	1569	1650	1849	1891	1546	**30261**
TITAN	12149	36	3							**12188**
SPECTRON-EF	10249	145	119	92	37	10	3	1	2	**10658**
LUBINUS SP II	3234	658	558	519	621	586	775	785	669	**8405**
FILLER	2373	295	295	321	375	328	261	287	240	**4775**
ITH	3723									**3723**
CHARNLEY MODULAR	1182	394	352	258	237	261	154	46	28	**2912**
HACTIV	1140	79	58	108	38	9	150	280	242	**2104**
MS-30	1849	27	1				17	21	143	**2058**
BIO-FIT	1993									**1993**
CPT	1089	21	2		1	2	1	2	436	**1554**
SCP/UNIQUE	1215	48	23	15	33	36	28	35	11	**1444**
ACCOLADE II					110	137	314	341	264	**1166**
ZWEYMÜLLER	1097	5								**1102**
C-STEM	531	9			1	2	75	203	248	**1069**
ELITE	1023	1	2	3	1					**1030**
OMNIFIT	786	70	28	6						**890**
PROFILE	890									**890**
ABG II	405	62	105	94	78	81	23			**848**
TAPERLOC	787									**787**
SP I	780									**780**
POLARSTEM		23	101	83	106	103	109	92	85	**702**
FJORD	652									**652**
LUBINUS	624									**624**
SECURFIT	126	136	167	94	32					**555**
CPS-PLUS	489	7								**496**
BICONTACT	443									**443**
LMT (Cemented)	417									**417**
KAR/Corail Revision	123	15	12	20	32	22	29	42	36	**331**
ABG I	304									**304**
TI-FIT	221									**221**
MÜLLER TYPE	213									**213**
FEMORA	182									**182**
BI-METRIC	95	33	15	5	2	3	7	16	1	**177**
SL-PLUS MIA	12	165								**177**
HARRIS/GALANTE	169									**169**
PROFEMUR GLADIATOR		4	48	71	38	4				**165**
PARHOFER	159									**159**
KAREY	136									**136**
MÜLLER TYPE V	132									**132**
ECHELON	119	2								**121**
ECHO- Bi-Metric					7	32	59	22		**120**
ANATOMIC CC	113									**113**
Other	911	42	24	26	29	74	84	71	80	**1341**

Femoral stems in revisions

Table 25: (The 45 most common)

Stem	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
KAR/Corail Revision	1966	130	157	138	147	120	138	103	97	**2996**
CHARNLEY	2960	12	6	1	1	2	1			**2983**
EXETER	1567	64	70	72	62	63	77	78	68	**2121**
CORAIL	1245	52	43	62	65	40	51	66	57	**1681**
RESTORATION	137	42	39	57	67	63	70	55	36	**566**
TITAN	536	1	1							**538**
CPT	461	7	6	7	2	5	7	6	22	**523**
FJORD	476									**476**
FILLER	280	19	19	15	17	16	10	19	19	**414**
TTHR	67	40	61	71	52	36	20	24	24	**395**
SPECTRON-EF	328	13	14	4	8	3	3	2	1	**376**
ELITE	349	2			1	1				**353**
REEF	295	21	3	5	2					**326**
LUBINUS SP II	161	3	2	9	8	30	15	9	17	**254**
ANATOMIC BR	192									**192**
ITH	192									**192**
MP RECONSTRUCTION	36	12	21	24	26	18	17	12	14	**180**
BIO-FIT	167									**167**
REVITAN		1		7	27	20	36	31	38	**160**
HACTIV	88	14		4	4		13	9	9	**141**
BI-METRIC	65	21	15	16	16	1		2	2	**138**
ARCOS			1	3	11	17	27	32	42	**133**
REACTIV	36	9	6	3	6	19	13	27	14	**133**
TAPERLOC	115									**115**
ZWEYMÜLLER	82	1								**83**
Profemur	5	26	16	11	14	5				**77**
Securus					6	15	11	19	20	**71**
ECHELON	62	5	1							**68**
SP I	66									**66**
SCAN HIP	59									**59**
RECLAIM				1	13	9	12	12	6	**53**
LUBINUS	51									**51**
HARRIS/GALANTE	44									**44**
CHARNLEY MODULAR	18	4	3	3	3	3	3	5	1	**43**
FEMORA	43									**43**
PARHOFER	43									**43**
C-STEM	13					1	3	12	11	**40**
MS-30	33	1						2	4	**40**
AURA	27	11								**38**
PRIUS						2	11	17	8	**38**
PROFEMUR GLADIATOR		1	6	19	9	3				**38**
LANDOS (Reconstruction)	33									**33**
MÜLLER TYPE	32									**32**
OMNIFIT	31		1							**32**
CPS-PLUS	26									**26**
Other	239	11	7	4	2	2	12	6	13	**296**

The 7 most common primary prostheses in last 5 years

Table 26a: Acetabular cup

2013	2014	2015	2016	2017
MARATHON (3317)	MARATHON (3190)	MARATHON (3045)	MARATHON (2993)	MARATHON (2751)
EXETER X3 RIMFIT (1370)	EXETER X3 RIMFIT (1362)	EXETER X3 RIMFIT (1570)	EXETER X3 RIMFIT (1632)	PINNACLE (1279)
REFLECTION * (933)	REFLECTION * (970)	REFLECTION * (798)	R3 (821)	EXETER X3 RIMFIT (1170)
IP (441)	TRILOGY (509)	TRILOGY (517)	TRILOGY (582)	R3 (874)
PINNACLE (385)	TRIDENT (346)	TRIDENT (441)	TRIDENT (544)	TRILOGY (576)
TRILOGY (350)	PINNACLE (331)	PINNACLE (397)	PINNACLE (518)	REFLECTION * (517)
IGLOO (211)	IP (286)	Continuum Acetabular System (319)	REFLECTION * (435)	TRIDENT (517)

Table 26b: Femoral stem

2013	2014	2015	2016	2017
CORAIL (4632)	CORAIL (4707)	CORAIL (4459)	CORAIL (4747)	CORAIL (5004)
EXETER (1569)	EXETER (1650)	EXETER (1849)	EXETER (1891)	EXETER (1546)
LUBINUS SP II (621)	LUBINUS SP II (586)	LUBINUS SP II (775)	LUBINUS SP II (785)	LUBINUS SP II (669)
FILLER (375)	FILLER (328)	ACCOLADE II (314)	ACCOLADE II (341)	CPT (436)
CHARNLEY * (237)	CHARNLEY * (261)	FILLER (261)	FILLER (287)	ACCOLADE II (264)
ACCOLADE II (110)	ACCOLADE II (137)	CHARNLEY * (154)	HACTIV (280)	C-STEM (248)
POLARSTEM (106)	POLARSTEM (103)	HACTIV (150)	C-STEM (203)	HACTIV (242)

Table 26c: Combinations of cup and stem

2013	2014	2015	2016	2017
MARATHON + CORAIL (2963)	MARATHON + CORAIL (2781)	MARATHON + CORAIL (2616)	MARATHON + CORAIL (2406)	MARATHON + CORAIL (2207)
EXETER X3 RIMFIT + EXETER (1190)	EXETER X3 RIMFIT + EXETER (1167)	EXETER X3 RIMFIT + EXETER (1360)	EXETER X3 RIMFIT + EXETER (1318)	PINNACLE + CORAIL (1235)
REFLECTION * + CORAIL (748)	REFLECTION * + CORAIL (823)	REFLECTION * + CORAIL (543)	R3 + CORAIL (491)	EXETER X3 RIMFIT + EXETER (986)
IP + LUBINUS SP II (420)	PINNACLE + CORAIL (321)	PINNACLE + CORAIL (385)	PINNACLE + CORAIL (490)	R3 + CORAIL (568)
PINNACLE + CORAIL (366)	IP + LUBINUS SP II (279)	IP + LUBINUS SP II (303)	Continuum Acetabular System + CORAIL (333)	TRILOGY + CORAIL (270)
TRILOGY + CORAIL (227)	TRILOGY + CORAIL (278)	Continuum Acetabular System + CORAIL (303)	TRILOGY + CORAIL (331)	TRILOGY + EXETER (259)
IGLOO + FILLER (211)	TRILOGY + EXETER (230)	LUBINUS + LUBINUS SP II (251)	TRIDENT + CORAIL (268)	TRIDENT + CORAIL (233)

* UNCEMENTED

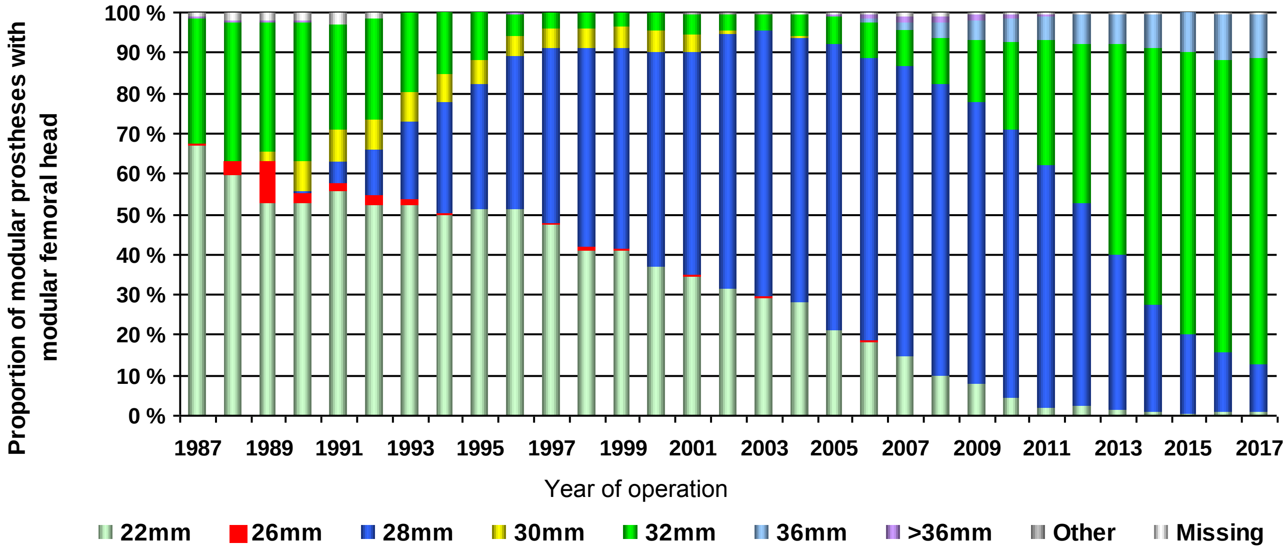
**' MODULAR

Femoral head diameter

Table 27: In primary operations and revisions

Year	22 mm	26 mm	28 mm	30 mm	32 mm	36 mm	>36 mm	Other	Missing	Total
2017	90		1 225		7 832	1 101	10	3	29	**10 290**
2016	82		1 499	1	7 352	1 181	1	5	33	**10 154**
2015	70		1 892		6 739	947	5	3	13	**9 669**
2014	97		2 439	1	5 851	803	4	4	27	**9 226**
2013	154	2	3 570	1	4 843	674	3	6	34	**9 287**
2012	212		4 519	3	3 503	671	25	5	27	**8 965**
2011	186		5 057		2 607	522	52	1	28	**8 453**
2010	384		5 570	3	1 826	482	82	1	52	**8 400**
2009	629	2	5 720	4	1 241	385	115	2	53	**8 151**
2008	761	2	5 628	2	880	279	136	3	66	**7 757**
2007	1 092		5 430	2	666	148	111	2	63	**7 514**
2006	1 318	6	5 015	3	638	58	60	5	36	**7 139**
2005	1 584	9	5 254		522	4	41	2	29	**7 445**
2004	1 942	26	4 548	7	393		4	3	27	**6 950**
2003	2 262	24	5 137	13	309		3	14	16	**7 778**
2002	2 169	16	4 320	62	274		2	24	14	**6 881**
2001	2 383	18	3 809	317	342		1	3	15	**6 888**
2000	2 389	6	3 425	347	269			3	8	**6 447**
1999	2 546	26	3 104	337	198			2	7	**6 220**
1998	2 500	66	3 036	305	224			2	5	**6 138**
1997	2 860	24	2 627	297	226		6	1	7	**6 048**
1996	2 861	7	2 102	287	306	1	15		5	**5 584**
1995	3 011	4	1 821	342	673		7		5	**5 863**
1994	2 639	13	1 474	359	806		5		7	**5 303**
1993	2 805	70	1 043	390	1 045		2		11	**5 366**
1992	2 771	124	605	404	1 332		8		70	**5 314**
1991	2 707	102	274	380	1 264		12		133	**4 872**
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	**51 169**	**1 364**	**90 177**	**4 417**	**57 389**	**7 257**	**774**	**94**	**1 110**	**213 751**

Figure 11: In primary operations and revisions



Femoral head prostheses

Table 28: In primary operations and revisions (The 50 most common)

Prosthesis	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
EXETER	19292	1471	1140	867	744	653	793	744	563	**26267**
LANDOS	19819	1157	671	72	7	15				**21741**
CERAMTEC	2423	1014	1797	2688	2579	2445	2215	2203	2067	**19431**
CORAIL	158	650	1253	2023	2401	2709	2895	3119	3443	**18651**
UNIVERSAL	16399	198	175	149	108	50	39	35	63	**17216**
FJORD	10422	768	510	62	6	2	3		2	**11775**
LFIT ANATOMIC	89	225	677	878	1244	1433	1644	1715	1458	**9363**
SP II	3478	695	605	566	680	646	822	834	733	**9059**
ELITE	2974	296	191	158	195	184	136	62	35	**4231**
IGLOO	1878	228	252	254	209	209	170	229	202	**3631**
SCANOS	1375	124	63	102	28	30	211	346	287	**2566**
PROTEK	1948	32	4	1					376	**2361**
PINNACLE	97	187	150	307	340	249	161	286	357	**2134**
PLUS ENDO	1381	103	38	29	34	30	14	16	15	**1660**
CPT	1575	32	11	7	9	2	1	4	4	**1645**
PROFILE	1405	9	14	1					1	**1430**
HIPBALL PREMIUM	58	75	143	188	236	166	137	116	66	**1185**
MALLORY-HEAD	619	60	43	34	42	65	107	93	61	**1124**
TAPERLOC	1088									**1088**
BIOTECHNI	864	57	56	44	29	4	2	1		**1057**
OXINIUM	570	172	73	68	68	47	5	10	6	**1019**
HARRIS/GALANTE	848	6	9	7	6		6	5		**887**
OMNIFIT	704	65	36	19	20	1	2	2	3	**852**
" OSTEONICS Hoder" , C-taper head	351	168	182	94	20					**815**
ZIRCONIA	763									**763**
VERSYS	42	21	45	41	38	29	80	81	140	**517**
BICONTACT	483		3	1	3	6	2	2	2	**502**
BIRMINGHAM HIP RESURFACING	331	73	39	20	2					**465**
BIOBALL	28	25	49	66	42	62	61	59	62	**454**
ABG I	369	11	9	7	3	7	6	3	3	**418**
SURGIVAL	372									**372**
FURLONG					7	71	80	91	105	**354**
ZWEYMÜLLER	342									**342**
STRYKER HODER	5	18	44	22	15	23	41	48	19	**235**
CERAMIC OSTEO	220									**220**
FEMORA	213									**213**
PARHOFER	182	1			1					**184**
Zimmer Hoder						1			158	**159**
TI-FIT	138	3								**141**
SMITH & NEPHEW KERAMIKKHODER	2	126								**128**
CHRISTIANSEN	126									**126**
PCA	101	3	2	1	1		2		1	**111**
BIOLOX DELTA				16	42	5	3	1	6	**73**
BIRMINGHAM HIP MODULÆR	45	9	3	1						**58**
ABG II	48									**48**
ASR MODULÆR	45									**45**
MUTARS	14			1	1	2	10	8	6	**42**
LINK Rippensystem	38									**38**
AURA II	23	4		2					1	**30**
HASTINGS HIP	29									**29**
Other	241	15	10	7	10	2	1	3	3	**292**

Dual Mobility articulation

Table 29 In primary operation

Prosthesis	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
AVANTAGE	337	104	109	119	104	118	98	157	187	**1333**
POLARCUP	3	5	46	58	79	66	64	49	91	**461**
TRIDENT				10	15	12	16	22	35	**110**
CAPTIV								18		**18**
Restoration Anatomic Cup			1	1	2	1		5	4	**14**
GYROS	2									**2**
Total	**342**	**109**	**156**	**188**	**200**	**197**	**178**	**251**	**317**	**1938**

Table 30 In revisions

Prosthesis	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
AVANTAGE	711	169	149	127	108	95	93	92	118	**1662**
POLARCUP	12	41	50	84	130	125	144	129	141	**856**
TRIDENT				10	11	23	48	33	44	**169**
Restoration Anatomic Cup			1	10	8	6	12	17	28	**82**
GYROS	10									**10**
CAPTIV								9		**9**
" OSTEONICS Hoder" , C-taper head									1	**1**
ARCOS									1	**1**
Total	**733**	**210**	**200**	**231**	**257**	**249**	**297**	**280**	**333**	**2790**

ASA classification

Figure 12: Primary operations

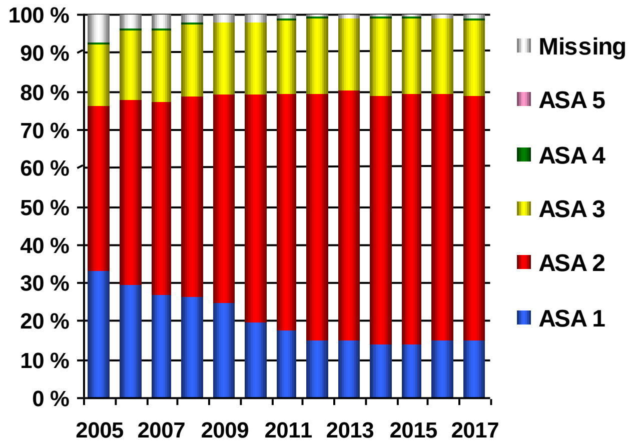
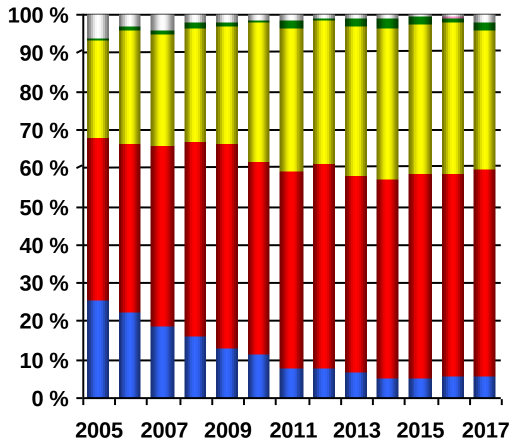


Figure 13: Revisions



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 31: Primary operations *

År	1		2		3		4		Missing		Total
2017	622	(7%)	7385	(81%)	983	(11%)	66	(1%)	41	(0%)	**9097**
2016	796	(9%)	7040	(79%)	972	(11%)	71	(1%)	52	(1%)	**8931**
2015	1063	(13%)	6274	(74%)	959	(11%)	57	(1%)	89	(1%)	**8442**
2014	1114	(14%)	5947	(73%)	965	(12%)	31	(0%)	75	(1%)	**8132**
2013	1341	(17%)	5634	(70%)	1050	(13%)	10	(0%)	63	(1%)	**8098**
2012	1580	(20%)	4854	(62%)	1322	(17%)	9	(0%)	82	(1%)	**7847**
2011	2220	(30%)	4304	(58%)	795	(11%)	3	(0%)	38	(1%)	**7360**
2010	2365	(32%)	4308	(59%)	610	(8%)	4	(0%)	43	(1%)	**7330**
2009	2606	(37%)	3862	(54%)	578	(8%)	3	(0%)	66	(1%)	**7115**
2008	3132	(46%)	3059	(45%)	574	(8%)	8	(0%)	75	(1%)	**6848**
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 32: Revisions *

År	1		2		3		4		Missing		Total
2017	204	(14%)	1 093	(74%)	137	(9%)	24	(2%)	28	(2%)	**1 486**
2016	205	(14%)	1 076	(72%)	162	(11%)	27	(2%)	27	(2%)	**1 497**
2015	220	(16%)	1 019	(72%)	133	(9%)	12	(1%)	24	(2%)	**1 408**
2014	224	(17%)	921	(71%)	118	(9%)	10	(1%)	20	(2%)	**1 293**
2013	226	(17%)	916	(69%)	153	(12%)	6	(0%)	26	(2%)	**1 327**
2012	240	(18%)	823	(63%)	216	(16%)	10	(1%)	26	(2%)	**1 315**
2011	318	(25%)	758	(59%)	184	(14%)	8	(1%)	19	(1%)	**1 287**
2010	439	(35%)	683	(54%)	125	(10%)	2	(0%)	10	(1%)	**1 259**
2009	421	(35%)	649	(54%)	126	(10%)	5	(0%)	8	(1%)	**1 209**
2008	477	(43%)	531	(47%)	94	(8%)	5	(0%)	15	(1%)	**1 122**
2007	501	(48%)	409	(39%)	106	(10%)	1	(0%)	35	(3%)	**1 052**
2006	587	(58%)	273	(27%)	122	(12%)	4	(0%)	21	(2%)	**1 007**
2005	706	(67%)	121	(11%)	162	(15%)	4	(0%)	64	(6%)	**1 057**

Figure 14: Primary operations

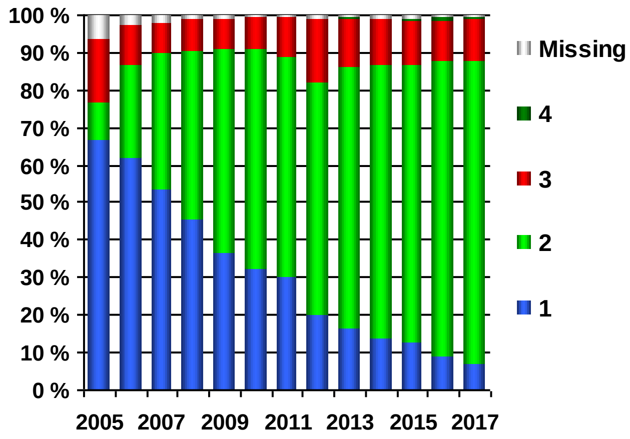
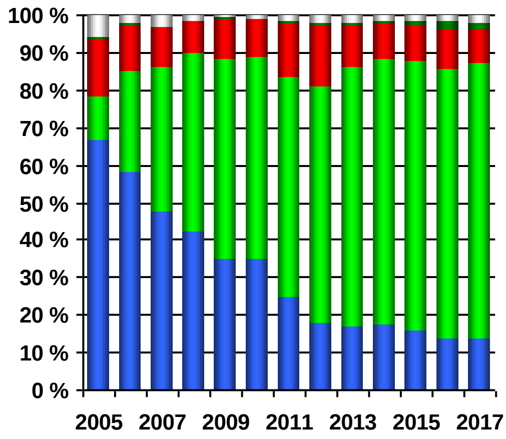


Figure 15: Revisions



*

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 33: All operations

Drugs	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)		0,1 %				0,1 %	0,4 %	0,6 %	0,8 %	0,8 %
Apixiban (Eliquis)					0,1 %	1,2 %	1,5 %	1,5 %	1,5 %	1,6 %
Dabigatranetixalat (Re-Novate, Pradaxa)	0,7 %	0,2 %					0,1 %	0,1 %		
Dalteparin (Fragmin)	52,7 %	50,7 %	63,2 %	65,1 %	63,2 %	56,1 %	51,6 %	58,5 %	61,6 %	64,2 %
Dekstran (Macrodex, Dextran)			0,1 %	0,3 %	0,1 %	0,1 %	0,1 %			
Enoksaparin (Klexane)	40,6 %	44,0 %	31,5 %	25,5 %	24,6 %	27,9 %	31,4 %	24,1 %	21,9 %	19,4 %
Rivaroksaban (Xarelto)			0,3 %	2,9 %	2,0 %	2,3 %	2,2 %	1,5 %	1,5 %	1,1 %
Warfarin (Marevan)	0,1 %	0,1 %	0,1 %		0,1 %			0,1 %		
Ximelagatran (Exanta, Malagatran)	0,6 %	0,1 %	0,1 %							
Other		0,1 %					0,1 %			
Combination of 2 drugs	1,1 %	3,2 %	3,9 %	5,1 %	8,4 %	10,7 %	10,6 %	11,5 %	10,0 %	10,3 %
Clinical study	0,9 %	0,7 %	0,1 %							
No drugs		0,1 %								
Missing/Unknown	3,2 %	0,7 %	0,7 %	0,9 %	1,5 %	1,4 %	2,0 %	2,2 %	2,6 %	2,6 %
Total	**30662**	**8324**	**8592**	**8658**	**9178**	**9462**	**9452**	**9871**	**10450**	**10601**

Figure 16: Drugs - All operations

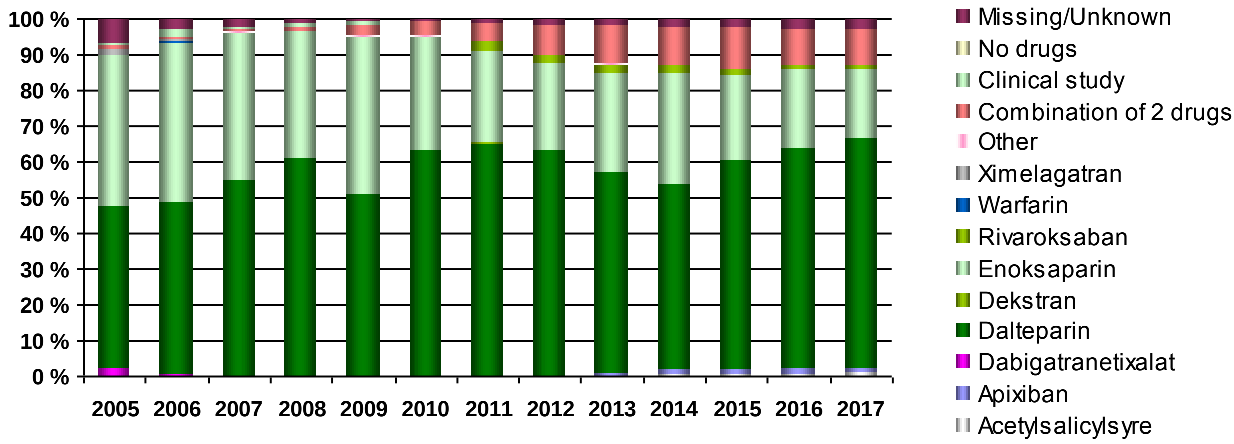


Table 34: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2017	1451	3884	1000	540	1890	25	0	1811	10601
2016	1426	3477	1113	729	2041	22	0	1642	10450
2015	1435	2882	725	942	2337	26	0	1524	9871
2014	1398	2278	578	904	2944	45	0	1305	9452
2013	1429	1406	598	1481	3231	63	0	1254	9462
2012	1163	1595	703	1496	3091	34	0	1096	9178
2011	700	1744	695	1397	3197	40	1	884	8658
2010	758	2174	636	1078	3154	44	2	746	8592
2009	880	2405	668	785	2637	37	6	906	8324
2008	837	2479	787	701	2166	124	5	871	7970
2007	847	2222	1230	388	2044	44	6	931	7712
2006	978	2096	1093	276	1738	111	0	1034	7326
2005	1036	2073	1203	363	1416	231	0	1332	7654

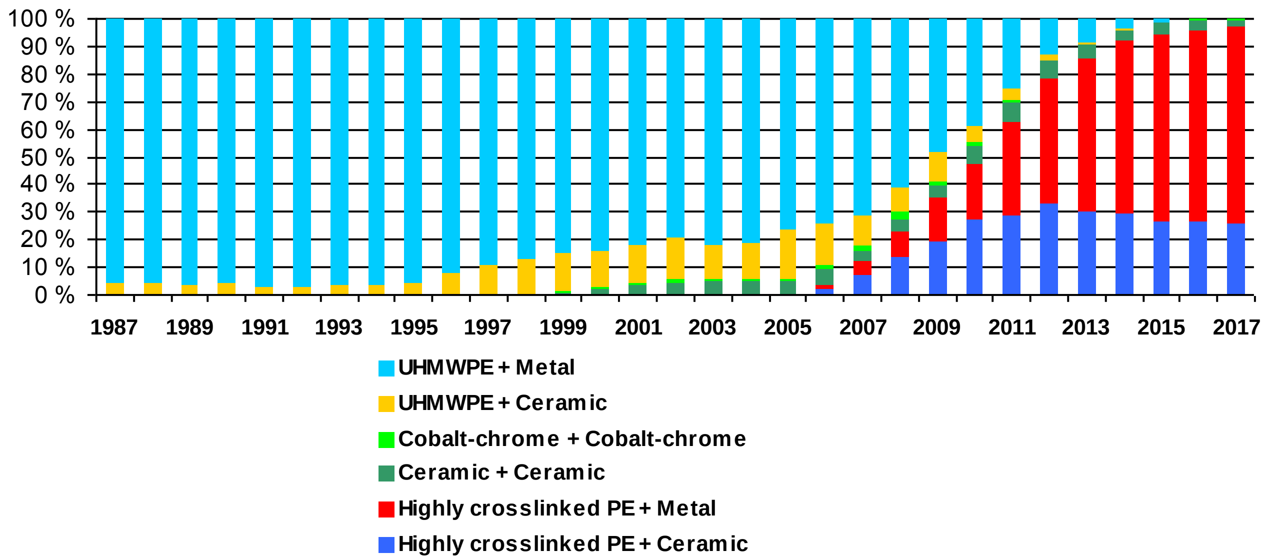
Registration of thrombosis prophylaxis started in 2005

Articulations

Table 35: In primary operations - All patients

Cup + Femoral head	1987-09	2010	2011	2012	2013	2014	2015	2016	2017	Total
UHMWPE + Steel	68538	1451	748	342	153	69	5	0	0	71306
UHMWPE + Cobalt-chrome	29736	1267	1014	638	526	238	110	12	13	33554
Highly crosslinked PE + Cobalt-chrome	1883	1157	1886	2745	3562	4161	4779	5229	5737	31139
Highly crosslinked PE + Alumina	2426	1508	1511	2011	1917	1773	1524	1419	858	14947
UHMWPE + Alumina	10067	354	293	146	44	8	4	2	0	10918
Highly crosslinked PE + Alumina/Zirconium[1]	374	368	512	481	426	552	633	898	1385	5629
Highly crosslinked PE + Steel	187	280	533	654	724	711	803	692	501	5085
Alumina + Alumina	2536	322	368	246	201	108	7	0	1	3789
UHMWPE + Titanium	2033	4	1	2	4	1	0	0	0	2045
Alumina/Zirconium + Alumina/Zirconium[1]	277	92	145	226	197	192	320	343	174	1966
UHMWPE + Zirconium	1402	0	0	0	0	0	0	0	0	1402
Cobalt-chrome + Cobalt-chrome	883	98	46	37	17	15	16	24	38	1174
Steel + Koboltkrom	205	58	90	95	106	131	105	158	195	1143
Highly crosslinked PE + Oxinium	410	149	56	61	51	39	3	2	2	773
Steel + Steel	91	39	30	37	24	19	36	47	41	364
UHMWPE + Alumina/Zirconium[1]	219	40	18	0	3	1	0	0	0	281
Titanium + Cobalt-chrome	52	3	23	34	35	19	25	14	31	236
Titanium + Alumina/Zirconium[1]	5	11	4	18	27	17	39	32	31	184
Titanium + Alumina	106	14	7	7	10	6	3	2	6	161
Highly crosslinked PE + Titanium	28	31	2	15	15	13	6	14	16	140
UHMWPE + Oxinium	76	0	0	0	0	0	0	0	0	76
Missing	3153	48	44	28	26	27	14	22	29	3391
Other (n<50)	283	36	29	24	30	32	10	21	28	493
Total	**124970**	**7330**	**7360**	**7847**	**8098**	**8132**	**8442**	**8931**	**9086**	**190196**

Figure 17: In primary operations



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

Completeness of reporting analysis for the Hip Arthroplasty Register, 2015-2016

A completeness of reporting analysis for the Hip Arthroplasty Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Hip Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions.

NCSP codes for combining data from NPR hospital stays and the Hip 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
Revision (level 1)	**NFC 2***	Secondary implantation of total prosthesis in hip joint not using cement
	NFC 3*	Secondary implantation of total prosthesis in hip joint using hybrid technique
	NFC 4*	Secondary implantation of total prosthesis in hip joint using cement
	NFC 99	Other secondary prosthetic replacement in hip joint
	NFU 1*	Removal of total prosthesis from hip joint

The completeness of reporting rate for the Hip Arthroplasty Register was calculated as follows:

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

Completeness of reporting 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. In 2015 and 2016, 17 863 primary hip replacements were reported to one or both of the registers. 96.9% of these were reported to the NAR while 95.6% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the Hip 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.

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

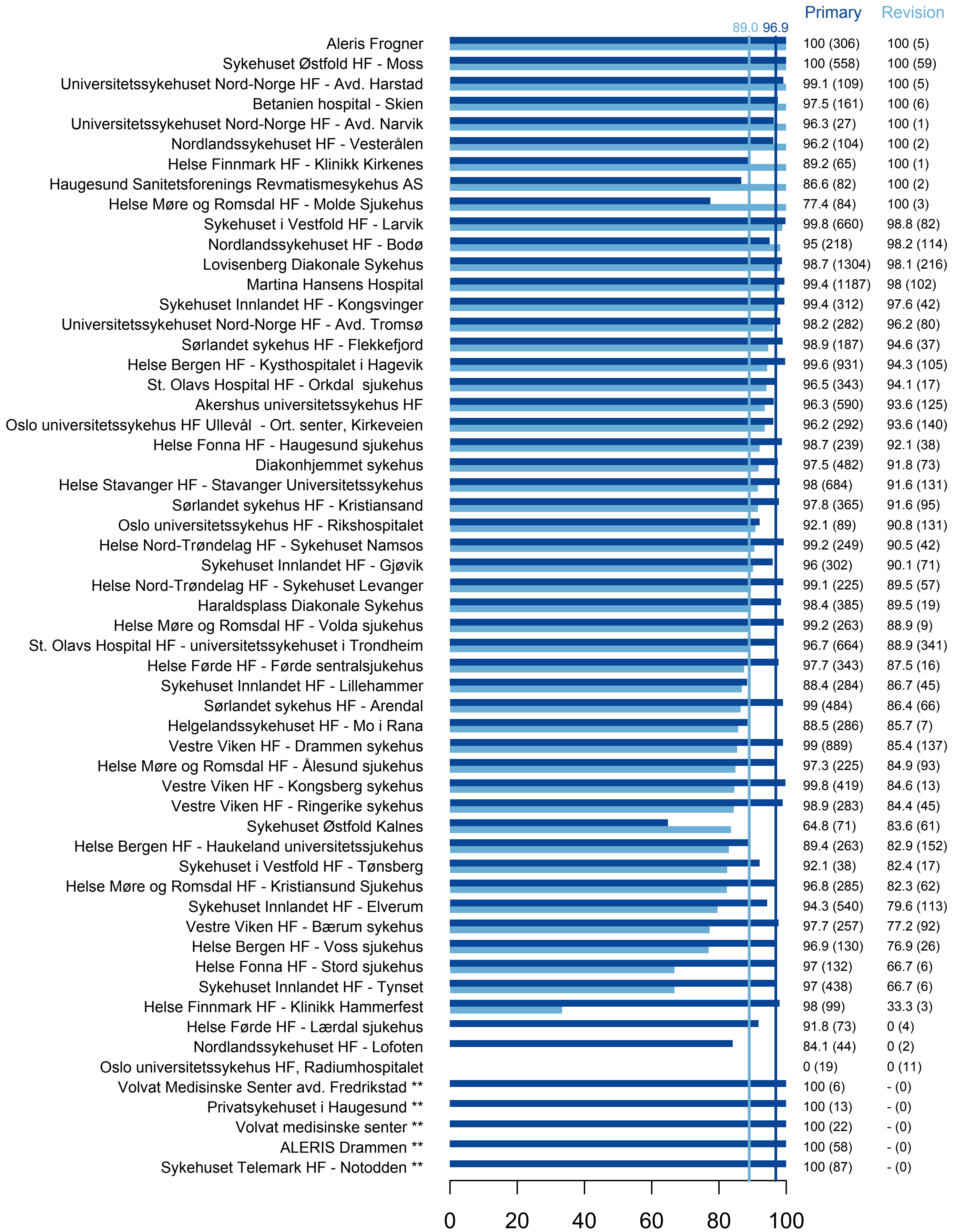
Revision operations. In 2015 and 2016, 3251 revisions were reported to one or both of the registers. 89.0% of these were reported to the NAR while 80.4% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the revision form was not sent to the NAR, or that other interventions than removal, replacement or insertion of a secondary prosthesis were incorrectly coded with NFC 2/3/4/99 or NFU1. The analysis shows that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:

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

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

Completeness of reporting for primary and revision operations, hip prosthesis, 2015-2016



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

* Have no registered primary operations in NAR or NPR.

** Have no registered revisions in NAR or NPR.

CONTENTS

Knee prostheses

Knee and other joints

In the period 1994-2017, 89 410 knee replacements, 8466 shoulder replacements and 9949 replacements of other joints than the hip, knee and shoulder were recorded. There has been a slight increase of 0.7% in primary knee replacements since 2016. The number of unicondylar knee replacements has also been stable in the past year. Osteoarthritis is the dominant cause of knee arthroplasty. The number of primary shoulder prostheses has increased by 8.3% since 2016.

Changes in the reporting form. Reoperations for periprosthetic fracture without replacement of the prosthesis should now also be reported for knee prostheses. The use of tourniquet for knee replacement surgery should be reported.

Patella components in total knee arthroplasty have increased from 104 in 2014 to 450 in 2017. This is probably due to an ongoing RCT and the results of a Norwegian RCT (Aunan et al.) showing a slightly better functional result in knee replacement with a patella component when a NexGen prosthesis was used. The NAR studies on the use of a patella component showed increased risk of infection and revision for loosening when a patella component was used (Furnes et al. 2002, Lygre et al. 2011). We also found no difference in function or pain (Lygre et al. 2010). It has also been shown that the risk of patella fracture increases with the use of a patella component. Possible slight functional improvement associated with a patellar component use must be weighed against an increased risk of complications.

Instability, infection, axial deviation including malrotation, and aseptic loosening of the tibial component are still the most frequent causes of revision of total knee arthroplasty. Many of these revisions are probably due to poor surgery. Results can be improved with a focus on good patient selection, infection prevention, correct stabilisation of the prosthesis, sound techniques for the alignment of prosthetic components, good balancing and a proper cementation technique.

QUALITY OF ARTHROPLASTY IN NORWAY

Survival curves show a gradual improvement since 1994 in results of total knee arthroplasty, 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 performing a lower number of such operations (Badawy et al. 2013). Unicondylar knee replacements should be concentrated at a smaller number of hospitals (Badawy et al. 2014) to decrease the number of reoperations. In the period 2012-2017, results of unicondylar knee prostheses were better than those of the preceding years.

In a recent study, we have shown an improvement in results in the latest ten-year period for total knee replacements, but not for unicondylar knee replacements (Dyrhovden et al. 2017). There is still considerable room for improvement in both prosthesis design and surgical techniques, and there are a particularly large number of revisions for infection, instability, loosening, malpositioned components and pain. Pain as the sole reason for revision surgery should be avoided.

For ankle prostheses, recent results are poorer. More ankle arthroplasties are being performed on patients with osteoarthritis and following injuries. These patients are younger and more often male than previously, when rheumatic patients dominated. There is a need for RCTs to clarify which patients should have ankle prostheses and which patients should have fusion surgery.

Shoulder replacements show a continued trend of a decrease in hemiprostheses use and an increase in reverse total prostheses. In both acute fractures and rotator cuff arthropathy, a reverse prosthesis is the most common choice. Patients under 60 years of age have generally lower prosthetic survival regardless of prosthetic type. The use of a total anatomic prosthesis is also increasing and in this case idiopathic osteoarthritis is still the main cause of surgery.

KNEE ARTHROPLASTY REVISIONS

There were 616 knee arthroplasty revisions reported to the Register in 2017. A new figure (t) shows results of all knee arthroplasty revisions, including revisions for infection. Almost 25% of knees had been re-revised after 10 years. In 2017, Tesfaye Leta completed his PhD on revisions of knee arthroplasty. The first publication (Leta T et al. 2015), showed a trend towards improved results in recent years (not statistically significant). Revision of the whole prosthesis yielded better results than revision of individual components. 22% of the revisions were operated again after 10 years, and half of the revisions took place within two years. Most early revisions are due to infection and instability. Revisions have significantly inferior results to primary operations.

In knee arthroplasty revisions involving only insertion of the patellar component due to pain, patients' quality of life improved slightly. The effect was most pronounced in those patients with the most pain before the revision. In one-third of patients, the surgery had no effect (Leta T et al. 2015).

No differences were found in pain, quality of life, functioning or prosthetic survival between revisions of total and unicondylar revisions (Leta T et al. 2016). Total arthroplasty revision was technically more challenging than revision of unicondylar knee prostheses to total knee arthroplasty, using more bone transplantation and stems, and with a higher infection rate. We find that the use of a stem is often not marked on the reporting form even though the stickrs are there. 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 can use both a femoral and tibial stem, and if this is not marked, we have no way of knowing where the stem was used.

COMPLETENESS OF REPORTING AT HOSPITAL LEVEL

In this report, we show completeness of reporting of primary operations and revisions for 2015-2016. The national average is good for primary knee arthroplasties (96.9%), which is an improvement from 95.3% for 2013-2014. For revisions, the coverage rate was 90.9%, compared to 89.0% in 2013-2014. We are pleased to note these improved figures. We are working on an analysis of patients reported as revision patients to the NPR, but not to the NAR. Each contact person will be contacted later this year to check the hospital figures. Some hospitals have low reporting of revisions. This may result in too positive revision rates at these hospitals. In the figures showing the proportion of non-revisions after two and ten years, we have excluded hospitals with lower than 80% completeness of reporting of revisions. Please note that hand, finger, back and toe arthroplasty must also be reported; these operations have a lower reporting rate than the other joints. We encourage hospitals to review their reporting routines if their completeness of reporting is low.

HOSPITAL RESULTS

We present some hospital results. Proportion of non-revised total knee arthroplasties after two and ten years for standard patients in 2011-2017 and 2006-2017. Standard patients are 55-85 years old, ASA class 1-2, with primary osteoarthritis. We also present funnel plots for the proportion of standard patients operated in 2006-2017 who were not revised after ten years. The funnel plot takes into account the number of knee arthroplasties performed at the hospital. Hospitals with a risk of revision of more than three standard deviations (99.8%) above the national average must be considered to have an excessively high risk of revision and must review their procedures.

KNEE PROSTHESIS RESULTS

We present three- and ten-year durability for the most commonly used knee prostheses in Norway (more than 500 prostheses in use). None of those used today have poor results, but some prosthesis combinations lack ten-year results from Norway. We are planning to study the degree to which hospitals use well-documented prostheses.

SHOULDER ARTHROPLASTY

In collaboration with the Nordic Arthroplasty Register Association (NARA), we are currently working on two publications focusing on risk factors for revision. There is a low overall risk of revision due to infection, but it has increased significantly for reverse prosthesis in men; this trend therefore needs to be closely monitored.
Resurfacing shoulder prostheses have not been widely used in Norway, but due to good cooperation in NARA, we now have a significant number of prostheses in the Nordic registers and further studies will focus on results of both resurfacing and short-stem shoulder prostheses.

ELBOW ARTHROPLASTY

The number of total elbow replacements is slightly down on recent years, but a few hemiprostheses have been inserted, which means that the total number of elbow arthroplasties is largely unchanged. A hemiprosthesis is used instead of a total prosthesis in supracondylar humerus fractures. The humeral component was fixed with cement in all patients except one, while the ulnar component was fixed with cement in fewer than half. In the past three years, Nexel has been most used, providing relatively short follow-up information. The number of revisions of elbow arthroplasty has decreased somewhat.
Use of the radial head prosthesis has increased steadily over the past 10 years, and a record number of these prostheses was recorded in 2017.

FINGER AND HAND ARTHROPLASTY

The number of finger prostheses inserted is still declining and 36% of the operations were revisions.

Wrist (radiocarpal) prosthesis is still seldom used and only eight primary operations were recorded in 2017. Only Motec Wrist and Remotion are used. In distal radioulnar joints, the use of prosthesis has increased, bringing the total to 22 primary operations.

The use of a carpal (CMC I) prosthesis increased somewhat last year (10 primary prostheses), while 2016 had the lowest figure (5 primary prostheses).

SUMMARY OF THE MOST IMPORTANT SCIENTIFIC FINDINGS LAST YEAR

Please see the introduction to the section on hip arthroplasty for a review of studies including both hip and knee replacement.

New types of bone cement used since 2005 yield similar results to the Palacos cement used before 2005. There is no difference in the risk of revision of knee arthroplasty between the original Palacos cement with gentamicin (Heraeus) and the copy Refobacin Bone Cement (Biomet) (Birkeland et al. 2017).

The incidence of knee arthroplasty was lower in Norway than in the other Nordic countries from 1997 to 2012, but has increased in all the countries (Niemelainen 2017). A comparison of the lifetime risk of knee arthroplasty in the Nordic countries and Australia for the years 2003 and 2013 showed an increase in all countries. Lifetime risk was highest for women in Australia (21.1%) and Finland (22.8%) and lowest in Norway (9.7%) (Ackerman et al. 2017).

In a Nordic study, Badawy et al. (2017) showed that hospitals performing fewer than 11 unicondylar knee arthroplasties per year had poorer results than hospitals with more operations.

A study by Gøthesen et al. (2017) of Norwegian and Australian data showed that a knee prosthesis with a rotating platform (mobile bearing) had a greater risk of revision and aseptic loosening than the three most commonly used fixed-bearing cruciate ligament-retaining knee prostheses. Kutzner et al. (2017), in a retrieval study of LCS rotating platform knee replacement, showed that the tibial component loosened between the cement and prosthesis in most cases and poor cementing technique (too thin cement) increased the risk of loosening. We have previously shown that the LCS rotating platform knee prosthesis had a higher risk of aseptic loosening than other knee prostheses (Gøthesen et al. 2013). In view of the findings from RCTs that show no difference in functional performance between rotating and fixed platform knee prostheses, rotating platform prostheses are not recommended.

A study by Badawy et al. (2017) showed that long surgery time did not lead to more infections if the patient was healthy and no complications occurred during the operation. Male patients, patients of ASA grade 3-4 and perioperative complications all indicated an increased risk of infection.

The four Nordic countries (the Nordic Arthroplasty Register Association) continue close cooperation on shoulder arthroplasty studies. Shoulder arthroplasty has increased in all the Nordic countries, and most cases are due to osteoarthritis (34%) and fractures (34%). Shoulder arthroplasty for osteoarthritis has increased the most. Total anatomic prostheses for osteoarthritis have a higher survival rate than hemiprostheses (Rasmussen et al. 2017). No difference was found with all revisions as endpoint, but reverse prostheses had a higher risk of revision due to infection (Brorson et al. 2017).

Krukhaug et al. (2018) showed that 5, 10, 15 and 20 year results of elbow prostheses were 92%, 81%, 71% and 61%. These are relatively good results, but not as good as for hip and knee replacement. Risk factors for revision were trauma sequelae and uncemented ulnar component.

We are pleased to announce collaboration with Oslo University Hospital and the Norwegian University of Science and Technology (NTNU), where the hip and knee arthroplasty registers have been linked to HUNT (Health Survey in Nord-Trøndelag). Marianne Bakke Johnsen and Alf Inge Hellevik successfully defended their PhD theses in June 2017 and April 2018 respectively. Congratulations!

Thank you all for good reporting, but please remember the small joints and the back. We would be pleased to receive suggestions for research projects.

Bergen, 6.6.2018

Ove Furnes
Chief Physician/Professor
Responsible knee

Anne Marie Fenstad
Biostatistician

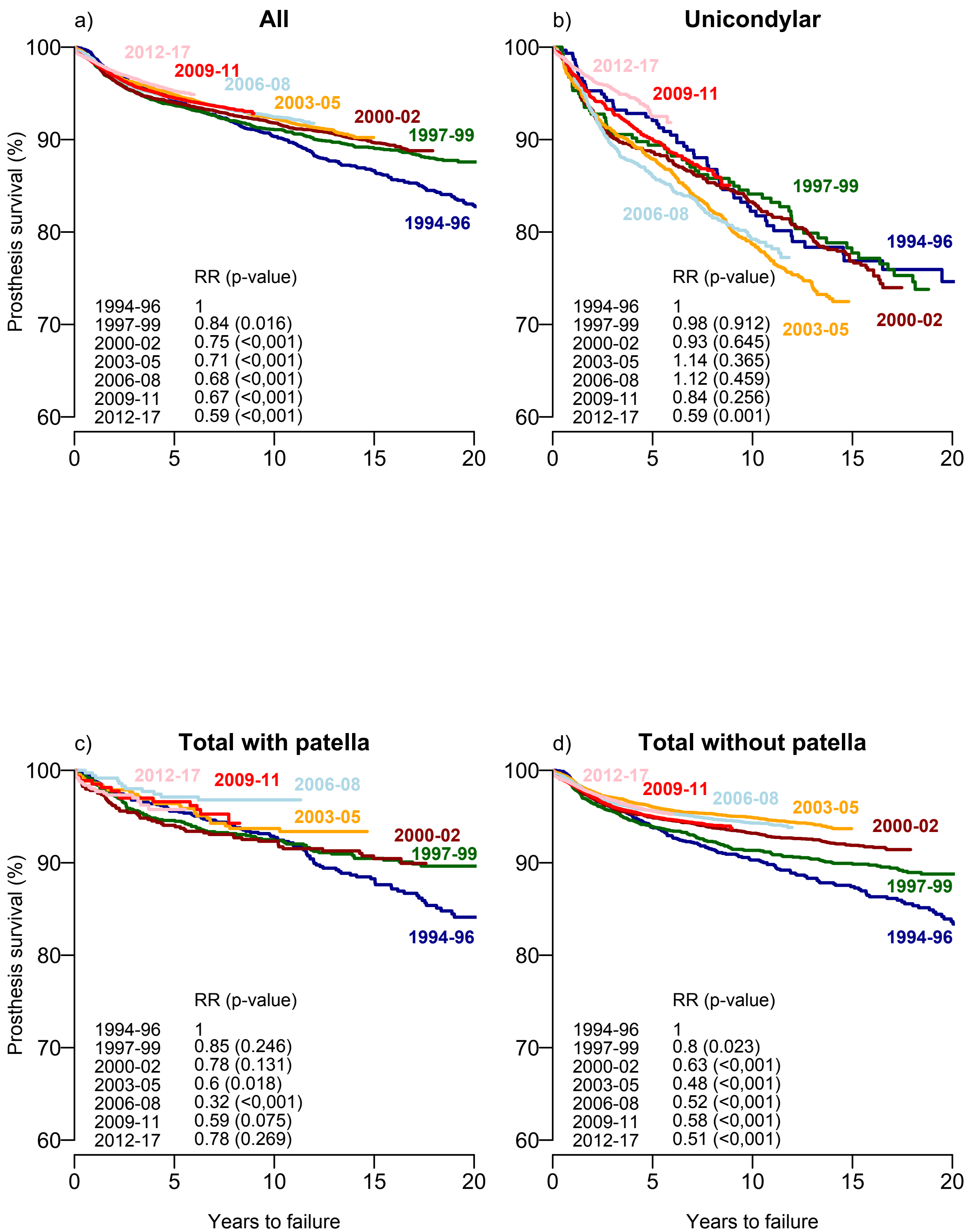
Yngvar Krukhaug
Chief Physician, Associate Professor
Responsible hand/finger

Irina A Kvinnesland
IT Consultant

Christoffer Bartz-Johannessen
Biostatistician

Randi Hole
Chief Physician,
Responsible shoulder

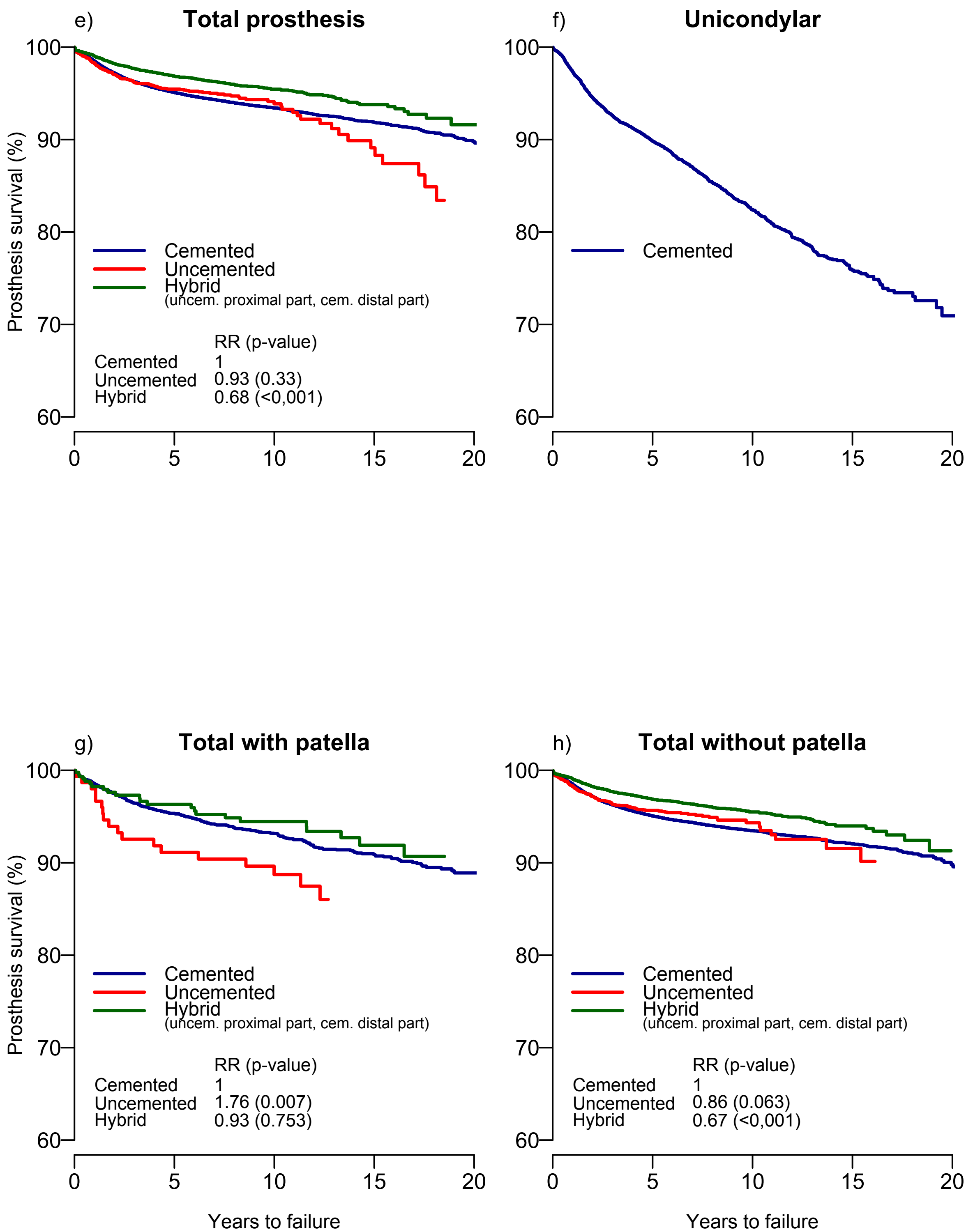
Survival curves for knee prosthesis



Survival curves estimated by the Kaplan-Meier method. Survival estimate is given as long as > 50 prostheses are at risk.

Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

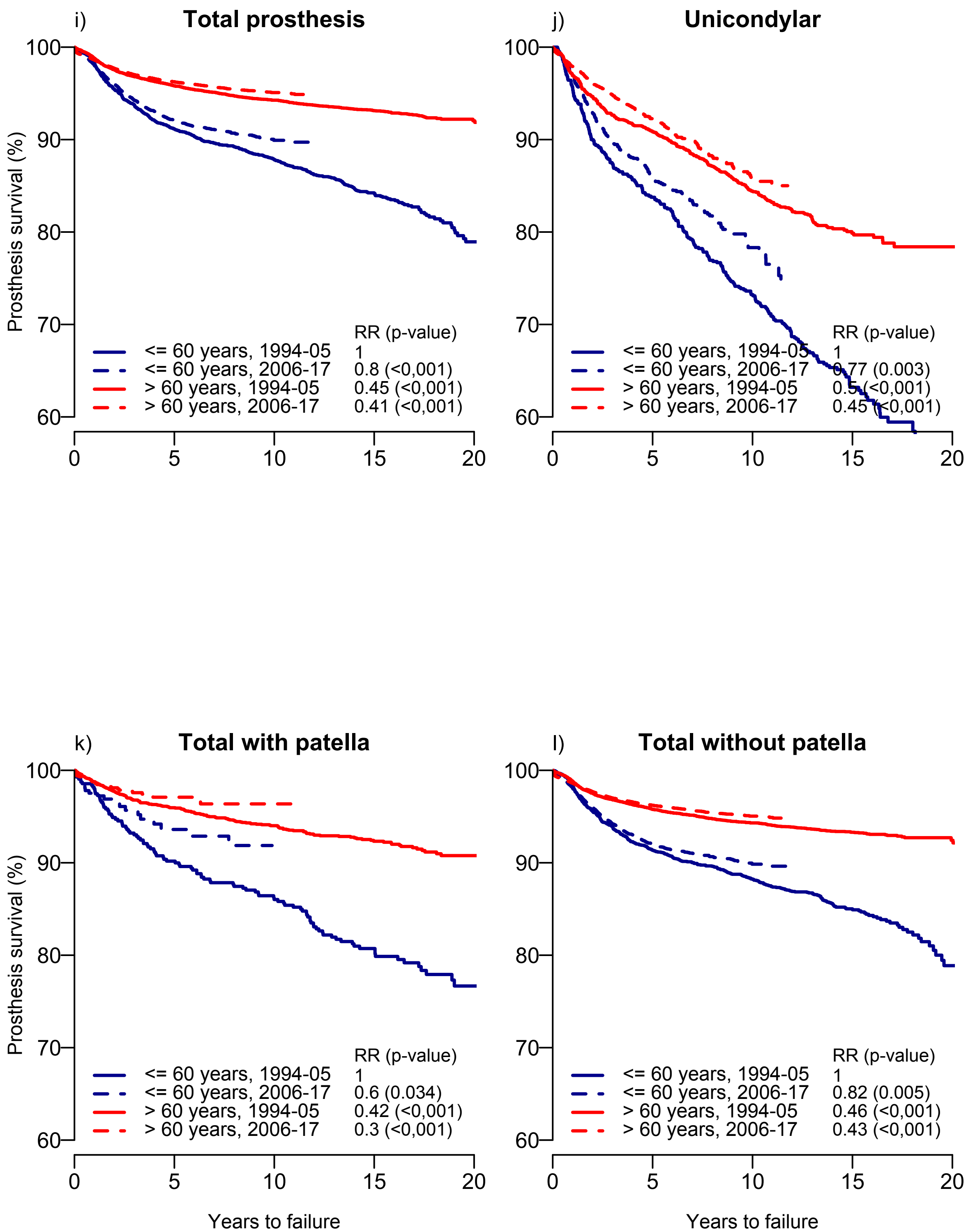
Survival curves for knee prosthesis - Fixation
1994 - 2017



Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.

Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

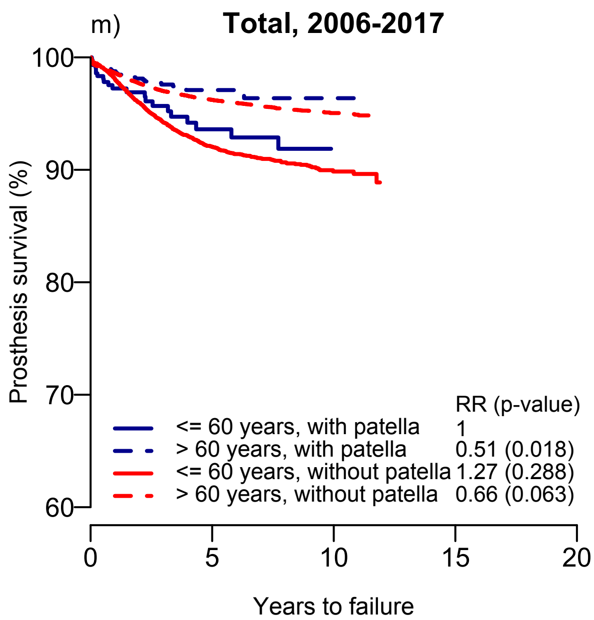
Survival curves for knee prosthesis - Age
1994 - 2017

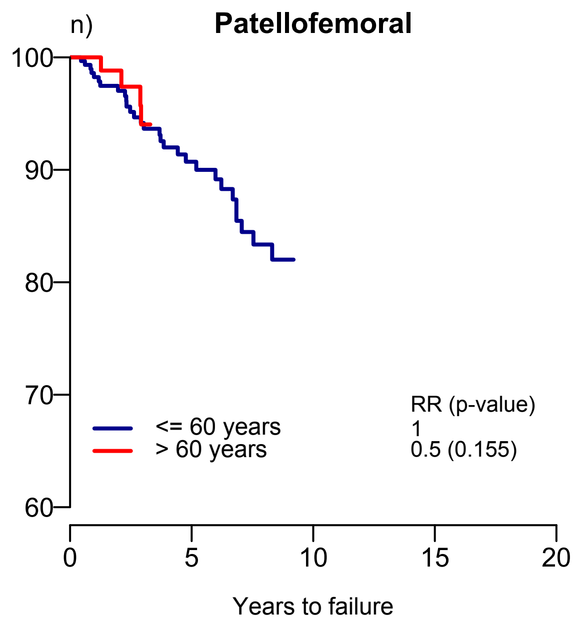


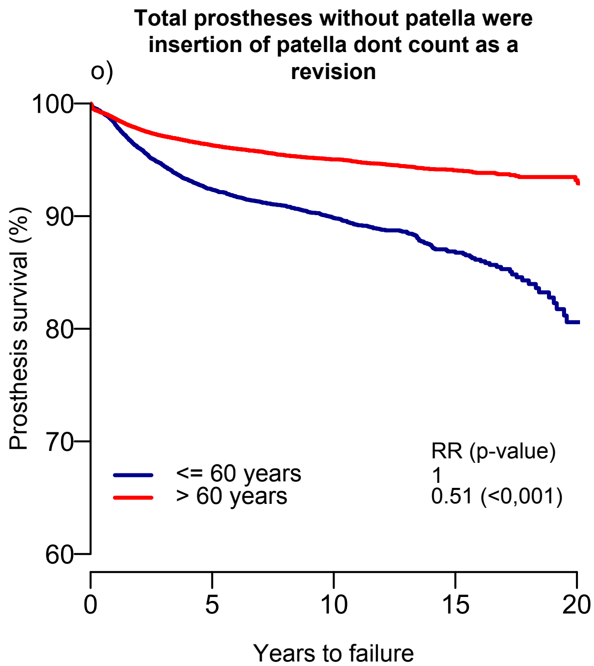
Survival curves estimated by the Kaplan-Meier method. Survival estimate is given as long as > 50 prostheses are at risk.

Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

Survival curves for knee prostheses
1994 - 2017



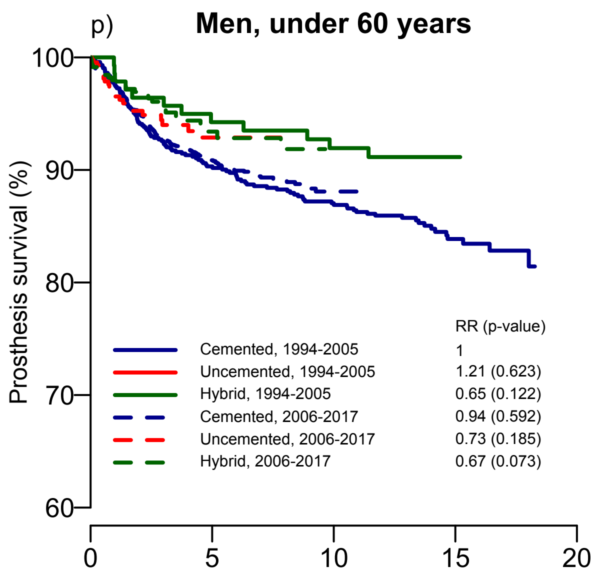


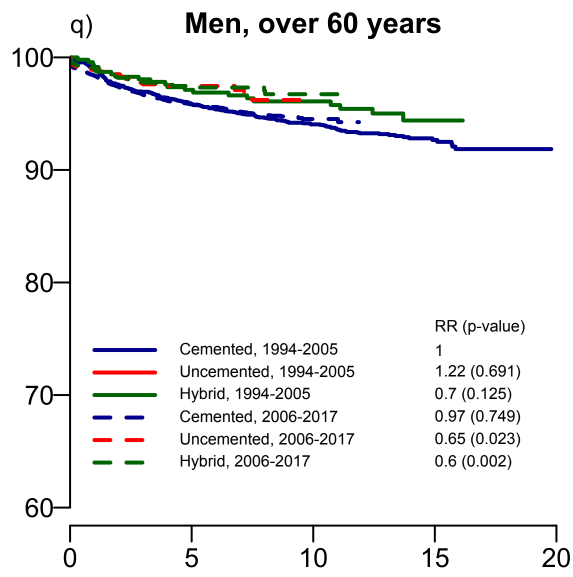


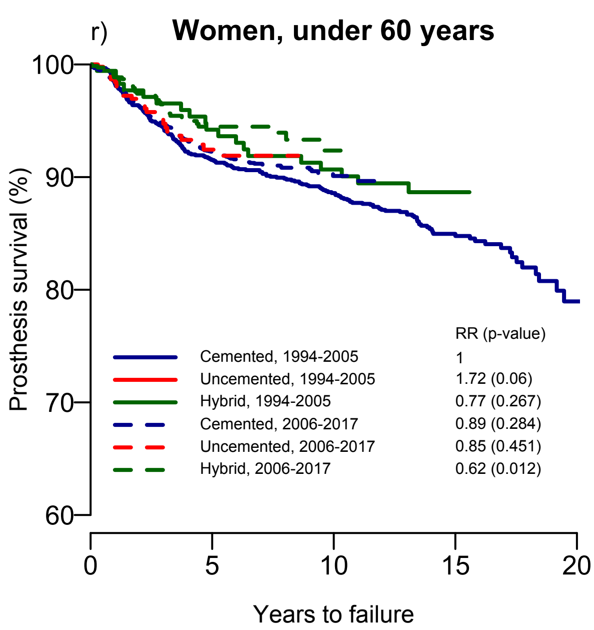
Survival curves estimated by the Kaplan-Meier method. Survival estimate is given as long as > 50 prostheses are at risk.

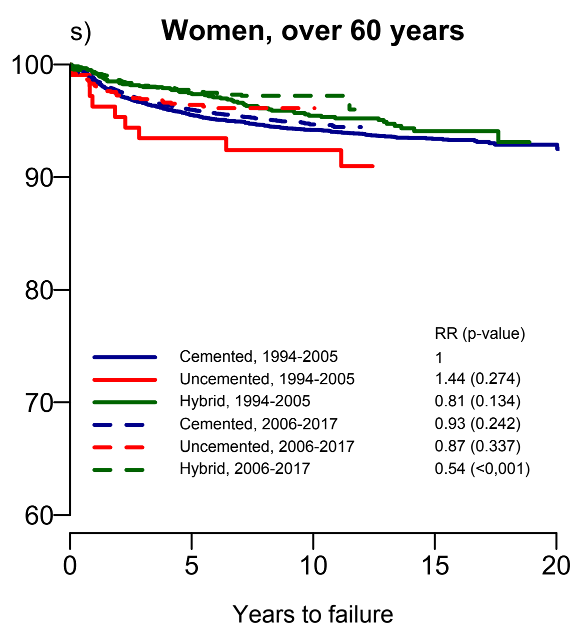
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

Survival curves for total prostheses in knee without patella 1994 - 2017





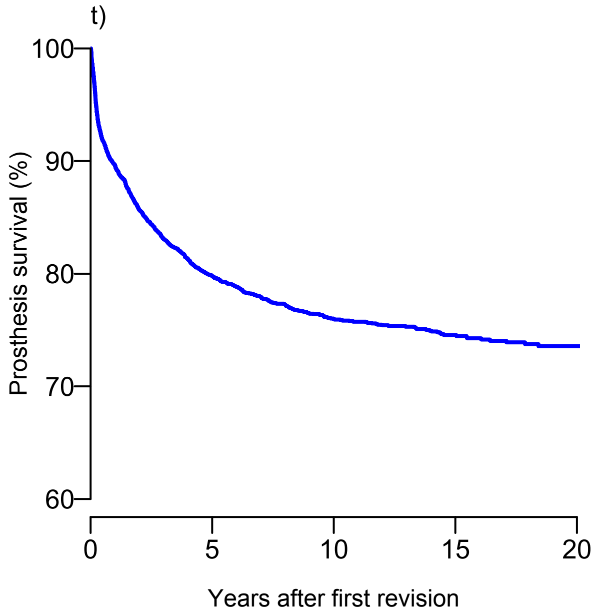




Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.

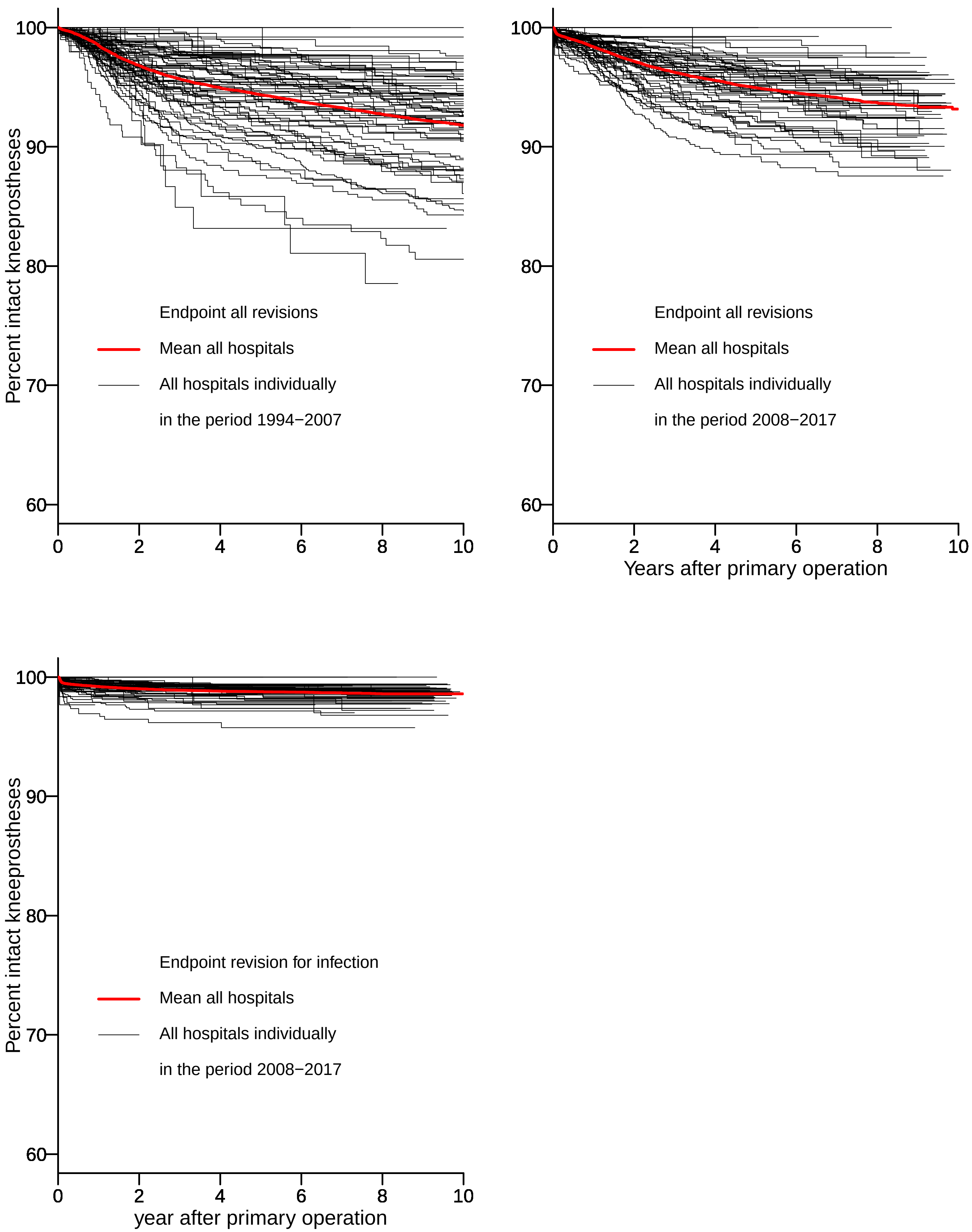
Risk ratio (RR) estimates adjusted for age, sex and diagnosis.

Survival curves for revisions of knee prostheses 1994 - 2017



Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.

Survival curves for total and unicondylar kneeprostheses



One stage bilateral knee prosthesis operations

Year	1994-2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Sum:
Number of patients	38	4	6	3	8	8	8	6	21	21	40	49	79	72	363

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

Figure x: Number of primary operations in knee, 2017:

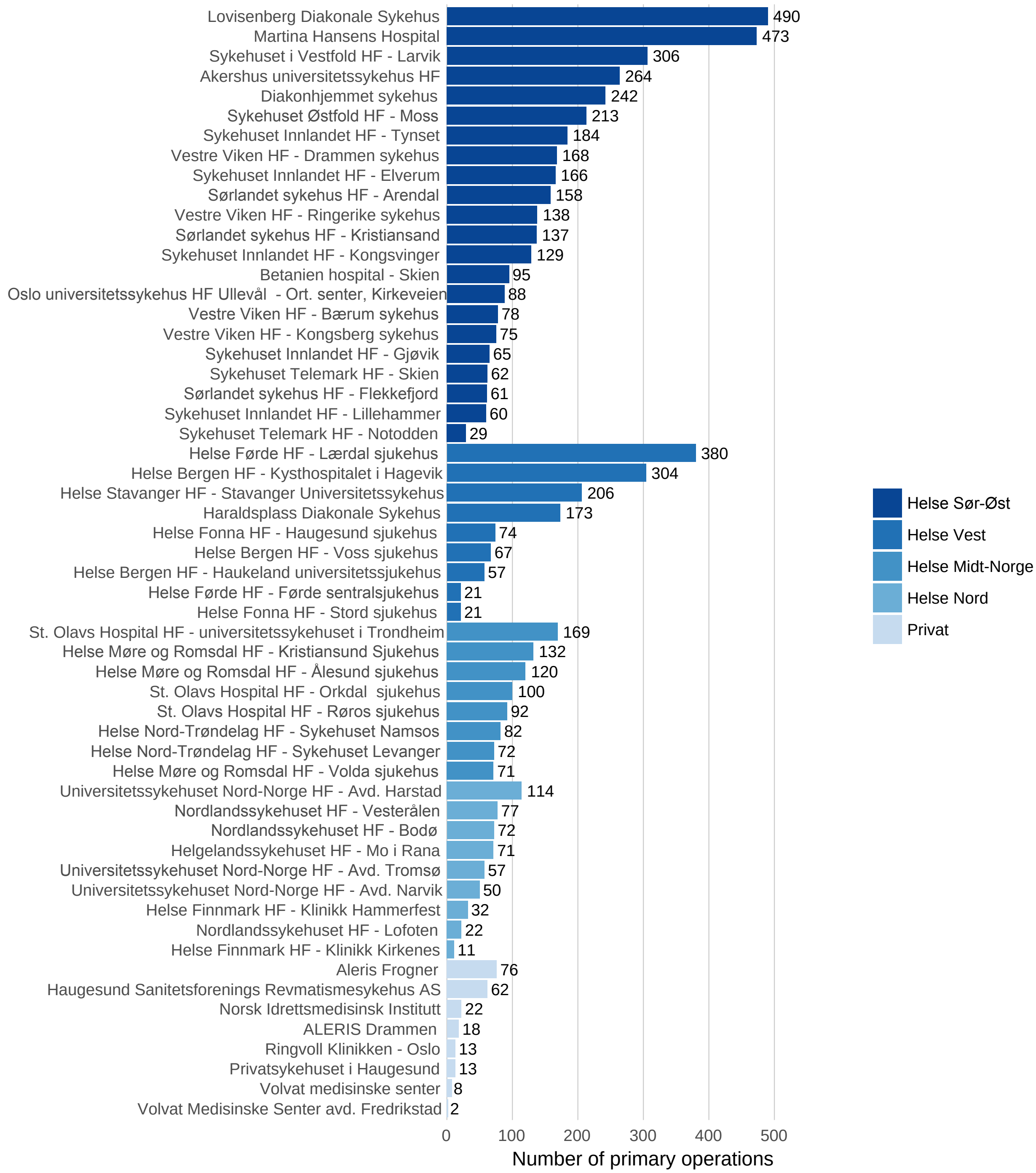
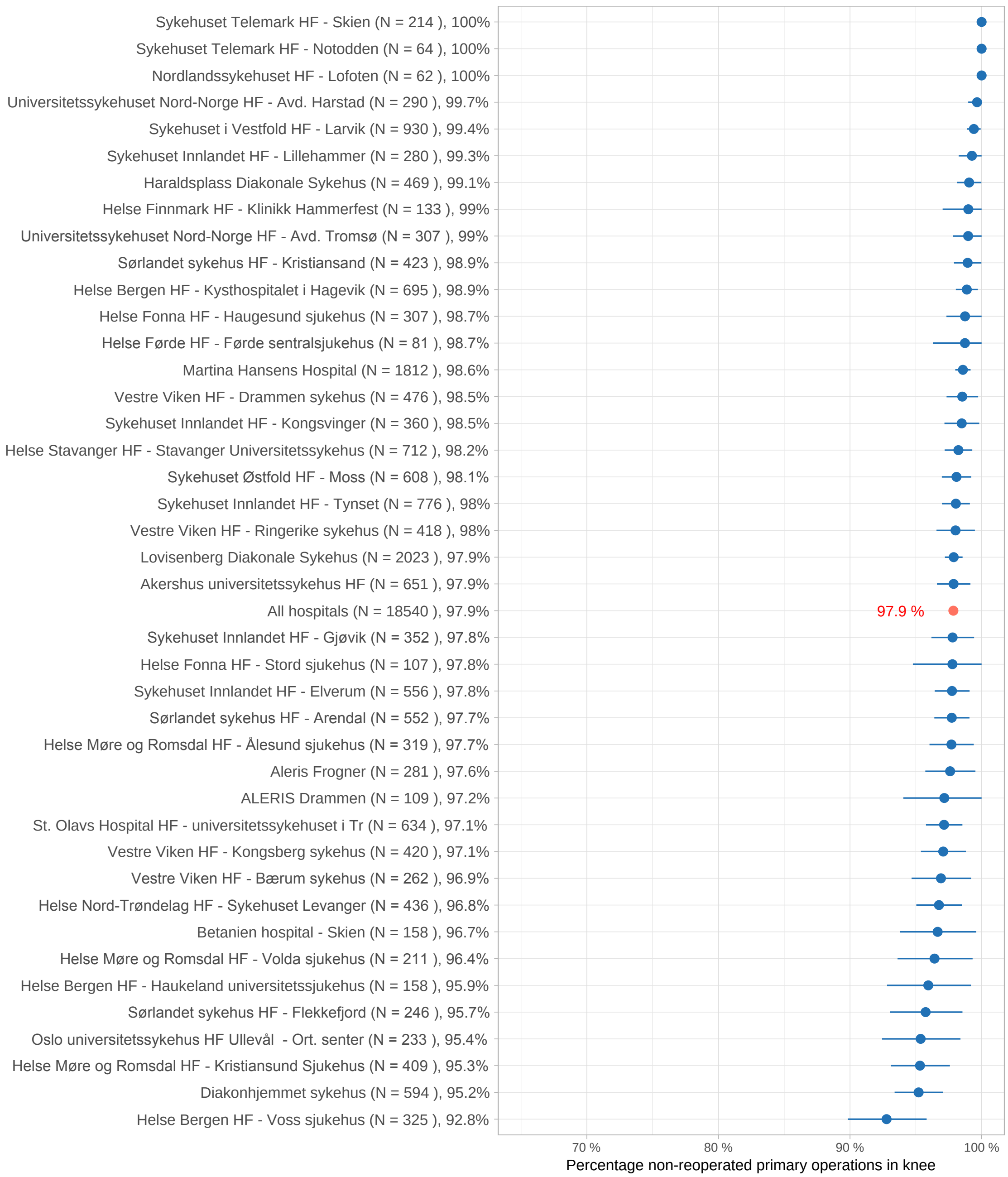


Figure y: Percentage non-revised standard patients two years after operations in 2011-2017



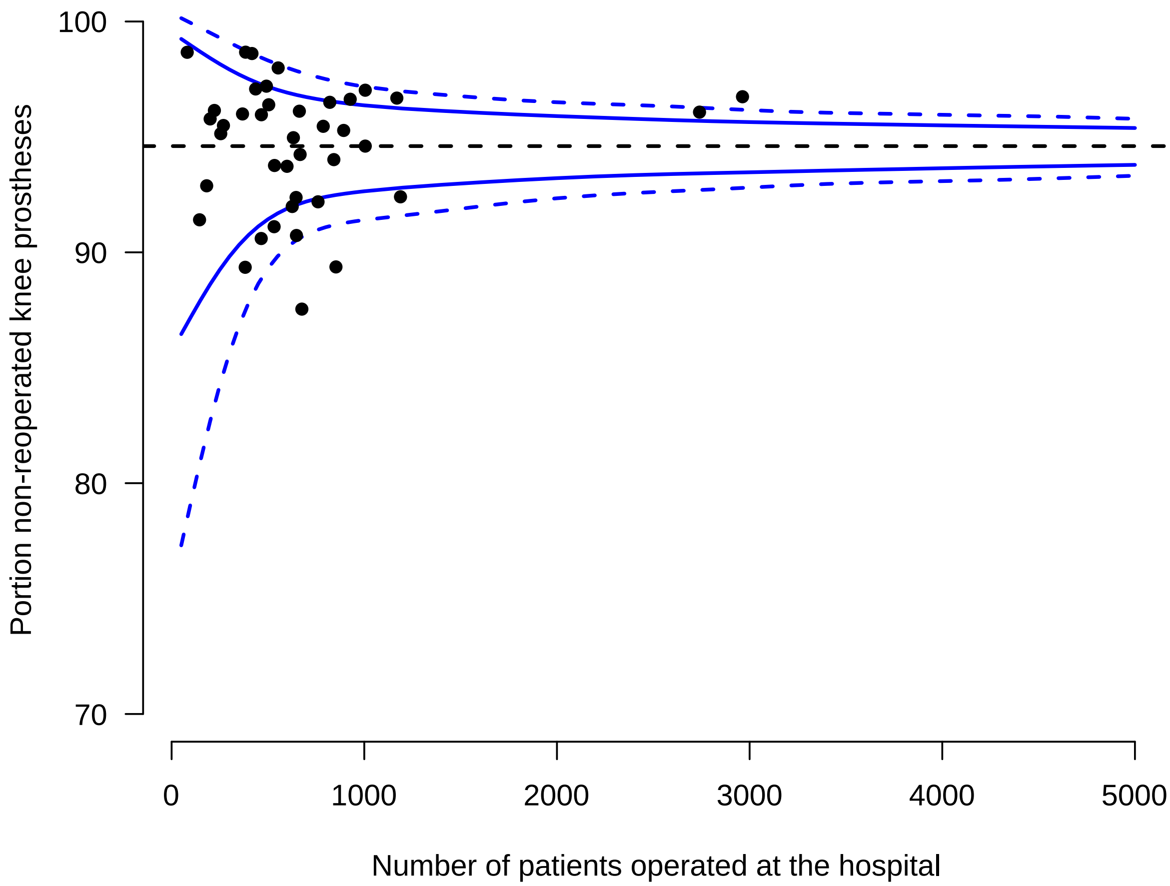
Kaplan-Meier estimates of percentage non-revised standard patients after two years with 95% confidence interval. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2, with idiopathic arthrosis at primary operation and with total prostheses. Endpoint is all revisions. Reoperations, i.e. revision operations without insertion, removal or replacement of the prosthesis, are excluded. Included are all patients operated on in the years 2011 to 2017. Only hospitals with operations in 2017 and with more than 50 operations from 2011 to 2017 are included. A further requirement is that the hospital must have at least 30 patients followed up for more than two years. Only hospitals with coverage of at least 80% for revisions from 2011 to 2016 are included.

Figure z: Percentage non-revised standard patients ten years after operations in 2006-2017

Kaplan-Meier estimates of percentage non-revised standard patients after ten years with 95% confidence interval. Standard patients are patients between 55 and 85 years old, with ASA class 1 or 2, with idiopathic arthrosis at primary operation and with total prostheses. Endpoint is all revisions. Reoperations, i.e. revision operations without insertion, removal or replacement of the prosthesis, are excluded. Included are all patients operated on in the years 2006 to 2017. Only hospitals with operations in 2017 and with more than 50 operations from 2006 to 2017 are included. A further requirement is that the hospital must have at least 30 patients followed up for more than ten years. Only hospitals with coverage of at least 80% for revisions from 2008 to 2016 are included.

See “How to interpret the hospital-based results” page 22.

Figure æ: Funnel plot, percentage non-revised standard patients ten years after operations in 2006-2017



Each point shows the percentage non-revised prostheses after 10 years for standard patients operated from 2006 to 2017 at Norwegian hospitals. Some hospitals are excluded. This can be due to low completeness of reporting of revisions (<80% from 2008 to 2016), that less than 50 hip prostheses have been operated in the period, that fewer than 10 patients have been followed up for more than 10 years, or that the hospital don't have any operations in 2017. The solid blue lines show the interval where 95% of the Norwegian patients will be. The dotted blue lines show the interval where 99.8% of the patients will be. Points to the right represents hospitals with many operations (see the x-axis). Points above or below the dotted lines are regarded as outliers with exceptionally good or exceptionally bad results respectively.

All of the points in the funnel plot correspond to a hospital in figure z. By choosing any point, and using the corresponding values for "Number of patients" and "Portion non-reoperated" on the x and y axis respectively, the hospital belonging to the point can be found in figure z. The two hospitals with points below the dotted lines have inferior results. One of the hospitals has inserted patella components in many reoperations due to pain. This is a small reoperation, but can be beneficial for some patients with much pain. The threshold for inserting a patella component will therefore influence the number of reoperations at the hospital.

Figure ø: Percentage non-reoperated total prostheses in knee after 3 and 10 years, 2005-2017

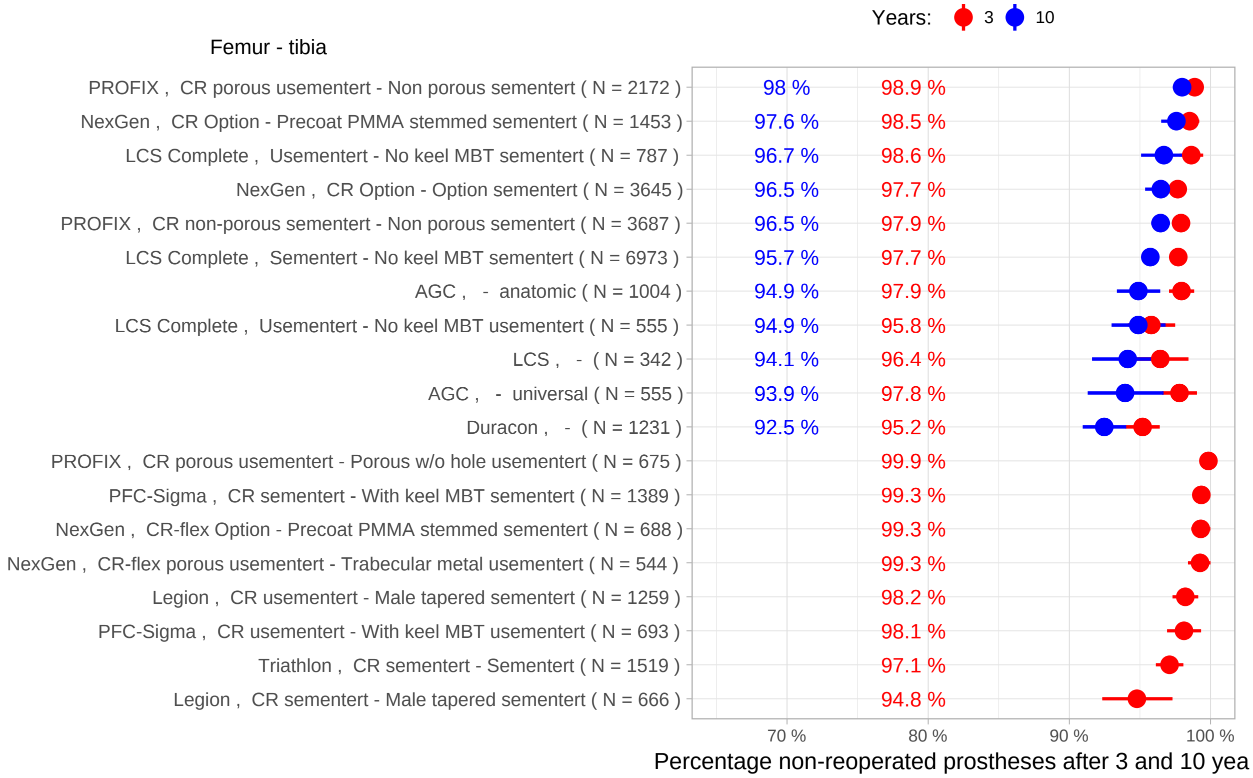


Figure å: Percentage non-reoperated uni prostheses in knee after 3 and 10 years, 2005-2017

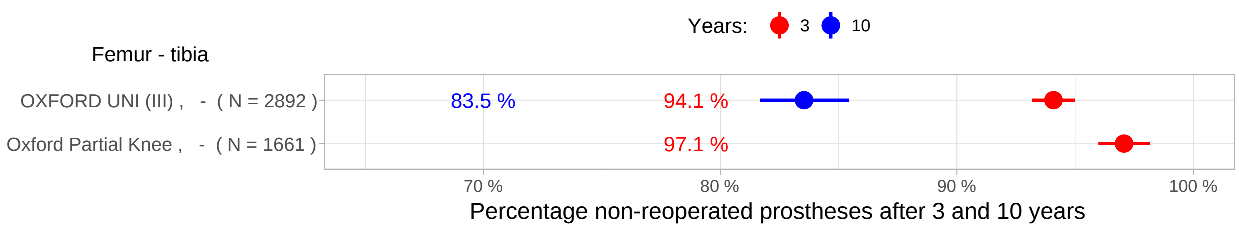


Figure ø and å shows the estimated Kaplan-Meier percentage at three and ten years for different combinations of knee prostheses. We have only included combinations used in 500 or more operations in 2005-2017. A further requirement for inclusion in the figure is that there must still be at least 50 examples of the combination at three and ten years respectively. Only standard patients from 2005 to 2017 have been included, and the number of prostheses will therefore be below 500 in some cases. A standard patient is aged 55-85 years, has ASA class 1 or 2 and was diagnosed with idiopathic osteoarthritis at primary surgery. Using standard patients provides a more homogenous group of patients, and we believe that this makes the results more comparable. Endpoint is all revision operations, except infections and reoperations without insertion, removal or replacement of the prosthesis.

Duracon knee prosthesis is no longer in use (Gøthesen Ø 2013)

See section “How to interpret the prosthesis results” page 25.

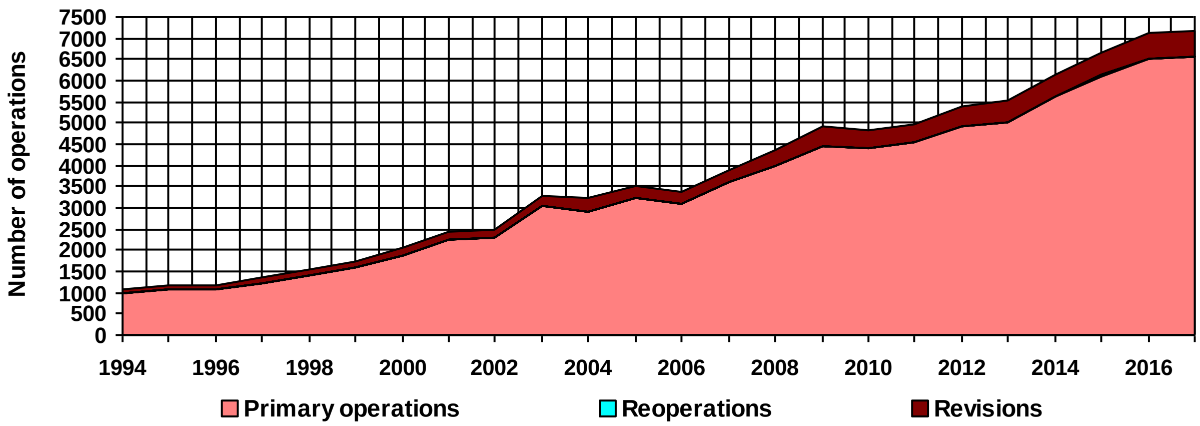
KNEE PROSTHESES

Table 1: Annual numbers of operations

Year	Primary operations		Reoperations *		Revisions		Total
2017	6 560	(91,3%)	12	(0,2%)	616	(8,6%)	**7 188**
2016	6 509	(91,5%)	10	(0,1%)	593	(8,3%)	**7 112**
2015	6 110	(91,7%)	9	(0,1%)	546	(8,2%)	**6 665**
2014	5 622	(91,9%)	7	(0,1%)	491	(8,0%)	**6 120**
2013	5 032	(91,3%)	6	(0,1%)	476	(8,6%)	**5 514**
2012	4 917	(90,9%)	7	(0,1%)	486	(9,0%)	**5 410**
2011	4 548	(91,3%)	2	(0,0%)	429	(8,6%)	**4 979**
2010	4 400	(91,5%)		(0,0%)	411	(8,5%)	**4 811**
2009	4 474	(91,1%)		(0,0%)	438	(8,9%)	**4 912**
2008	3 996	(91,6%)		(0,0%)	367	(8,4%)	**4 363**
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	3 255	(92,8%)		(0,0%)	251	(7,2%)	**3 506**
2004	2 907	(90,2%)		(0,0%)	317	(9,8%)	**3 224**
2003	3 037	(92,4%)		(0,0%)	250	(7,6%)	**3 287**
2002	2 274	(91,3%)		(0,0%)	218	(8,7%)	**2 492**
1994-01	11 523	(91,7%)		(0,0%)	1 044	(8,3%)	**12 567**
Total	**81 861**	**(91,6%)**	**53**	**(0,1%)**	**7 501**	**(8,4%)**	**89 415**

* 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. 63 % performed in women.

Mean age at primary surgery was 68,5 years, 69,2 years for women and 67,4 years for men

Mean age at primary surgery was 70,2 years in 1994, 70,8 years for women and 68,3 years for men.

Mean age at primary surgery was 68 years in 2017, 68,2 years for women and 67,7 years for men.

Figure 2: Incidence of primary knee prostheses

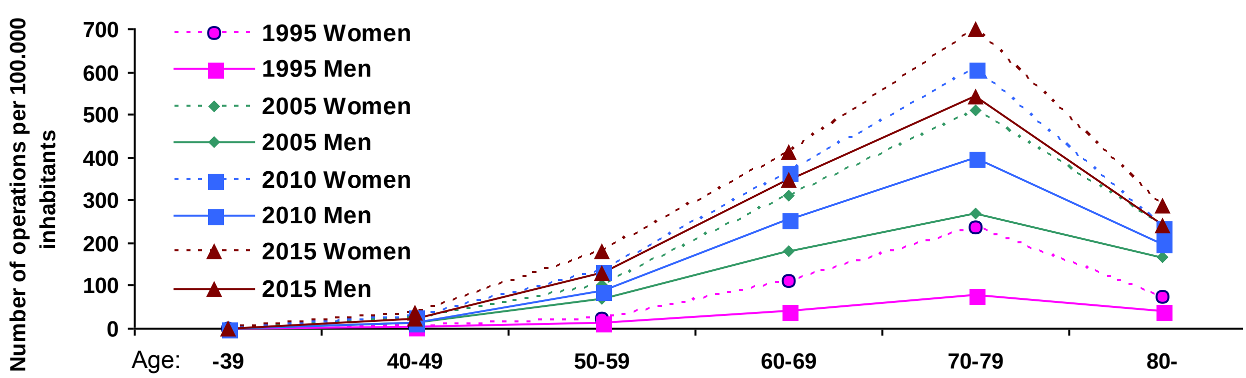


Figure 3: Age at the insertion of primary total knee prostheses

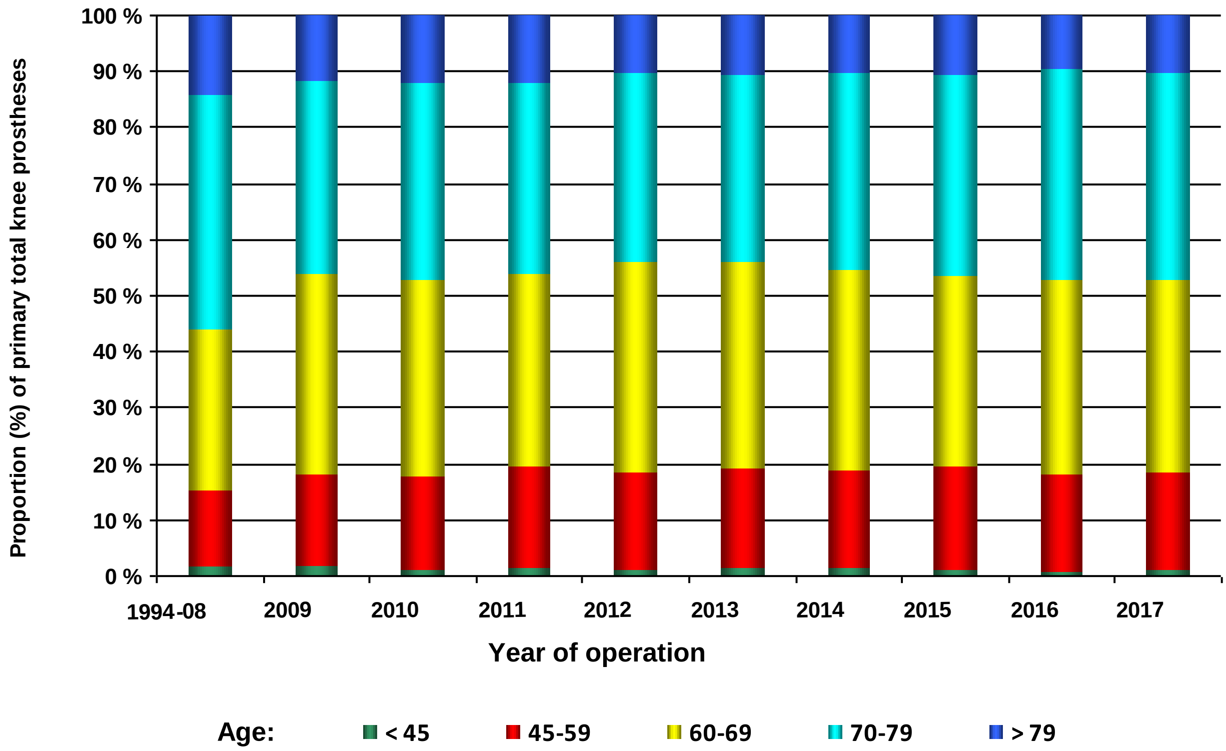


Figure 4: Age at the insertion of primary unicondylar knee prostheses

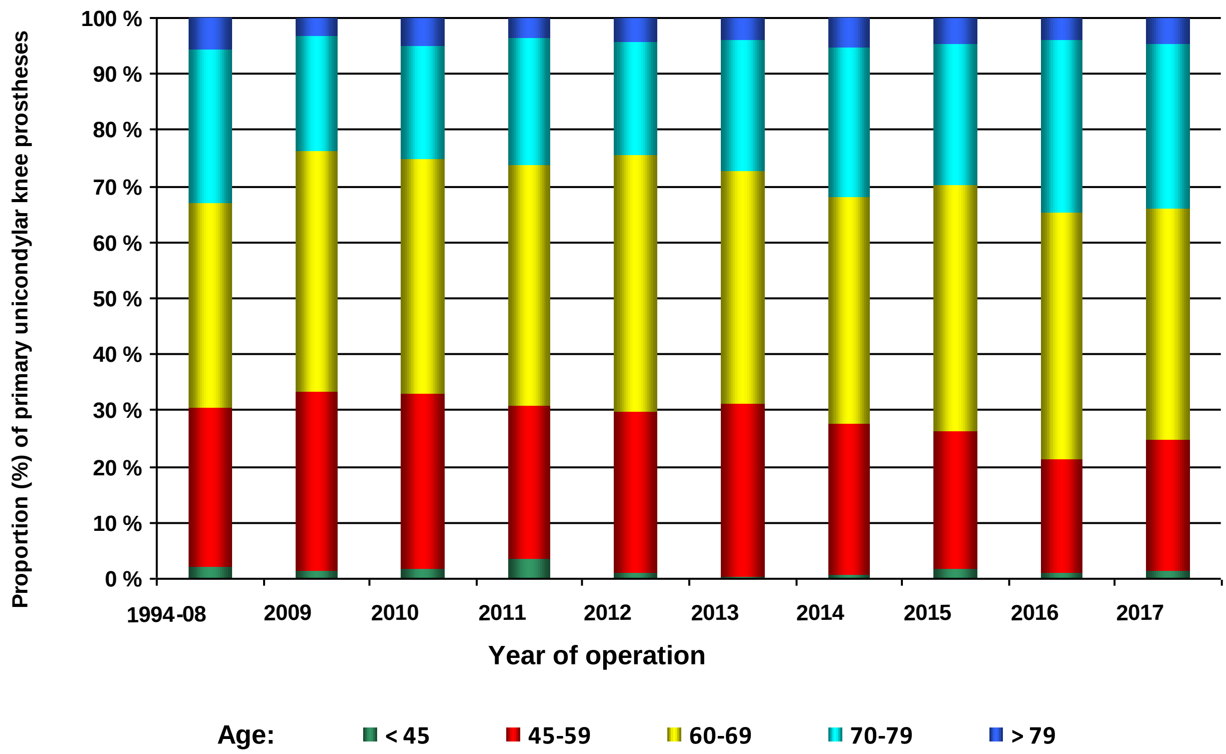


Figure 5: Age and sex at the insertion of primary total knee prostheses

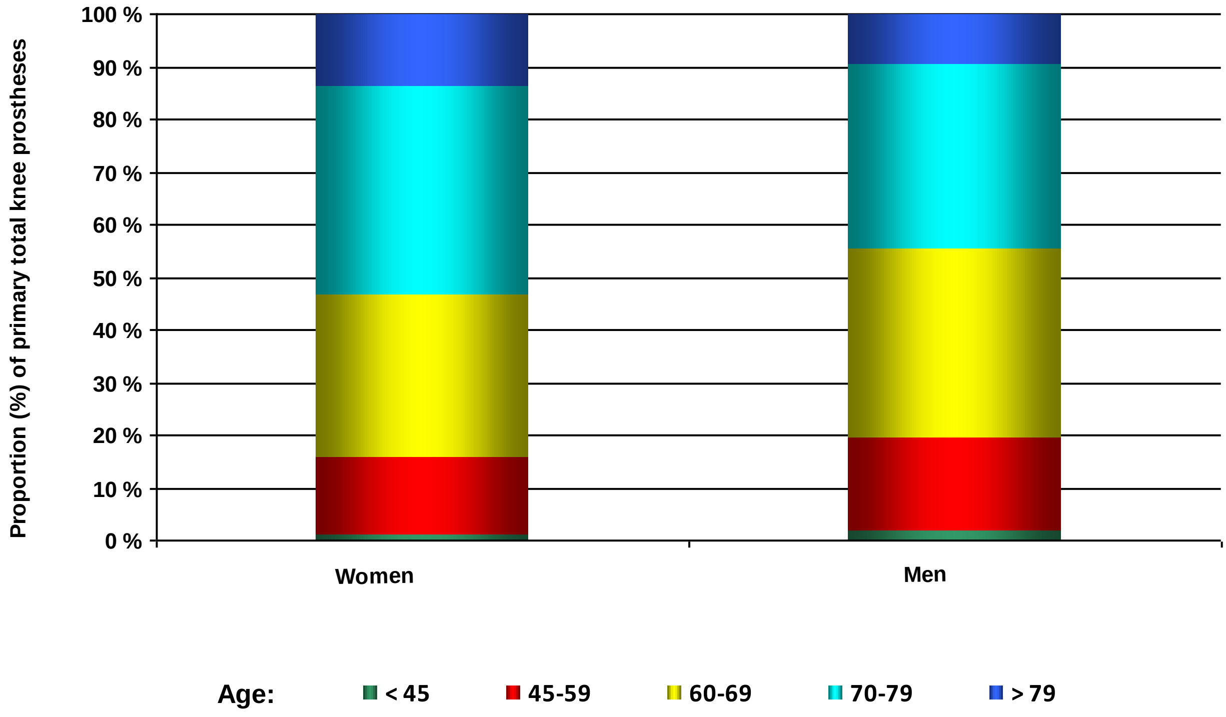
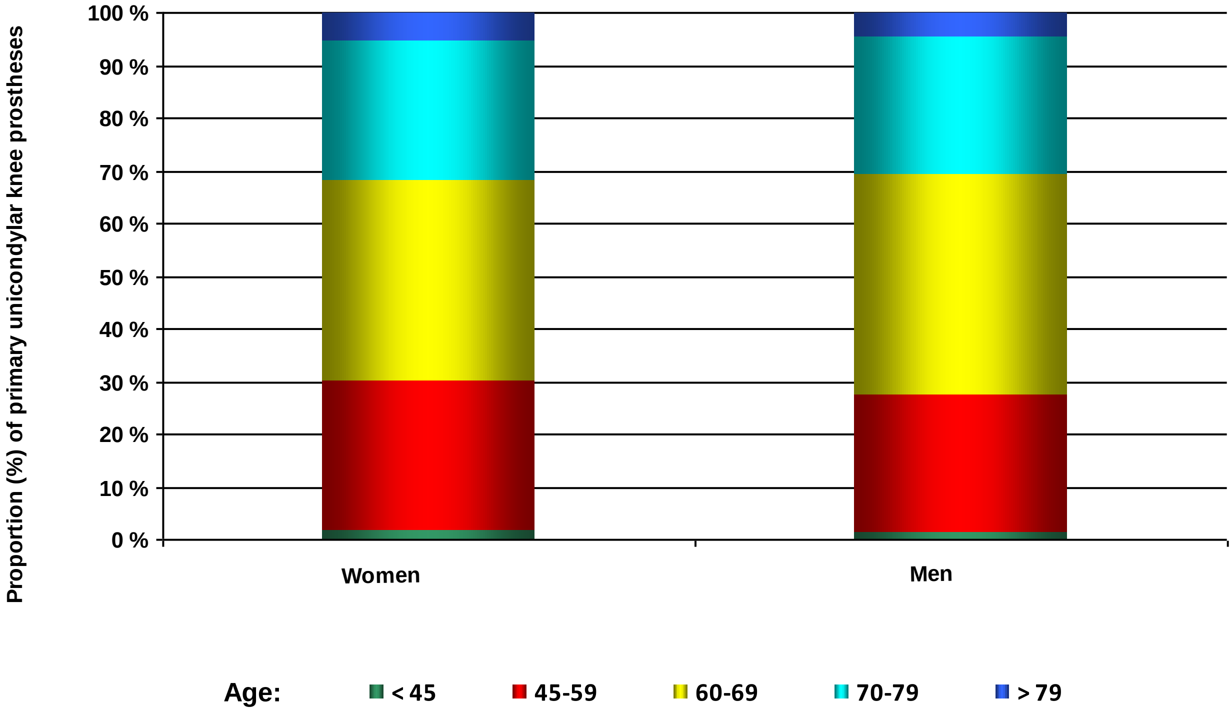


Figure 6: Age and sex at the insertion of primary unicondylar knee prostheses



Types of knee prostheses

Table 2: Primary operations

Year	Total with patella	Total without patella	Unicondylar	Patello-femoral	Bicompart-mental	Hinged * prostheses	Missing	Total
2017	450 (6,9%)	5 133 (78,2%)	866 (13,2%)	79 (1,2%)		32 (0,5%)		**6 560**
2016	221 (3,4%)	5 324 (81,8%)	863 (13,3%)	67 (1,0%)		32 (0,5%)		**6 509**
2015	160 (2,6%)	5 127 (83,9%)	750 (12,3%)	39 (0,6%)		33 (0,5%)	1 (0,0%)	**6 110**
2014	108 (1,9%)	4 853 (86,3%)	603 (10,7%)	38 (0,7%)		20 (0,4%)		**5 622**
2013	97 (1,9%)	4 409 (87,6%)	477 (9,5%)	38 (0,8%)		9 (0,2%)	2 (0,0%)	**5 032**
2012	98 (2,0%)	4 292 (87,3%)	474 (9,6%)	34 (0,7%)		17 (0,3%)	2 (0,0%)	**4 917**
2011	87 (1,9%)	3 974 (87,4%)	439 (9,7%)	29 (0,6%)		19 (0,4%)		**4 548**
2010	88 (2,0%)	3 857 (87,7%)	414 (9,4%)	23 (0,5%)		18 (0,4%)		**4 400**
2009	96 (2,1%)	3 890 (86,9%)	463 (10,3%)	19 (0,4%)		6 (0,1%)		**4 474**
1994-08	3 873 (11,5%)	25 626 (76,1%)	4 058 (12,0%)	77 (0,2%)	2 (0,0%)	52 (0,2%)	1 (0,0%)	**33 689**
Total	**5 278 (6,4%)**	**66 485 (81,2%)**	**9 407 (11,5%)**	**443 (0,5%)**	**2 (0,0%)**	**238 (0,3%)**	**6 (0,0%)**	**81 861**

* Indicated by the surgeon on the report form

Figure 7: Primary operations

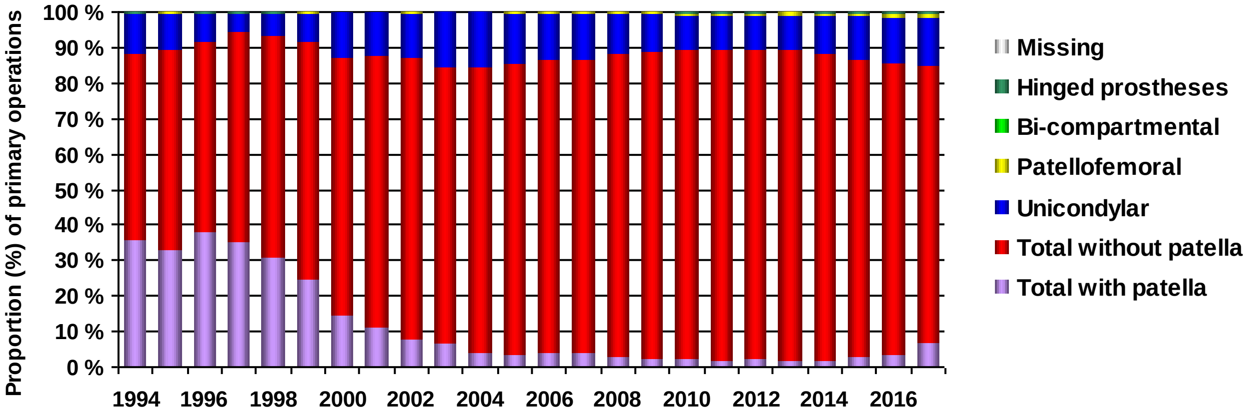


Table 3a: Classification of stability and modularity in primary total prostheses (with and without patella component)

	---------- MS ----------		----------- PS -----------					
Year	All poly	MT	All poly	MT	CCK	Rotating platform	Hinged * prostheses	Total
2017	0	3656	0	538	42	1 344	32	**5 612**
2016	4	3684	0	464	19	1 370	32	**5 573**
2015	2	3529	0	330	22	1 403	33	**5 319**
2014	2	3385	0	130	22	1 416	20	**4 975**
2013	2	3170	0	53	25	1 254	9	**4 513**
2012	5	2853	0	23	16	1 490	17	**4 404**
2011	5	2540	0	14	9	1 490	19	**4 077**
2010	3	2486	0	19	5	1 427	18	**3 958**
2009	3	2541	0	8	8	1 417	6	**3 983**
2008	1	2170	0	25	3	1 324	8	**3 531**
2007	0	1925	0	16	2	1 162	7	**3 112**
2006	0	1637	0	8	2	1 047	2	**2 696**
2005	0	1618	0	11	0	1 156	3	**2 788**
2004	1	1508	0	8	3	922	1	**2 443**
2003	4	1764	0	7	0	778	1	**2 554**
2002	2	1254	0	14	0	702	3	**1 975**
1994-01	4	8194	0	45	12	2 081	28	**10 364**

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

* Information taken from the catalogue number of prostheses

Table 3b: Classification of stability and modularity in revision total prostheses (with and without patella component)

	---------- MS ----------		----------- PS -----------					
Year	**All poly**	**MT**	**All poly**	**MT**	**CCK**	**Rotating platform**	**Hinged * prostheses**	**Total**
2017	0	124	0	133	66	88	63	**474**
2016	0	110	0	96	67	80	79	**432**
2015	0	128	0	100	50	75	66	**419**
2014	0	120	0	57	65	90	62	**394**
2013	1	132	0	61	75	87	32	**388**
2012	0	151	0	39	46	102	30	**368**
2011	1	142	0	19	58	98	23	**341**
2010	0	153	0	11	62	94	12	**332**
2009	0	147	0	12	44	119	21	**343**
2008	0	125	0	9	23	121	12	**290**
2007	0	101	0	7	15	99	9	**231**
2006	0	90	0	8	8	83	8	**197**
2005	0	109	0	3	3	71	4	**190**
2004	1	120	0	2	9	89	3	**224**
2003	0	99	0	6	3	54	7	**169**
2002	0	78	0	6	7	53	4	**148**
1994-01	1	510	0	31	30	69	16	**657**

MS = Minimally stabilized = Posterior cruciate retaining prosthesis and deep dish

PS = Posterior cruciate stabilizing prostheses

CCK = Constrained Condylar Knee = high level stabilized

MT = Metal backed tibia

All poly = All polyethylene tibial component

* Information taken from the catalogue number of prostheses

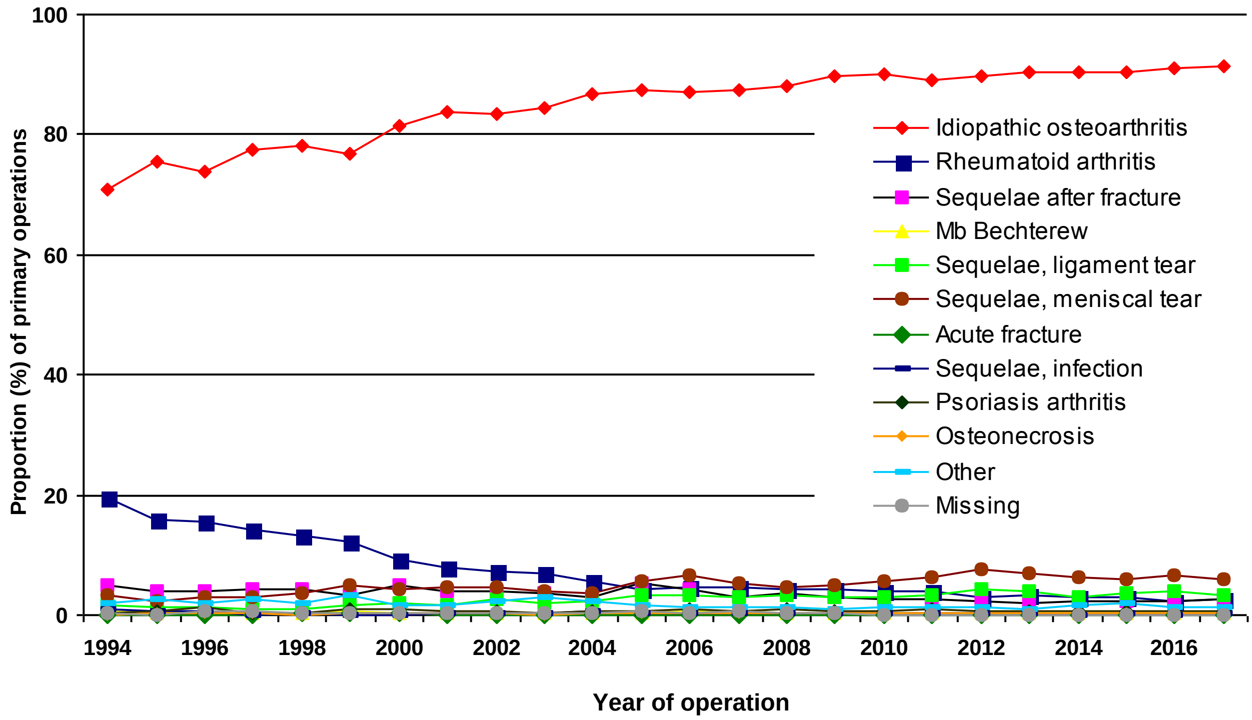
Reasons for primary operations - Total knee prostheses

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
2017	5 094	155	147	19	179	339	3	18	39	13	72	0
2016	5 055	136	120	18	229	368	2	9	40	15	75	0
2015	4 787	165	114	16	199	321	1	17	36	10	100	2
2014	4 486	140	122	22	140	307	3	6	30	15	89	2
2013	4 078	144	94	11	173	308	1	16	29	9	40	4
2012	3 944	125	106	15	182	332	2	13	33	11	60	4
2011	3 617	161	113	12	133	260	1	18	35	10	51	2
2010	3 548	155	99	13	114	216	1	9	25	7	51	3
2009	3 579	167	117	11	116	200	2	13	25	7	42	10
2008	3 105	150	125	14	116	169	2	9	30	10	50	7
2007	2 715	146	94	17	97	162	4	11	17	11	43	16
2006	2 353	123	114	14	92	178	0	12	23	11	40	5
2005	2 435	120	145	13	94	155	2	11	19	7	47	14
2004	2 130	138	76	6	59	89	0	15	14	6	53	10
2003	2 167	174	94	9	49	98	2	11	8	1	78	5
2002	1 648	144	79	7	54	90	3	9	12	6	48	5
2001	1 645	157	75	5	35	90	1	6	11	7	35	8
2000	1 324	151	79	6	35	69	3	2	14	4	27	3
1999	1 124	180	50	9	24	73	3	2	13	5	48	3
1998	1 033	177	55	3	15	47	5	5	3	2	27	4
1997	907	167	49	3	10	34	1	1	5	2	31	9
1996	725	154	40	8	14	29	0	8	12	3	20	6
1995	735	154	38	4	13	22	0	6	6	4	25	1
1994	625	172	45	5	15	30	0	10	4	0	17	2
Total	**62 859**	**3 655**	**2 190**	**260**	**2 187**	**3 986**	**42**	**237**	**483**	**176**	**1 169**	**125**

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

Figure 8:



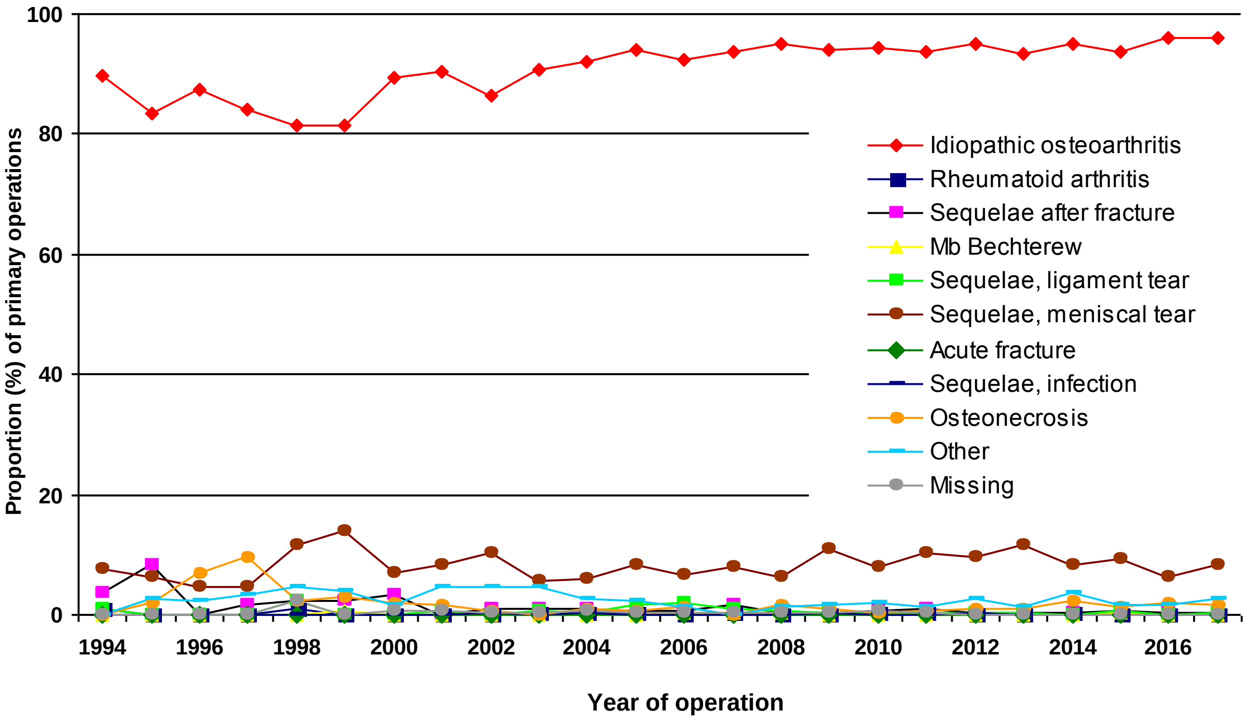
Reasons for primary operations - Unicondylar knee prostheses

Table 5:

Year	Idiopathic osteoarthritis	Rheumatoid arthritis	Sequelae after fracture	Mb. Bechterew	Sequelae, ligament tear	Sequelae, meniscal tear	Sequelae, infection	Osteonecrosis	Other	Missing
2017	831	1	4	0	3	71	0	13	22	0
2016	830	1	2	1	1	54	1	16	13	0
2015	703	0	4	2	5	70	0	11	13	0
2014	573	2	2	0	0	49	0	13	21	0
2013	446	0	1	0	1	55	0	4	6	0
2012	451	0	1	0	1	46	1	4	13	0
2011	412	1	4	0	1	45	0	3	6	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	**8 761**	**16**	**75**	**7**	**46**	**774**	**6**	**122**	**209**	**23**

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

Figure 9:



Use of cement - Primary total knee prostheses

Figure 10: Femur

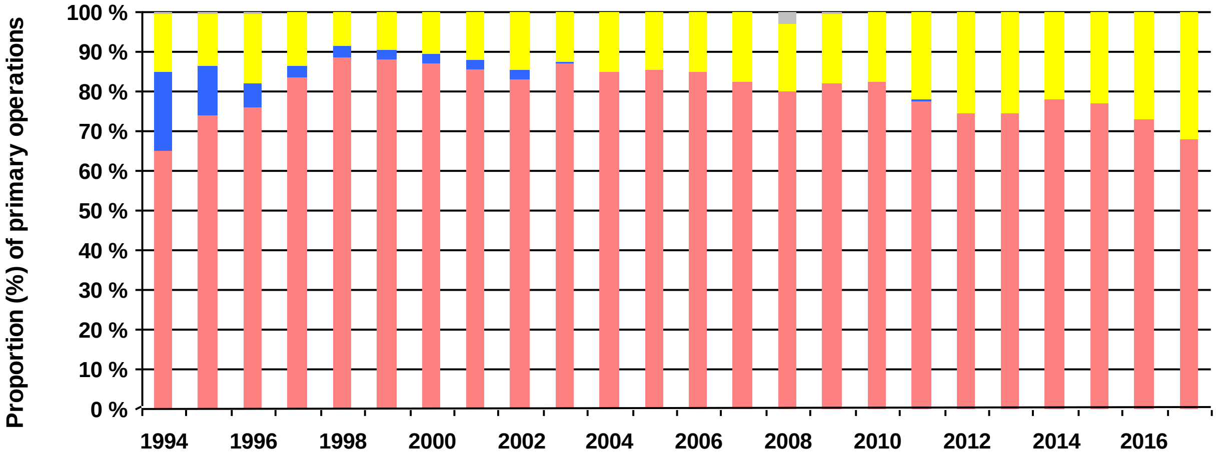


Figure 11: Tibia

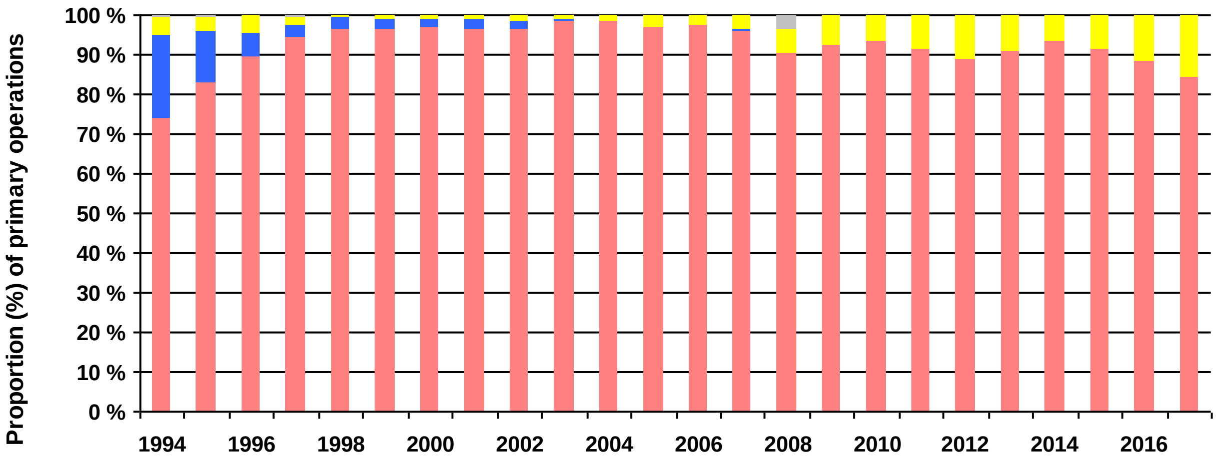
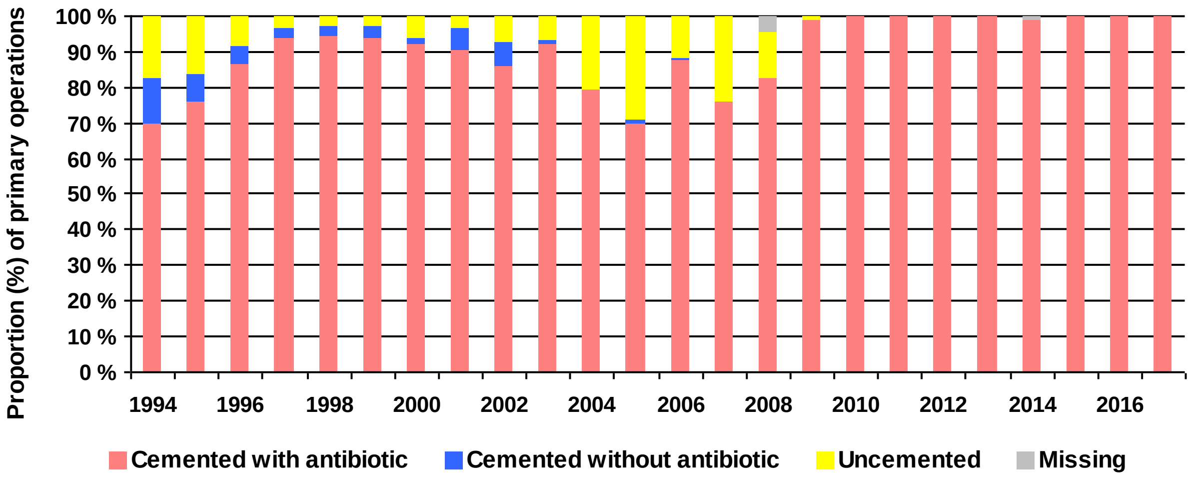


Figure 12: Patella



Use of cement in total knee prostheses

Figure 13: Primary operations

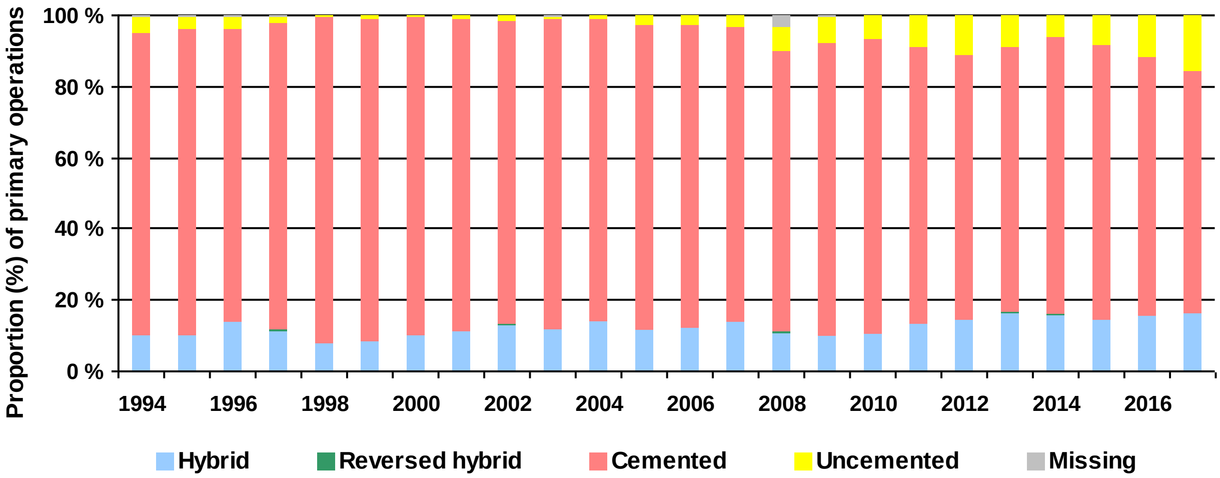
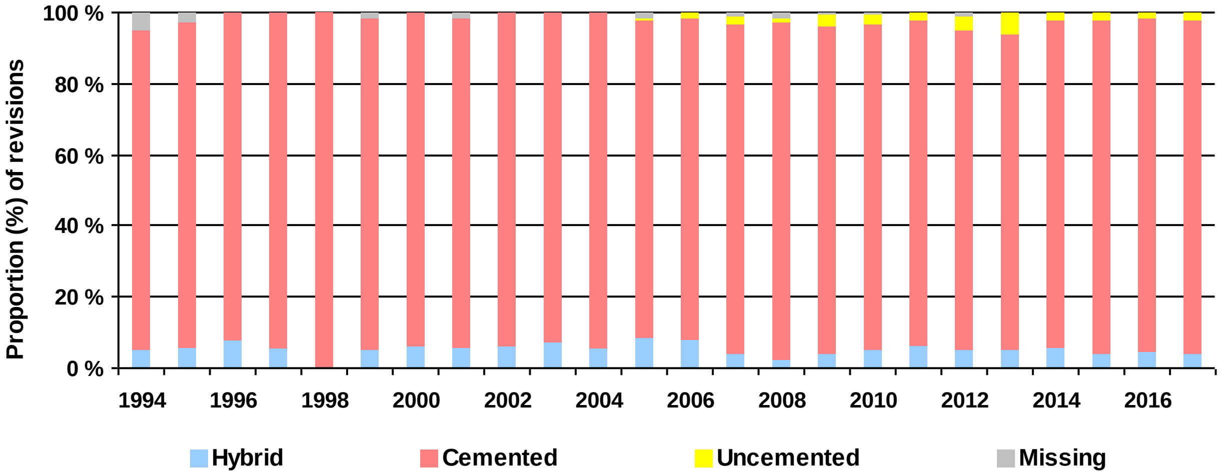
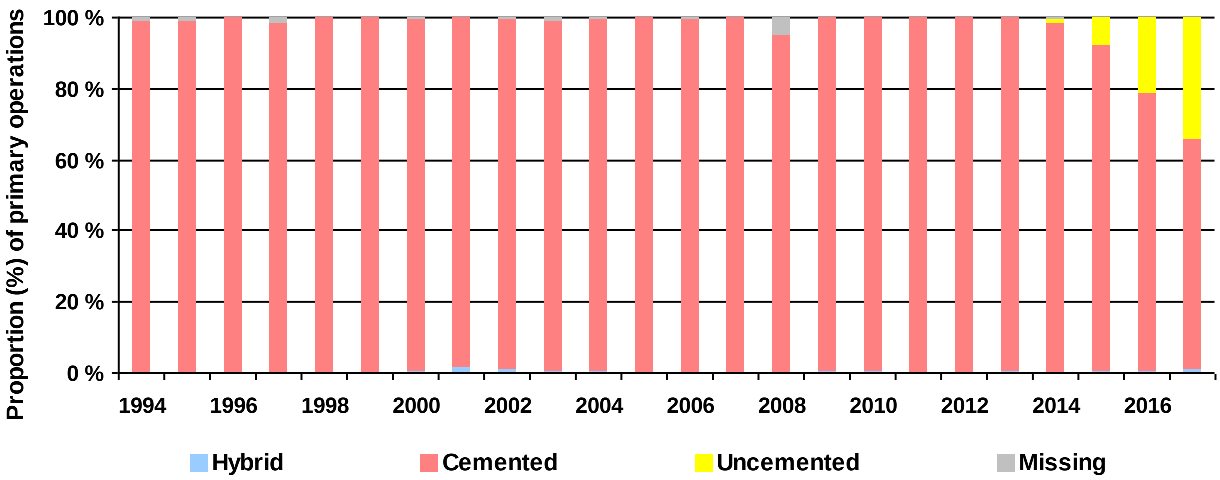


Figure 14: Revisions



Use of cement in unicondylar knee prostheses

Figure 15: Primary operations



The 7 most common primary total prostheses without patella component in 2013-2017

Table 6:

Product	Cemented *	Uncemented *	Hybrid	All poly	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
NexGen	9 210	1 037	1 200	0	0	1 096	10380	:+03	126	**11 455**
LCS Complete	2 923	58	434	0	3 418	0	3412	6	0	**3 418**
PFC-Sigma	2 046	1 126	191	0	3 358	0	3361	4	2	**3 367**
Legion	1 083	4	1 685	0	0	58	2706	74	7	**2 775**
Triathlon	1 472	266	131	0	0	1 840	1819	35	25	**1 872**
PROFIX	702	147	319	2	0	0	1169	0	0	**1 169**
Vanguard TM	301	0	0	0	0	0	300	17	0	**301**

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	PS	CCK	Total
CR Option	6 822	2	6827	0	0	**6 827**
CR-flex porous uncemented	53	1 412	1467	0	0	**1 467**
CR-flex Option	923	0	923	0	0	**923**
CR-flex gender	580	0	580	0	0	**580**
LPS-flex porous standard	2	455	0	458	0	**458**
LPS Option	353	0	0	353	0	**353**
CR Porous uncemented	35	294	329	0	0	**329**
CR Precoat	191	1	192	0	0	**192**
LCCK Option	125	0	0	0	125	**125**
LPS-flex Option	111	9	0	120	0	**120**
CR-flex porous	3	45	48	0	0	**48**
LPS-flex	6	0	0	6	0	**6**
Other	9	5	1	13	0	**14**
Unknown	9	4	0	0	0	**13**

Product: PROFIX (35)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
CR non-porous cemented	597	3	600	0	0	**600**
CR porous uncemented	98	458	556	0	0	**556**
Other	6	0	6	0	0	**6**
Unknown	5	1	0	0	0	**7**

Product: LCS Complete (48)

Product Category	Cemented *	Uncemented *	Stabilization MS	PS	CCK	Total
Cemented	2 864	0	0	0	0	**2 866**
Uncemented	51	492	0	0	0	**543**
Revision	5	0	0	0	0	**5**
Unknown	4	0	0	4	0	**4**

Product: PFC-Sigma (49)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	2 044	1	2048	0	0	**2 048**
CR uncemented	7	1 304	1311	0	0	**1 311**
Other	5	0	0	4	0	**5**
Unknown	4	0	0	0	0	**4**

Product: Triathlon (58)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR cemented	1 410	3	1416	0	0	**1 416**
Beaded CR uncemented	8	391	399	0	0	**399**
PS cemented	28	0	0	28	0	**28**
TS cemented	21	0	0	0	21	**21**
Unknown	8	0	0	0	0	**8**

Product: Legion (62)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR uncemented	12	1 684	1697	0	0	**1 697**
CR cemented	994	0	995	0	0	**995**
PS cemented	51	4	0	55	0	**55**
CR Oxinium cemented	16	0	16	0	0	**16**
PS Oxinium cemented	12	0	0	13	0	**13**
Other	6	1	0	4	3	**7**
Unknown	1	0	0	0	0	**1**

Product: Vanguard TM (67)

Product Category	Cemented*	Uncemented *	Stabilization MS	PS	CCK	Total
CR Anatomic interlok cemented	298	0	298	0	0	**298**
PS Anatomic interlok cemented	14	0	0	14	0	**14**
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	6 865	9	0	**6 874**
Precoat PMMA stemmed cemented	3 340	1	0	**3 342**
Trabecular metal uncemented	6	1 040	0	**1 046**
Precoat AP wedge stemmed	170	1	0	**171**
Unknown	21	0	0	**22**

Product: PROFIX (35)

Product Category	Cemented *	Uncemented *	All poly	Total
Non porous cemented	980	3	0	**983**
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	3 331	1	0	**3 333**
No keel MBT* uncemented	1	56	0	**57**
MBT* revision	19	0	0	**19**
Other	3	2	0	**5**
Unknown	5	0	0	**5**

* MBT = Mobile bearing tray

Product: PFC-Sigma (49)

Product Category	Cemented *	Uncemented *	All poly	Total
With keel MBT* cemented	2 183	4	0	**2 188**
With keel MBT* uncemented	12	1 123	0	**1 135**
MBT* revision	10	8	0	**18**
No keel MBT* cemented	14	3	0	**17**
Unknown	8	1	0	**9**

* MBT = Mobile bearing tray

Product: Triathlon (58)

Product Category	Cemented *	Uncemented *	All poly	Total
Cemented	1 546	2	0	**1 548**
PA uncemented	5	266	0	**271**
Universal cemented	46	0	0	**46**
Unknown	6	1	0	**7**

Product: Legion (62)

Product Category	Cemented *	Uncemented *	All poly	Total
Male tapered cemented	2 766	5	0	**2 771**
All poly CR	8	0	8	**8**
Unknown	6	0	0	**6**

Product: Vanguard TM (67)

Product Category	Cemented *	Uncemented *	All poly	Total
Highly polished modular PCR	297	0	0	**297**
Interlok Monobloc PCR cemented	14	0	0	**14**
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	PS	CCK	Total
CR-Flex	0	0	9219	0	0	**9 219**
CR-Prolong	0	1 089	1089	0	0	**1 089**
LPS-FlexFixed	0	0	0	E+03	0	**1 008**
LCCK	0	0	0	0	88	**88**
CR	0	0	10	0	0	**10**
LPS-flex	0	7	0	7	0	**7**
Unknown	0	0	0	0	0	**34**

Product: PROFIX (35)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Conforming PCR	0	0	1019	0	0	**1 019**
Conforming+	0	0	141	0	0	**141**
Unknown	0	0	8	0	0	**8**

Product: LCS Complete (48)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Rotating platform RP	3 412	0	3412	0	0	**3 412**
Unknown	6	0	0	6	0	**6**

Product: PFC-Sigma (49)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Rotating platform RP-CV	3 352	0	3352	0	0	**3 352**
Other	6	0	1	0	2	**7**
Unknown	0	0	0	0	0	**8**

Product: Triathlon (58)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR-X3 HXLPE	0	1 475	1475	0	0	**1 475**
CS-X3 HXLPE	0	331	331	0	0	**331**
TS-X3 HXLPE	0	19	0	0	19	**19**
PS	0	0	0	17	0	**17**
PS-X3 HXLPE	0	15	0	15	0	**15**
CR	0	0	9	0	0	**9**
Unknown	0	0	0	0	0	**6**

Product: Legion (62)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
CR standard	0	0	1511	0	0	**1 511**
Dished	0	0	1184	0	0	**1 184**
PS high flex	0	51	0	51	0	**51**
PS	0	0	0	16	0	**16**
CR-highflex HXLPE	0	6	6	0	0	**6**
Other	0	1	1	0	4	**5**
Unknown	0	0	0	0	0	**3**

Product: Vanguard TM (67)

Product Category	Rotating platform	HXLPE	Stabilization MS	PS	CCK	Total
Arcom CR	0	0	287	0	0	**287**
Arcom PS	0	0	0	13	0	**13**
Other	0	0	0	1	0	**1**
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	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Profix	8609	1217	1155	1170	1389	1041	131		1	1	**14714**
NexGen	1147	207	251	221	656	1603	2423	2689	2700	2594	**14491**
LCS Complete	3847	1376	1420	1491	1488	802	712	675	618	614	**13043**
LCS	4819										**4819**
PFC-Sigma	1			3	1	453	707	729	754	733	**3381**
Genesis I	3293										**3293**
AGC Universal	2550	104	144	148	155	27					**3128**
Legion					3	136	673	752	774	759	**3097**
Triathlon	99	179	164	287	329	245	229	297	507	605	**2941**
Duracon	1278	508	470	396	101						**2753**
AGC Anatomic	1180	237	146	99	69						**1731**
Tricon -C with Pro-Fit	1085										**1085**
Vanguard TM	4	66	144	199	149	147	65	65	42	2	**883**
E-motion	412	46	10								**468**
Kinemax	411										**411**
Tricon M	337										**337**
Advance	94	38	29	44	43	51	12				**311**
Attune									44	122	**166**
Journey II BCS							7	70	56	31	**164**
NexGen Rotating Hinge	11	3	10	16	10	4	19	29	25	29	**156**
Scorpio	104	7	12	2	2						**127**
Interax I.S.A.	106										**106**
Persona									12	78	**90**
Evolution Medial-Pivot								10	19	26	**55**
AGC Dual	43										**43**
Search	40										**40**
GMK Sphere									18	16	**34**
Kotz	33										**33**
RT-Plus Modular	1		4	1	6	4					**16**
Other (n<15)	45	4	4	3	6	2	3	4	7	5	**83**
Total	**29549**	**3992**	**3963**	**4080**	**4407**	**4515**	**4981**	**5320**	**5577**	**5615**	**71999**

Table 8: Femoral prostheses in revisions

Prosthesis	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
NexGen	115	34	29	42	60	107	102	122	107	124	**842**
Profix	446	48	54	47	40	43	6				**684**
LCS Complete	166	71	61	60	57	42	31	16	23	25	**552**
NexGen Rotating Hinge	28	12	9	12	17	18	47	53	53	38	**287**
Genesis I	211										**211**
Triathlon		1	10	17	29	34	24	23	18	31	**187**
LCS	181										**181**
Legion	1	8	7		1	6	26	41	38	50	**178**
PFC-Sigma						12	21	24	30	19	**106**
Scorpio	27	19	25	16	7						**94**
AGC	72	1	3	2	4	1					**83**
Duracon	45	17	5	5	4						**76**
Vanguard TM	1	17	23	21	3	2					**67**
AGC Dual	62										**62**
S-ROM Rotat. Hinge	3	2		7	2	1	4	1	4	8	**32**
Dual Articular 2000	30										**30**
Legion Hinge Knee							1	7	8	9	**25**
RT-Plus Modular		3	1	1	9	9	1				**24**
Tricon -C with Pro-Fit	20										**20**
Kinemax	16										**16**
E-motion	10	5	1								**16**
Other (n<15)	65	7	3	7	7	2	2		6	10	**109**
Total	**1499**	**245**	**231**	**237**	**240**	**277**	**265**	**287**	**287**	**314**	**3882**

Table 9: Tibial prostheses in primary operations

Prosthesis	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Profix	8603	1217	1155	1170	1389	1041	131		1		**14707**
NexGen	1147	207	251	221	656	1603	2423	2689	2700	2594	**14491**
LCS Complete	3799	1376	1419	1491	1488	802	712	675	619	616	**12997**
AGC	3746	342	290	248	224	27					**4877**
LCS	4497										**4497**
PFC-Sigma	1			3	1	453	707	730	753	733	**3381**
Genesis I	3293										**3293**
Legion					3	136	673	752	774	760	**3098**
Triathlon	99	179	164	287	329	245	229	297	507	605	**2941**
Duracon	1278	508	470	396	101						**2753**
Tricon II	1417										**1417**
Vanguard TM	4	66	144	199	148	146	65	65	42	2	**881**
E-motion	412	46	10								**468**
Kinemax	411										**411**
LCS Universal	373										**373**
Advance	94	38	29	44	43	51	12				**311**
Attune									44	122	**166**
Journey II BCS							7	70	56	31	**164**
NexGen Rotating Hinge	11	3	10	16	10	4	19	29	25	29	**156**
Scorpio	104	7	12	2	2						**127**
Interax I.S.A.	106										**106**
Persona									12	78	**90**
Evolution Medial-Pivot								10	19	26	**55**
Search	40										**40**
GMK Sphere									18	16	**34**
Kotz	33										**33**
AGC Dual	27										**27**
RT-Plus Modular	1		4	1	6	4					**16**
Other (n<15)	44	3	4	1	7	3	3	3	7	3	**78**
Total	**29540**	**3992**	**3962**	**4079**	**4407**	**4515**	**4981**	**5320**	**5577**	**5615**	**71988**

Table 10a Tibial prostheses in revisions

Prosthesis	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
NexGen	115	33	30	42	61	111	109	124	115	125	**865**
LCS Complete	216	94	73	81	68	55	46	25	25	33	**716**
Profix	451	47	53	45	45	44	7	1	1	1	**695**
NexGen Rotating Hinge	28	12	8	12	16	18	47	51	51	38	**281**
Genesis I	258			1							**259**
LCS	236										**236**
Triathlon		1	10	18	31	35	24	24	21	31	**195**
Legion	1	8	7		1	6	26	40	38	47	**174**
Duracon	53	21	12	14	11	7					**118**
PFC-Sigma						12	20	24	33	28	**117**
Scorpio	27	19	26	17	8			1			**98**
AGC	74	1	4	2	4						**85**
Tricon II	71										**71**
Vanguard TM		17	22	21	4	3					**67**
AGC Dual	59										**59**
Dual Articular 2000	29										**29**
Legion Hinge Knee							1	7	8	9	**25**
RT-Plus Modular		3	1	1	9	9	1				**24**
Maxim	21		1								**22**
E-motion	10	6	1		1						**18**
Kinemax	17										**17**
Other (n<15)	37	5	3	6	11	3	4		8	11	**88**
Total	**1703**	**267**	**251**	**260**	**270**	**303**	**285**	**297**	**300**	**323**	**4259**

Table 10b: Material in Foring Tibia Insert for total prostheses in primary operations

Prosthesis	Material	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Attune	HXLPE									43	122	**165**
Dual Articular 2000	Uhmwpe	4										**4**
Duracon	Uhmwpe	1269	504	470	396	101						**2740**
E-motion	Uhmwpe	411	46	10								**467**
Freemann/Samuelson	Uhmwpe	2										**2**
Genesis I	Uhmwpe	3278										**3278**
GMK Sphere	Uhmwpe									17	16	**33**
INTERAX I.S.A.	Uhmwpe	103										**103**
Journey II BCS	HXLPE							7	70	56	31	**164**
Kinemax	Uhmwpe	409										**409**
LCS	Uhmwpe	4469										**4469**
LCS Complete	Uhmwpe	3789	1371	1417	1490	1488	802	712	675	618	614	**12976**
Legion	HXLPE						7	12	29	17	43	**108**
MAXIM	Uhmwpe	5										**5**
MG II	Uhmwpe	1										**1**
Mutars	Uhmwpe	2	2	3	1	1	1	1				**11**
NexGen	HXLPE			18	5	9	54	119	150	292	484	**1131**
NexGen	Uhmwpe	1135	207	233	216	647	1547	2296	2532	2397	2104	**13314**
NexGen Rotating Hinge	Uhmwpe	11	3	10	16	10	4	19	29	24	29	**155**
Persona	Uhmwpe									12	78	**90**
PFC-Sigma	Uhmwpe	1			3		453	707	729	753	733	**3379**
PROFIX	Uhmwpe	8587	1211	1150	1166	1385	1041	131		1		**14672**
RT-Plus Modular	Uhmwpe	1		4	1	6	4					**16**
Scan Knee	Uhmwpe	8										**8**
Scorpio	HXLPE	8	6	1	1	2						**18**
Scorpio	Uhmwpe	96	1	11	1							**109**
Search	Uhmwpe	40										**40**
S-ROM Rotating Hinge	Uhmwpe				1				1		2	**4**
Triathlon	HXLPE	66	164	126	209	284	240	220	293	496	599	**2697**
Triathlon	Uhmwpe	33	13	37	78	45	4	7	3	9	6	**235**
Vanguard 360 Revision	Uhmwpe					2						**2**
Vanguard TM	Uhmwpe	2	4	51	80	99	135	62	65	42	2	**542**
Total		**23730**	**3532**	**3541**	**3664**	**4079**	**4292**	**4293**	**4576**	**4777**	**4863**	**61347**

Table 10c: Material in Foring Tibia Insert for unicondylar knee prostheses in primary operations

Prosthesis	Material	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Genesis Uni	Uhmwpe	230										**230**
MILLER-GALANTE UNI(unicondylær)	Uhmwpe	3										**3**
Oxford Partial Knee	Uhmwpe				1	104	206	373	520	632	555	**2391**
OXFORD UNI (III)	Uhmwpe	2952	442	400	412	335	232	205	192	202	290	**5662**
OXFORD UNI II	Uhmwpe	46										**46**
Preservation Uni	Uhmwpe	66	3									**69**
Sigma High Performance Uni	HXLPE				8	6	11	6	9	3	1	**44**
Thriathlon PKR - UNI	HXLPE						3					**3**
Total		**3297**	**445**	**400**	**421**	**445**	**452**	**584**	**721**	**837**	**846**	**8448**

Unicondylar knee prostheses

Table 11: Femoral prostheses in primary operations

Prosthesis	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Oxford UNI (III)	2959	444	400	412	334	233	204	197	204	300	**5687**
Oxford Partial Knee				1	105	205	374	515	631	549	**2380**
Genesis UNI	345	1									**346**
Miller-Galante UNI	292	4									**296**
MOD III uni	200										**200**
Preservation Uni	148	7	11								**166**
LINK Schlitten UNI	9			3	14	21	15	17	17	14	**110**
Duracon uni	50										**50**
Journey Uni				7	14	3	3	12	7	2	**48**
Oxford UNI II	45										**45**
Sigma High Performance Uni				8	6	11	6	9	3	1	**44**
ZUK (Unicondylar)	9	7	3	8	1						**28**
Other (n<15)	1					3	1		1		**6**
Total	**4058**	**463**	**414**	**439**	**474**	**476**	**603**	**750**	**863**	**866**	**9406**

Table 12: Tibial prostheses in primary operations

Prosthesis	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Oxford UNI (III)	2957	444	400	412	334	232	205	193	207	306	**5690**
Oxford Partial Knee				1	105	206	373	519	628	543	**2375**
Genesis UNI	345	1									**346**
Miller-Galante UNI	289	4									**293**
MOD III uni	201										**201**
Preservation Uni	148	7	11								**166**
LINK Schlitten UNI	9			3	14	21	15	17	17	14	**110**
Duracon uni	50										**50**
Journey Uni				7	14	3	3	12	7	2	**48**
Oxford UNI II	46										**46**
Sigma High Performance Uni				8	6	11	6	9	3	1	**44**
ZUK (Unicondylar)	9	7	3	8	1						**28**
Other (n<15)	1					3			1		**5**
Total	**4055**	**463**	**414**	**439**	**474**	**476**	**602**	**750**	**863**	**866**	**9402**

Patellofemoral prostheses

Table 13: Femoral prostheses in primary operations

Prosthesis	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
NexGen PFJ Gender	0	0	2	4	20	16	16	32	49	53	**192**
Journey PFJ	19	18	21	25	14	18	22	7	18	17	**179**
Patella Mod III / II	33	0	0	0	0	0	0	0	0	0	**33**
LCS PFJ	17	1	0	0	0	0	0	0	0	0	**18**
Legion	0	0	0	0	0	0	0	0	0	9	**9**
Other (n<5)	8	0	0	0	0	4	0	0	0	0	**12**
Total	**77**	**19**	**23**	**29**	**34**	**38**	**38**	**39**	**67**	**79**	**443**

Table 14: Patella prostheses in primary operations

Prosthesis	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
NexGen PFJ Gender			2	4	20	16	16	31	48	53	**190**
Journey PFJ	17	18	21	25	14	18	22	7	18	26	**186**
Patella Mod III / II	33										**33**
LCS PFJ	17										**17**
Other (n<5)	8	1				4		1	1		**15**
Total	**75**	**19**	**23**	**29**	**34**	**38**	**38**	**39**	**67**	**79**	**441**

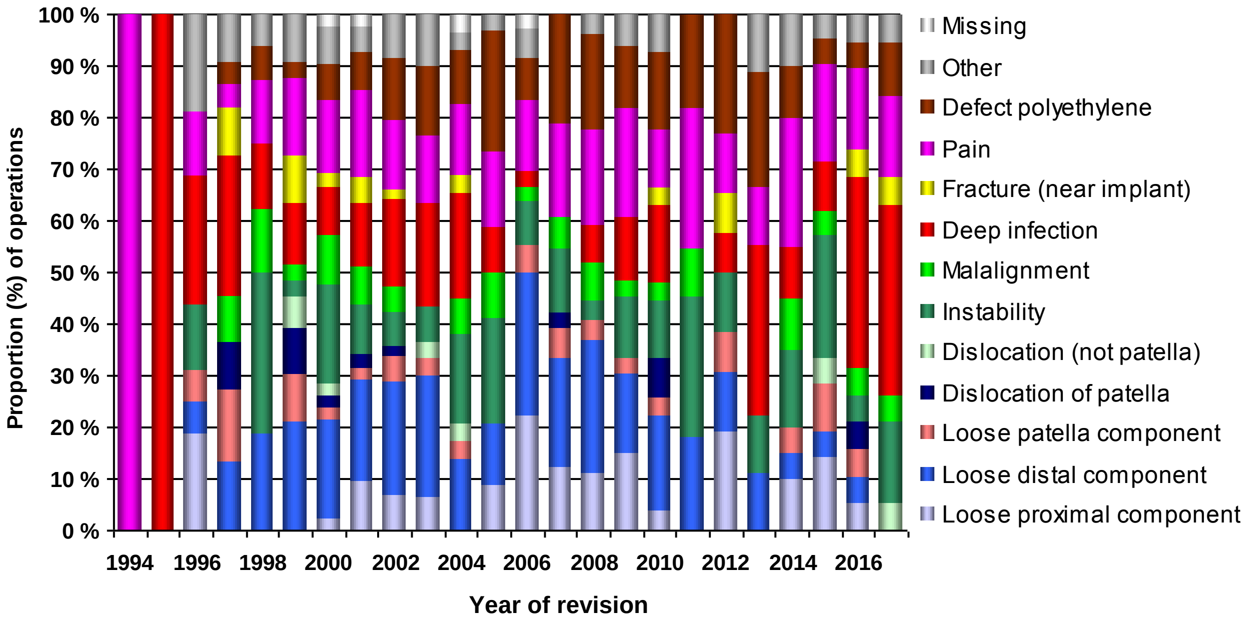
Reasons for revisions

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
2017	0	0	0	0	1	3	1	7	1	3	2	1	0
2016	1	1	1	1	0	1	1	7	1	3	1	1	0
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	3	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	3	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	**49**	**101**	**27**	**12**	**7**	**72**	**33**	**85**	**15**	**93**	**70**	**37**	**4**

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

Figure 16: Reasons for revisions of total knee prostheses with patella



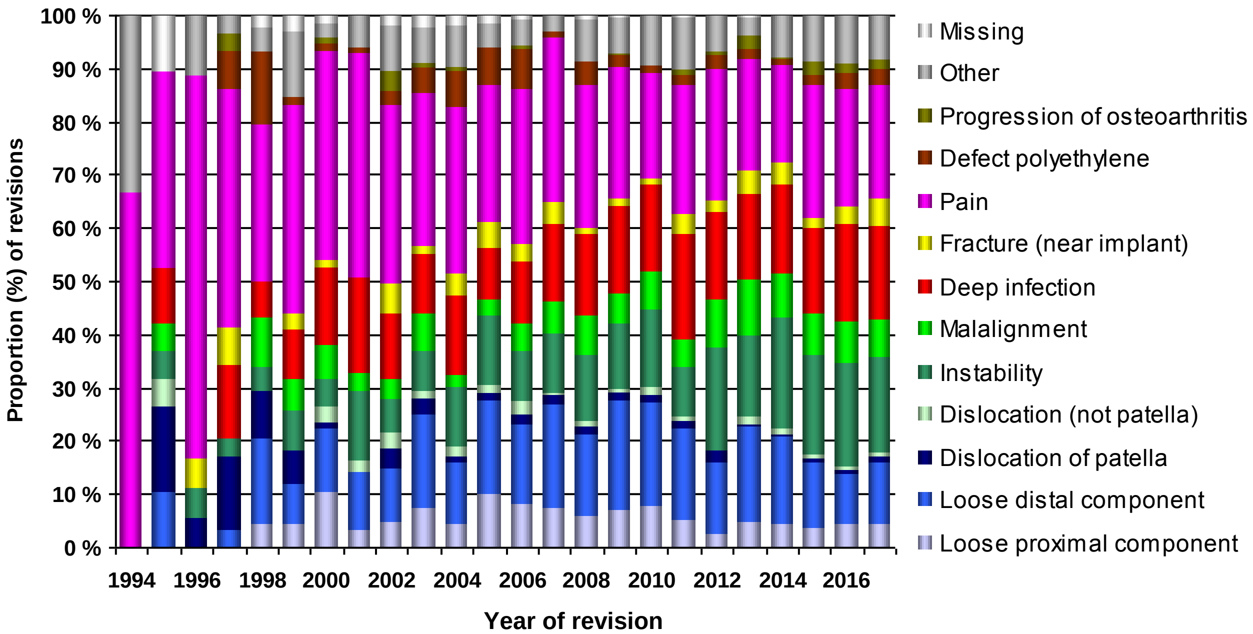
Reasons for revisions

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)	Fracture osteosynthesis	Pain	Defect polyethylene	Progression of osteoarthritis	Other
2017	20	49	6	3	78	30	77	19	4	92	13	8	36
2016	19	39	3	3	81	33	77	9	5	92	13	8	37
2015	15	47	3	3	73	30	63	7		97	8	10	33
2014	16	60	2	4	75	31	61	14		67	4	2	28
2013	15	58	1	5	49	34	51	14		68	6	8	11
2012	8	42	7	0	60	28	51	7		77	8	2	21
2011	16	54	5	3	29	17	62	12		76	6	3	31
2010	21	51	4	4	38	19	43	3		52	4		25
2009	20	60	4	2	36	16	47	5		71	6	1	20
2008	15	39	4	3	32	19	39	3		69	11		20
2007	13	33	3	1	19	10	25	7		53	2		5
2006	14	26	3	5	16	9	20	6		50	13	1	9
2005	13	23	2	2	17	4	13	6		34	9		6
2004	7	19	2	3	18	4	24	7		51	11	1	13
2003	10	23	4	2	10	9	15	2		38	6	1	9
2002	5	11	4	3	7	4	13	6		36	3	4	9
2001	3	9	0	2	11	3	15	0		36	1		5
2000	8	9	1	2	4	5	11	1		30	1	1	2
1999	3	5	4	0	5	4	6	2		26	1		8
1998	2	7	4	0	2	4	3	0		13	6		2
1997	0	1	4	0	1	0	4	2		13	2	1	1
1996	0	0	1	0	1	0	0	1		13	0		2
1995	0	2	3	1	1	1	2	0		7	0		0
1994	0	0	0	0	0	0	0	0		2	0		1
Total	**243**	**667**	**74**	**51**	**663**	**314**	**722**	**133**	**9**	**1 163**	**134**	**51**	**334**

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

Figure 17: Reasons for revisions of total knee prostheses without patella



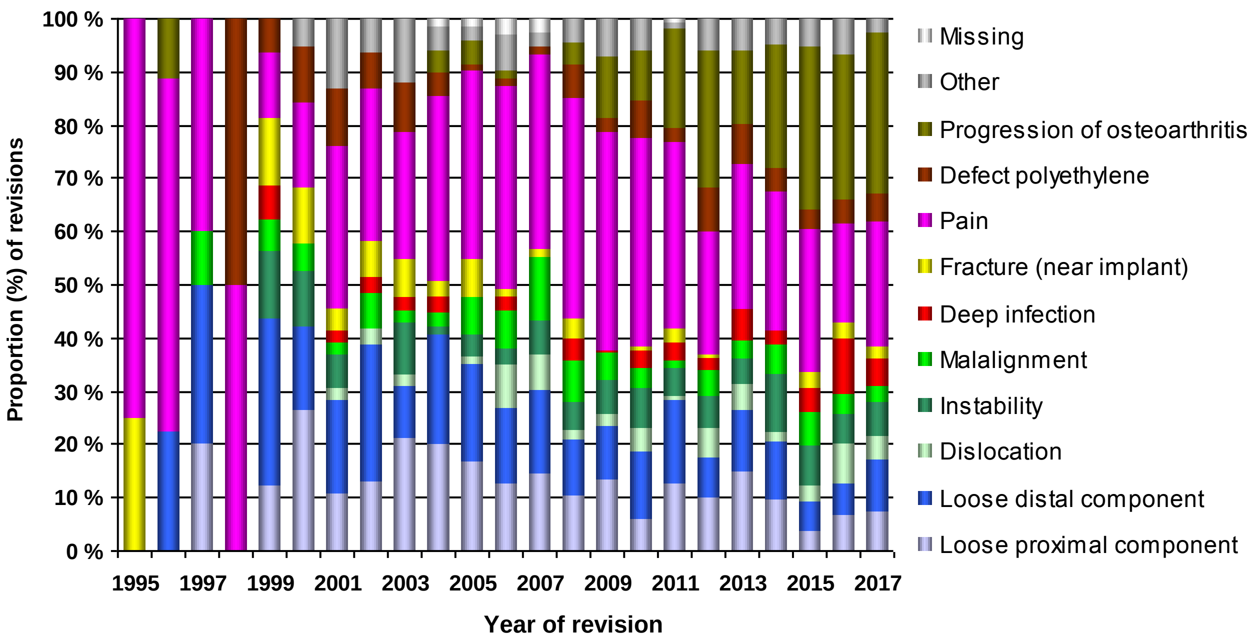
Reasons for revisions

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
2017	12	15	7	10	5	8	4	37	8	48	4	0
2016	9	8	10	7	5	14	4	25	6	36	9	0
2015	5	8	4	10	9	6	4	37	5	42	7	0
2014	14	15	3	15	8	4	0	37	6	33	7	0
2013	18	14	6	6	4	7	0	33	9	17	7	0
2012	13	10	7	8	6	3	1	30	11	33	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		6	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	**197**	**211**	**63**	**108**	**87**	**64**	**42**	**548**	**89**	**271**	**91**	**7**

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

Figure 18: Reasons for revisions of unicondylar knee prostheses

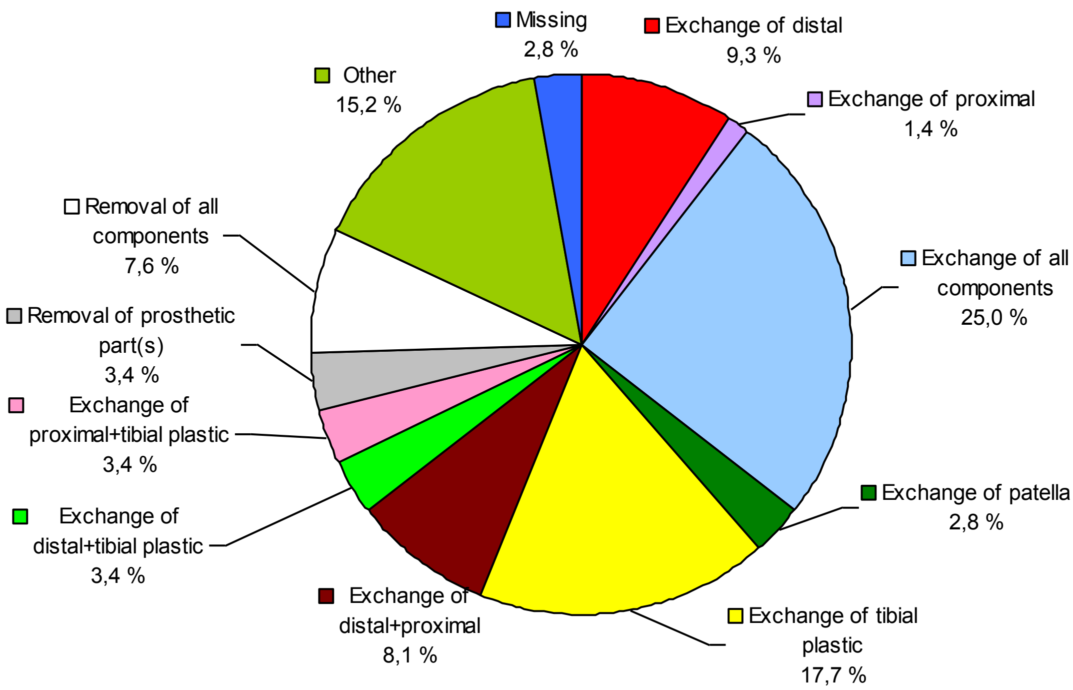


Type of revision

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	Removal of whole prosthesis	Removal of prosthetic part(s)	Other	Missing	Total
2017						3		1				1	**5**
2016						6					1		**7**
2015					2	1					1		**4**
2014		1				3						1	**5**
2013						1						1	**2**
2012		1	1	1		1							**4**
2011						3							**3**
2010				1		1					1		**3**
2009						3		1			2		**7**
2008				1		1		1	1				**4**
2007				1		2				1			**4**
2006		1			1			1					**3**
2005		1		1					1		1	1	**5**
2004		1		2		3		1		1	1		**9**
2003	1	1		6		2			1		2		**13**
2002	4		1	3	1	2			1		2		**14**
2001	6			3	1	2	2		3	1	1		**19**
2000	3		4	6		4		1	3	1	2		**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	8	2	**40**
1995	1		7	14		6	2	1	4		9		**44**
1994	1	1	2	16	2	2	1			1	6	1	**33**
Total	**33**	**12**	**29**	**89**	**10**	**63**	**5**	**12**	**27**	**12**	**54**	**10**	**357**

Figure 19: Total knee prostheses with patella

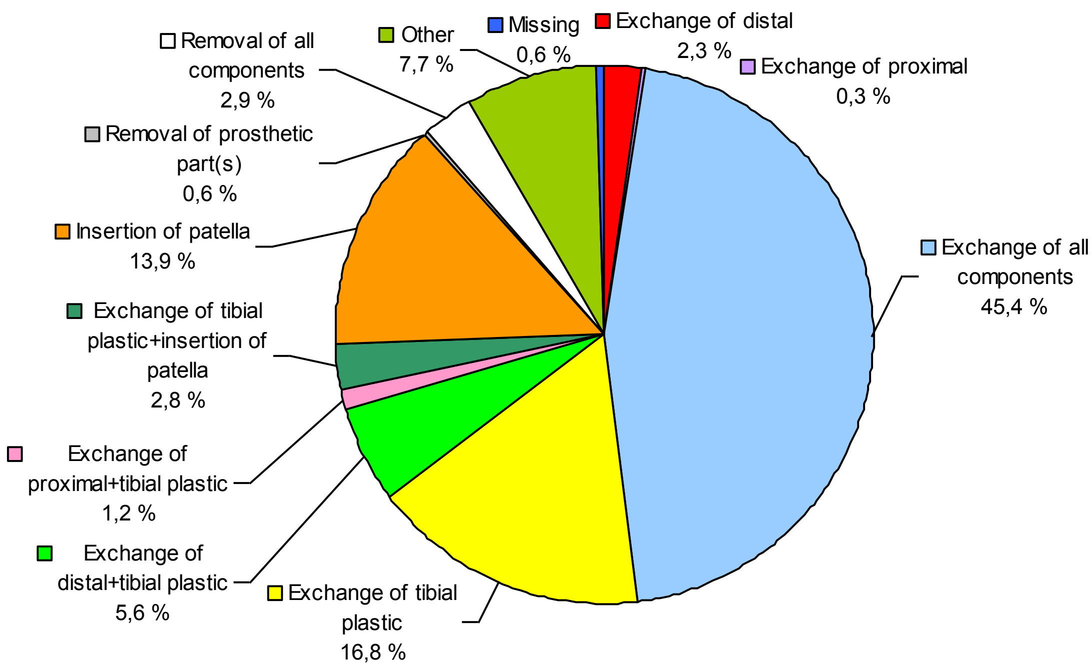


Type of revision

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
2017		4	6		41		2				6		**59**
2016		7	44	5	48		2	1		4	22		**133**
2015		7	51	8	49		3			21	27		**166**
2014		13	74	16	45		1	6		18	14		**187**
2013	1	10	113	7	43		4	1		20	17		**216**
2012	1	20	140	9	47			5	1	17	16	1	**257**
2011	1	23	160	9	53		2	8		26	21	1	**305**
2010	1	23	147	4	45	1	2	5	2	34	15		**279**
2009	4	20	146	1	50		6	9	1	26	19		**282**
2008	1	19	110	9	46	1	2	9	2	23	14	1	**237**
2007	1	13	124	6	31	1	2	6	1	21	14		**220**
2006	5	11	88	3	15	1	2	9	1	25	15	1	**176**
2005	6	11	69	2	15		2	6		26	19		**156**
2004	9	11	68	3	26		5	9		23	10	2	**166**
2003	5	7	78	1	28		2	12		29	13	1	**176**
2002	9	11	62	7	22		2	5	1	26	7	1	**153**
2001	14	4	54	8	12	1	4	6	1	41	7	2	**154**
2000	5	3	68	2	15	1	1	1	4	24	11		**135**
1999	10	4	45	4	14	2	1	5	1	32	7	3	**128**
1998	8	1	18	2	9			5	1	24	5	4	**77**
1997	3	1	40	1	5	1		1	2	25	7	1	**87**
1996	5	2	32	3	6			4	3	20	9	2	**86**
1995			38		5	1		1		24	4	1	**74**
1994	3		42		3		1	3	1	25	10	3	**91**
Total	**92**	**225**	**1817**	**110**	**673**	**10**	**46**	**117**	**22**	**554**	**309**	**24**	**4000**

Figure 20: Total knee prostheses without patella

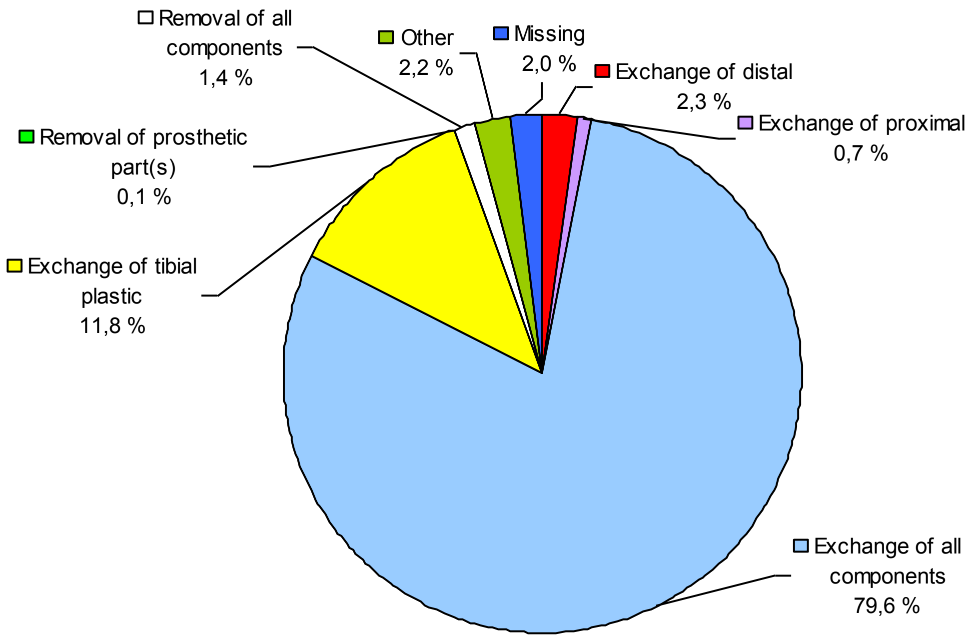


Type of revision

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
2017		2	6						**8**
2016		6	11						**17**
2015	1	19	8						**28**
2014	2	17	4		1		2		**26**
2013		17	9		1				**27**
2012	2	27	10		1				**40**
2011	1	31	7				2	1	**42**
2010		46	11				1		**58**
2009		51	11		1		1		**64**
2008	1	64	8		2				**75**
2007		84	7	1	2		4	2	**100**
2006	1	74	7	1	1		3	2	**89**
2005	2	80	11				1	4	**98**
2004		95	7		2			2	**106**
2003	4	105	7	1			7	6	**130**
2002		38	6	2	2	1			**49**
2001	7	41	7		2		2	1	**60**
2000	1	55	5		1		1	1	**64**
1999	2	21		1				3	**27**
1998	2	16		1			1		**20**
1997		14		1					**15**
1996		9			1			1	**11**
1995	1	22							**23**
1994		21					1	1	**23**
Total	**27**	**955**	**142**	**8**	**17**	**1**	**26**	**24**	**1200**

Figure 21: 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
2017	667	4 396	1 273	13		211	**6 560**
2016	707	4 386	1 236	12		168	**6 509**
2015	680	4 147	1 189	7		87	**6 110**
2014	581	3 901	1 058	8		74	**5 622**
2013	550	3 513	894	5	1	69	**5 032**
2012	667	3 276	902	8		64	**4 917**
2011	582	3 022	873	6		65	**4 548**
2010	661	2 845	797	7		90	**4 400**
2009	832	2 745	794	8		95	**4 474**
2008	787	2 355	765	8	1	80	**3 996**
2007	747	2 060	709			72	**3 588**
2006	769	1 718	541	10	1	70	**3 109**
2005	913	1 567	559	2		214	**3 255**

Table 22: Revisions

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2017	50	353	190	5	1	29	**628**
2016	27	357	184	2		33	**603**
2015	35	314	180	7		19	**555**
2014	50	296	137	2		13	**498**
2013	45	292	133			12	**482**
2012	52	287	136	3		15	**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 22: Primary operations

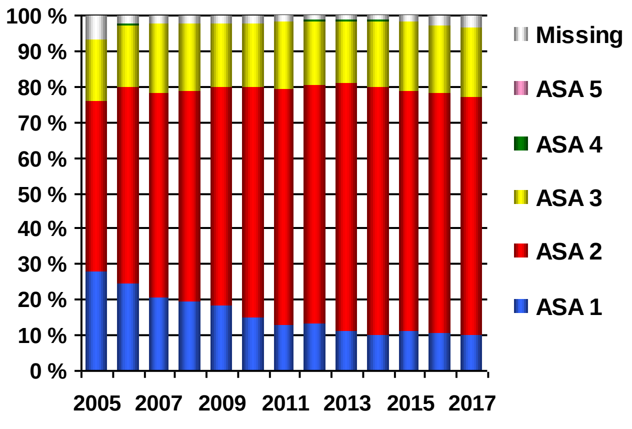
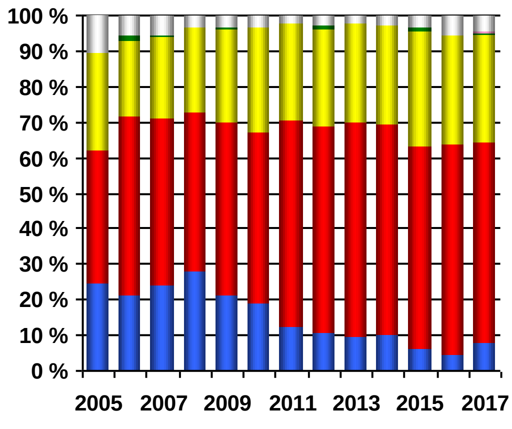


Figure 23: Revisions



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
2017	778	4 876	825	51	30	**6 560**
2016	844	4 790	787	59	29	**6 509**
2015	924	4 296	816	29	45	**6 110**
2014	798	4 008	763	25	28	**5 622**
2013	902	3 349	716	10	55	**5 032**
2012	1 132	2 879	871	7	28	**4 917**
2011	1 270	2 289	952	8	29	**4 548**
2010	1 412	2 408	533	8	39	**4 400**
2009	1 610	2 388	425	10	41	**4 474**
2008	1 652	1 829	464	13	38	**3 996**
2007	1 876	1 259	416	5	32	**3 588**
2006	1 802	675	578	14	40	**3 109**
2005	2 022	388	702	8	135	**3 255**

Table 24: Revisions

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2017	84	457	75	7	5	**628**
2016	97	425	72	7	2	**603**
2015	64	407	68	11	5	**555**
2014	69	350	67	7	5	**498**
2013	77	317	77	6	5	**482**
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 24: Primary operations

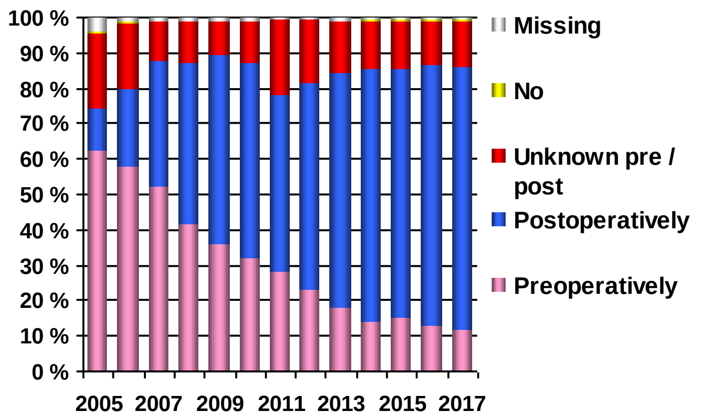
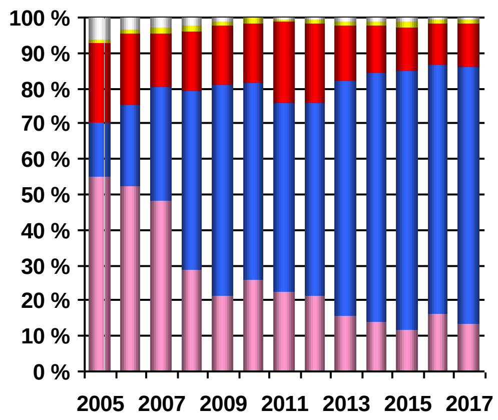


Figure 25: Revisions



Registration of thrombosis prophylaxis started in 2005

Thrombosis prophylaxis

Table 25: Drugs - All operations

Drugs	2005-07	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)	0,1%	0,0%			0,0%	0,0%		0,3%	0,4%	0,6%	0,9%
Apixiban (Eliquis)							1,2%	1,1%	0,9%	1,0%	1,1%
Dalteparin (Fragmin)	52,1%	57,3%	52,6%	62,4%	64,4%	59,2%	54,2%	50,4%	56,3%	56,5%	60,6%
Enoksaparin (Klexane)	41,6%	38,1%	43,4%	32,8%	28,2%	29,3%	30,0%	32,2%	26,7%	24,4%	20,2%
Rivaroksaban (Xarelto)				0,1%	2,2%	2,6%	2,4%	1,8%	1,4%	1,1%	1,1%
Ximelagatran (Exanta, Malagatran)	1,2%										
No drugs	0,4%	0,5%	0,3%	0,3%	0,2%	0,2%	0,3%	0,5%	0,6%	0,9%	0,8%
Clinical study	0,4%	1,1%									
Combination of 2 drugs	1,4%	1,1%	2,1%	3,1%	3,5%	7,2%	10,0%	12,2%	12,2%	14,1%	13,9%
Other	0,4%	0,3%	0,1%	0,1%	0,0%	0,2%	0,2%	0,2%	0,1%	0,0%	0,1%
Missing	2,6%	1,5%	1,4%	1,1%	1,4%	1,2%	1,6%	1,2%	1,5%	1,2%	1,3%

Figure 26: Drugs

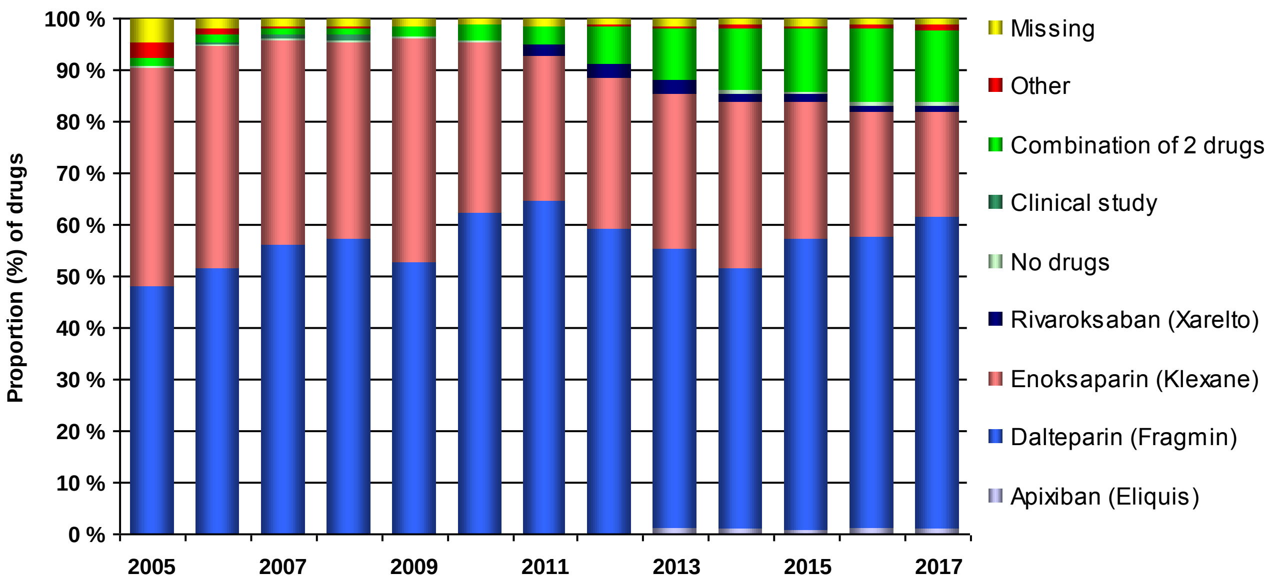


Table 26: Duration - All operations

Year	Days: 1-7	8-14	15-21	22-28	29-35	>35	No drugs	Missing	Total
2017	1 178	3 197	501	281	773	13	58	1 187	**7 188**
2016	1 176	3 159	551	314	718	38	66	1 090	**7 112**
2015	1 011	2 388	977	326	866	143	40	914	**6 665**
2014	956	1 797	1 024	370	1 065	153	32	723	**6 120**
2013	723	1 595	1 005	398	1 002	120	16	655	**5 514**
2012	583	1 633	1 206	335	890	96	13	654	**5 410**
2011	289	1 345	1 380	403	799	101	10	652	**4 979**
2010	348	1 348	1 321	239	779	52	14	710	**4 811**
2009	398	1 589	1 168	228	762	8	14	745	**4 912**
2008	425	1 456	828	172	754	31	20	677	**4 363**
2007	488	1 178	797	119	743	8	9	547	**3 889**
2006	441	1 040	576	113	544	9	17	636	**3 376**
2005	547	1 060	622	111	530	69	12	555	**3 506**

Registration of thrombosis prophylaxis started in 2005

Fibrinolysis Inhibitor

Table 27: Drugs - Primary operations

Drugs	2010	2011	2012	2013	2014	2015	2016	2017	Total
Cyclokapron (Tranexamic acid)	2	1375	3490	3951	4710	5314	5750	5798	30390
Missing		74	145	92	114	72	63	84	644
Total	**2**	**1449**	**3635**	**4043**	**4824**	**5386**	**5813**	**5882**	**31034**

Registration of fibrinolysis inhibitor started in 2011

Perioperative complications

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

Type	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Fracture	66	12	10	17	11	10	8	12	12	10	168
Patella tendon rupture / Avulsion fractures / ligament rupture / tendon injury	53	14	1	13	12	10	21	17	15	6	162
Rupture / damage MCL (medial colateral ligament)	1	7	14	5	12	12	5	5	10	19	90
Technical problem with cement	19	6	6	10	5	6	5	4		1	62
Failure of instruments	23	3	4	3	5	3	7	1	1		50
Blood torniquet failing	29	1	4	5	4	3		1			47
Adm. failure (missing comp. etc.)	17	4		2	7	7	2		4	3	46
Problem due to difficult anatomy	10	2	5	3	6	3	5	5	3	2	44
Anesthesia problems	8		5	7	2	4	7	4	1	3	41
Violation of sterility routines	5	1	2	5	2	7	4	6	1		33
Other periop. compl.	106	24	22	20	26	26	30	34	26	22	336

Previous operation in relevant joint

Table 29: For primary total prostheses

Type	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Meniscus	2717	411	511	582	706	700	768	757	882	733	8767
Osteotomy	1595	123	121	110	116	110	134	119	137	111	2676
Arthroscopy (diagnostic)	667	71	112	106	111	97	183	205	194	166	1912
Osteosynthesis of intraarticular joint fracture	651	89	76	83	72	60	95	94	98	114	1432
Synovectomy	843	100	58	69	65	64	66	66	41	51	1423
Cruciate Ligament	307	56	57	70	101	105	105	125	188	119	1233
Artrodesis	21		1	1	2	2			2	1	30
Other previous op.	507	49	63	70	94	89	83	78	85	106	1224

Mini-invasive surgery

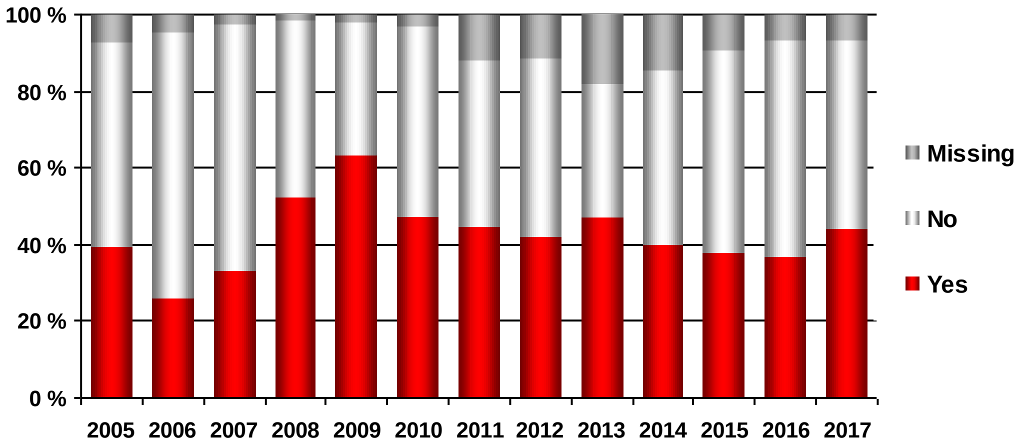
Table 30: Primary operations - Total knee prostheses

Year	Yes	No	Missing	Total
2017	9 (0%)	5 014 (90%)	560 (10%)	**5 583**
2016	10 (0%)	4 959 (89%)	576 (10%)	**5 545**
2015	5 (0%)	4 627 (88%)	655 (12%)	**5 287**
2014	2 (0%)	4 314 (87%)	645 (13%)	**4 961**
2013	10 (0%)	3 780 (84%)	716 (16%)	**4 506**
2012	16 (0%)	3 689 (84%)	685 (16%)	**4 390**
2011	15 (0%)	3 581 (88%)	465 (11%)	**4 061**
2010	21 (1%)	3 739 (95%)	185 (5%)	**3 945**
2009	25 (1%)	3 796 (95%)	165 (4%)	**3 986**
2008	15 (0%)	3 356 (95%)	155 (4%)	**3 526**
2007	22 (1%)	2 955 (95%)	129 (4%)	**3 106**
2006	3 (0%)	2 579 (96%)	115 (4%)	**2 697**
2005	5 (0%)	2 483 (89%)	300 (11%)	**2 788**

Table 31: Primary operations - Unicondylar knee prostheses

Year	Yes	No	Missing	Total
2017	381 (44%)	428 (49%)	57 (7%)	**866**
2016	318 (37%)	486 (56%)	59 (7%)	**863**
2015	283 (38%)	398 (53%)	69 (9%)	**750**
2014	240 (40%)	277 (46%)	86 (14%)	**603**
2013	224 (47%)	167 (35%)	86 (18%)	**477**
2012	199 (42%)	221 (47%)	54 (11%)	**474**
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 27: Primary operations - Unicondylar knee prostheses



Registration of MIS started in 2005

Computernavigation

Table 32: Primary operations - Total knee prostheses

Year	Yes		No		Missing		Total
2017	569	(10%)	4 500	(81%)	514	(9%)	**5 583**
2016	582	(10%)	4 410	(80%)	553	(10%)	**5 545**
2015	471	(9%)	4 167	(79%)	649	(12%)	**5 287**
2014	433	(9%)	3 882	(78%)	646	(13%)	**4 961**
2013	381	(8%)	3 402	(75%)	723	(16%)	**4 506**
2012	416	(9%)	3 292	(75%)	682	(16%)	**4 390**
2011	444	(11%)	3 170	(78%)	447	(11%)	**4 061**
2010	659	(17%)	3 101	(79%)	185	(5%)	**3 945**
2009	762	(19%)	3 064	(77%)	160	(4%)	**3 986**
2008	742	(21%)	2 640	(75%)	144	(4%)	**3 526**
2007	374	(12%)	2 613	(84%)	119	(4%)	**3 106**
2006	254	(9%)	2 334	(87%)	109	(4%)	**2 697**
2005	185	(7%)	2 331	(84%)	272	(10%)	**2 788**

Figure 28: Primary operations - Total knee prostheses

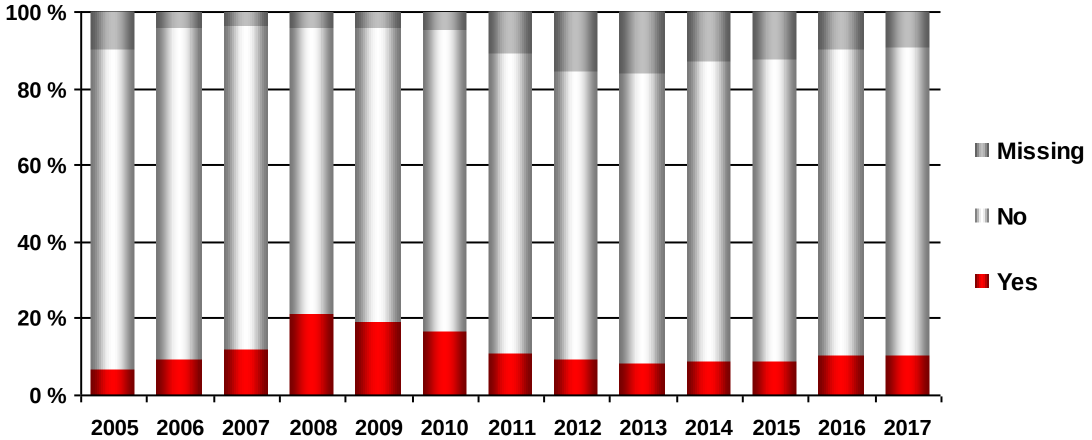


Table 33: Primary operations - Unicondylar knee prostheses

Year	Yes		No		Missing		Total
2017	0		808	(93%)	58	(7%)	**866**
2016	0		800	(93%)	63	(7%)	**863**
2015	3	(0%)	679	(91%)	68	(9%)	**750**
2014	0		516	(86%)	87	(14%)	**603**
2013	0		389	(82%)	88	(18%)	**477**
2012	0		418	(88%)	56	(12%)	**474**
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	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Palacos R + G	4093	1780	1659	1312	1271	1406	1444	1478	1428	996	**16867**
Palacos w/gentamicin	14676										**14676**
Optipac Refobacin Bonecement R	160	680	1098	1326	1315	1323	1728	2149	1833	1439	**13051**
Refobacin Bone Cement R	3109	533	366	409	397	349	353	158	551	882	**7107**
Cemex w/gentamycin	576	118	110	173	189	216	209	160	149	92	**1992**
Refobacin-Palacos	1577										**1577**
SmartMix Cemvac + SmartSet GHV Genta	67	7		21	188	183	269	291	274	246	**1546**
Simplex w/Tobramycin	426	170	78								**674**
Palacos	424										**424**
Palacos R+G pro								5	15	359	**379**
Cemex System Genta FAST	111	44	34	13							**202**
Simplex	184										**184**
CMW I w/gentamicin	169										**169**
CMW I	53										**53**
Other (n<50)	130	9		2	3	7	6	7	4	20	**188**
Missing information	46	8	8	15	4	2					**83**
Total	**25801**	**3349**	**3353**	**3271**	**3367**	**3486**	**4009**	**4248**	**4254**	**4034**	**59172**

Table 35: Primary operations - Tibia

Cement	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Palacos R + G	5334	2268	2184	1950	1949	2132	2184	2223	2248	1133	**23605**
Palacos w/gentamicin	17796										**17796**
Optipac Refobacin Bonecement R	181	728	1176	1416	1448	1472	1902	2317	1967	1508	**14115**
Refobacin Bone Cement R	3293	566	393	446	472	394	374	171	566	931	**7606**
Cemex w/gentamycin	699	118	112	181	190	214	222	165	150	91	**2142**
Refobacin-Palacos	1626										**1626**
SmartMix Cemvac + SmartSet GHV Genta	77	7		21	188	182	270	293	276	246	**1560**
Palacos R+G pro						1		5	40	1129	**1175**
Simplex w/Tobramycin	433	169	77								**679**
Palacos	452										**452**
Cemex System Genta FAST	170	61	38	13							**282**
CMW I w/gentamicin	193		1								**194**
Simplex	186										**186**
CMW I	54										**54**
Other (n<50)	145	12	1	3	5	9	6	12	5	29	**227**
Missing information	51	8	9	9	3	3	1	1			**85**
Total	**30690**	**3937**	**3991**	**4039**	**4255**	**4407**	**4959**	**5187**	**5252**	**5067**	**71784**

Cements used in unicondylar knee prostheses

Table 36: Primary operations - Femur

Cement	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Palacos R + G	599	244	232	220	255	288	387	426	364	167	**3182**
Palacos w/gentamicin	2201										**2201**
Optipac Refobacin Bonecement R	27	100	110	159	164	156	168	227	223	176	**1510**
Refobacin Bone Cement R	582	56	46	40	49	18	26	25	81	111	**1034**
Refobacin-Palacos	269										**269**
Simplex w/Tobramycin	165	36	14	4		2	2				**223**
Palacos R+G pro									6	110	**116**
Cemex w/gentamycin	60	3									**63**
Cemex System Genta FAST	33	22	7								**62**
SmartSet GHV	2			8	6	11	6	9	2	1	**45**
Simplex	40										**40**
Other (n<20)	65		3	7		2	3	2	1	2	**85**
Total	**4043**	**461**	**412**	**438**	**474**	**477**	**592**	**689**	**677**	**567**	**8830**

Table 37: Primary operations - Tibia

Cement	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Palacos R + G	605	247	236	221	255	287	391	425	366	168	**3201**
Palacos w/gentamicin	2199										**2199**
Optipac Refobacin Bonecement R	27	100	107	159	164	154	167	227	224	175	**1504**
Refobacin Bone Cement R	576	55	46	40	49	18	26	25	81	109	**1025**
Refobacin-Palacos	266										**266**
Simplex w/Tobramycin	157	36	14	4		2	2				**215**
Palacos R+G pro									6	108	**114**
Cemex w/gentamycin	60	3									**63**
Cemex System Genta FAST	32	22	7								**61**
SmartSet GHV	2			8	6	11	6	9	2	1	**45**
Simplex	39										**39**
Other (n<20)	60		3	7		2	3	2	1	2	**80**
Total	**4023**	**463**	**413**	**439**	**474**	**474**	**595**	**688**	**680**	**563**	**8812**

Antibiotic prophylaxis

Table 38: Primary operations

Drugs	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Cefalotin (Keflin)	26350	3700	3628	3732	3941	4184	4893	5226	5637	5629	**66920**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	3162	143	172	205	162	101	14		1		**3960**
Klindamycin (Dalacin, Clindamycin)	530	125	112	146	215	228	281	316	341	345	**2639**
Kloksacillin (Ekvacillin)	901	206	249	235	265	185	134	208	23	1	**2407**
Dikloksacillin (Diclocil, Dicillin)	1528	68	13	27	17	22	8	1	3	1	**1688**
Cefazolin (Cephazolin)	34	4			1		1			332	**372**
Imipenem (Tienam)	51										**51**
Cefaleksin (Keflex, Cefalexin)	19				1		1				**21**
Benzylpenicillin (Penicillin G)	18					1	1				**20**
Erytromycin (Ery-max, Abboticin)	16					1					**17**
Vankomycin (Vancomycin, Vancocin)	2	1		2		1		1		3	**10**
Ciprofloksasin (Ciproxin)	6	1			1				2		**10**
Combination of 2 drugs	893	182	175	157	271	273	230	305	460	223	**3169**
Other (n<10)	21			1	1	1	2	3	6	3	**38**
Missing	158	44	51	43	42	35	57	50	36	23	**539**
Total	**33689**	**4474**	**4400**	**4548**	**4917**	**5032**	**5622**	**6110**	**6509**	**6560**	**81861**

Table 39: Revisions

Drugs	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Cefalotin (Keflin)	1916	281	275	271	291	300	290	322	356	354	**4656**
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	287	10	8	6	12	2	1	1	1		**328**
Klindamycin (Dalacin, Clindamycin)	111	26	12	17	27	23	27	25	27	27	**322**
Dikloksacillin (Diclocil, Dicillin)	180	4	3	8	12	8	3	6	5	4	**233**
Kloksacillin (Ekvacillin)	82	3	6	19	9	18	21	19	15	9	**201**
Vankomycin (Vancomycin, Vancocin)	45	14	16	11	13	21	19	8	14	10	**171**
Benzylpenicillin (Penicillin G)	17	6	5	2		4	2	4	4	7	**51**
Cefazolin (Cephazolin)		1								25	**26**
Ampicillin (Pentrexyl, Pondocillin, Doktacilin)	10			2		1				1	**14**
Ciprofloksasin (Ciproxin)	8						1		1	1	**11**
Combination of 2 drugs	242	64	63	71	123	98	122	157	139	148	**1227**
Other (n<10)	16		4	1	1	1	4	6	1	4	**38**
Missing	101	29	19	23	5	6	8	7	40	38	**276**
Total	**3015**	**438**	**411**	**431**	**493**	**482**	**498**	**555**	**603**	**628**	**7554**

Patient specific instruments

Table 40:

Year	Yes	No	Missing	Total
2017	1	7133	1 133	**8 267**
2016	5	7061	1 155	**8 221**
2015	14	6217	1 516	**7 747**
2014	22	5487	1 570	**7 079**
2013	25	4675	1 782	**6 482**
2012	88	4242	1 959	**6 289**
2011	65	1695	4 142	**5 902**

Registration started in 2011

Drain

Table 41:

Year	Yes	No	Missing	Total
2017	1 564	5662	1 041	**8 267**
2016	2 060	5152	1 009	**8 221**
2015	2 277	4685	785	**7 747**
2014	2 244	3911	924	**7 079**
2013	2 084	3344	1 054	**6 482**
2012	2 208	2841	1 240	**6 289**
2011	1 096	1128	3 678	**5 902**

Registration started in 2011

Completeness of reporting analysis for the Knee Arthroplasty Register, 2015-2016

A completeness of reporting 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 (NAR). There are separate statistics on primary operations and revisions. Some hospitals have few knee arthroplasty operations and the completeness of reporting rate must be seen in this light.

NCSP codes for combining data from NPR hospital stays and the Knee Arthroplasty Register

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

The completeness of reporting rate for the Knee Arthroplasty Register was calculated as follows:

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

Completeness of reporting 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. In 2015 and 2016, 12 884 primary knee replacements were reported to one or both of the registers. 96.9% of these were reported to the NAR, while 96.8% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting 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.

Procedure codes to be used for primary operations: NGB 0* - NGB 1* - NGB 20 - NGB 30 - NGB 40

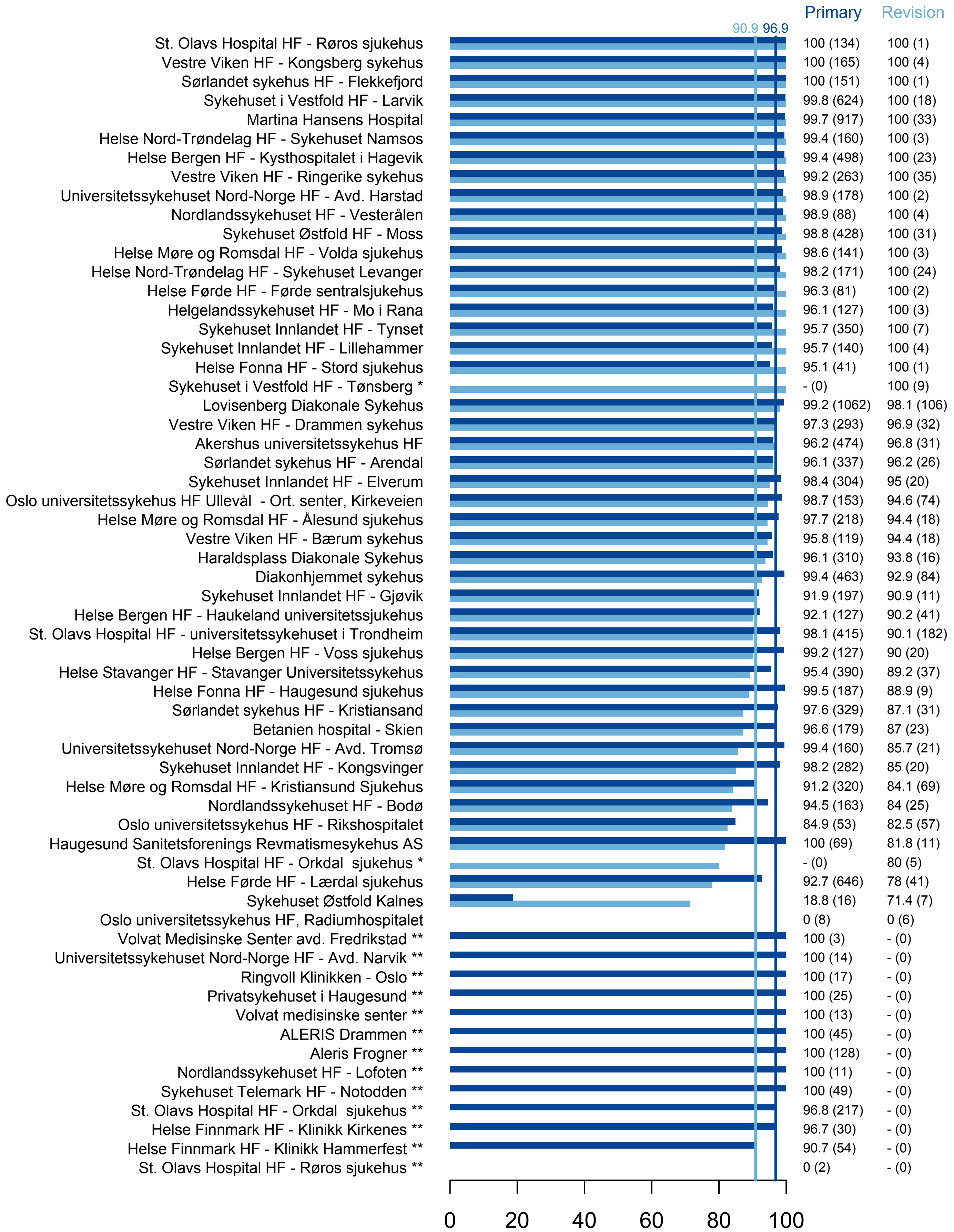
Revision operations. In 2015 and 2016, 1272 revisions were reported to one or both of the registers. 90.9% of these were reported to the NAR, while 84.0% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:

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

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

Completeness of reporting for primary and revision operations, knee prosthesis, 2015-2016



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

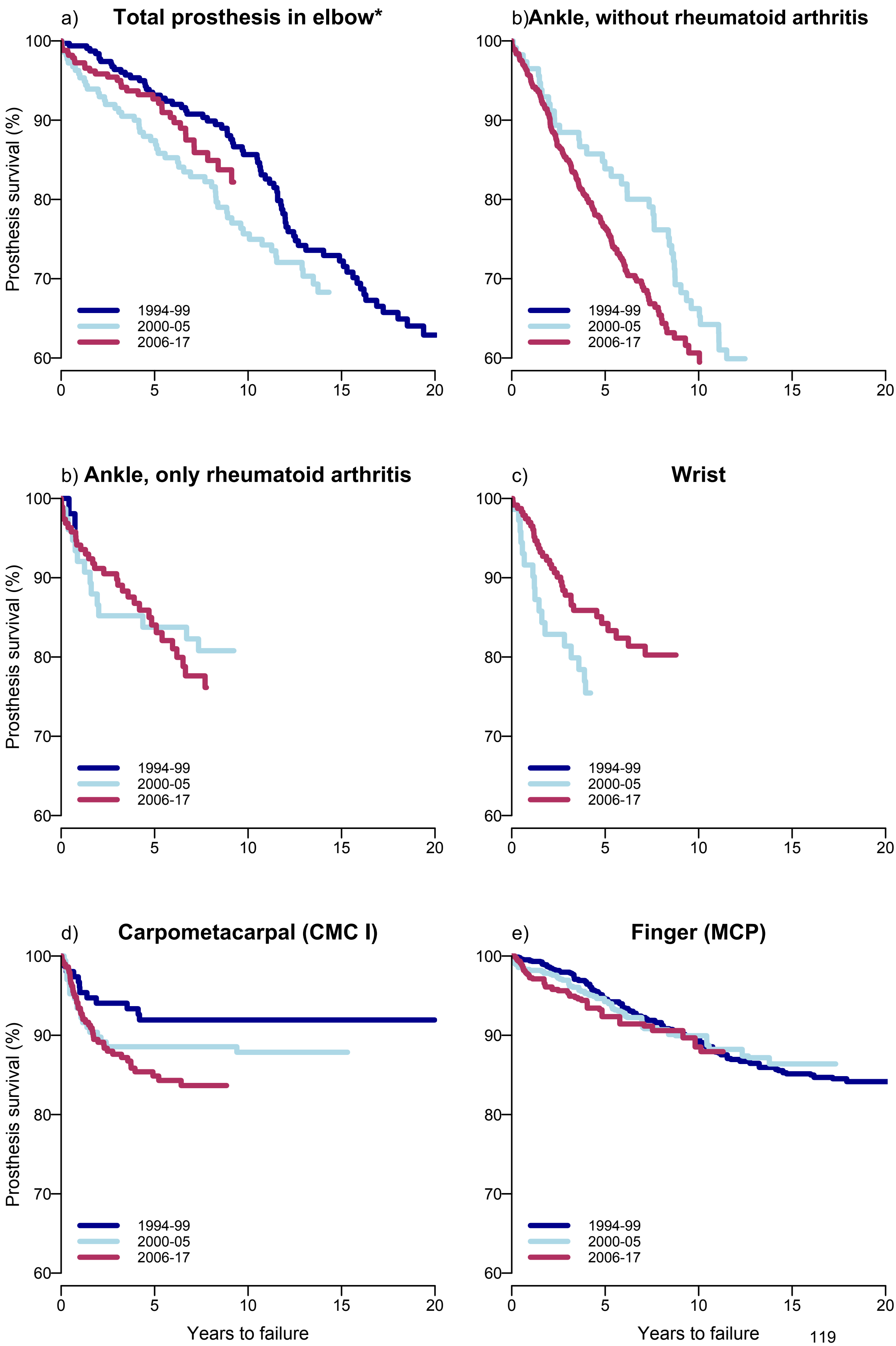
* Have no registered primary operations in NAR or NPR.

** Have no registered revisions in NAR or NPR.

CONTENTS

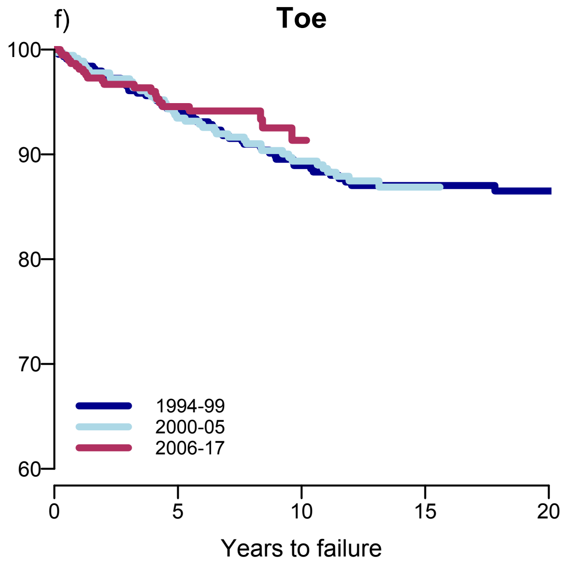
Completeness analysis

Survival curves for joint prosthesis



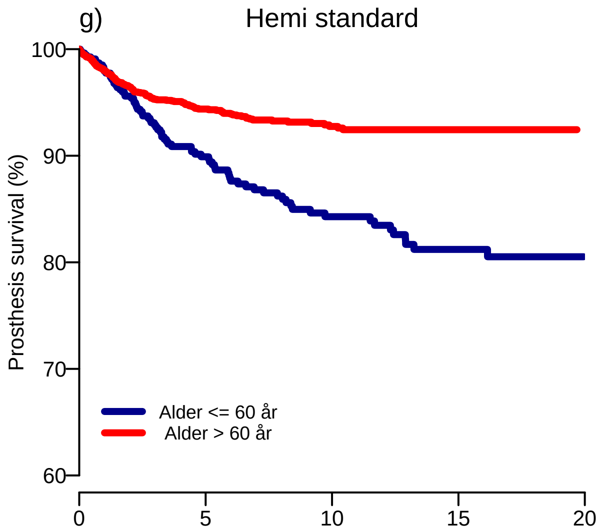
*Caput radii prosthesis for acute fracture is not included.
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.

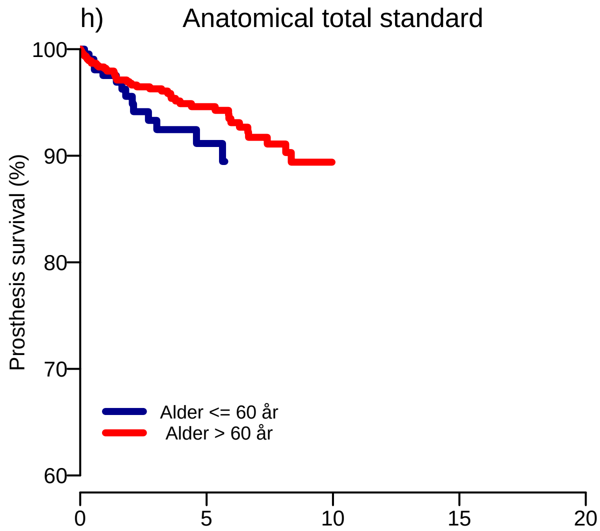
Survival curves for joint prosthesis

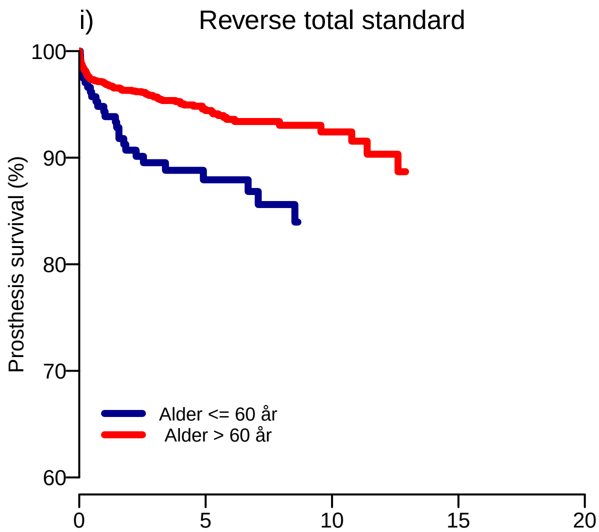


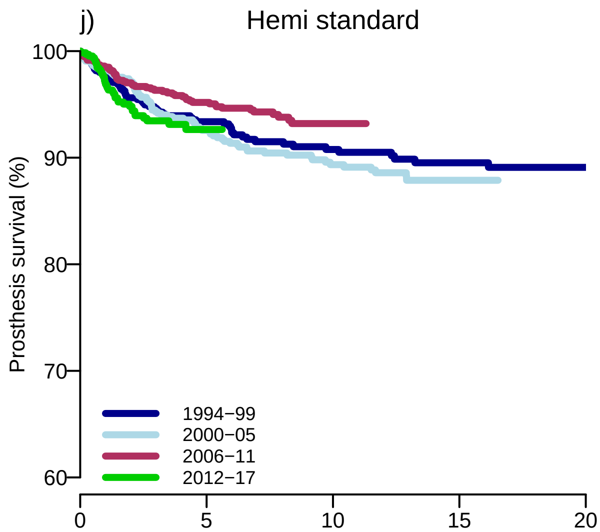
Kaplan-Meier survival curves. Survival estimate is given as long as > 50 prostheses are at risk.

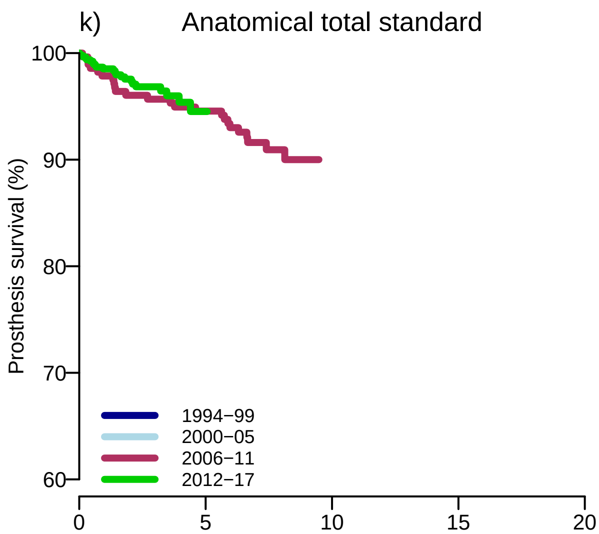
Survival curves for shoulder prosthesis

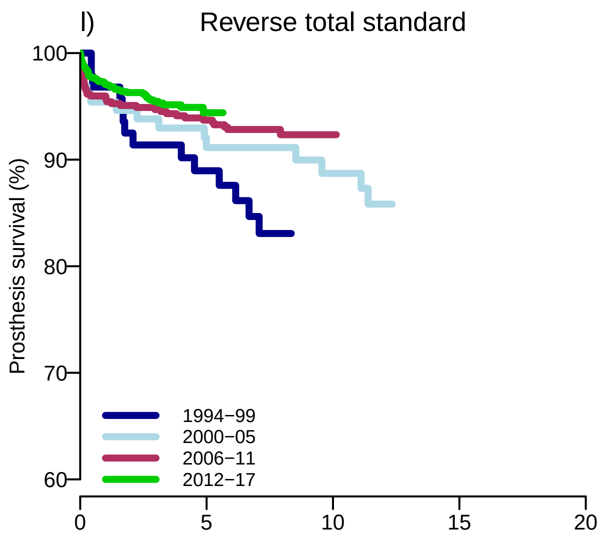












Kaplan−Meier survival curves. Survival estimate is given as long as > 50 prosthesis are in the risk set.

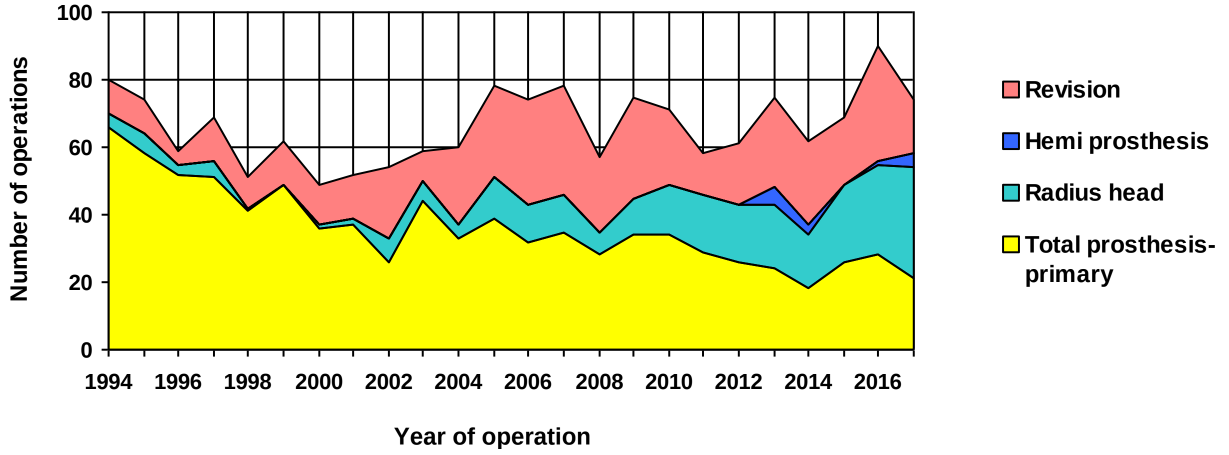
ELBOW PROSTHESES

Table 1: Annual number of prostheses

Year	Hemi prosthesis		Primary operations Total prosthesis		Radius head		Reoperations *		Revisions		Total
2017	4	(5,4%)	21	(28,4%)	33	(44,6%)			16	(21,6%)	**74**
2016	1	(1,1%)	28	(31,1%)	27	(30,0%)	1	(1,1%)	33	(36,7%)	**90**
2015			26	(37,7%)	23	(33,3%)			20	(29,0%)	**69**
2014	3	(4,8%)	18	(29,0%)	16	(25,8%)			25	(40,3%)	**62**
2013	5	(6,7%)	24	(32,0%)	19	(25,3%)			27	(36,0%)	**75**
2012			26	(42,6%)	17	(27,9%)			18	(29,5%)	**61**
2011			29	(50,0%)	17	(29,3%)	1	(1,7%)	11	(19,0%)	**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**
1994-01			390	(78,6%)	22	(4,4%)			84	(16,9%)	**496**
Total	**13**	**(0,8%)**	**867**	**(54,5%)**	**258**	**(16,2%)**	**2**	**(0,1%)**	451	(28,3%)	**1591**

* 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



52,4 % of all operations were performed on the right side. 74,4 % 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
2017	1	7	9			6		1	
2016	3	17	4			6			
2015	1	13	4			8		2	
2014		13	5			2			
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	
1994-01	12	360	13	1		4	1	12	5
Total	**52**	**655**	**94**	**6**	**3**	**64**	**3**	**45**	**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
2017						4			
2016						1			
2014		1				3			
2013			1			4			
Total	**0**	**1**	**1**	**0**	**0**	**12**	**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
2017		1	4			29			
2016			3			23		1	
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	
1994-01		13	6			3		2	
Total	**9**	**14**	**41**	**0**	**1**	**194**	**0**	**8**	**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
2017	25	(96,2%)			1	(3,8%)			**26**
2016	29	(100,0							**29**
2015	25	(96,2%)			1	(3,8%)			**26**
2014	19	(90,5%)					2	(9,5%)	**21**
2013	27	(93,1%)			2	(6,9%)			**29**
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	14	(53,8%)	3	(11,5%)	9	(34,6%)			**26**
1994-01	206	(52,8%)	89	(22,8%)	92	(23,6%)	3	(0,8%)	**390**
Total	**596**	**(67,7%)**	**95**	**(10,8%)**	**180**	**(20,4%)**	**10**	**(1,1%)**	**881**

Table 6: Primary operations - Ulna/radius

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2017	26	(47,3%)			29	(52,7%)			**55**
2016	35	(63,6%)			20	(36,4%)			**55**
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	43	(93,5%)			2	(4,3%)	1	(2,2%)	**46**
2006	36	(83,7%)			7	(16,3%)			**43**
2005	42	(82,4%)			9	(17,6%)			**51**
2004	30	(81,1%)			7	(18,9%)			**37**
2003	41	(82,0%)	4	(8,0%)	4	(8,0%)	1	(2,0%)	**50**
2002	23	(69,7%)	3	(9,1%)	7	(21,2%)			**33**
1994-01	289	(70,1%)	89	(21,6%)	32	(7,8%)	2	(0,5%)	**412**
Total	**814**	**(72,4%)**	**97**	**(8,6%)**	**198**	**(17,6%)**	**16**	**(1,4%)**	**1 125**

Prostheses used in elbow prostheses - Total prostheses

Table 7: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Discovery	49	21	24	21	18	19	9	18	15	4	**198**
Norway	180										**180**
Kudo	162										**162**
IBP	121	4	5	2	3	1					**136**
GSB III	52	7	5	2	4	3	3	1			**77**
NES	53	1									**54**
Nexel								4	13	17	**34**
Mutars	2	1		1	1		1	2			**8**
IBP Reconstruction	5										**5**
Coonrad/Morrey	1			2			1	1			**5**
Other (n < 5)	2			1		1	4				**8**
Total	**627**	**34**	**34**	**29**	**26**	**24**	**18**	**26**	**28**	**21**	**867**

Table 8: Primary operations - Ulna/radius

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Discovery	49	21	24	21	18	19	9	18	15	4	**198**
Norway	179										**179**
Kudo	162										**162**
IBP	121	4	5	2	3	1					**136**
GSB III	52	7	5	2	4	3	3	1			**77**
NES	54	1									**55**
Nexel								4	13	17	**34**
Mutars	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				**7**
Total	**627**	**34**	**34**	**29**	**26**	**24**	**17**	**26**	**28**	**21**	**866**

Prostheses used in elbow prostheses - Hemiprostheses

Table 9: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Latitude Anatomic hemi						5	3		1	4	**13**
Total						**5**	**3**		**1**	**4**	**13**

Prostheses used in elbow prostheses - Radius head prostheses

Table 10: Primary operations - Radius

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Acumed anatomic radial head	1			4	11	16	5	13	13	12	**75**
rHead	33	9	9	8	1		2		1	1	**64**
Explor				2	2	3	5	7	10	17	**46**
Radial Head	22	2	5								**29**
Silastic H.P. 100	20										**20**
Link radius				2	1		4	3			**10**
Evolve	3				2					3	**8**
Other (n < 5)	1		1	1					3		**6**
Total	**80**	**11**	**15**	**17**	**17**	**19**	**16**	**23**	**27**	**33**	**258**

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
2017	4	2		2		4	6	1	5	5	
2016	10	10	1		1	12	3	2	6	5	
2015	4	5	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	2	2	2	3	7	2	2	6	
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
1994-01	42	38	6	4	3	4	14	16	3	12	2
Total	**131**	**151**	**26**	**31**	**19**	**75**	**68**	**55**	**66**	**94**	**7**

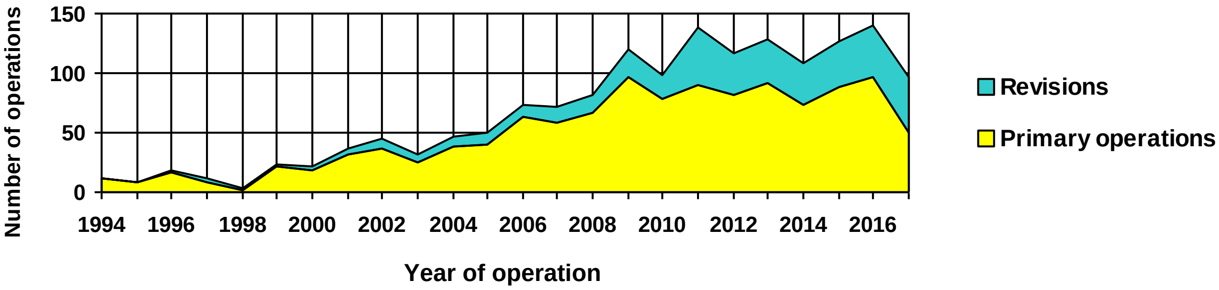
More than one reason for revision is possible

ANKLE PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2017	50	(52,1%)	46	(47,9%)	**96**
2016	97	(69,3%)	43	(30,7%)	**140**
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	96	(80,0%)	24	(20,0%)	**120**
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**
1994-01	119	(88,1%)	16	(11,9%)	**135**
Total	**1195**	**(74,3%)**	**413**	**(25,7%)**	**1608**

Figure 1: Annual numbers of operations



57,8 % of all operations were performed on the right side. 53,9 % performed in women. Mean age: 59,9 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
2017	13	12	15	1	8		1	4	
2016	24	14	28	1	31			6	
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	28		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	
1994-01	18	78	16	2	1			12	
Total	**329**	**321**	**381**	**12**	**142**	**0**	**5**	**73**	**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
2017					50	(100,0%)			**50**
2016					97	(100,0%)			**97**
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	(5,2%)			89	(92,7%)	2	(2,1%)	**96**
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**
1994-01	21	(17,6%)	10	(8,4%)	87	(73,1%)	1	(0,8%)	**119**
Total	**29**	**(2,4%)**	**10**	**(0,8%)**	**1 148**	**(96,1%)**	**7**	**(0,6%)**	**1 194**

Table 4: Primary operations - Talus

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2017					50	(100,0%)			**50**
2016					97	(100,0%)			**97**
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	(5,2%)			89	(92,7%)	2	(2,1%)	**96**
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**
1994-01	22	(18,5%)	10	(8,4%)	87	(73,1%)			**119**
Total	**31**	**(2,6%)**	**11**	**(0,9%)**	**1 146**	**(96,0%)**	**6**	**(0,5%)**	**1 194**

Prostheses used in ankle prostheses

Table 5: Primary operations - Tibia

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Link S.T.A.R.	391	57	40	50	39	38		1			**616**
Salto Talaris						26	62	85	81	27	**281**
Mobility	6	26	26	16	12	15					**101**
CCI	4	12	13	17	12	11	9				**78**
TM Total Ankle							3	3	16	20	**42**
Norwegian TPR	32										**32**
Rebalance				7	8						**15**
Salto Mobile					11	1					**12**
Hintegra	10	1									**11**
AES	3										**3**
INFINITY										2	**2**
Integra Cadence										1	**1**
Total	**446**	**96**	**79**	**90**	**82**	**91**	**74**	**89**	**97**	**50**	**1194**

Table 6: Primary operations - Talus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Link S.T.A.R.	391	57	40	50	39	38		1			**616**
Salto Talaris						22	61	84	80	26	**273**
Mobility	6	26	26	16	12	15					**101**
CCI	4	12	13	17	12	11	9				**78**
TM Total Ankle							3	3	16	20	**42**
Norwegian TPR	32										**32**
Rebalance				7	8						**15**
Salto Mobile					11	1					**12**
Hintegra	10	1									**11**
Salto XT						4	1	1	1	1	**8**
AES	3										**3**
INFINITY										2	**2**
Integra Cadence										1	**1**
Total	**446**	**96**	**79**	**90**	**82**	**91**	**74**	**89**	**97**	**50**	**1194**

Table 7: Primary operations - Material in Foring Tibia Insert for total prostheses

Prosthesis	Material	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
TM Total Ankle	HXLPE							3	3	15	20	**41**
INFINITY	Uhmwpe										2	**2**
Integra Cadence	HXLPE										1	**1**
Total		**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**15**	**23**	**44**

Reasons for revisions in ankle prostheses

Table 8:

Year	Loose proximal comp.	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017	13	9		2	8	4	1	22	8	11	
2016	13	12		2	2	3	2	15	5	4	
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		
1994-01	11	9		2	4		1	6		2	
Total	**109**	**83**	**4**	**40**	**66**	**33**	**12**	**165**	**85**	**42**	**0**

More than one reason for revision is possible

FINGER JOINT PROSTHESES

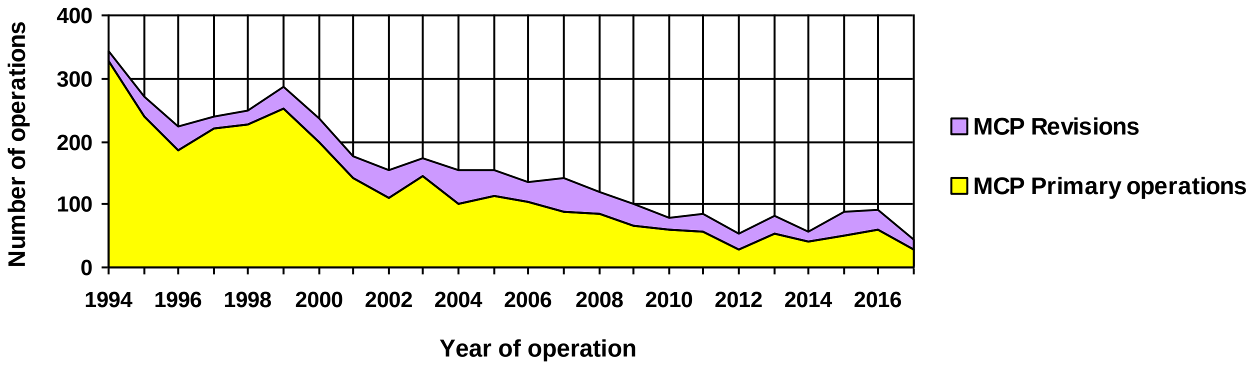
Table 1: Annual number of operations - MCP

Year	Primary operations		Revisions		Total
2017	29	(64,4%)	16	(35,6%)	**45**
2016	61	(67,8%)	29	(32,2%)	**90**
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	60	(76,9%)	18	(23,1%)	**78**
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	144	(83,7%)	28	(16,3%)	**172**
2002	110	(71,4%)	44	(28,6%)	**154**
1994-01	1792	(88,6%)	230	(11,4%)	**2022**
Total	**2983**	**(80,0%)**	**747**	**(20,0%)**	**3730**

Table 2: Annual number of operations - PIP

Year	Primary operations		Revisions		Total
2017	4	(100,0%)			**4**
2016	3	(75,0%)	1	(25,0%)	**4**
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**
1994-01	25	(80,6%)	6	(19,4%)	**31**
Total	**95**	**(86,4%)**	**15**	**(13,6%)**	**110**

Figure 1: Annual number of operations



61,4 % of all operations were performed on the right side. 87,6 % 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
2017	5	24							
2016	4	57						2	
2015	5	43		1				2	
2014		33					1	8	
2013		53	1					3	
2012		25	1					1	
2011	1	50						6	
2010	3	54	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	131		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	**83**	**2805**	**16**	**10**	**1**	**1**	**3**	**92**	**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
2017	4								
2016	1						2		
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	**39**	**36**	**11**	**0**	**2**	**2**	**3**	**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
2017					29	(100,0%)			**29**
2016	2	(3,3%)			59	(96,7%)			**61**
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					60	(100,0%)			**60**
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					144	(100,0%)			**144**
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	**6**	**(0,2%)**	**2**	**(0,1%)**	**2 960**	**(99,3%)**	**12**	**(0,4%)**	**2 980**

Table 6: Primary operations - Distal

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2016					2	(100,0%)			**2**
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					**37**	**(100,0%)**			**37**

Use of cement in PIP prostheses

Table 7: Primary operations - Proximal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented		Missing		Total
2017			4	(100,0%)			**4**
2016			3	(100,0%)			**3**
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	(83,3%)	1	(16,7%)	**6**
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			**92**	**(96,8%)**	**3**	**(3,2%)**	**95**

Table 8: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented		Missing		Total
2017			4	(100,0			**4**
2016			2	(100,0			**2**
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			**33**	**(97,1%)**	**1**	**(2,9%)**	**34**

Finger prostheses

Table 9: MCP prostheses in primary operations - Proximal

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Silastic HP 100	1754	61	53	49	27	25		5	1	5	**1980**
Avanta	554		1					1		4	**560**
Silastic HP 100 II			5	6		28	41	45	56	20	**201**
NeuFlex	194	4									**198**
Ascension MCP	25	1	1	2			1		2		**32**
MCS	6										**6**
SR Avanta									2		**2**
Moje	1										**1**
Total	**2534**	**66**	**60**	**57**	**27**	**53**	**42**	**51**	**61**	**29**	**2980**

Table 10: MCP prostheses in primary operations - Distal

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Ascension MCP	23	1	1	2			1		2		**30**
MCS	6										**6**
Moje	1										**1**
Total	**30**	**1**	**1**	**2**			**1**		**2**		**37**

Table 11: PIP prostheses in primary operations - Proximal

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Silastic HP 100	21					4	2				**27**
SR Avanta	7	3	4	1		1	1	5	1		**23**
Ascension MCP	18										**18**
NeuFlex	7										**7**
TACTYS									2	4	**6**
Ascension PIP PyroCarbon			2	2			1				**5**
MCS	4										**4**
Avanta	3					1					**4**
Moje	1										**1**
Total	**61**	**3**	**6**	**3**		**6**	**4**	**5**	**3**	**4**	**95**

Table 12: PIP prostheses in primary operations - Distal

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Ascension MCP	18										**18**
TACTYS									3	4	**7**
Ascension PIP PyroCarbon			2	2			1				**5**
MCS	4										**4**
Moje	2										**2**
Total	**24**		**2**	**2**			**1**		**3**	**4**	**36**

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
2017			1	3			9	4			9	
2016			5	5	8	1	2	10	9	5	8	
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	
2001		3	3	4	7			11	3	9	10	
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**	**47**	**98**	**112**	**19**	**34**	**217**	**47**	**340**	**111**	**20**

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
2016	1											
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	**5**	**3**	**1**	**2**	**2**	**0**	**0**	**3**	**0**	**6**	**1**	**0**

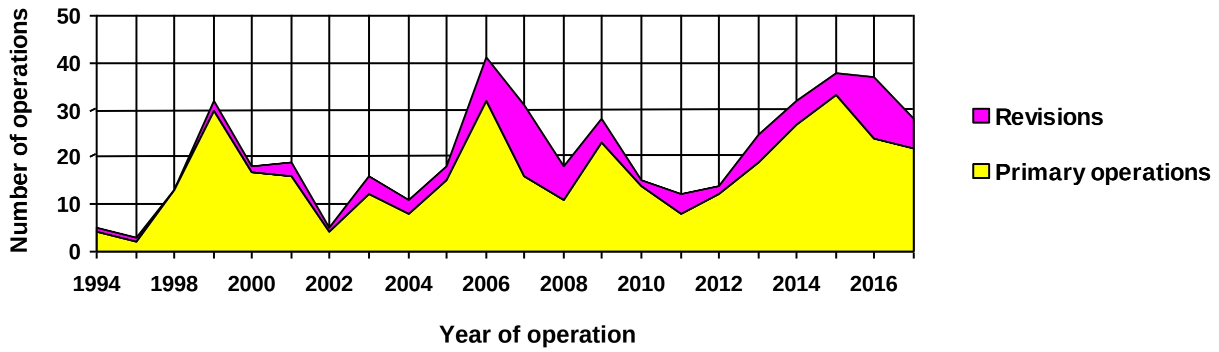
Revision reasons are not mutually exclusive. More than one reason for revision is possible

WRIST PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2017	22	(78,6%)	6	(21,4%)	**28**
2016	24	(64,9%)	13	(35,1%)	**37**
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**
1994-01	82	(91,1%)	8	(8,9%)	**90**
Total	**362**	**(78,9%)**	**97**	**(21,1%)**	**459**

Figure 1: Annual number of operations



57,5 % of all operations were performed on the right side. 62,1 % performed in women Mean age: 56,3 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
2017	1	3	8		8	1	1	4	
2016	4		10		9	1		1	
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							
1994-01	2	73	2	1				4	
Total	**46**	**143**	**89**	**1**	**53**	**2**	**3**	**42**	**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
2017					20	(100,0%)			**20**
2016					24	(100,0%)			**24**
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**	**(2,0%)**	**1**	**(0,3%)**	**345**	**(96,4%)**	**5**	**(1,4%)**	**358**

Table 4: Primary operations - Distal

Year	Cement with antibiotics		Cement without antibiotics		Uncemented		Missing		Total
2017					22	(100,0%)			**22**
2016					24	(100,0%)			**24**
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**	**(2,6%)**			**339**	**(97,1%)**	**1**	**(0,3%)**	**349**

Wrist prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Motec Wrist	56	21	14	5	5	4	9	17	11	4	**146**
Biax	90										**90**
Remotion Wrist				3	3	10	13	13	8	4	**54**
Elos[1]	23										**23**
Scheker Radio-ulnar	2				1	3	3	1	3	8	**21**
Uhead (Druj)					3	2	2	1	2	4	**14**
Silastic ulnar head	7										**7**
Eclypse radio-ulnar		2									**2**
TMW	1										**1**
Total	**179**	**23**	**14**	**8**	**12**	**19**	**27**	**32**	**24**	**20**	**358**

Table 6: Primary operations - Distal

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Motec Wrist	56	21	14	5	5	4	9	17	11	4	**146**
Biax	89										**89**
Remotion Wrist				3	3	10	13	14	8	4	**55**
Elos[1]	23										**23**
Scheker Radio-ulnar					1	3	3	1	3	8	**19**
Uhead (Druj)					3	2	2	1	2	4	**14**
RCPI										2	**2**
TMW	1										**1**
Total	**169**	**21**	**14**	**8**	**12**	**19**	**27**	**33**	**24**	**22**	**349**

Table 7: Reasons for revisions

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing	Total
2017	1	1			1			3		1		7
2016		4	2	1	1	2		3	1	1		15
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	**6**	**35**	**4**	**6**	**14**	**18**	**0**	**30**	**4**	**12**	**0**	**129**

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

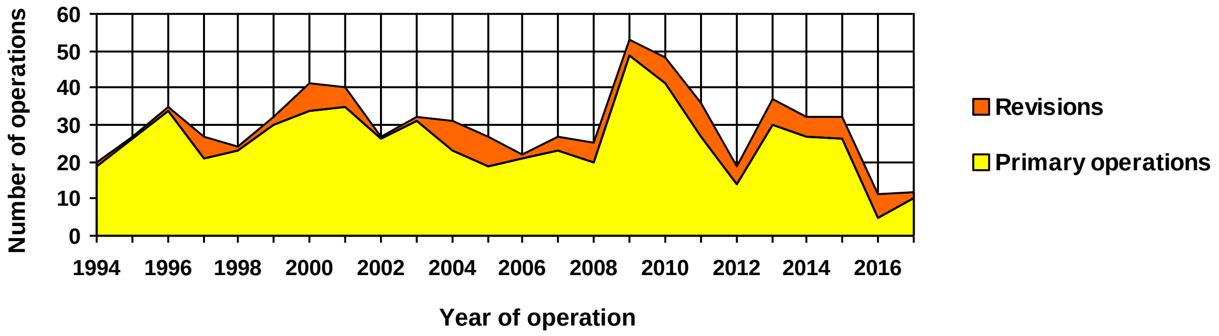
[1]Elos are 3 different development models of Motec Wrist. Motec Wrist was previously sold under the name Gibbon.

CARPOMETACARPAL PROSTHESES (CMC I)

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2017	10	(83,3%)	2	(16,7%)	**12**
2016	5	(45,5%)	6	(54,5%)	**11**
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**
1994-01	222	(90,2%)	24	(9,8%)	**246**
Total	**614**	**(85,6%)**	**103**	**(14,4%)**	**717**

Figure 1: Annual number of operations



47,1 % of all operations were performed on the right side. 82 % performed in women. Mean age: 62,8 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
2017	10								
2016	3	2							
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	
1994-01	147	67	2	4				8	
Total	**483**	**109**	**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
2017					10	(100,0%)			**10**
2016					5	(100,0%)			**5**
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**
1994-01	1	(0,5%)			220	(99,1%)	1	(0,5%)	**222**
Total	**3**	**(0,5%)**			**603**	**(98,4%)**	**7**	**(1,1%)**	**613**

Carpometacarpal prostheses - Prosthesis brand

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

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Swanson Silastic Trapezium	298	16	11	9	6	8	8	4	2		**362**
Swanson Titanium Basal	71		1								**72**
Motec		21	17	15	2						**55**
Elektra	5	10	12	3	5	4	5	8	2		**54**
Motec II					1	18	14	14			**47**
Avanta Trapezium	6	1									**7**
ARPE									1	6	**7**
Custom made	5										**5**
IVORY										4	**4**
Total	**385**	**48**	**41**	**27**	**14**	**30**	**27**	**26**	**5**	**10**	**613**

Reasons for revisions

Table 5:

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017			1			1		1			
2016	3		1	1				2			
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
1994-01	1		10	3				14	1	6	
Total	**30**	**0**	**39**	**11**	**0**	**3**	**1**	**49**	**2**	**11**	**1**

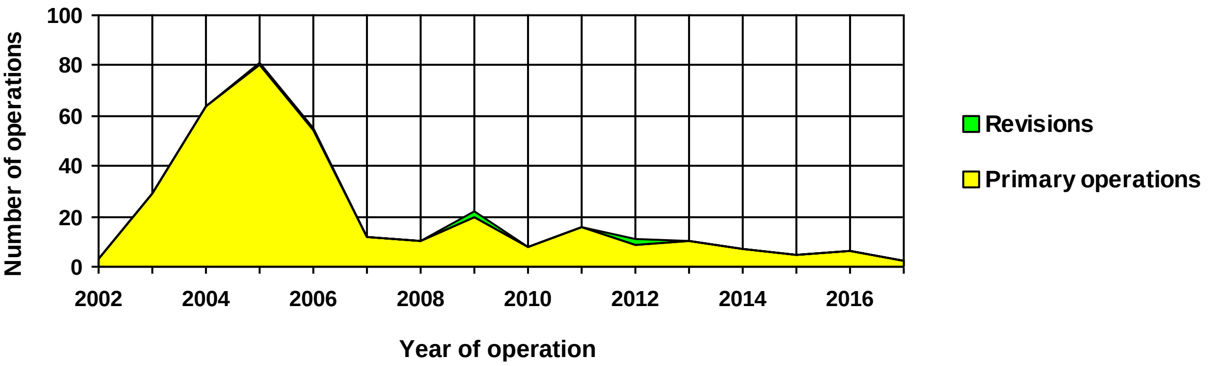
Revision reasons are not mutually exclusive. More than one reason for revision is possible

LUMBAR DISC PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2017	2	(100,0%)			**2**
2016	6	(100,0%)			**6**
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	**335**	**(98,2%)**	**6**	**(1,8%)**	**341**

Figure 1: Annual number of operations



59,5 % 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
2017					2			
2016	1				6			
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				2	
Totalt	**11**	**1**	**161**	**43**	**126**	**1**	**28**	**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
2017			2 (100,0%)		**2**
2016			6 (100,0%)		**6**
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			**335 (100,0%)**		**335**

Table 4: Primary operations - Distal

Year	Cement with antibiotics	Cement without antibiotics	Uncemented	Missing	Total
2017			2 (100,0%)		**2**
2016			6 (100,0%)		**6**
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%)**		**330 (98,5%)**	**2 (0,6%)**	**335**

Lumbar disc prostheses - Prosthesis brand

Table 5: Primary operations - Proximal

Prostheses	2002-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Prodisc	216		4	16	9	10	7	5	6	2	**275**
Charité	38	20	4								**62**
Total	**254**	**20**	**8**	**16**	**9**	**10**	**7**	**5**	**6**	**2**	**337**

Table 6: Primary operations - Distal

Prostheses	2002-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Prodisc	216		4	16	9	10	7	5	6	2	**275**
Charité	38	20	4								**62**
Total	**254**	**20**	**8**	**16**	**9**	**10**	**7**	**5**	**6**	**2**	**337**

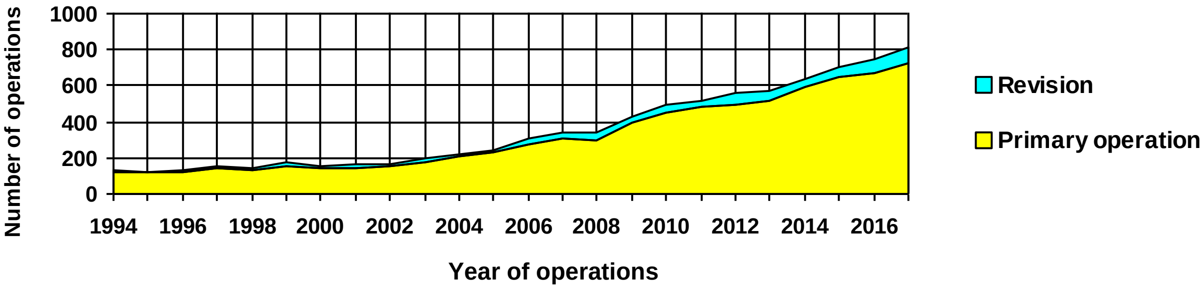
SHOULDER PROSTHESES

Table 1: Annual number of operations in shoulder prostheses

Year	Primary operations	Reoperations *	Revisions	Total
2017	729 (89,4%)	1 (0,1%)	85 (10,4%)	**815**
2016	673 (90,3%)		72 (9,7%)	**745**
2015	644 (91,7%)		58 (8,3%)	**702**
2014	594 (92,4%)	1 (0,2%)	48 (7,5%)	**643**
2013	517 (90,9%)	2 (0,4%)	50 (8,8%)	**569**
2012	500 (89,1%)	1 (0,2%)	60 (10,7%)	**561**
2011	481 (92,5%)		39 (7,5%)	**520**
2010	447 (91,2%)		43 (8,8%)	**490**
2009	392 (90,7%)		40 (9,3%)	**432**
1994-08	2730 (91,3%)		259 (8,7%)	**2989**
Total	**7707 (91,0%)**	**5 (0,1%)**	**754 (8,9%)**	**8466**

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

Figure 1: Annual number of operations - All prostheses



53,4 % of all operations were performed on the right side   71,1 % performed in women.   Mean age: 69,9 years.

Figure 2: Prostheses - all operations

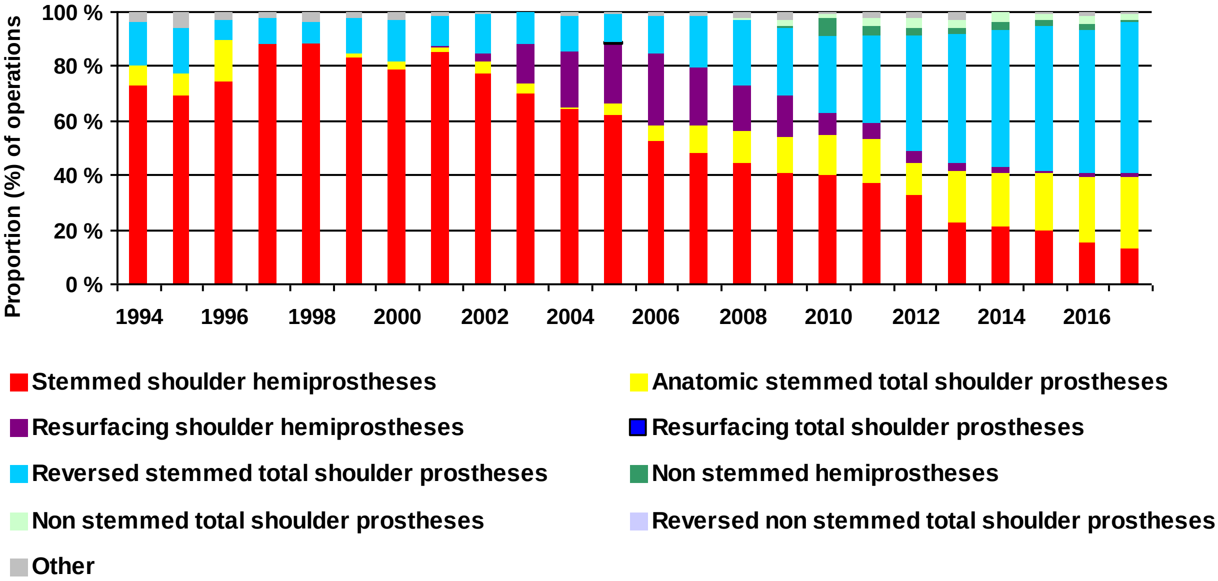


Figure 3: Age at the insertion of primary total prostheses

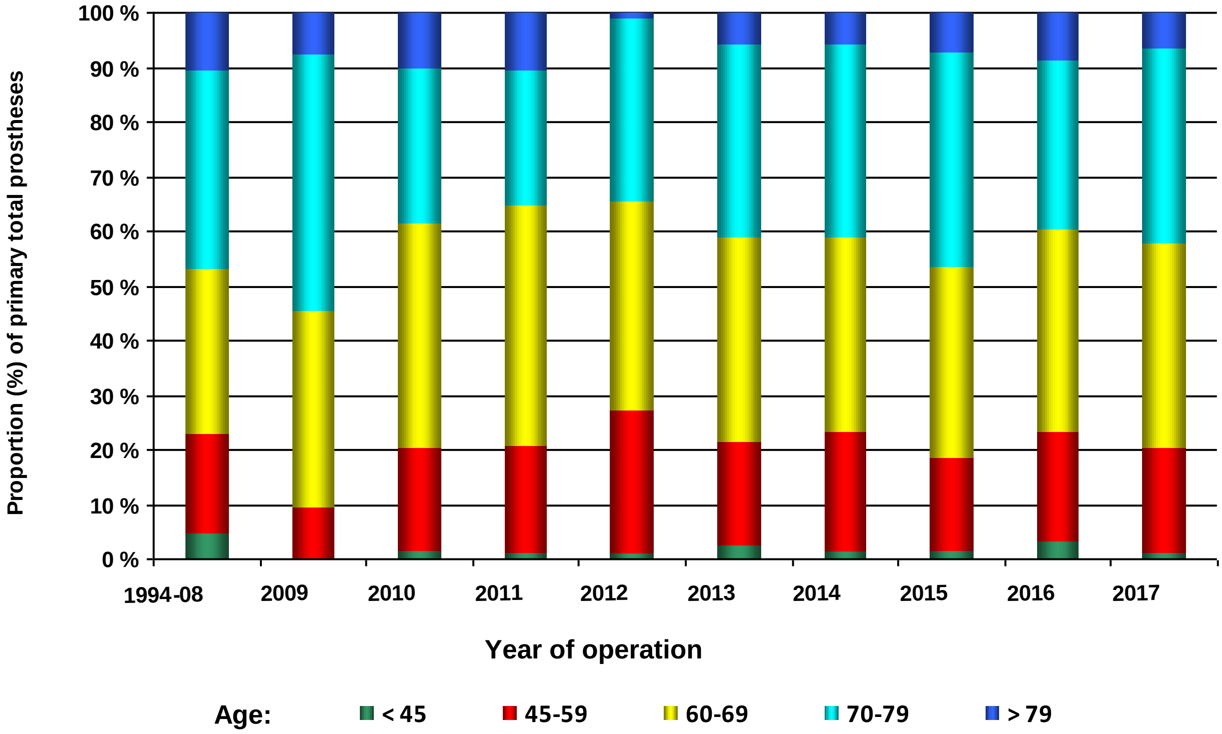


Figure 4: Age at the insertion of primary reversed total prostheses

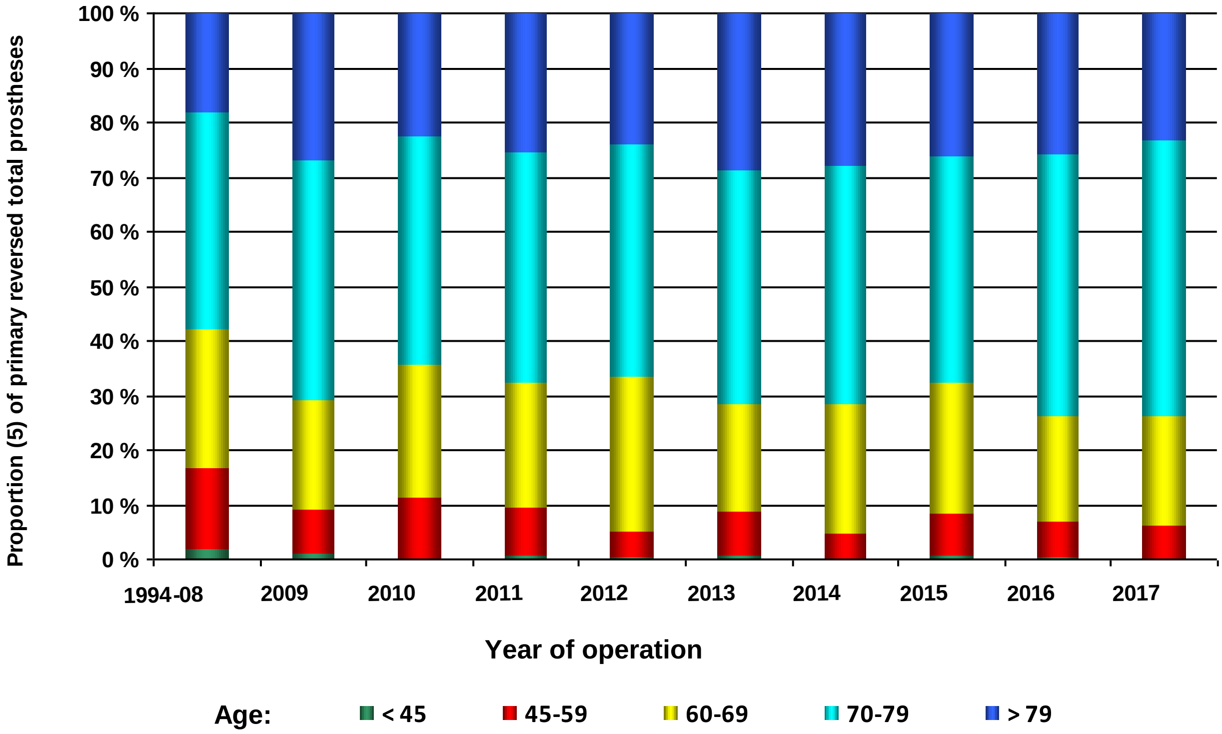


Figure 5: Age at the insertion of primary hemiprostheses

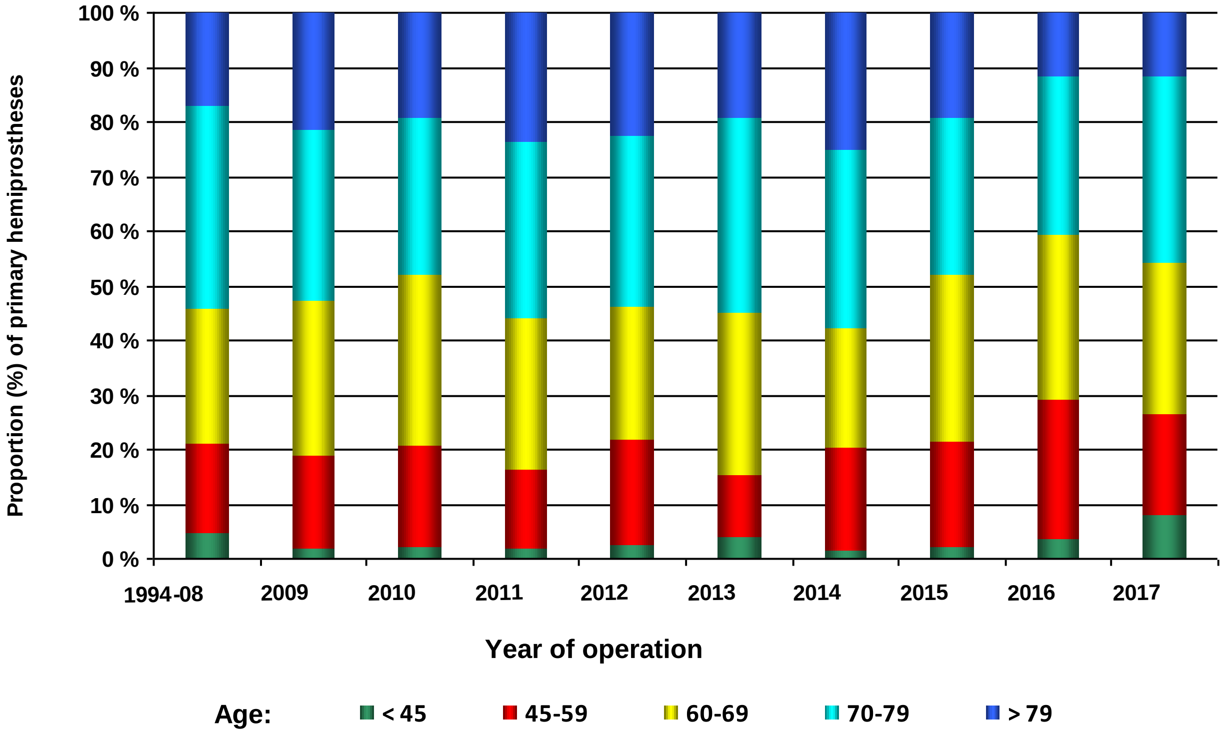


Table 2: Annual number of operations - Stemmed shoulder hemiprostheses

Year	Primary operations		Revisions		Total
2017	86	(78,2%)	23	(20,9%)	**110**
2016	97	(82,9%)	20	(17,1%)	**117**
2015	116	(85,9%)	19	(14,1%)	**135**
2014	124	(93,2%)	9	(6,8%)	**133**
2013	109	(85,8%)	18	(14,2%)	**127**
2012	166	(91,7%)	15	(8,3%)	**181**
2011	179	(92,7%)	14	(7,3%)	**193**
2010	177	(92,7%)	14	(7,3%)	**191**
2009	162	(91,5%)	15	(8,5%)	**177**
1994-08	1845	(92,9%)	140	(7,1%)	**1985**
Total	**3061**	**(91,4%)**	**287**	**(8,6%)**	**3349**

Figure 6: Annual number of operations - Stemmed hemiprostheses

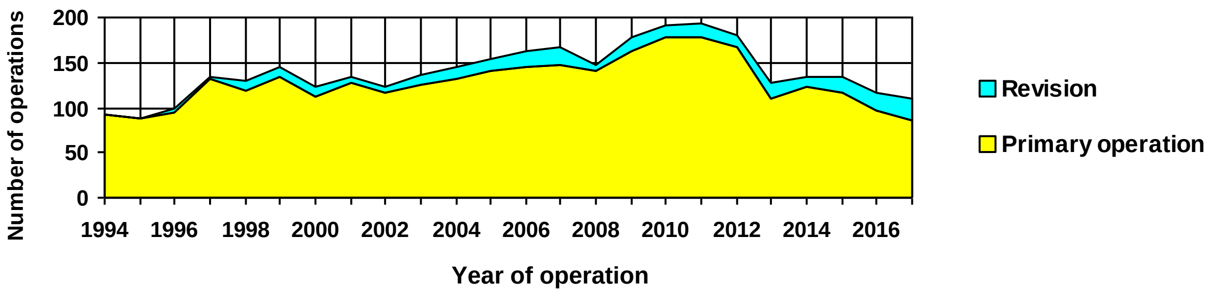


Table 3: Annual number of operations - Anatomic stemmed total shoulder prostheses

Year	Primary operations		Revisions		Total
2017	198	(92,5%)	16	(7,5%)	**214**
2016	167	(91,8%)	15	(8,2%)	**182**
2015	140	(95,9%)	6	(4,1%)	**146**
2014	120	(91,6%)	11	(8,4%)	**131**
2013	99	(95,2%)	5	(4,8%)	**104**
2012	61	(93,8%)	4	(6,2%)	**65**
2011	79	(94,0%)	5	(6,0%)	**84**
2010	69	(90,8%)	7	(9,2%)	**76**
2009	56	(96,6%)	2	(3,4%)	**58**
1994-08	149	(82,8%)	31	(17,2%)	**180**
Total	**1138**	**(91,8%)**	**102**	**(8,2%)**	**1240**

Figure 7: Annual number of operations - Anatomic stemmed total shoulder prostheses

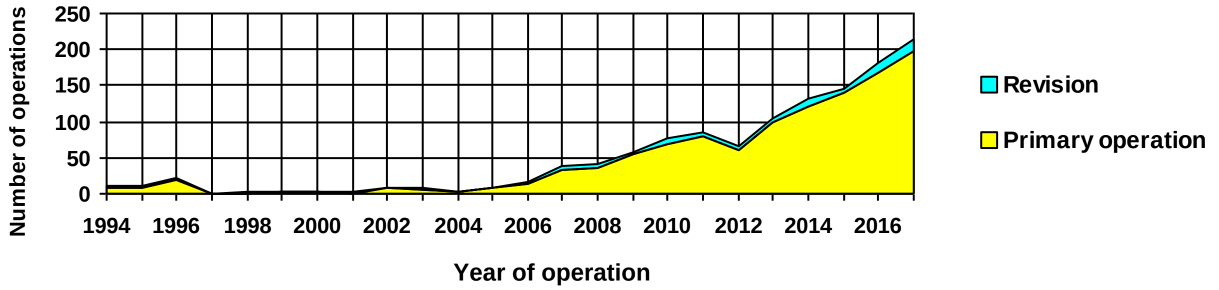


Table 4: Annual number of operations - Resurfacing shoulder hemiprostheses

Year	Primary operations		Revisions		Total
2017			10	(100,0%)	**10**
2016			11	(100,0%)	**11**
2015	3	(37,5%)	5	(62,5%)	**8**
2014			11	(100,0%)	**11**
2013	9	(52,9%)	8	(47,1%)	**17**
2012	11	(45,8%)	13	(54,2%)	**24**
2011	20	(71,4%)	8	(28,6%)	**28**
2010	25	(71,4%)	10	(28,6%)	**35**
2009	55	(84,6%)	10	(15,4%)	**65**
1994-08	315	(94,3%)	19	(5,7%)	**334**
Total	**438**	**(80,7%)**	**105**	**(19,3%)**	**543**

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

Year	Primary operations		Revisions		Total
2011	1	(100,0%)			**1**
2010	1	(100,0%)			**1**
1994-08	2	(66,7%)	1	(33,3%)	**3**
Total	**4**	**(80,0%)**	**1**	**(20,0%)**	**5**

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

Year	Primary operations		Reoperations *		Revisions		Total
2017	425	(93,8%)			28	(6,2%)	**453**
2016	378	(95,0%)			20	(5,0%)	**398**
2015	353	(92,4%)			29	(7,6%)	**382**
2014	305	(94,1%)			19	(5,9%)	**324**
2013	254	(95,1%)			13	(4,9%)	**267**
2012	216	(90,4%)	1	(0,4%)	22	(9,2%)	**239**
2011	161	(95,8%)			7	(4,2%)	**168**
2010	132	(93,6%)			9	(6,4%)	**141**
2009	100	(92,6%)			8	(7,4%)	**108**
1994-08	404	(89,2%)			49	(10,8%)	**453**
Total	**2728**	**(93,0%)**	**1**	**(0,0%)**	**204**	**(7,0%)**	**2933**

Figure 8: Annual number of operations - Reversed stemmed total shoulder prostheses

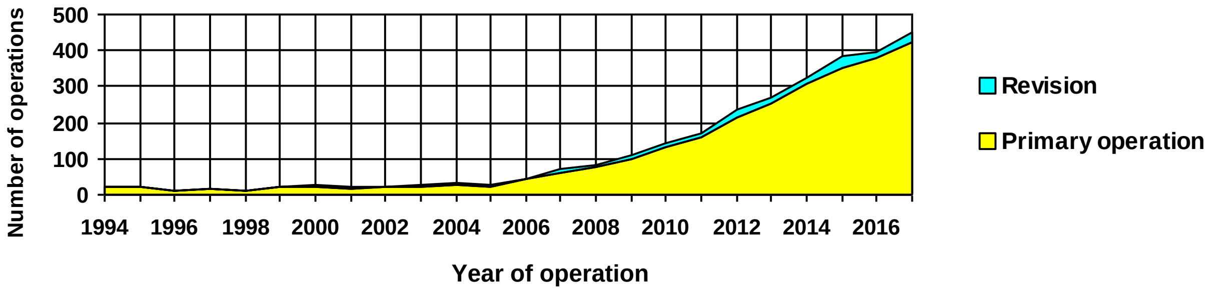


Table 7: Annual number of operations - Non stemmed hemiprostheses

Year	Primary operations		Reoperations *		Revisions		Total
2017	1	(20,0%)			4	(80,0%)	**5**
2016	13	(76,5%)			4	(23,5%)	**17**
2015	16	(72,7%)			6	(27,3%)	**22**
2014	23	(82,1%)	1	(3,6%)	4	(14,3%)	**28**
2013	26	(100,0%)					**26**
2012	24	(82,8%)			5	(17,2%)	**29**
2011	21	(95,5%)			1	(4,5%)	**22**
2010	35	(100,0%)					**35**
2009	5	(100,0%)					**5**
Total	**164**	**(86,8%)**	**1**	**(0,5%)**	**24**	**(12,7%)**	**189**

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

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

Year	Primary operations		Revisions		Total
2017	18	(85,7%)	3	(14,3%)	**21**
2016	18	(85,7%)	3	(14,3%)	**21**
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	16	(100,0%)			**16**
2010	8	(100,0%)			**8**
2009	8	(100,0%)			**8**
1994-08	3	(100,0%)			**3**
Total	**145**	**(89,5%)**	**17**	**(10,5%)**	**162**

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

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

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
2017	19	4	10			52	1	1	8	
2016	18	1	9	1		64		2	3	
2015	15	2	15			85	1		5	
2014	21		15			89			4	
2013	21	1	7		1	78		2	3	
2012	22	3	13			126			4	
2011	34	4	27			116			2	
2010	35	9	22	1		109			2	
2009	28	9	27			102		1	3	
1994-08	345	438	395	15	7	627	8	5	82	10
Total	**558**	**471**	**540**	**17**	**8**	**1448**	**10**	**11**	**116**	**10**

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
2017	166	3	18		4				13	
2016	138	7	20		1	2	1		2	
2015	124	4	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	
1994-08	98	16	19	1	1	2	1		11	1
Total	**924**	**49**	**116**	**1**	**15**	**5**	**6**	**0**	**42**	**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	3									
2013	8		1	1						
2012	9								2	
2011	18	1						1	1	
2010	17	3	3						2	
2009	35	13	5		2			1		1
1994-08	204	77	25	3	3	1	3	3	14	2
Total	**294**	**94**	**34**	**4**	**5**	**1**	**3**	**5**	**19**	**3**

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
2011	1									
2010	1									
1994-08	2								1	
Total	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**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
2017	130	26	72		8	114	2	122	18	
2016	119	29	62	2	13	102	2	82	14	
2015	126	30	63	1	17	78	4	60	19	
2014	116	22	45	2	18	87	2	39	12	
2013	87	26	37		15	78	1	24	4	
2012	61	19	50		24	43	4	33	10	
2011	46	21	30	1	9	30	1	35	9	1
2010	42	27	26		5	12	4	21	8	1
2009	42	19	15	1	1	9	2	13	4	
1994-08	91	166	87	2	3	12	3	38	27	1
Total	**860**	**385**	**487**	**9**	**113**	**565**	**25**	**467**	**125**	**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
2017							1			
2016	7		5		1				1	
2015	13		3			1		1		
2014	16		2		1				4	
2013	23	1	2						2	
2012	16	3	3	2				1		
2011	13	6	2						1	
2010	24	3	8			1			2	
2009	2		1		1				2	
Total	**114**	**13**	**26**	**2**	**3**	**2**	**1**	**2**	**12**	**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
2017	14		2						3	
2016	12	2	1		2			1		
2015	13		1		1					
2014	18		3							
2013	15		1		1				2	
2012	17			1	1				1	
2011	14	2								
2010	6	1							1	
2009	5	2	1							
1994-08	2	1								
Total	**116**	**8**	**9**	**1**	**5**	**0**	**0**	**1**	**7**	**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
2014						1				
Total	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**

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

Use of cement in shoulder prostheses

Figure 9: Stemmed shoulder hemiprostheses - Primary operations - Humerus

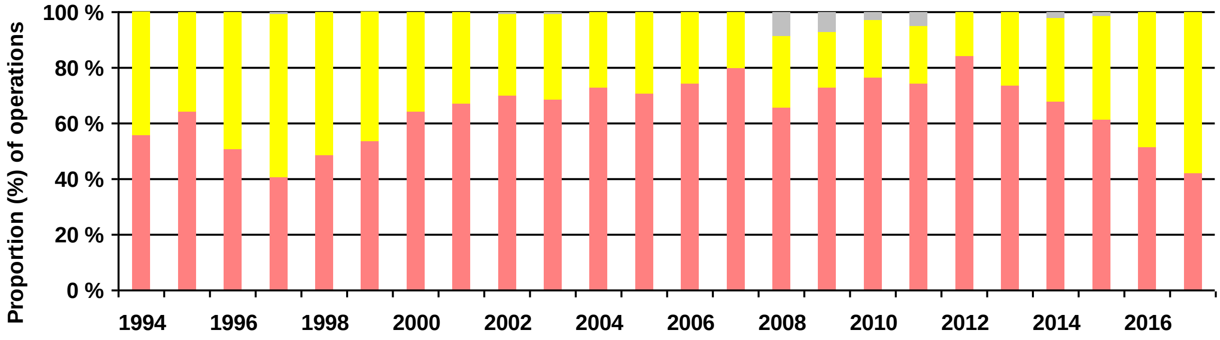


Figure 10: Anatomic stemmed total shoulder prostheses - Primary operations - Glenoid

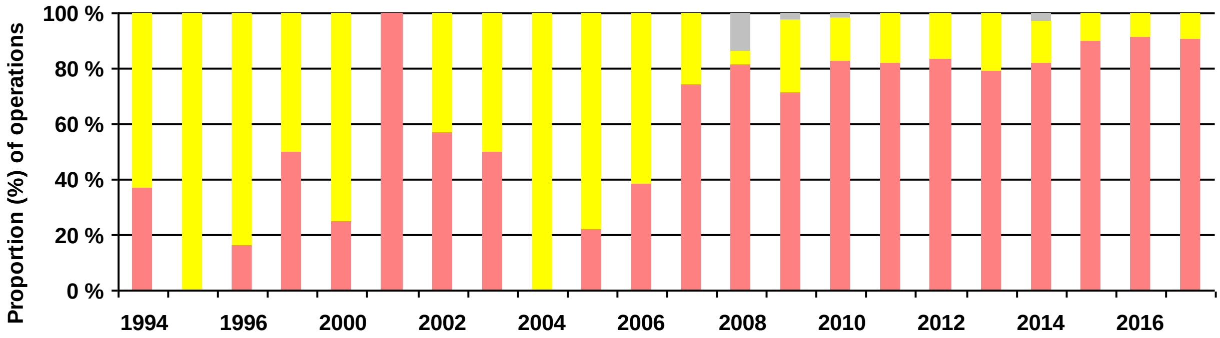


Figure 11: Anatomic stemmed total shoulder prostheses - Primary operations - Humerus

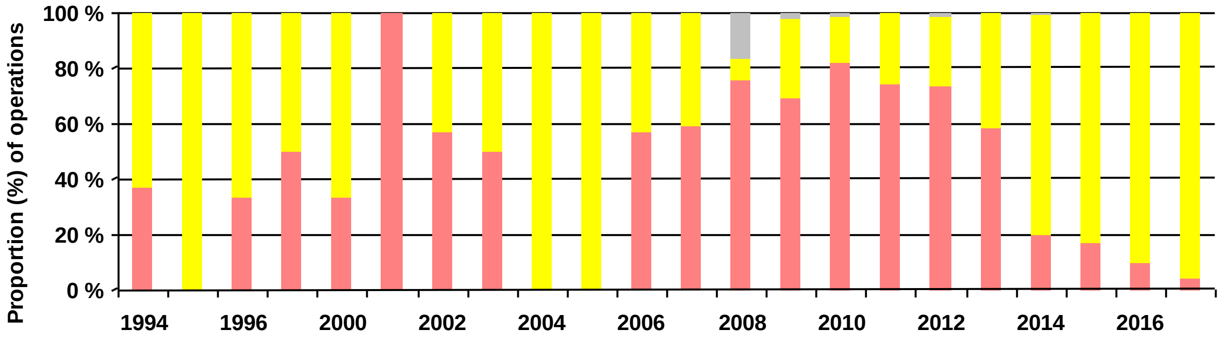


Figure 12: Resurfacing shoulder hemiprostheses - Primary operations - Humerus

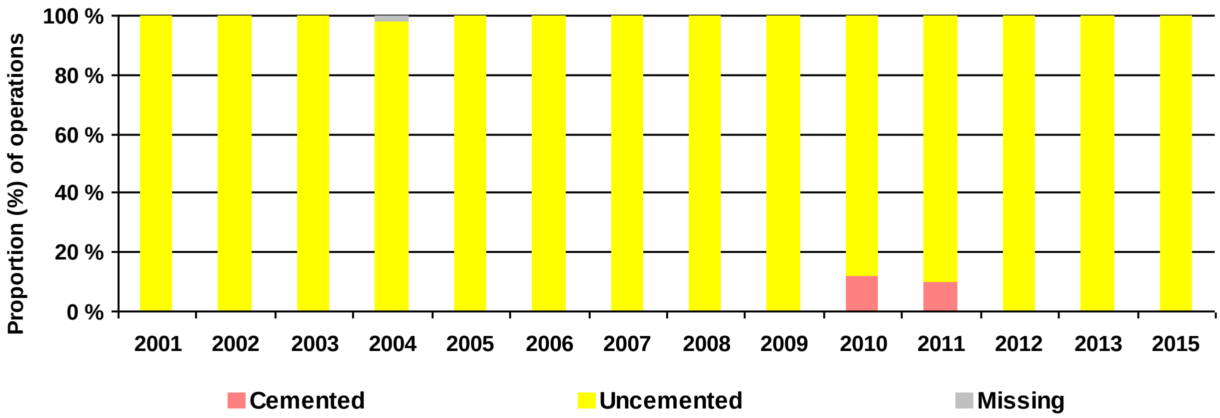


Figure 13: Resurfacing total shoulder prostheses - Primary operations - Glenoid

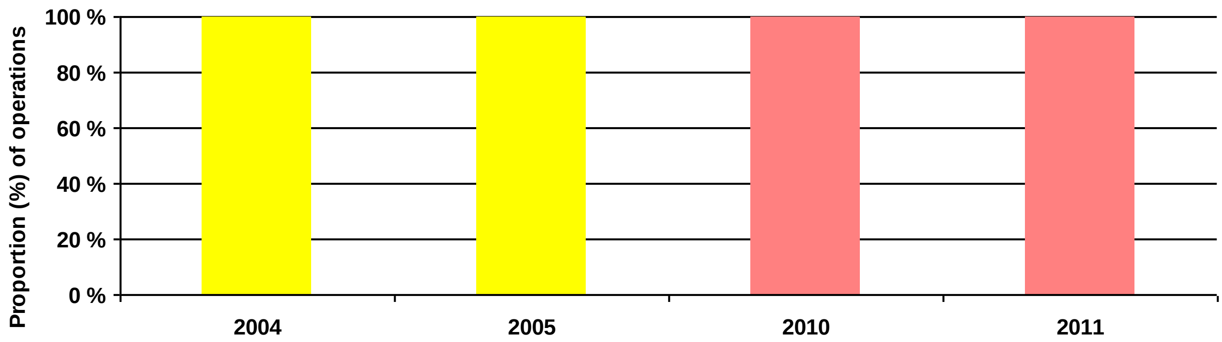


Figure 14: Resurfacing total shoulder prostheses - Primary operations - Humerus

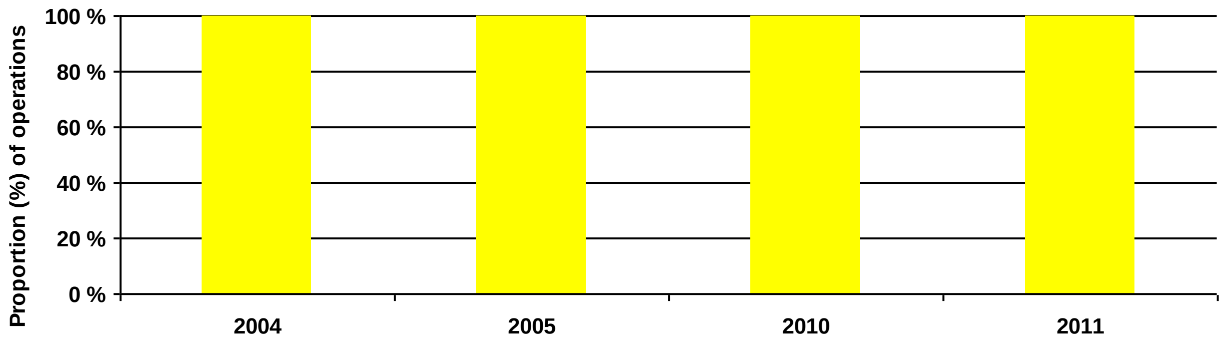


Figure 15: Reversed stemmed total shoulder prostheses - Primary operations - Glenoid

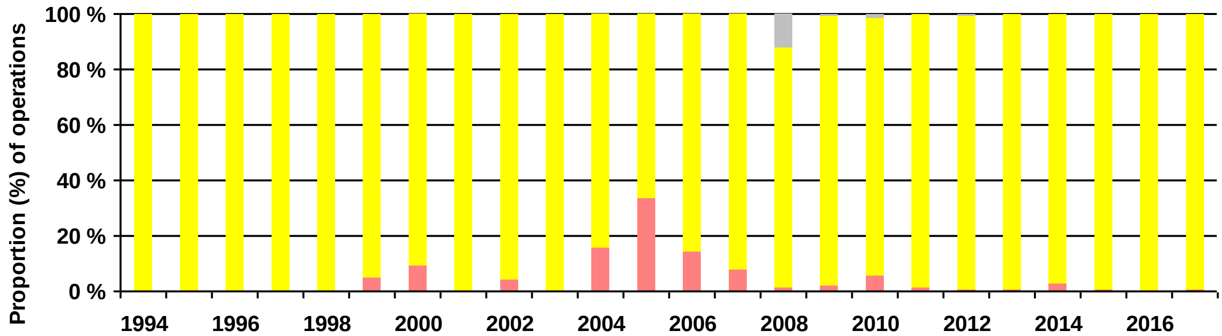


Figure 16: Reversed stemmed total shoulder prostheses - Primary operations - Humerus

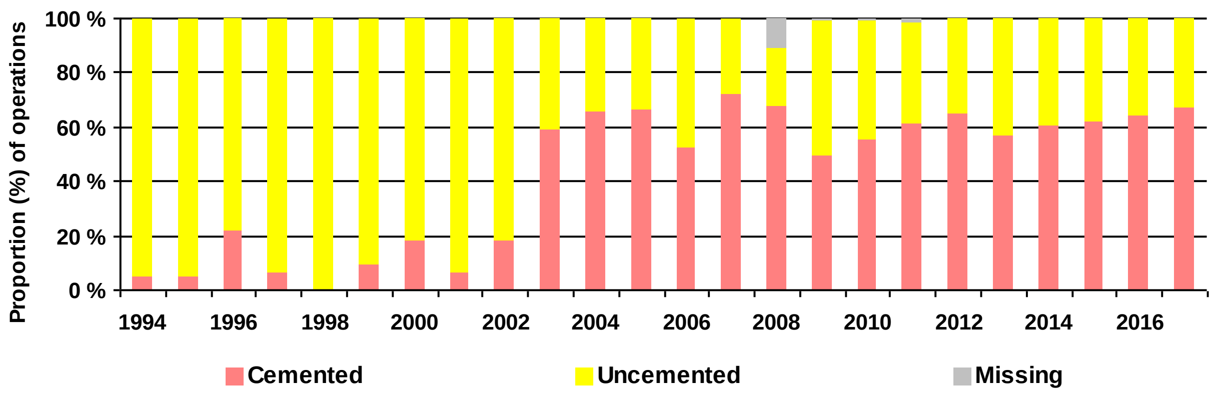


Figure 17: Non stemmed shoulder hemiprostheses - Primary operations - Humerus

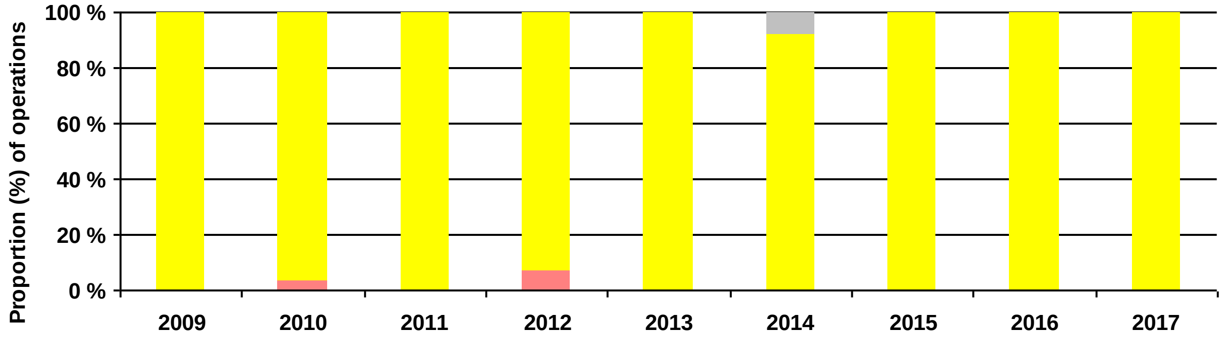


Figure 18: Non stemmed total shoulder prostheses - Primary operations - Glenoid

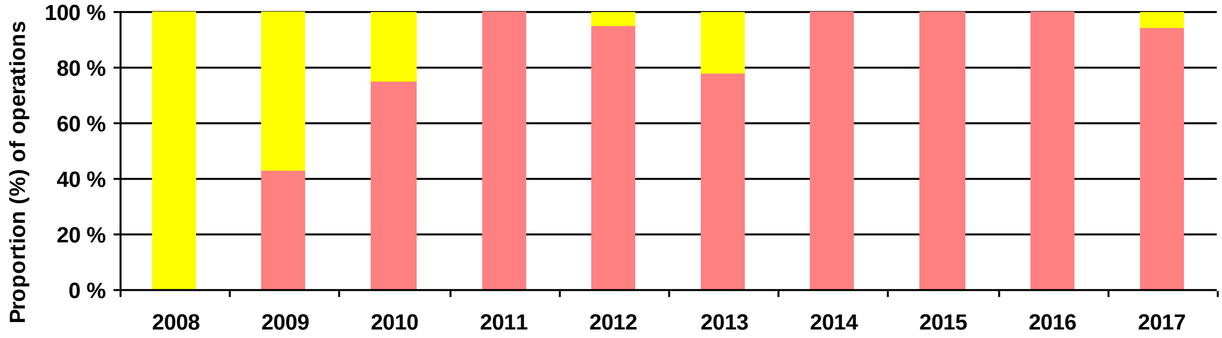


Figure 19: Non stemmed total shoulder prostheses - Primary operations - Humerus

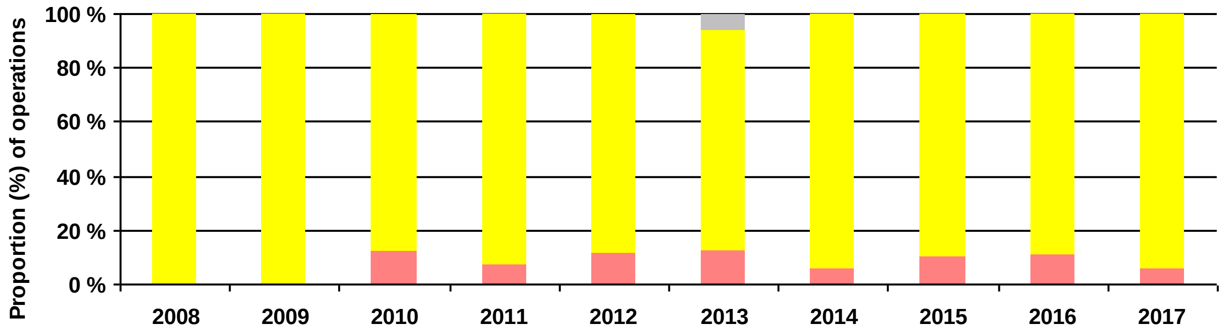
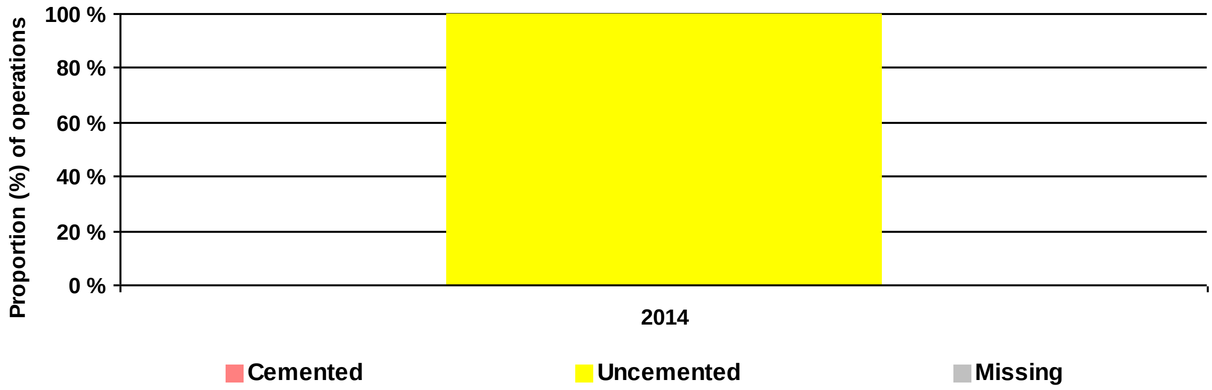


Figure 20: Reversed non stemmed total shoulder prostheses - Primary operations



Prosthesis brand

Stemmed hemiprostheses shoulder

Table 18: Primary operations- Caput humeri

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Bio - Modular	662	21	36	15	20	2	1	2			**759**
Global Advantage	387	53	54	66	44	36	40	34	16	1	**731**
Global Fx	68	27	29	47	50	17	16	13	11		**278**
Global	248										**248**
Nottingham	184	7	7	3	3						**204**
EPOCA		27	20	28	24	20	21	5			**145**
Global Unite					1		11	21	25	28	**86**
Delta I	63										**63**
Promos standard					8	14	12	11	6	2	**53**
Comprehensive					2	4	6	5	13	16	**46**
Aequalis	14	6	5	8	7	6					**46**
Aequalis-Fracture	9	3	7	7	2	3	3	1	1	3	**39**
Nottingham 1	2	12	15	2	4	2					**37**
Modular	33										**33**
Bigliani/Flatow	19	4	1	3		2		1			**30**
JR-Vaios Anatomic						1	7	9	3	6	**26**
Aequalis Ascend Flex Anatomic						2	2	8	3	11	**26**
SMR- anatomic							1	2	7	13	**23**
Global unite anatomic							3	3	9	3	**18**
Other (n < 10)	7	1	1				1	1	3	3	**17**
Total	**1696**	**161**	**175**	**179**	**165**	**109**	**124**	**116**	**97**	**86**	**2908**

Table 19: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Bio - Modular	681	21	34	15	20	2	1	2			**776**
Global Advantage	224	45	42	60	41	35	38	33	16	1	**535**
Global Fx	232	35	41	53	54	18	18	14	11		**476**
Global	261										**261**
Nottingham	179	10	10	4	7						**210**
EPOCA		27	21	28	24	20	21	5			**146**
Global Unite					1		11	21	25	28	**86**
Delta I	64										**64**
Scan Shoulder	56										**56**
Promos standard					8	14	12	11	6	2	**53**
Neer II	47										**47**
Aequalis-Fracture	10	5	7	7	2	4	3	1	1	3	**43**
Aequalis	13	4	5	8	7	5					**42**
Modular	33										**33**
Nottingham 1	4	10	15	1		2					**32**
Bigliani/Flatow	19	4	1	3		2		1			**30**
JR-Vaios Anatomic						1	7	9	3	6	**26**
Aequalis Ascend Flex Anatomic						2	2	8	3	11	**26**
Comprehensive Fracture		1			2	4	6	5	3	3	**24**
SMR- anatomic							1	2	7	13	**23**
Comprehensive									10	13	**23**
Global unite anatomic							3	3	9	3	**18**
Monosperical	14										**14**
Other (n < 10)	8		1				1	1	3	3	**17**
Total	**1845**	**162**	**177**	**179**	**166**	**109**	**124**	**116**	**97**	**86**	**3061**

Anatomic stemmed total shoulder prostheses

Table 20: Primary operations - Glenoid

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Global unite anatomic							3	81	100	139	**323**
Aequalis	40	31	51	51	32	36	3				**244**
Aequalis Ascend Flex Anatomic						11	68	15	29	24	**147**
Global	16	20	14	18	14	30	9	1			**122**
Global Advantage	4					2	18	27	18	1	**70**
Bio - Modular	49	1									**50**
JR-Vaios Anatomic						4	8	8	11	8	**39**
Promos standard					1	3	6	6	4	3	**23**
Bigliani/Flatow	10	1		2	4	1	2		1	2	**23**
Comprehensive				2	3	2		1		10	**18**
SMR- anatomic							1		4	11	**16**
Anatomical shoulder					5	8	2	1			**16**
Nottingham	13										**13**
Elos	13										**13**
Andre (n < 10)	2	3	4	6	1						**16**
Total	**147**	**56**	**69**	**79**	**60**	**97**	**120**	**140**	**167**	**198**	**1133**

Table 21: Primary operations - Caput humeri

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Global unite anatomic							3	81	100	130	**314**
Aequalis	40	31	51	51	33	36	6				**248**
Global Advantage	21	19	14	18	14	31	27	28	17	1	**190**
Aequalis Ascend Flex Anatomic						12	65	14	29	24	**144**
Bio - Modular	48	1									**49**
JR-Vaios Anatomic						4	8	8	11	8	**39**
Promos standard					1	4	6	6	4	3	**24**
Bigliani/Flatow	10	1		2	4	1	2		1	2	**23**
Comprehensive				2	3	2		1		10	**18**
Anatomical shoulder					5	8	2	2			**17**
SMR- anatomic							1		4	11	**16**
Nottingham	15										**15**
Other (n < 10)	2	4	4	6	1	1			1	9	**28**
Total	**136**	**56**	**69**	**79**	**61**	**99**	**120**	**140**	**167**	**198**	**1125**

Table 22: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Global unite anatomic							3	81	100	130	**314**
Aequalis	40	31	51	51	33	36	6				**248**
Global Advantage	20	18	14	18	14	31	26	27	16	1	**185**
Aequalis Ascend Flex Anatomic						12	63	14	29	24	**142**
Bio - Modular	47	1									**48**
JR-Vaios Anatomic						3	8	8	11	8	**38**
Promos standard					1	4	6	6	4	3	**24**
Bigliani/Flatow	10	1		2	4	1	2		1	2	**23**
Comprehensive				2	3	2		1		10	**18**
SMR- anatomic							1		4	11	**16**
Anatomical shoulder					5	8	1	2			**16**
Nottingham	15										**15**
Other (n < 10)	4	4	1	5	1	2	3	1	2	9	**32**
Total	**136**	**55**	**66**	**78**	**61**	**99**	**119**	**140**	**167**	**198**	**1119**

Resurfacing shoulder hemiprostheses

Table 23: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Copeland	248	36	12	4	4						**304**
Global C.A.P.	54	12	8	11	4	2		2			**93**
EPOCA Resurfacing		2	3	4	2	7		1			**19**
Aequalis Resurfacing	10	3		1	1						**15**
Other (n < 10)	3	2	2								**7**
Total	**315**	**55**	**25**	**20**	**11**	**9**		**3**			**438**

Resurfacing total shoulder prostheses

Table 24: Primary operations - Glenoid

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Copeland	2										**2**
Aequalis Resurfacing			1	1							**2**
Total	**2**		**1**	**1**							**4**

Table 25: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Copeland	2										**2**
Aequalis Resurfacing			1	1							**2**
Total	**2**		**1**	**1**							**4**

Reversed stemmed total shoulder prostheses

Table 26: Primary operations - Glenoid

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Delta Xtend	64	64	91	114	147	142	179	222	245	299	**1567**
Delta III	312	1	1								**314**
Tess Reversed	15	30	31	28	32	30	38	39	28	17	**288**
Aequalis Ascend Flex Reverse						17	38	47	40	30	**172**
Promos Reverse				9	10	17	21	14	17	11	**99**
Aequalis Reversed II				1	18	37	11	13	5	8	**93**
Comprehensive Reverse				1	1	1	3	8	29	22	**65**
SMR-reverse							2	3	11	31	**47**
Aequalis-Reversed	11	3	9	7	2						**32**
JRI-Vaios Inverse						9	5	4	3	5	**26**
Trebecular Metal Reverse Shou	1	2		1	1	1	3	2		2	**13**
Anatomical shoulder Reversed					5		5				**10**
Andre (n < 10)								1			**1**
Total	**403**	**100**	**132**	**161**	**216**	**254**	**305**	**353**	**378**	**425**	**2727**

Table 27: Primary operations - Caput humeri

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Delta Xtend	64	64	91	115	147	142	179	222	245	299	**1568**
Delta III	305	1	1								**307**
Tess Reversed	15	29	31	27	32	30	38	39	28	17	**286**
Aequalis Ascend Flex Reversed						17	41	44	34	30	**166**
Promos Reverse				9	10	17	21	14	17	11	**99**
Comprehensive Reverse				1	1	1	3	8	29	22	**65**
Aequalis Reversed Fracture					3	16	8	16	11	8	**62**
Aequalis-Reversed	8	3	9	8	10	13					**51**
SMR-reverse							2	4	11	31	**48**
JRI-Vaios Inverse						9	5	4	3	5	**26**
Aequalis Reversed II					6	8					**14**
Trebecular Metal Reverse Shoulder	1	2		1	1		3	2		2	**12**
Anatomical shoulder Reversed					5		5				**10**
Total	**393**	**99**	**132**	**161**	**215**	**253**	**305**	**353**	**378**	**425**	**2714**

Table 28: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Delta Xtend	64	64	91	115	147	142	179	222	245	299	**1568**
Delta III	313	1	1								**315**
Tess Reversed	15	30	31	27	32	30	38	39	28	17	**287**
Aequalis Ascend Flex Reversed						17	41	44	34	30	**166**
Promos Reverse				9	10	17	21	14	17	11	**99**
Comprehensive Reverse				1	1	1	3	8	27	21	**62**
Aequalis-Reversed	11	3	9	8	12	19					**62**
Aequalis Reversed Fracture					3	16	8	16	11	8	**62**
SMR-reverse							2	4	11	31	**48**
JRI-Vaios Inverse						9	5	4	3	5	**26**
Trebecular Metal Reverse Shoulder	1	2		1	1	1	3	2		2	**13**
Anatomical shoulder Reversed					5		5				**10**
Other (n < 10)					5	2			2	1	**10**
Total	**404**	**100**	**132**	**161**	**216**	**254**	**305**	**353**	**378**	**425**	**2728**

Non stemmed shoulder hemiprostheses

Table 29: Primary operations - Caput humeri

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Tess-Anatomic		5	30	16	13	7	7	3	6		**87**
ECLIPSE TM			5	5	10	15	10	11	3		**59**
Other (n < 10)					1	4	6	2	4	1	**18**
Total		**5**	**35**	**21**	**24**	**26**	**23**	**16**	**13**	**1**	**164**

Table 30: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Tess-Anatomic		5	30	16	13	7	7	3	6		**87**
Other (n < 10)					1	4	6	2	4	1	**18**
Total		**5**	**30**	**16**	**14**	**11**	**13**	**5**	**10**	**1**	**105**

Non stemmed total shoulder prostheses

Table 31: Primary operations - Glenoid

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Tess-Anatomic	3	7	8	14	7	3	3	3	4	2	**54**
Aequalis Ascend Flex Anatomic							13	7	12	13	**45**
Simpliciti					10	10					**20**
ECLIPSE TM				2	3	2	4	5		2	**18**
Andre (n < 10)						3	1		2	1	**7**
Total	**3**	**7**	**8**	**16**	**20**	**18**	**21**	**15**	**18**	**18**	**144**

Table 32: Primary operations - Caput humeri

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Simpliciti					10	12	13	7	12	13	**67**
Tess-Anatomic	3	8	8	14	7	4	3	3	4	2	**56**
ECLIPSE TM				2	3	2	4	5		2	**18**
Other (n < 10)							1		2	1	**4**
Total	**3**	**8**	**8**	**16**	**20**	**18**	**21**	**15**	**18**	**18**	**145**

Table 33: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Simpliciti					10	12	14	7	12	13	**68**
Tess-Anatomic	3	8	8	14	7	4	3	3	4	2	**56**
Other (n < 10)									2	1	**3**
Total	**3**	**8**	**8**	**14**	**17**	**16**	**17**	**10**	**18**	**16**	**127**

Reversed stemmed total shoulder prostheses

Table 34: Primary operations - Glenoid

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Comprehensive Reverse							1				**1**
Total							**1**				**1**

Table 35: Primary operations - Caput humeri

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Comprehensive Reverse							1				**1**
Total							**1**				**1**

Table 36: Primary operations - Humerus

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Comprehensive Nano Stemless Reverse							1				**1**
Total							**1**				**1**

Reasons for revisions

Table 37: Stemmed shoulder hemiprostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017	4	2	4	4		4	6	12	5	13	
2016	11	8	3	1		11	3	10	6	12	
2015	5	5	3	4	1	8		11	7	8	
2014	5	4	2	2		6	3	9	4	5	
2013	3	4	2	7		11	3	12	11	10	
2012	2	4	6	2		6	2	6	5	12	1
2011	2	3	4	3		3	2	7	2	6	
2010	2	10	5	3	2	5	7	10	2	11	
2009	6	9	1	6	2	4	5	14	5	13	
2008	4	2	1	3	2	5		8	1	6	1
2007	3	8	2	4	1	4		14	2	11	2
2006	9	13	2	7	1	5	4	11	3	11	
2005	5	4	4	2	2	4	3	6	2	3	
2004	4	7	6	6		1	2	7	1	5	
2003	1	3	1	1		4	1	7		3	
2002	3	5	1	2	2	1	3	9	1	1	1
1994-01	10	8	12	5	1	4	5	32	1	13	3
Total	**79**	**99**	**59**	**62**	**14**	**86**	**49**	**185**	**58**	**143**	**8**

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

Table 38: Anatomic stemmed total shoulder prostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017	3		2	6			1	4		6	
2016	4	1		2		7		3		1	
2015				1	1	1		4		1	
2014	2			4	2	3	1	4		4	
2013	1					3		2	1		
2012			1	2				2	2		
2011	1	1	3					1			
2010			1	2		4		1		1	
2009			1			1				1	
2008								1	3		
2007	1		1			1			3		
2006		1	1							1	
2004	1										
2003								1			
2002	1	1	1					1			
1994-01	4		4	1		2		5		3	
Total	**18**	**4**	**15**	**18**	**3**	**22**	**2**	**29**	**9**	**18**	**0**

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

Table 39: Resurfacing shoulder hemiprostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017				1			1	8		1	
2016		4	1	1	1			7		3	
2015	1	2						1		1	
2014		2		1			1	11		3	
2013		1						7		1	
2012		2	1	2		2		6		3	
2011					1			7		6	
2010								9		1	
2009								9		2	
2008		2		1				11		2	
2007	1	1	1			1		2	1		
2006		1		1		1		2			
2005		2						1			
Total	**2**	**17**	**3**	**7**	**2**	**4**	**2**	**81**	**1**	**23**	**0**

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

Table 40: Resurfacing total shoulder prostheses

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

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

Table 41: Reversed stemmed total shoulder prostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017	2	2	6	3	1	12	2	6	2	1	
2016	4	3	4	1		9	4	2	1		
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		2	1			3				
2010	3	1	2	1		1	1			2	
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					
1994-01	4	1		1		7	1	1		2	
Total	**44**	**27**	**42**	**16**	**3**	**75**	**14**	**18**	**9**	**20**	**1**

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

Table 42: Non stemmed shoulder hemiprostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017			1					3			
2016							1	3		2	
2015								3		3	
2014		1						4		1	
2012			1			2		1		2	
2011										1	
Total	**0**	**1**	**2**	**0**	**0**	**2**	**1**	**14**	**0**	**9**	**0**

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

Table 43: Non stemmed total shoulder prostheses

Year	Loose proximal	Loose distal comp	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017	1		1							1	
2016		1				1		1		1	
2015	2			1		3		1			
2014	1							1			
2012	4					3		1			
Total	**8**	**1**	**1**	**1**	**0**	**7**	**0**	**4**	**0**	**2**	**0**

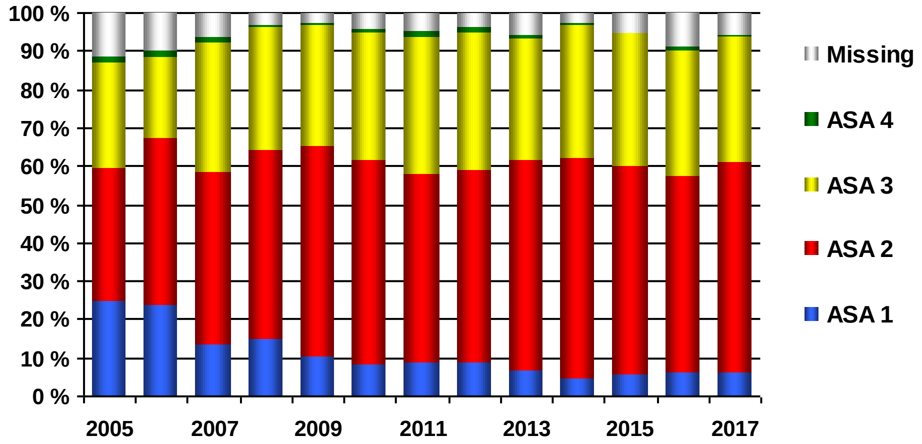
Revision reasons are not mutually exclusive. More than one reason for revision is possible. All revisions were included.

ASA classification all shoulder prostheses

Table 44: Primary operations

Year	ASA 1	ASA 2	ASA 3	ASA 4	ASA 5	Missing	Total
2017	45	402	238	4		40	**729**
2016	41	347	220	7		58	**673**
2015	37	349	223	3		32	**644**
2014	28	342	206	4		14	**594**
2013	36	283	163	5		30	**517**
2012	44	252	177	8		19	**500**
2011	42	236	174	6		23	**481**
2010	36	240	147	6		18	**447**
2009	41	215	123	3		10	**392**
2008	46	148	97	2		9	**302**
2007	41	140	104	4		20	**309**
2006	66	121	60	4		27	**278**
2005	56	79	62	3		26	**226**

Figure 21: Primary 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.

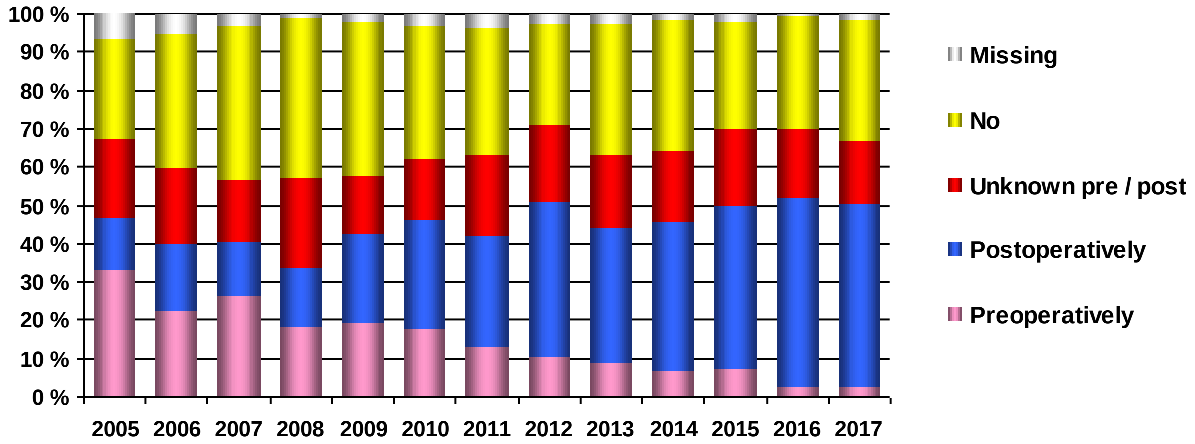
Registration of ASA classification started in 2005

Thrombosis prophylaxis

Table 45: Primary operations

Year	Preoperatively	Postoperatively	Unknown* pre / post	No	Missing	Total
2017	17	348	123	229	12	**729**
2016	18	329	123	198	5	**673**
2015	46	276	129	180	13	**644**
2014	40	230	111	205	8	**594**
2013	46	183	99	176	13	**517**
2012	52	201	102	133	12	**500**
2011	62	141	100	160	18	**481**
2010	78	128	71	155	15	**447**
2009	75	92	59	158	8	**392**
2008	54	47	71	127	3	**302**
2007	82	43	50	125	9	**309**
2006	62	49	54	98	15	**278**
2005	75	30	47	59	15	**226**

Figure 22: Primary operations



Registration of thrombosis prophylaxis started in 2005

Previous operation in relevant joint

Table 46: For primary total prostheses

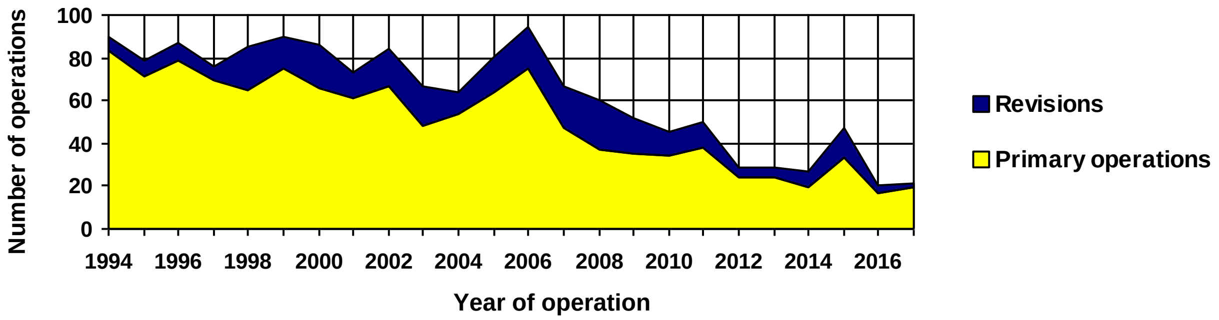
Type	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Osteosynthesis of intraarticular joint fracture	198	11	27	23	35	25	30	37	46	54	486
Synovectomy	101	6	11	12	7	9	6	5	5	7	169
"Shaving"/Cleanup (Debridement)	5	1	1	4		2	1		1	5	20
Osteotomy	7		1			2	1	1	4	1	17
Ligament	1			1				1	2	6	11
Artrodesis	3								1	1	5
Other previous op.	114	31	31	33	49	44	59	53	68	82	564

TOE JOINT PROSTHESES

Table 1: Annual number of operations

Year	Primary operations		Revisions		Total
2017	19	(90,5%)	2	(9,5%)	**21**
2016	17	(85,0%)	3	(15,0%)	**20**
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**
1994-01	569	(85,4%)	97	(14,6%)	**666**
Total	**1204**	**(80,1%)**	**299**	**(19,9%)**	**1 503**

Figure 1: Annual number of operations



52,6 % of all operations were performed on the right side. 83,4 % 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
2017	14	3						2	
2016	14	3						1	
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	
1994-01	49	486	3	4	1			26	3
Total	**272**	**838**	**19**	**10**	**2**	**1**	**2**	**86**	**4**

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
2017				19	(100,0%)			**19**
2016				17	(100,0%)			**17**
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%)**		**1 189**	**(98,8%)**	**8**	**(0,7%)**	**1 203**

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**
Total	**3**	**(3,2%)**		**92**	**(96,8%)**		**95**

Toe joint prostheses

Table 5: Primary operations - Proximal

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Silastic HP 100	806	25	22	22	14	13	11	11	5	6	**935**
LPT	32	3	6	14	9	10	8	20	12		**114**
Toefit-plus	35	7	5	2	1	1		1			**52**
Sutter	26										**26**
Biomet Total Toe	25										**25**
Moje	18										**18**
LaPorta	14										**14**
Epyc								1		10	**11**
Swanson Titanium	4		1								**5**
HAPY										3	**3**
Total	**960**	**35**	**34**	**38**	**24**	**24**	**19**	**33**	**17**	**19**	**1203**

Table 6: Primary operations - Distal

Prostheses	1994-08	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Toefit-plus	35	7	5	2	1	1		1			**52**
Biomet Total Toe	25										**25**
Moje	18										**18**
Total	**78**	**7**	**5**	**2**	**1**	**1**		**1**	**1**		**95**

Reasons for revisions

Table 7:

Year	Loose proximal	Loose distal comp.	Dislocation	Instability	Malalignment	Deep infection	Fracture (near implant)	Pain	Defect polyethylene	Other	Missing
2017	1							1		1	
2016								1	1		
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	**6**	**23**	**7**	**16**	**82**	**27**	**3**	**133**	**23**	**93**	**9**

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

Completeness of reporting analysis for total elbow arthroplasty, 2015-2016

A completeness of reporting analysis has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions. Some hospitals have few total elbow arthroplasties and the completeness of reporting rate must be seen in this light.

NCSP codes for combining data from NPR hospital stays and total elbow arthroplasties

Type	Code	Description
Primary operation	**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
Revision level 1	**NCC 2y**	Secondary implantation of total prosthesis in elbow joint not using cement Includes: Of component of total prosthesis
	NCC 3y	Secondary implantation of total prosthesis in elbow joint using hybrid technique Includes: Of component of total prosthesis
	NCC 4y	Secondary implantation of total prosthesis in elbow joint using cement Includes: Of component of total prosthesis
	NCC 99	Other secondary prosthetic replacement in elbow joint
	NCU 1y	Removal of total prosthesis from elbow joint

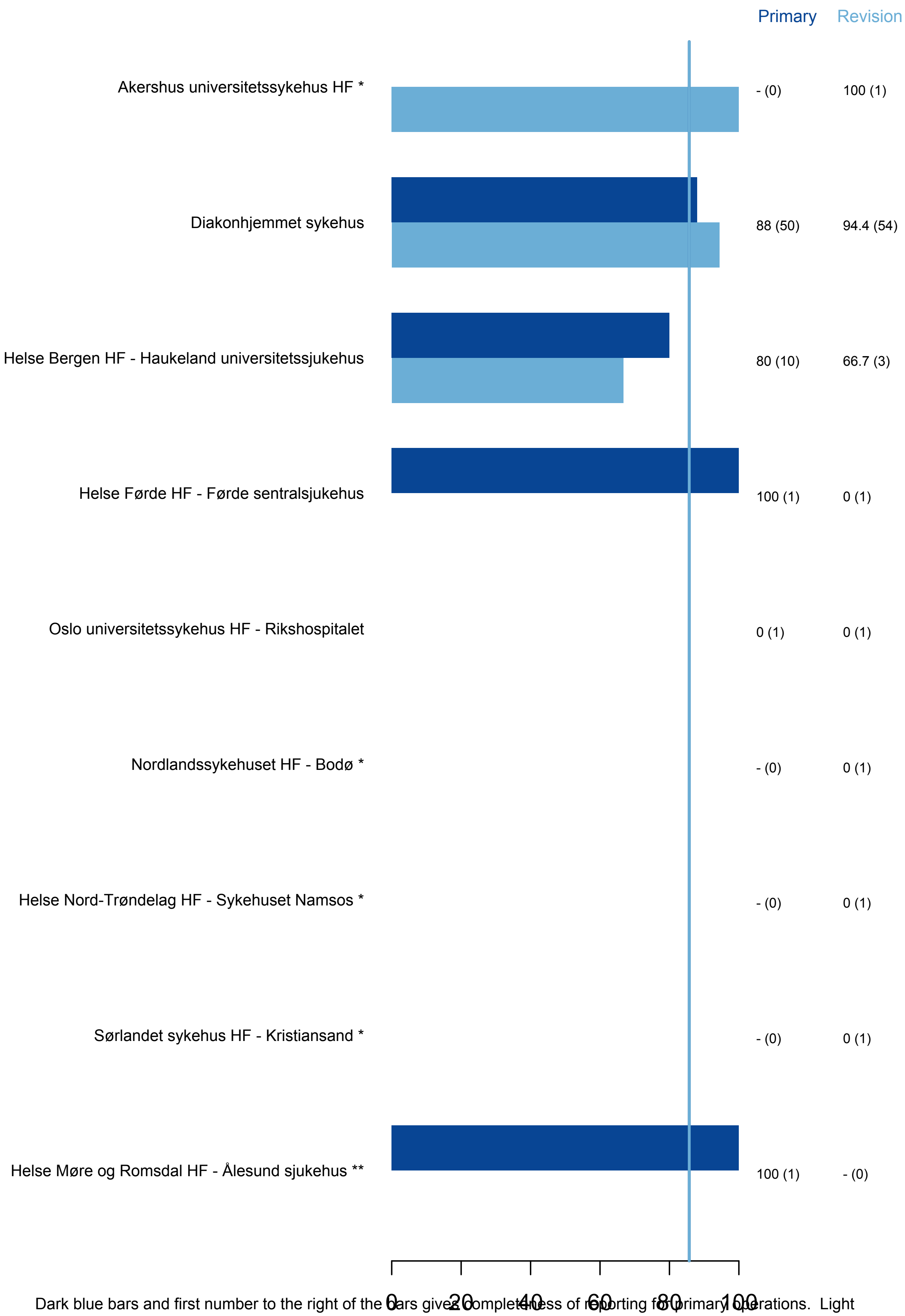
Primary operations. From 2015 to 2016, 63 primary total elbow arthroplasties were reported to one or both of the registers. 85.7% were reported to the NAR while 100% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than elbow arthroplasties were incorrectly coded with NCB 20*/NCB 30*/NCB 40*.

Procedure codes to be used for primary operations: NCB 20*/NCB 30*/NCB 40*

Revision operations. From 2015 to 2016, 63 revisions were reported to one or both of the registers. 85.7% of these were reported to the NAR, while 76.2% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations, level 1:
NCC 2* - NCC 3* - NCC 4* and possibly NCU 1* and NCC 99.

Completeness of reporting for primary and revision operations, elbow total prosthesis, 2015-2016



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

* Have no registered primary operations in NAR or NPR.

** Have no registered revisions in NAR or NPR.

Completeness of reporting analysis for ankle arthroplasty, 2015-2016

A completeness of reporting analysis has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions. Some hospitals have few ankle arthroplasties and the completeness of reporting rate must be seen in this light.

NCSP codes for combining data from NPR hospital stays and ankle arthroplasties

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
Revision level 1	**NHC 0y**	Secondary implantation of partial prosthesis in ankle joint not using cement Excludes: Of component of total prosthesis
	NHC 1y	Secondary implantation of partial prosthesis in ankle joint using cement Excludes: Of component of total prosthesis
	NHC 2y	Secondary implantation of total prosthesis in ankle joint not using cement Includes: Of component of total prosthesis
	NHC 3y	Secondary implantation of total prosthesis in ankle joint using hybrid technique Includes: Of component of total prosthesis
	NHC 4y	Secondary implantation of total prosthesis in ankle joint using cement
	NHU 0y	Removal of partial prosthesis from ankle joint
	NHU 1y	Removal of total prosthesis from ankle joint

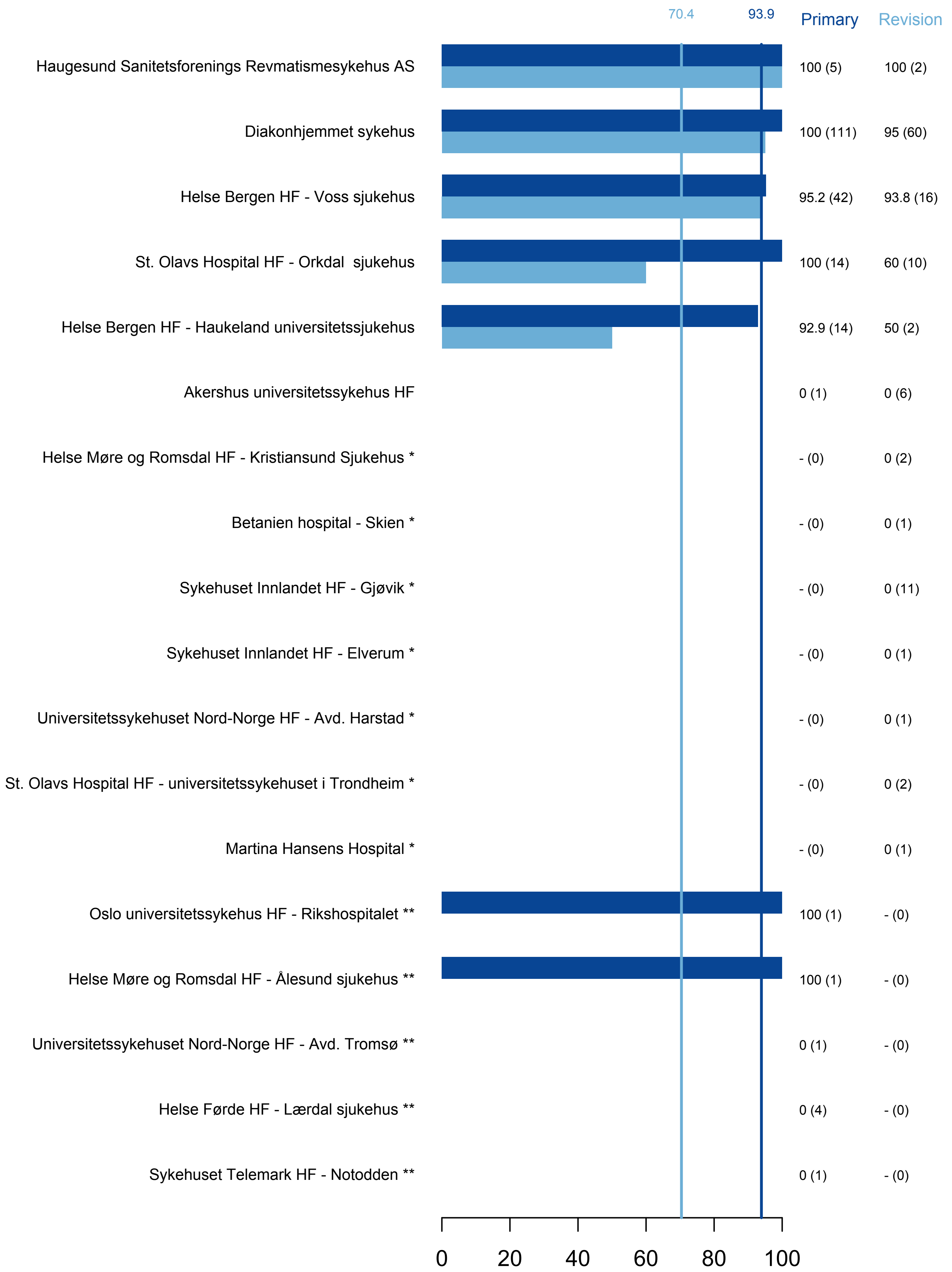
Primary operations. From 2015 to 2016, 198 primary ankle arthroplasties were reported to one or both of the registers. 93.9% were reported to the NAR, while 97.5% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than ankle arthroplasties were incorrectly coded with NHB 0*/NHB 1*/NHB 20/NHB 30/NHB 40.

Procedure codes to be used for primary operations:
NHB 0* - NHB 1* - NHB 20 - NHB 30 - NHB 40

Revision operations. From 2015 to 2016, 115 revisions were reported to one or both of the registers. 70.4% of these were reported to the NAR, while 97.4% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:
NHC 0* - NHC 1* - NHC 2* - NHC 3* - NHC 4* - NHC 99 - NHU 0* - NHU 1*

Completeness of reporting for primary and revision operations, ankle prosthesis, 2015-2016



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

* Have no registered primary operations in NAR or NPR.

** Have no registered revisions in NAR or NPR.

Completeness of reporting analysis for finger arthroplasty, 2015-2016

A completeness of reporting analysis has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions. Some hospitals have few finger arthroplasties and the completeness of reporting rate must be seen in this light.

NCSP codes for combining data from NPR hospital stays and finger arthroplasties

Type	Code	Description
Primary operation	**NDB 8y**	Primary prosthetic replacement of joint of finger or metacarpal
Revision level 1	**NDC 8y**	Secondary prosthetic replacement in joint of finger or metacarpal
	NDU 2y	Removal of prosthesis from other joint of hand

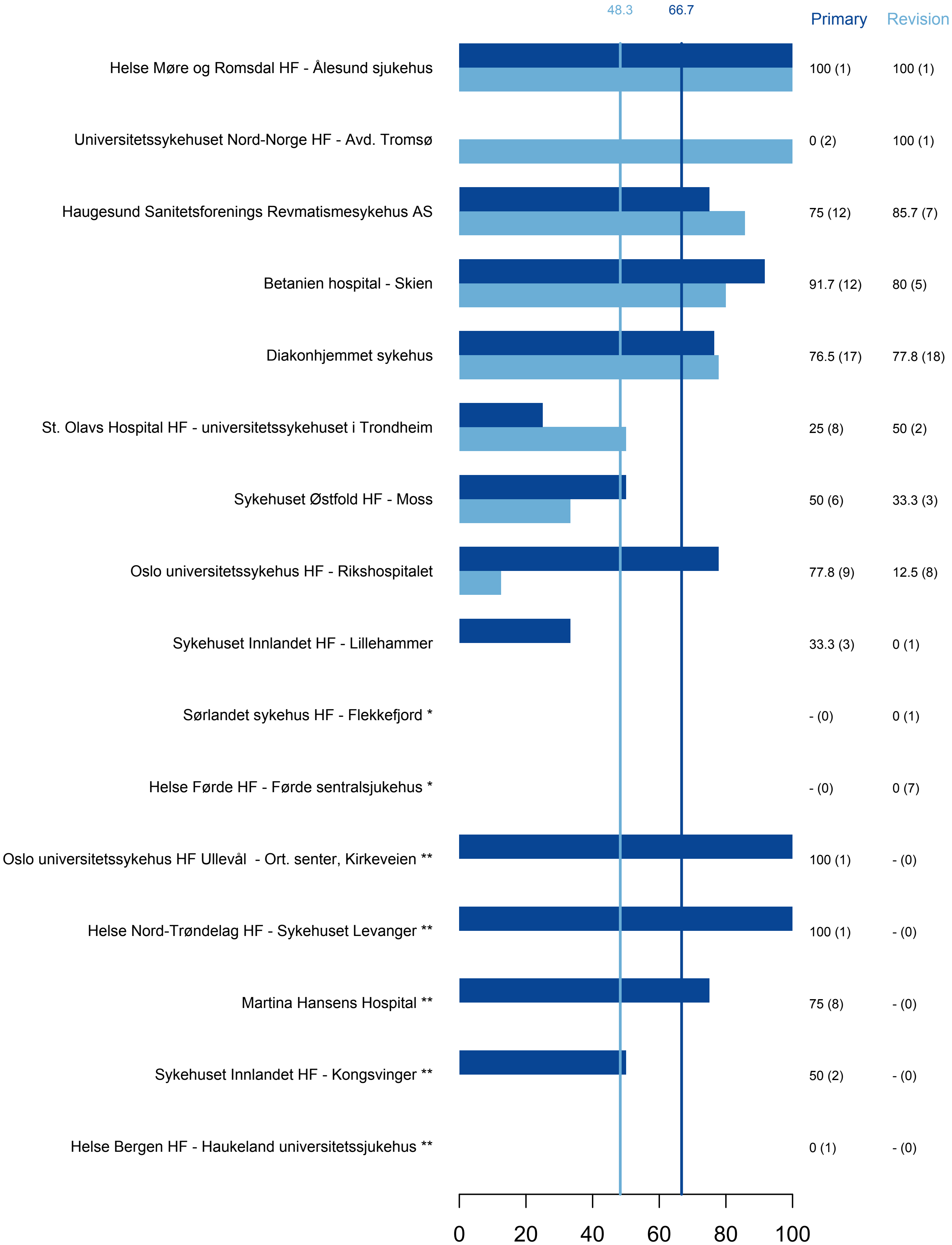
Primary operations. From 2015 to 2016, 84 primary finger arthroplasties were reported to one or both of the registers. 66.7% were reported to the NAR, while 95.2% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than finger arthroplasties were incorrectly coded with NDB 8y.

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

Revision operations. From 2015 to 2016, 60 revisions were reported to one or both of the registers. 48.3% of these were reported to the NAR, while 100% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the revision form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:
NDC 8y - NDU 2y

Completeness of reporting for primary and revision operations, finger prosthesis, 2015-2016



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

* Have no registered primary operations in NAR or NPR.

** Have no registered revisions in NAR or NPR.

Completeness of reporting analysis for wrist/carpus/distal radioulnar joint (DRUJ), 2015-2016

A completeness of reporting analysis has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions. Some hospitals perform few of these arthroplasties and the completeness of reporting rate must be seen in this light.

NCSP codes for combining data from NPR hospital stays and wrist/carpus/DRUJ

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
Revision level 1	**NDC 0y**	Secondary implantation of partial prosthesis in joint of wrist not using cement Excludes: Of component of total prosthesis
	NDC 1y	Secondary implantation of partial prosthesis in joint of wrist using cement Excludes: Of component of total prosthesis
	NDC 2y	Secondary implantation of total prosthesis in joint of wrist not using cement Includes: Of component of total prosthesis
	NDC 3y	Secondary implantation of total prosthesis in joint of wrist using hybrid technique Includes: Of component of total prosthesis
	NDC 4y	Secondary implantation of total prosthesis in joint of wrist using cement
	NDC 5y	Secondary implantation of interposition prosthesis in joint of wrist
	NDU 0y	Removal of partial prosthesis from joint of wrist
	NDU 1y	Removal of total prosthesis from joint of wrist

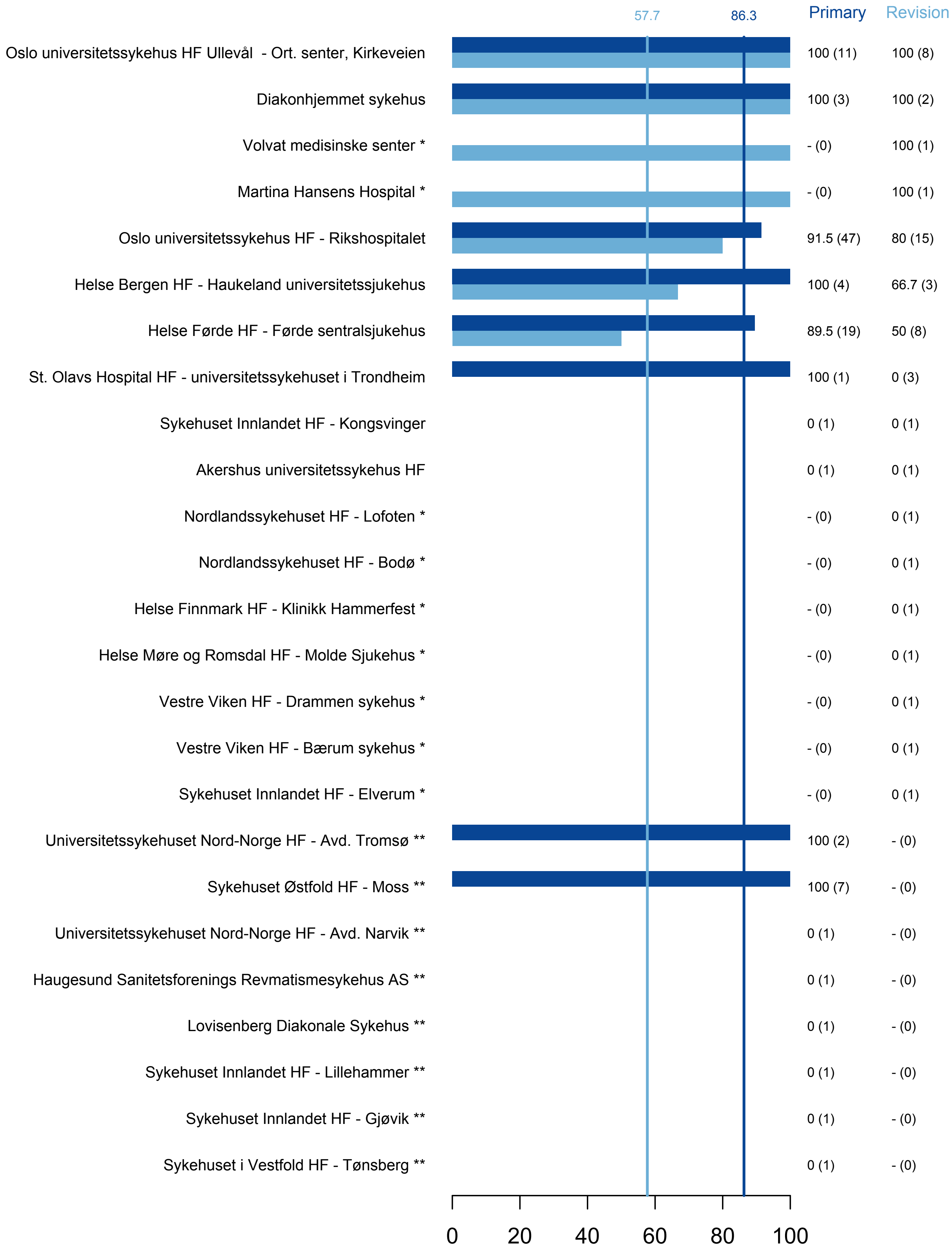
Primary operations. From 2015 to 2016, 102 primary wrist/carpus/DRUJ arthroplasties were reported to one or both of the registers. 86.3% were reported to the NAR while 77.5% were reported to the NPR. Completeness of reporting varies much between the different hospitals.

Procedure codes to be used for primary operations: NDB 0* - NDB 1* - NDB 2* - NDB 3* - NDB 4* - NDB 5*

Revision operations. From 2015 to 2016, 52 revisions were reported to one or both of the registers. 57.7% of these were reported to the NAR, while 67.3% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations: NDC 0* - NDC 1* - NDC 2* - NDC 3* - NDC 4* - NDB 5*

Completeness of reporting for primary and revision operations, hand prosthesis, 2015-2016



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

* Have no registered primary operations in NAR or NPR.

** Have no registered revisions in NAR or NPR.

Completeness of reporting analysis for shoulder arthroplasty, 2015-2016

A completeness of reporting analysis has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions. Some hospitals perform few shoulder arthroplasties and the completeness of reporting rate must be seen in this light.

NCSP codes for combining data from NPR hospital stays and shoulder arthroplasties

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
Revision level 1	**NBC 0y**	Secondary implantation of partial prosthesis in humero-scapular joint not using cement Excludes: Of component of total prosthesis
	NBC 1y	Secondary implantation of partial prosthesis in humero-scapular joint using cement Excludes: Of component of total prosthesis
	NBC 2y	Secondary implantation of total prosthesis in humero-scapular joint not using cement Includes: Of component of total prosthesis
	NBC 3y	Secondary implantation of total prosthesis in humero-scapular joint using hybrid technique Includes: Of component of total prosthesis
	NBC 4y	Secondary implantation of total prosthesis in humero-scapular joint using cement
	NBC 99	Other secondary prosthetic replacement in joint of shoulder
	NBU 0y	Removal of partial prosthesis from humero-scapular joint
	NBU 1y	Removal of total prosthesis from humero-scapular joint

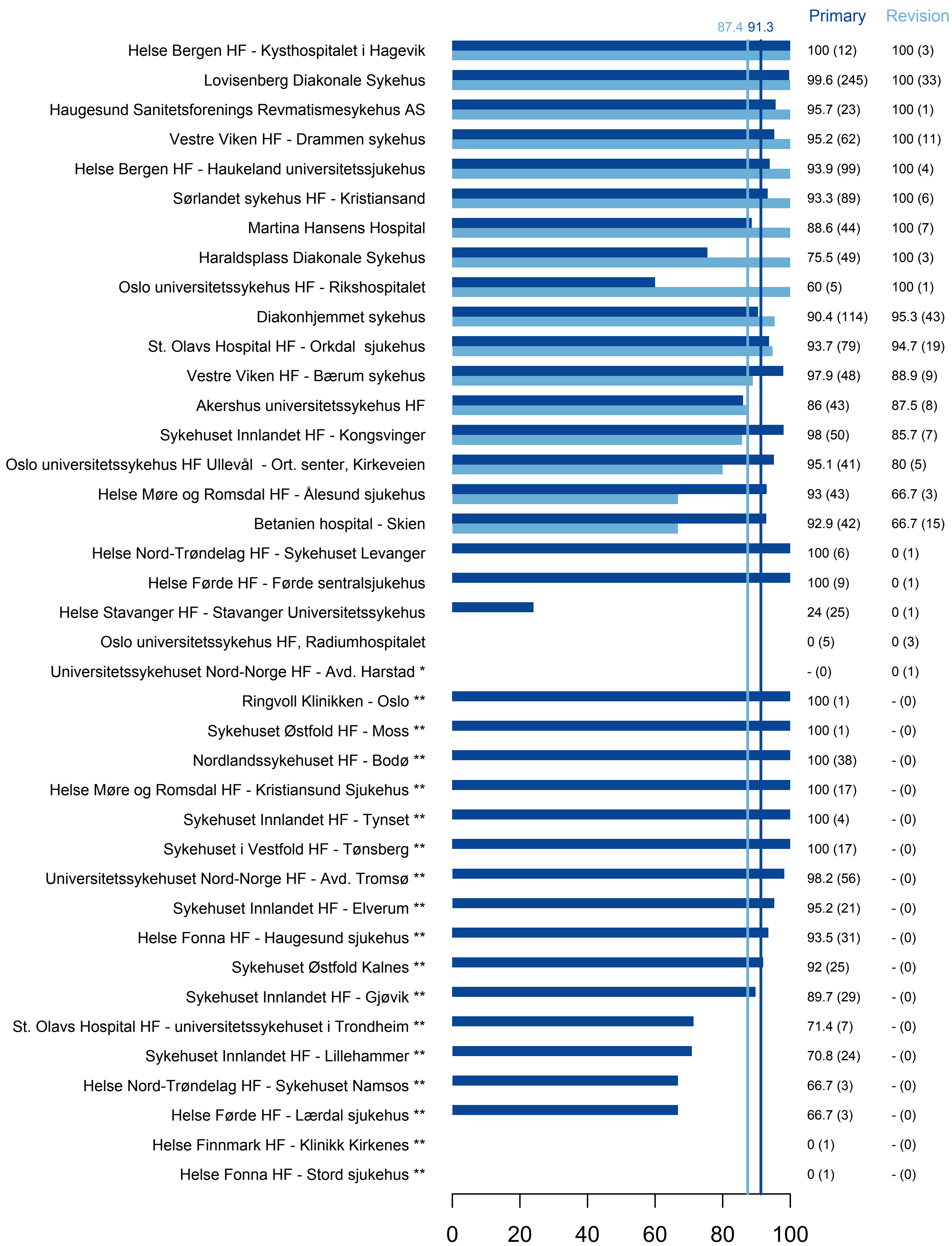
Primary operations. From 2015 to 2016, 1441 primary shoulder arthroplasties were reported to one or both of the registers. 91.3% were reported to the NAR, while 97.2% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than shoulder arthroplasties were incorrectly coded with NBB 0*/NBB 1*/NBB 20/NBB 30/NBB 40.

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

Revision operations. From 2015 to 2016, 190 revisions were reported to one or both of the registers. 87.4% of these were reported to the NAR, while 85.8% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations: NBC 0* - NBC 1* - NBC 2* - NBC 3* - NBC 4* - NBC 99 - NBU 0* - NBU 1*

Completeness of reporting for primary and revision operations, shoulder prosthesis, 2015-2016



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

* Have no registered primary operations in NAR or NPR.

** Have no registered revisions in NAR or NPR.

Completeness of reporting analysis for toe joint replacements, 2015-2016

A completeness of reporting analysis has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Norwegian Arthroplasty Register (NAR). There are separate statistics on primary operations and revisions. Some hospitals perform few toe joint replacements and the completeness of reporting rate must be seen in this light.

NCSP codes for combining data from NPR hospital stays and toe joint replacements

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
Revision level 1	**NHC 6y**	Secondary prosthetic replacement of first metatarsophalangeal joint
	NHC 7y	Secondary prosthetic replacement of other metatarsophalangeal joint
	NHC 8y	Secondary prosthetic replacement in other joint of foot
	NHC 99	Other secondary prosthetic replacement in joint of ankle or foot
	NHU 2y	Removal of prosthesis from other joint of foot

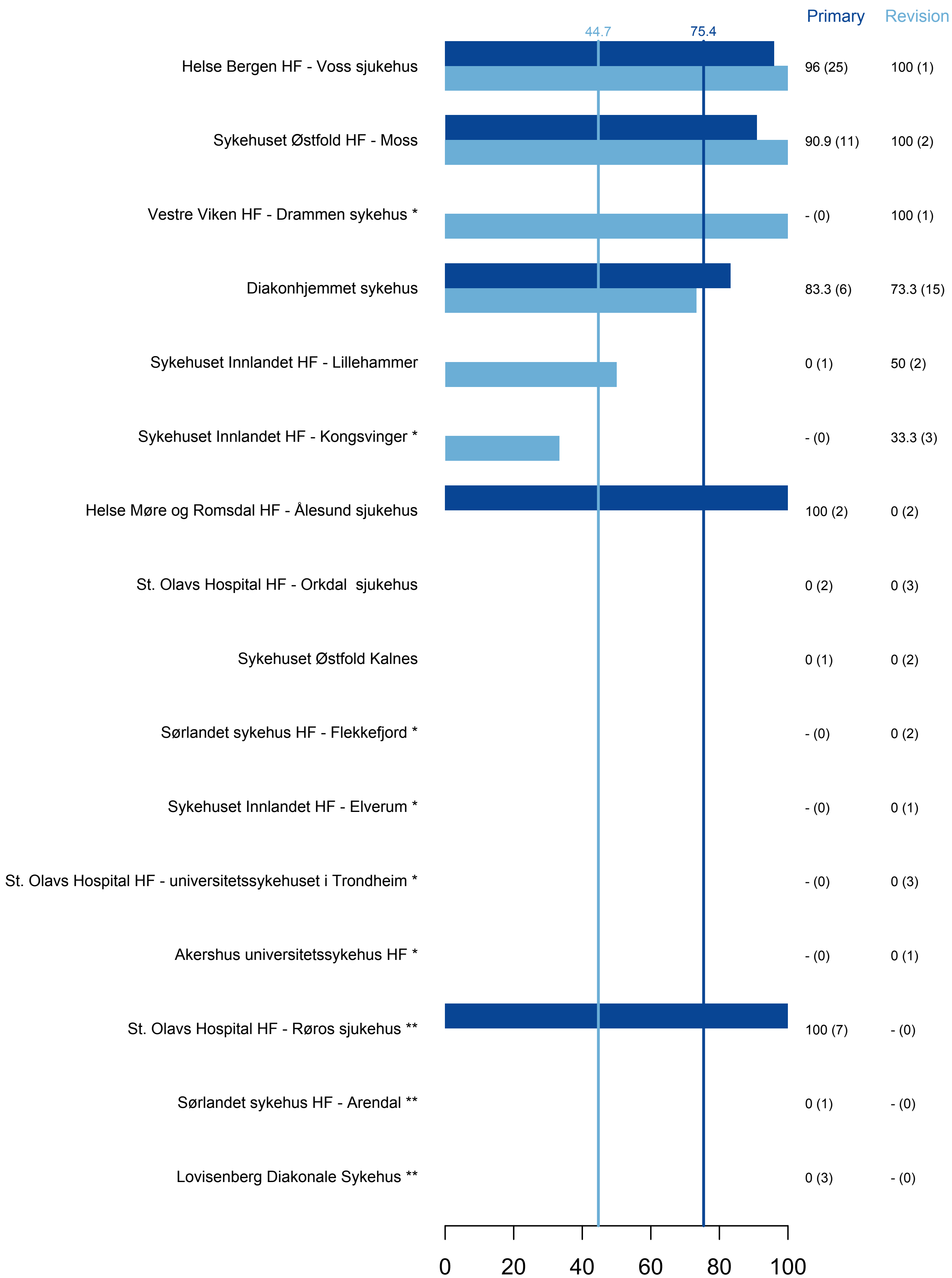
Primary operations. From 2015 to 2016, 65 primary toe joint replacements were reported to one or both of the registers. 75.4% were reported to the NAR, while 96.9% were reported to the NPR. Completeness of reporting varies much between the different hospitals. For hospitals with a low completeness of reporting rate for the NAR, either the form was not sent, or other interventions than toe joint replacements were incorrectly coded with NHB 6y/NHB 7y/NHB 8y.

Procedure codes to be used for primary operations: NHB 6y - NHB 7y - NHB 8y

Revision operations. From 2015 to 2016, 38 revisions were reported to one or both of the registers. 44.7% of these were reported to the NAR, while 97.4% were reported to the NPR (revision level 1). Completeness of reporting varies much between the different hospitals. A low completeness of reporting rate may mean that the form was not sent in. It appears that a number of revision forms are missing in cases where the prosthesis was removed without a new one being inserted in the same operation; in such cases, a form should be submitted both when the prosthesis is removed and when any new insertion is performed.

Procedure codes to be used for revision operations:
NHC 6y - NHC 7y - NHC 8y - NHU 2y

Completeness of reporting for primary and revision operations, toe prosthesis, 2015-2016



Dark blue bars and first number to the right of the bars gives completeness of reporting for primary operations. Light blue bars and second number to the right of the bars gives completeness of reporting for revision operations (level 1). The numbers in brackets gives the number of operations registered at both NAR and NPR. Vertical lines shows the national averages.

* Have no registered primary operations in NAR or NPR.

** Have no registered revisions in NAR or NPR.

CONTENTS

Norwegian Hip Fracture Register

NORWEGIAN HIP FRACTURE REGISTER
ANNUAL REPORT 2017

The Norwegian Hip Fracture Register now contains data from 105 000 primary operations and over 11 500 reoperations. In 2017, 8307 primary and 882 reoperations were reported to the Register. This is a slight decrease in both primary operations and reoperations compared to the previous two years. This may be due to an actual decrease in the number of operations performed, but it may also be caused by poorer reporting to the Register. When the annual report with the hospital results is sent out later this year, we ask all hospitals to compare the number of operations recorded in the Hip Fracture Register with their own records.

The Hip Fracture Register presented online interactive results in 2017 as one of only few national medical quality registers, and as the first orthopaedic quality register. For several years, this has been called for by the Centre for Clinical Documentation and Evaluation (SKDE) at the National Service Centre for Medical Quality Registers. Updated online results are also a requirement for assessment as a stage 4 register. The interactive results of the Hip Fracture Register are available at www.kvalitetsregistre.no. The results have so far been well received and we hope that they will be used in quality improvement work. Further improvement of the interactive results is planned for the autumn.

Work on quality indicators by the Hip Fracture Register has been successful. The quality indicators are now well-established, both among the Register's contact persons and among various groups of professionals in the Norwegian Orthopaedic Association. There is still great variation between hospitals in the time patients have to wait from fracture to surgery. Both the Norwegian Knowledge Centre for the Health Services and the Hip Fracture Register recommend that hip fractures are operated within 24 hours, or within 48 hours as a maximum. Many hospitals fail to operate most of their hip fracture patients within these time limits. There are few reasons to postpone hip fracture surgery for more than 48 hours. This should be a priority at all hospitals. The Hip Fracture Register has also recommended avoiding the use of uncemented femoral stems in hip fracture surgery in patients over 70 years. We are therefore pleased to note that the proportion of uncemented prostheses decreased from 20% to 13% last year. Nonetheless, uncemented stems are still routinely used in some hospitals. We hope that their use will continue to decline in 2018.

New interdisciplinary guidelines for the treatment of hip fracture patients were recently presented in Oslo. The guidelines have been developed in collaboration between the Norwegian Orthopaedic Association, the Norwegian Geriatrics Society and the Norwegian Anaesthesiology Association. The new guidelines should be used in the design of standard pathways for hip fracture patients. The hospital-based results and interactive results of the Hip Fracture Register will indicate whether recommendations in the guidelines are being followed. Until now, the Hip Fracture Register has been surgery-oriented. We are investigating the possibility of expanding the Register to include reporting of other variables such as hospital days, post-discharge care, fall prevention, osteoporosis treatment and medical complications in connection with hospital stays. This will enable the Register to be used to an even greater extent in quality improvement work at hospitals. The Register will also be able to monitor, at the national level, compliance with the recommendations in the new guidelines. Such monitoring has proved very useful in the UK, where the national hip fracture register has played an important role in quality improvement work on hip fractures, including direct feedback to hospitals that show poor compliance with recommended practice. The new variables in the Hip Fracture Register will probably be recorded on a form completed by a doctor or nurse at discharge. An electronic reporting solution will hopefully make registration easier.

The Hip Fracture Register presented a scientific exhibition at the AAOS meeting in New Orleans in March 2017. An electronic version of the exhibition is available on the NRL website http://nrlweb.ihelse.net/.

Lars Birger (Lasse) Engesæter retired as head of the Hip Fracture Register on 1 September 2017. We would like to thank him for his many years of work and enthusiasm for the Hip Fracture Register!

PUBLICATIONS SINCE 1 JANUARY 2017

Gjertsen JE et al. have studied the results of hip fracture surgery in Norway from 2005 to 2014. Data from the Hip Fracture Register shows that the proportion of reoperations has decreased, especially as a result of the altered treatment of displaced femoral neck fractures in the ten-year period studied. In addition, patient survival has increased for both femoral neck and trochanteric fractures.

Johansen A et al. have compared the information available in the annual reports of eight national hip fracture registers. The study showed, somewhat surprisingly, considerable variation between countries in types of fracture, surgical methods, types of anaesthesia, and hospital days following hip fractures. The article was the first step towards international cooperation between the registers in the hope of developing a common, standardised dataset of hip fractures.

Bartels S et al. have studied treatment of displaced femoral neck fractures in younger patients (55-70 years). The results showed a high proportion of reoperations following screw fixation. Patients receiving a hemiprosthesis or total prosthesis reported better quality of life and less pain and were more satisfied with the outcome of the surgery than patients operated on with screw fixation.

Ruths S et al. have studied the relationship between municipal resources and patient-related outcomes in the first year following hip fracture. No significant effect on survival or health-related quality of life was found.

Authen A et al. have investigated whether the level of experience of the surgeon affects risk of reoperaton following hip fractures. The results showed an increased risk of reoperation if the operating surgeon had less than three years of experience in treating fractures. The risk was higher in particular for displaced femoral neck fractures, regardless of treatment method. The conclusion was that at least one of the surgeons involved in operations for displaced femoral neck fracture should be experienced.

Please also see the list of publications in this report and on our website: http://nrlweb.ihelse.net/

The Hip Fracture Register cooperates with a number of hospitals on studies of national and local results. We are very pleased that the huge amount of data in the Register is being used in research and we encourage all researchers who wish to use data from the Register to contact us.

Thank you all for good reporting and we look forward to continued fruitful cooperation!

Bergen, June 2018

Jan-Erik Gjertsen
Chief Physician, Associate Professor
Head of the Hip Fracture Register

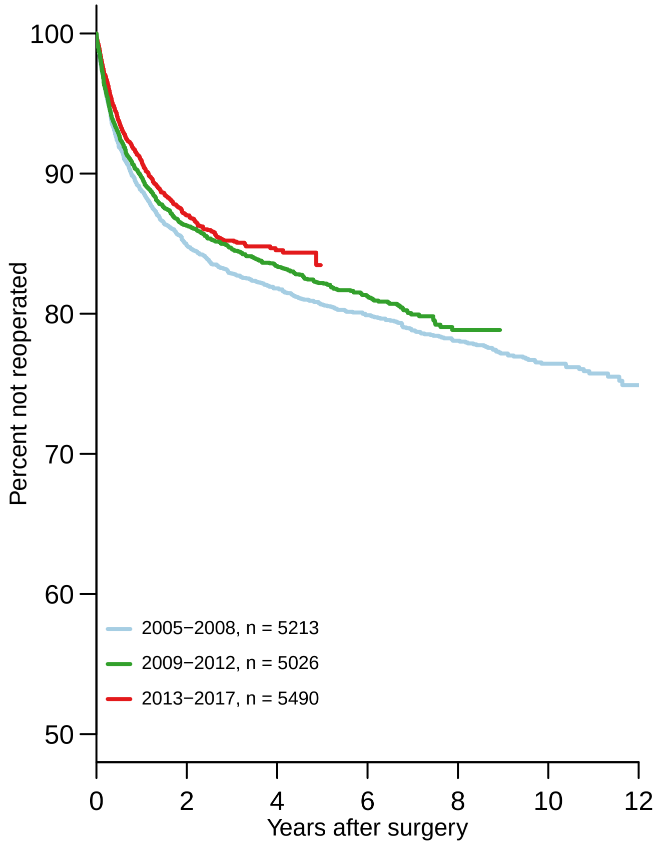
Eva Dybvik
Biostatistician

Lise Kvamsdal
Advisor

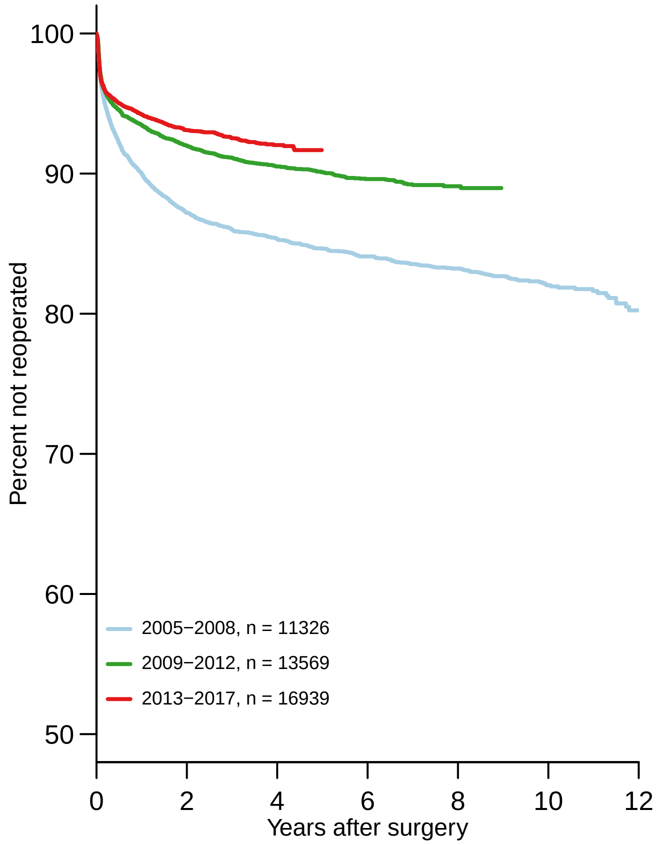
Irina Kvinnesland
IT Consultant

Survival of hip fracture implants

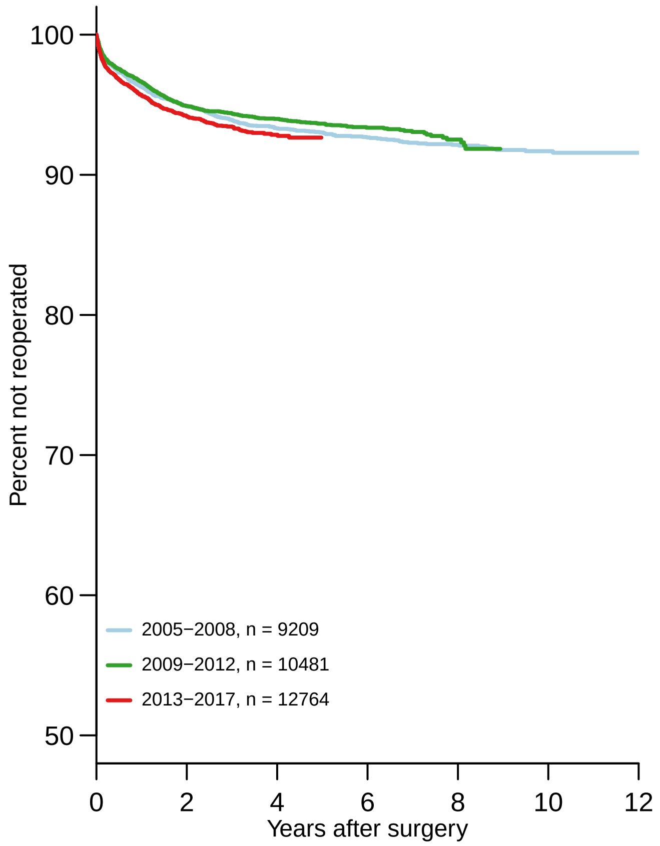
2005−2017



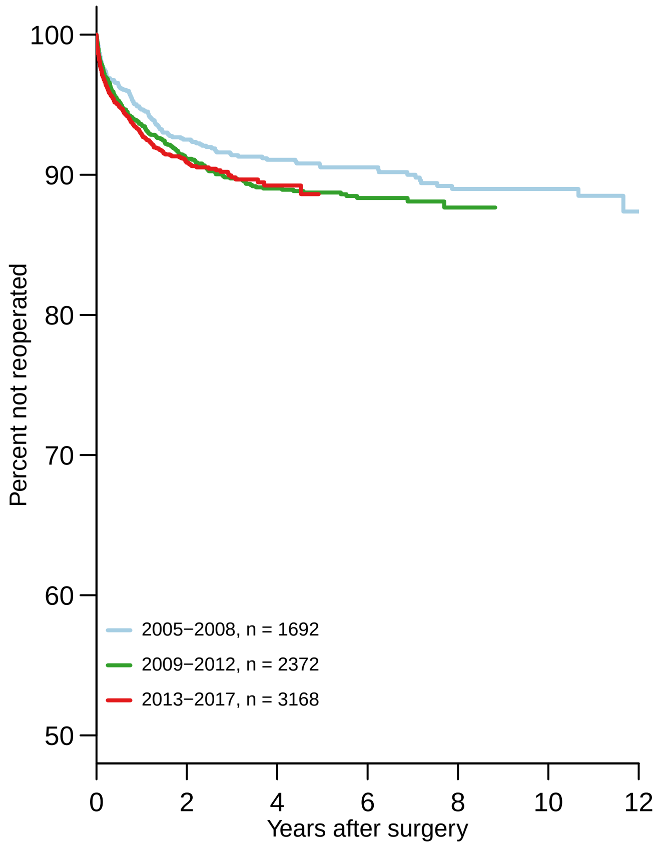
a) Femoral neck fractures, undisplaced



b) Intracapsular fractures, displaced

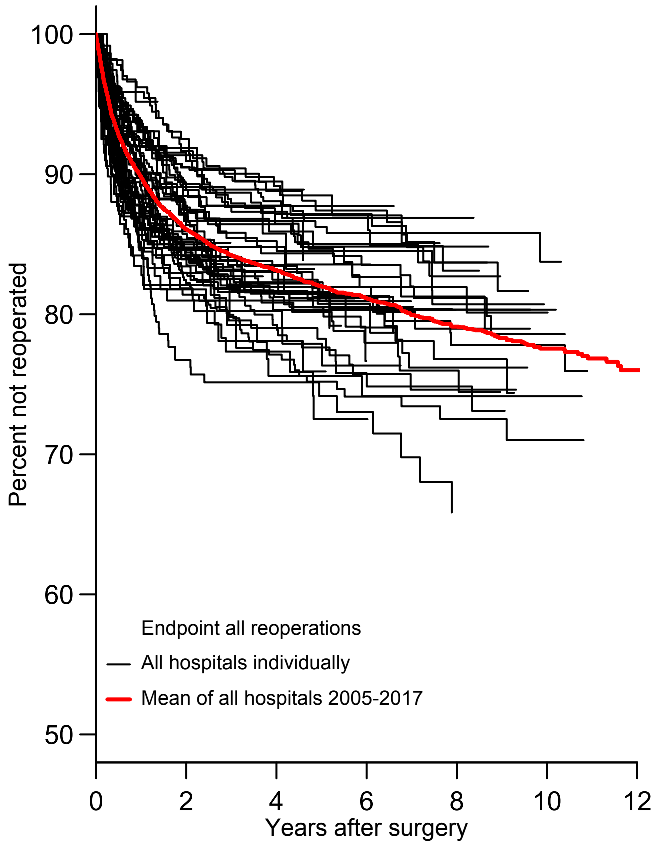


c) Trochanteric fractures

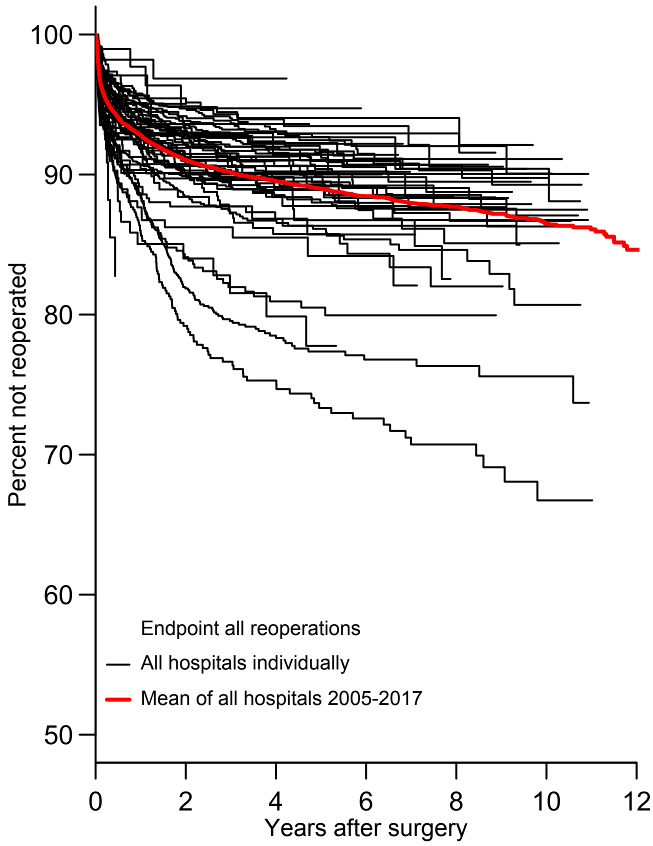


d) Sub−/intertrochanteric fractures

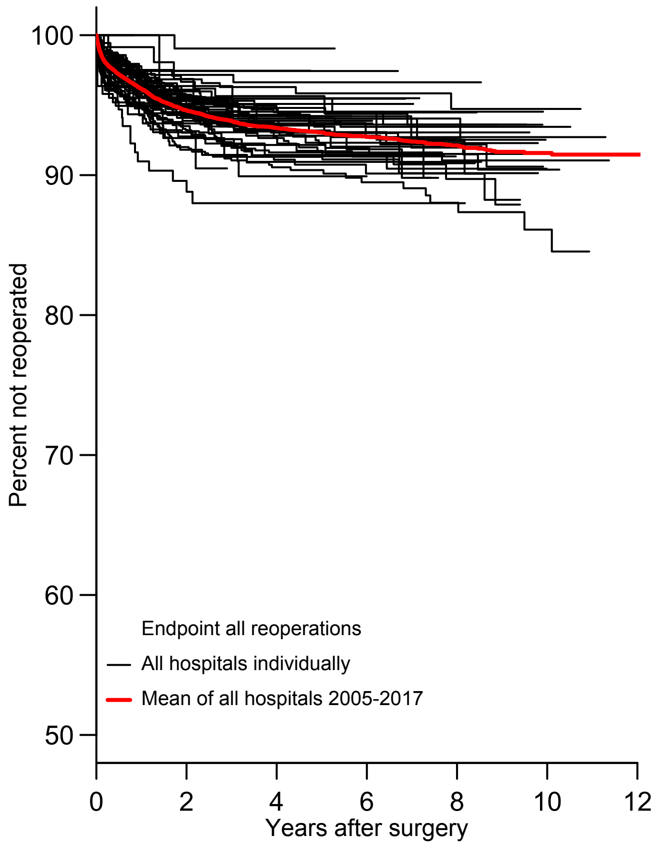
Hospital results after hip fractures
2005-2017



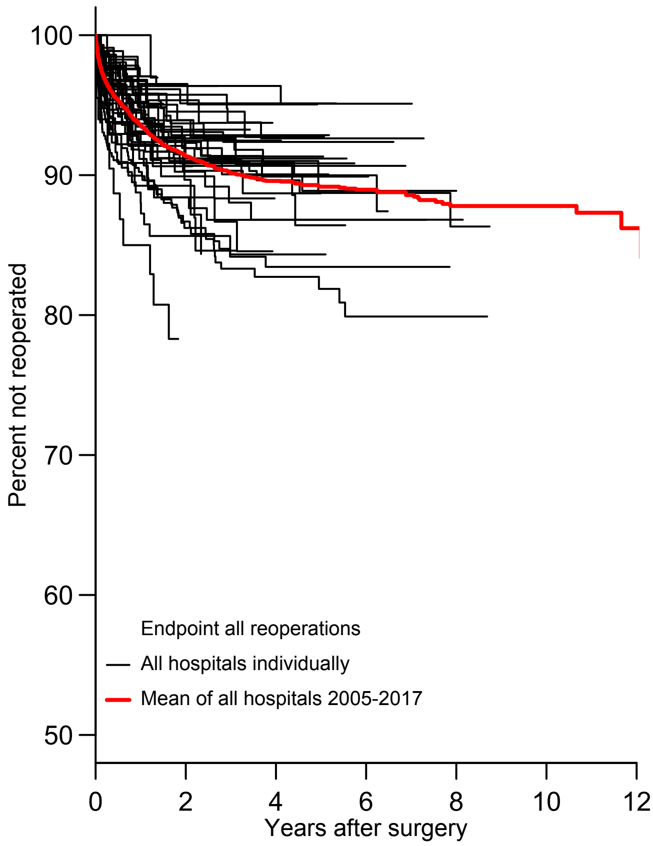
e) Femoral neck fractures, undisplaced



f) Femoral neck fractures, displaced



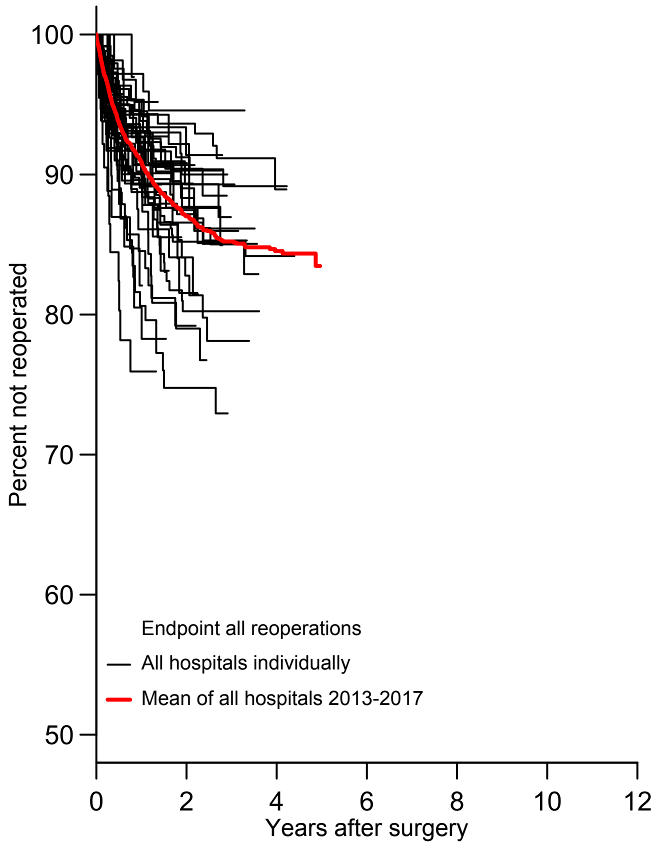
g) Trochanteric fractures



h) Sub-/intertrochanteric fractures

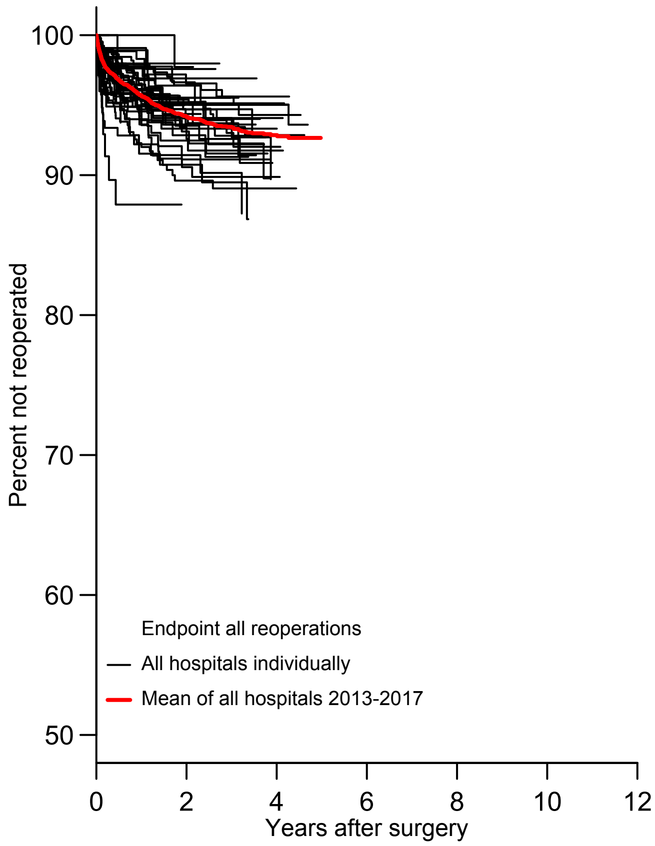
Hospital results after hip fractures

2013-2017

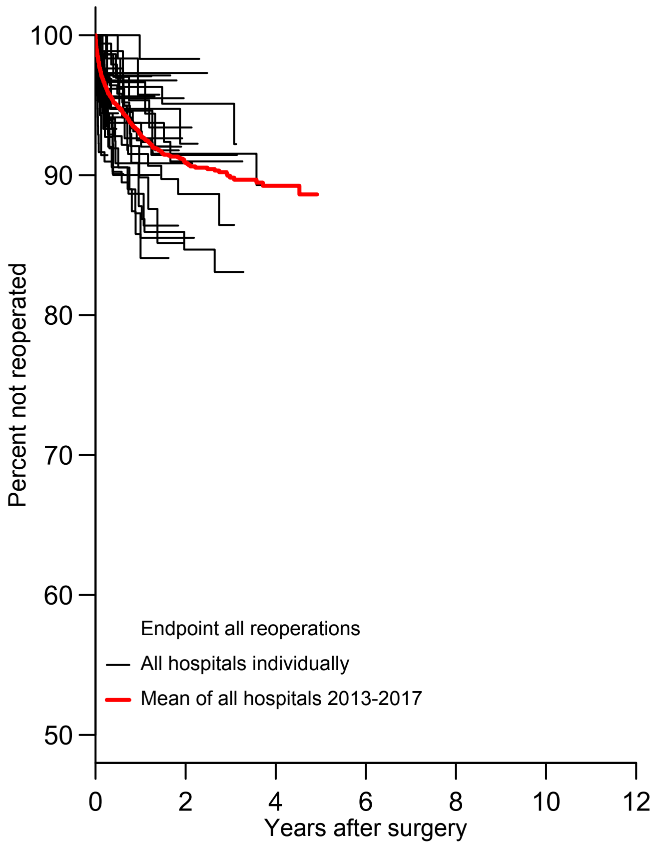


i) Femoral neck fractures, undisplaced

j) Femoral neck fractures, displaced



k) Trochanteric fractures



l) Sub-/intertrochanteric fractures

HIP FRACTURES

Numbers of operations

Table 1: Annual numbers of operations

Year	Primary operation		Reoperation		Total
2017	8321	(90,3%)	891	(9,7%)	**9212**
2016	8490	(89,7%)	977	(10,3%)	**9467**
2015	8410	(90,0%)	930	(10,0%)	**9340**
2014	8180	(91,2%)	789	(8,8%)	**8969**
2013	8308	(90,3%)	898	(9,8%)	**9206**
2012	8435	(90,4%)	896	(9,6%)	**9331**
2011	8600	(90,3%)	923	(9,7%)	**9523**
2010	8363	(90,7%)	861	(9,3%)	**9224**
2009	8258	(89,5%)	970	(10,5%)	**9228**
2008	8362	(89,9%)	942	(10,1%)	**9304**
2007	7870	(89,4%)	933	(10,6%)	**8803**
2006	7517	(89,4%)	893	(10,6%)	**8410**
2005	5879	(89,9%)	664	(10,2%)	**6543**
Total	**104993**	**(90,1%) ***	**11567**	**(9,9%) ****	**116560**

49% of primary operations were on the right side. 69% of primary operations were performed on women.
Mean age at primary surgery was 80 years: 82 years for women and 77 years for men.
* 2941 (3%) were primary operations with total hip prostheses from the Norwegian Arthroplasty Register.
** 3971 (34%) were reoperations with total hip prostheses from the Norwegian Arthroplasty Register.

Figure 1: Annual numbers of operations

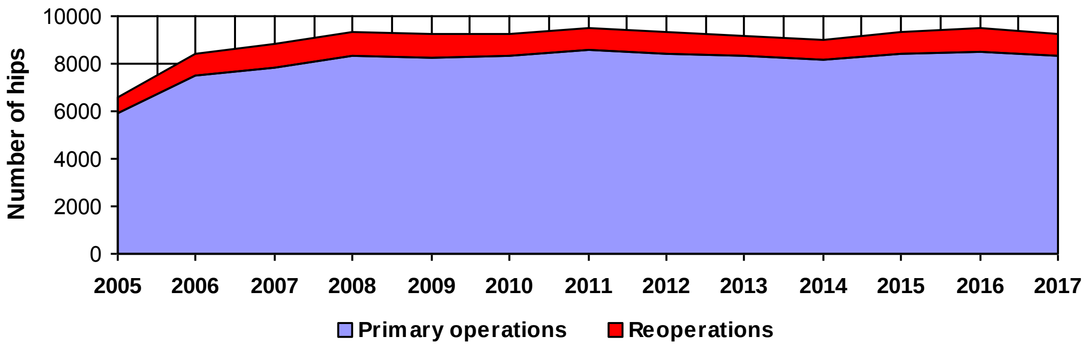
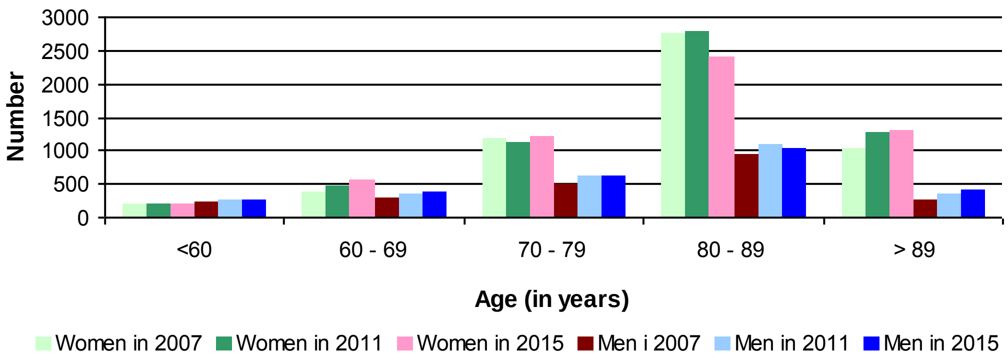


Figure 2: Age by primary operation (in 2007, 2011 and 2015)



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
2017	298 (3,8%)	1109 (14,0%)	2762 (34,9%)	2373 (30,0%)	1205 (15,2%)	165 (2,1%)	**7913**
2016	299 (3,7%)	1107 (13,6%)	2894 (35,5%)	2424 (29,8%)	1232 (15,1%)	187 (2,3%)	**8143**
2015	309 (3,8%)	1085 (13,4%)	3054 (37,8%)	2330 (28,8%)	1105 (13,7%)	202 (2,5%)	**8085**
2014	326 (4,1%)	1157 (14,7%)	2996 (38,0%)	2188 (27,7%)	1045 (13,2%)	178 (2,3%)	**7890**
2013	314 (3,9%)	1129 (14,1%)	2932 (36,6%)	2260 (28,2%)	1198 (15,0%)	178 (2,2%)	**8011**
2012	316 (3,8%)	1167 (14,2%)	2936 (35,7%)	2309 (28,1%)	1326 (16,1%)	171 (2,1%)	**8225**
2011	313 (3,7%)	1206 (14,3%)	2844 (33,8%)	2419 (28,8%)	1421 (16,9%)	205 (2,4%)	**8408**
2010	355 (4,3%)	1218 (14,9%)	2882 (35,1%)	2216 (27,0%)	1340 (16,3%)	189 (2,3%)	**8200**
2009	354 (4,4%)	1290 (15,9%)	2857 (35,3%)	2128 (26,3%)	1306 (16,1%)	165 (2,0%)	**8100**
2008	385 (4,7%)	1321 (16,1%)	2834 (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	**4631 (4,5%)**	**16005 (15,7%)**	**36222 (35,5%)**	**27550 (27,0%)**	**15450 (15,1%)**	**2193 (2,1%)**	**102052**

* Total hip prostheses are not counted

Figure 3: Time from fracture to operation - grouped in hours (n=102052)

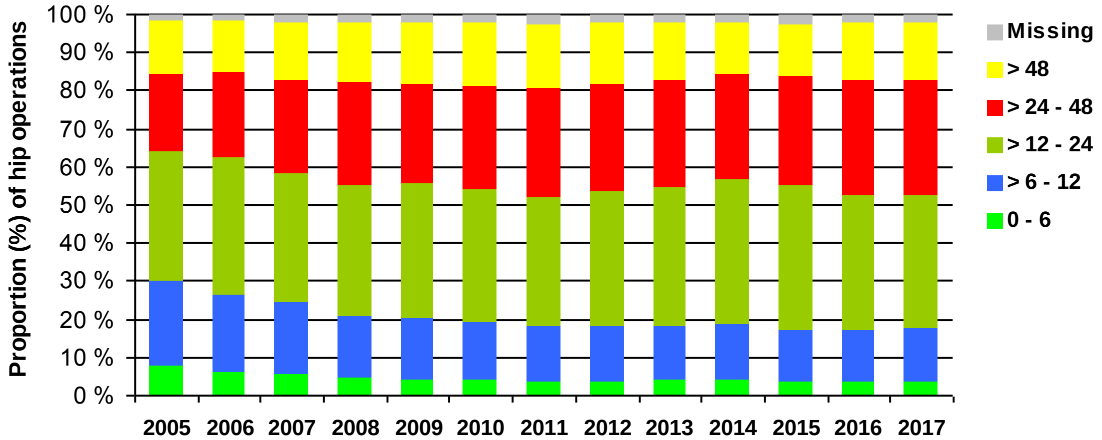
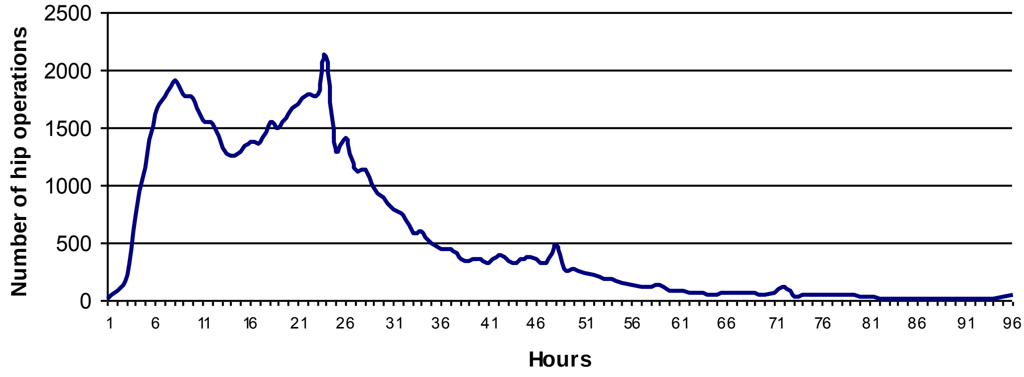


Figure 4: Time from fracture to operation - continuous (n=51636)



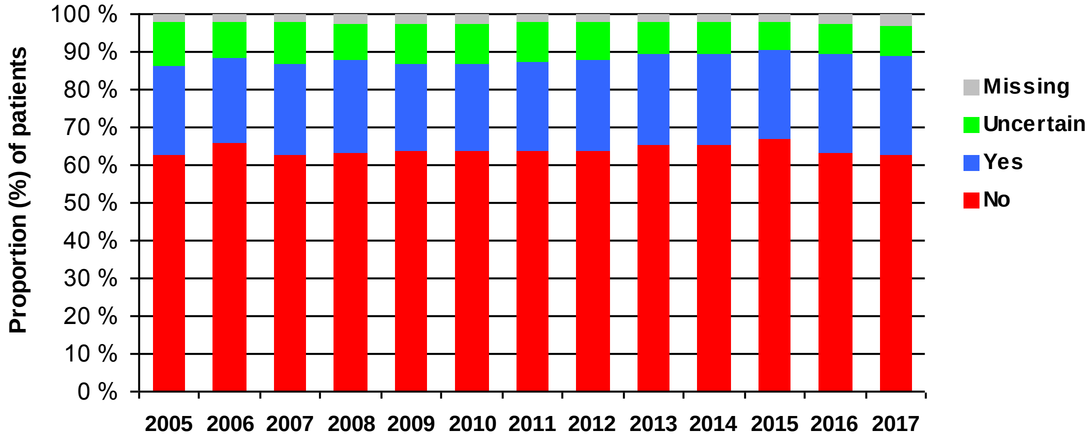
Mean time from fracture to operation was 23 hours (median 21 hours).

Cognitive impairment

Table 3: Cognitive impairment - primary operations*

	No		Yes		Uncertain		Missing		Total
2017	4968	(62,8%)	2074	(26,2%)	637	(8,1%)	234	(3,0%)	**7913**
2016	5154	(63,3%)	2136	(26,2%)	635	(7,8%)	218	(2,7%)	**8143**
2015	5385	(66,6%)	1919	(23,7%)	601	(7,4%)	180	(2,2%)	**8085**
2014	5135	(65,1%)	1933	(24,5%)	642	(8,1%)	180	(2,3%)	**7890**
2013	5235	(65,3%)	1938	(24,2%)	675	(8,4%)	163	(2,0%)	**8011**
2012	5221	(63,5%)	2007	(24,4%)	821	(10,0%)	176	(2,1%)	**8225**
2011	5348	(63,6%)	1990	(23,7%)	901	(10,7%)	169	(2,0%)	**8408**
2010	5220	(63,7%)	1917	(23,4%)	834	(10,2%)	229	(2,8%)	**8200**
2009	5157	(63,7%)	1890	(23,3%)	832	(10,3%)	221	(2,7%)	**8100**
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	**65298**	**(64,0%)**	**24762**	**(24,3%)**	**9577**	**(9,4%)**	**2415**	**(2,4%)**	**102052**

Figure 5: Cognitive impairment - primary operations*



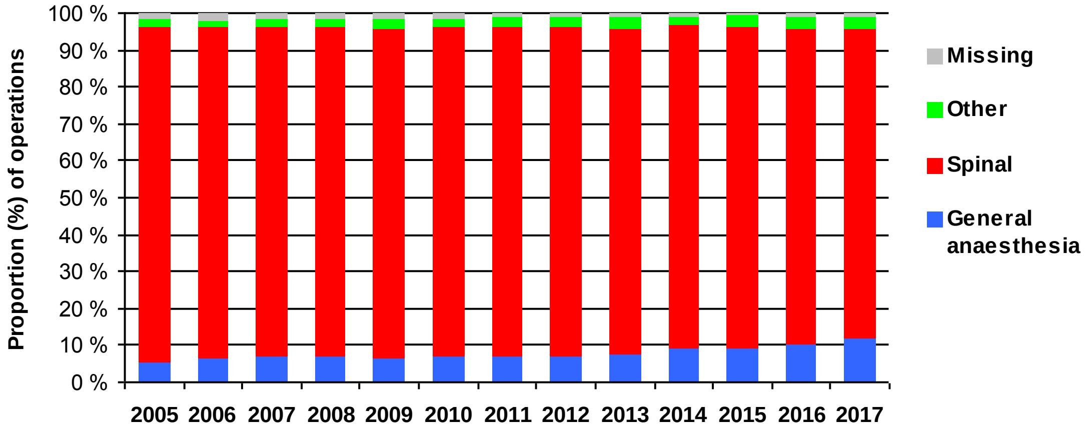
* Total hip prostheses are not counted

Type of anaesthesia

Table 4: Type of anaesthesia - primary operations*

	General anaesthesia		Spinal		Other		Missing		Total
2017	925	(11,7%)	6653	(84,1%)	257	(3,2%)	78	(1,0%)	**7913**
2016	810	(9,9%)	6966	(85,6%)	282	(3,5%)	84	(1,0%)	**8142**
2015	758	(9,4%)	7039	(87,1%)	226	(2,8%)	62	(0,8%)	**8085**
2014	732	(9,3%)	6889	(87,3%)	203	(2,6%)	66	(0,8%)	**7890**
2013	588	(7,3%)	7094	(88,6%)	256	(3,2%)	73	(0,9%)	**8011**
2012	560	(6,8%)	7364	(89,5%)	219	(2,7%)	82	(1,0%)	**8225**
2011	586	(7,0%)	7506	(89,3%)	219	(2,6%)	97	(1,2%)	**8408**
2010	565	(6,9%)	7321	(89,3%)	194	(2,4%)	120	(1,5%)	**8200**
2009	520	(6,4%)	7246	(89,5%)	188	(2,3%)	146	(1,8%)	**8100**
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	**7980**	**(7,8%)**	**90081**	**(88,3%)**	**2673**	**(2,6%)**	**1317**	**(1,3%)**	**102051**

Figure 6: Type of anaesthesia in primary operations*



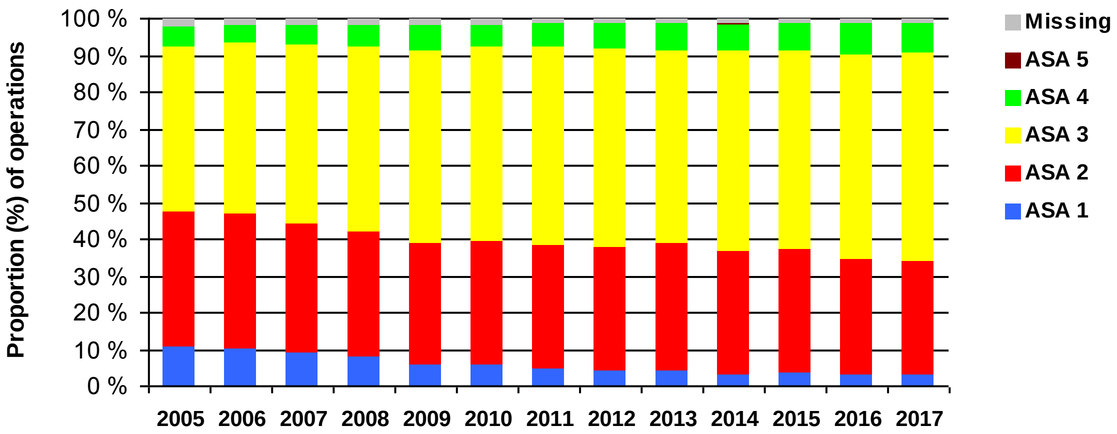
* Total hip prostheses are not counted

ASA classification (ASA = American Society of Anesthesiologists)

Table 5: ASA classification - primary operations

	ASA 1		ASA 2		ASA 3		ASA 4		ASA 5		Missing		Total
2017	282	(3,4%)	2541	(30,5%)	4717	(56,7%)	675	(8,1%)	15	(0,2%)	91	(1,1%)	**8321**
2016	263	(3,1%)	2690	(31,7%)	4725	(55,7%)	708	(8,3%)	10	(0,1%)	93	(1,1%)	**8489**
2015	302	(3,6%)	2851	(33,9%)	4525	(53,8%)	624	(7,4%)	12	(0,1%)	96	(1,1%)	**8410**
2014	255	(3,1%)	2732	(33,4%)	4471	(54,7%)	608	(7,4%)	14	(0,2%)	100	(1,2%)	**8180**
2013	378	(4,5%)	2839	(34,2%)	4382	(52,7%)	609	(7,3%)	17	(0,2%)	83	(1,0%)	**8308**
2012	356	(4,2%)	2833	(33,6%)	4547	(53,9%)	594	(7,0%)	8	(0,1%)	97	(1,1%)	**8435**
2011	437	(5,1%)	2877	(33,5%)	4612	(53,6%)	558	(6,5%)	6	(0,1%)	110	(1,3%)	**8600**
2010	493	(5,9%)	2806	(33,6%)	4410	(52,7%)	498	(6,0%)	16	(0,2%)	140	(1,7%)	**8363**
2009	509	(6,2%)	2720	(32,9%)	4309	(52,2%)	564	(6,8%)	10	(0,1%)	146	(1,8%)	**8258**
2008	677	(8,1%)	2858	(34,2%)	4172	(49,9%)	527	(6,3%)	9	(0,1%)	119	(1,4%)	**8362**
2007	716	(9,1%)	2767	(35,2%)	3820	(48,5%)	451	(5,7%)	7	(0,1%)	109	(1,4%)	**7870**
2006	772	(10,3%)	2746	(36,5%)	3496	(46,5%)	372	(4,9%)	13	(0,2%)	118	(1,6%)	**7517**
2005	639	(10,9%)	2166	(36,8%)	2620	(44,6%)	316	(5,4%)	13	(0,2%)	125	(2,1%)	**5879**
Total	**6079**	(5,8%)	**35426**	(33,7%)	**54806**	(52,2%)	**7104**	(6,8%)	**150**	(0,1%)	**1427**	(1,4%)	**104993**

Figure 7: ASA classification - primary operations



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

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

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

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

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

Primary operations

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

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6	Type 7	Type 8	Type 9	Annet	Missing	Total
2017	1034	3425	217	1150	1312	471	401	7	206	98	0	**8321**
	12,4%	41,2%	2,6%	13,8%	15,8%	5,7%	4,8%	0,1%	2,5%	1,2%	0,0%	
2016	1082	3544	234	1243	1319	464	343	4	162	93	2	**8490**
	12,7%	41,7%	2,8%	14,6%	15,5%	5,5%	4,0%	0,0%	1,9%	1,1%	0,0%	
2015	1154	3350	243	1336	1254	442	323	2	228	77	1	**8410**
	13,7%	39,8%	2,9%	15,9%	14,9%	5,3%	3,8%	0,0%	2,7%	0,9%	0,0%	
2014	1050	3331	287	1333	1243	421	288	2	161	63	1	**8180**
	12,8%	40,7%	3,5%	16,3%	15,2%	5,1%	3,5%	0,0%	2,0%	0,8%	0,0%	
2013	1171	3296	259	1302	1277	447	293	4	167	91	1	**8308**
	14,1%	39,7%	3,1%	15,7%	15,4%	5,4%	3,5%	0,0%	2,0%	1,1%	0,0%	
2012	1226	3471	262	1277	1271	467	207	3	173	75	3	**8435**
	14,5%	41,1%	3,1%	15,1%	15,1%	5,5%	2,5%	0,0%	2,1%	0,9%	0,0%	
2011	1317	3443	276	1346	1393	398	188	4	162	73	0	**8600**
	15,3%	40,0%	3,2%	15,7%	16,2%	4,6%	2,2%	0,0%	1,9%	0,8%	0,0%	
2010	1249	3287	321	1313	1364	431	161	2	167	66	2	**8363**
	14,9%	39,3%	3,8%	15,7%	16,3%	5,2%	1,9%	0,0%	2,0%	0,8%	0,0%	
2009	1234	3368	328	1306	1211	425	151	7	149	71	8	**8258**
	14,9%	40,8%	4,0%	15,8%	14,7%	5,1%	1,8%	0,1%	1,8%	0,9%	0,1%	
2008	1316	3222	351	1475	1240	439	149	2	83	82	3	**8362**
	15,7%	38,5%	4,2%	17,6%	14,8%	5,2%	1,8%	0,0%	1,0%	1,0%	0,0%	
2007	1416	2993	391	1353	1052	438	158	1	0	66	2	**7870**
	18,0%	38,0%	5,0%	17,2%	13,4%	5,6%	2,0%	0,0%	0,0%	0,8%	0,0%	
2006	1408	2820	343	1311	1010	414	131	5	0	71	4	**7517**
	18,7%	37,5%	4,6%	17,4%	13,4%	5,5%	1,7%	0,1%	0,0%	0,9%	0,1%	
2005	1073	2291	276	1011	757	318	102	3	0	35	13	**5879**
	18,3%	39,0%	4,7%	17,2%	12,9%	5,4%	1,7%	0,1%	0,0%	0,6%	0,2%	
Total	**15730**	**41841**	**3788**	**16756**	**15703**	**5575**	**2895**	**46**	**1658**	**961**	**40**	**104993**
	15,0%	**39,9%**	**3,6%**	**16,0%**	**15,0%**	**5,3%**	**2,8%**	**0,0%**	**1,6%**	**0,9%**	**0,0%**	

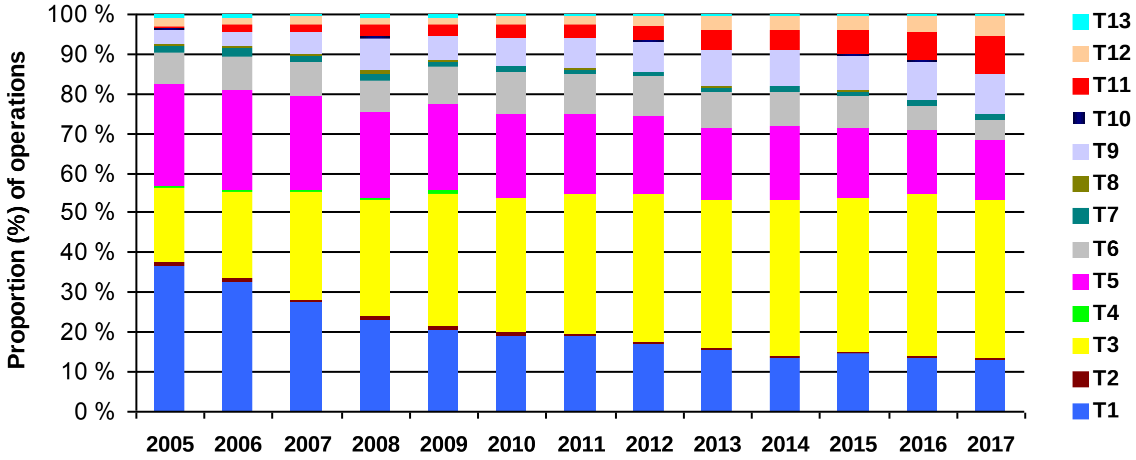
Type 1: Intracapsular fracture, undisplaced
Type 2: Intracapsular fracture, displaced
Type 3: Basocervical fracture
Type 4: Trochanteric fracture (2 fragments) (AO / OTA A1)
Type 5: Trochanteric fracture (multifragment) (AO / OTA A2)
Type 6: Subtrochanteric fracture
Type 7: Intracapsular fracture unspecified (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 operations - all fractures

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	Total
2017	1075	46	3326	1	1259	400	104	19	825	24	800	408	34	0	**8321**
	12,9%	0,6%	40,0%	0,0%	15,1%	4,8%	1,2%	0,2%	9,9%	0,3%	9,6%	4,9%	0,4%	0,0%	
2016	1158	39	3444	2	1384	517	97	21	817	11	614	347	39	0	**8490**
	13,6%	0,5%	40,6%	0,0%	16,3%	6,1%	1,1%	0,2%	9,6%	0,1%	7,2%	4,1%	0,5%	0,0%	
2015	1241	36	3233	2	1499	664	96	14	758	8	509	325	25	0	**8410**
	14,8%	0,4%	38,4%	0,0%	17,8%	7,9%	1,1%	0,2%	9,0%	0,1%	6,1%	3,9%	0,3%	0,0%	
2014	1127	31	3188	1	1551	689	102	17	733	7	418	290	26	0	**8180**
	13,8%	0,4%	39,0%	0,0%	19,0%	8,4%	1,2%	0,2%	9,0%	0,1%	5,1%	3,5%	0,3%	0,0%	
2013	1289	32	3100	3	1495	749	109	20	747	4	430	297	33	0	**8308**
	15,5%	0,4%	37,3%	0,0%	18,0%	9,0%	1,3%	0,2%	9,0%	0,0%	5,2%	3,6%	0,4%	0,0%	
2012	1455	27	3138	5	1632	848	97	19	635	8	332	210	28	0	**8435**
	17,2%	0,3%	37,2%	0,1%	19,3%	10,1%	1,1%	0,2%	7,5%	0,1%	3,9%	2,5%	0,3%	0,0%	
2011	1650	50	3003	19	1697	870	112	12	658	14	281	192	42	0	**8600**
	19,2%	0,6%	34,9%	0,2%	19,7%	10,1%	1,3%	0,1%	7,7%	0,2%	3,3%	2,2%	0,5%	0,0%	
2010	1616	83	2781	29	1733	899	127	17	571	4	280	163	60	0	**8363**
	19,3%	1,0%	33,3%	0,3%	20,7%	10,7%	1,5%	0,2%	6,8%	0,0%	3,3%	1,9%	0,7%	0,0%	
2009	1688	81	2755	82	1765	788	101	50	489	8	228	158	65	0	**8258**
	20,4%	1,0%	33,4%	1,0%	21,4%	9,5%	1,2%	0,6%	5,9%	0,1%	2,8%	1,9%	0,8%	0,0%	
2008	1943	64	2439	70	1784	690	128	64	686	10	266	151	65	0	**8362**
	23,2%	0,8%	29,2%	0,8%	21,3%	8,3%	1,5%	0,8%	8,2%	0,1%	3,2%	1,8%	0,8%	0,0%	
2007	2181	50	2115	48	1868	644	127	36	430	6	157	159	48	1	**7870**
	27,7%	0,6%	26,9%	0,6%	23,7%	8,2%	1,6%	0,5%	5,5%	0,1%	2,0%	2,0%	0,6%	0,0%	
2006	2466	60	1643	34	1891	628	142	43	272	4	127	136	69	1	**7517**
	32,8%	0,8%	21,9%	0,5%	25,2%	8,4%	1,9%	0,6%	3,6%	0,1%	1,7%	1,8%	0,9%	0,0%	
2005	2154	52	1112	24	1492	469	110	28	211	3	55	105	61	2	**5879**
	36,6%	0,9%	18,9%	0,4%	25,4%	8,0%	1,9%	0,5%	3,6%	0,1%	0,9%	1,8%	1,0%	0,0%	
Total	**21043**	**651**	**35277**	**320**	**21050**	**8855**	**1452**	**360**	**7832**	**111**	**4497**	**2941**	**595**	**4**	**104993**
	20,0%	**0,6%**	**33,6%**	**0,3%**	**20,0%**	**8,4%**	**1,4%**	**0,3%**	**7,5%**	**0,1%**	**4,3%**	**2,8%**	**0,6%**	**0,0%**	

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: Hip compression screw system and additional anti-rotational screw
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

Figure 8: Type of primary operations - all fractures



T1: Two screws or pins
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T10: Long intramedullary nail without distal locking
T11: Long intramedullary nail with distal locking
T12: Total hip prosthesis
T13: Other
T14: Missing

Table 8: Type of primary operation per type of primary fracture

Type of primary fracture	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	Total
Intracapsular fracture, undisplaced	14102 89,1%	221 1,4%	920 5,8%	4 0,0%	346 2,2%	0 0,0%	90 0,6%	7 0,0%	25 0,2%	0 0,0%	4 0,0%	0 0,0%	10 0,1%	0 0,0%	**15820**
Intracapsular fracture, displaced	6775 16,1%	425 1,0%	33605 80,0%	301 0,7%	350 0,8%	6 0,0%	164 0,4%	4 0,0%	40 0,1%	0 0,0%	12 0,0%	0 0,0%	158 0,4%	1 0,0%	**42005**
Basocervical fracture	132 3,0%	2 0,0%	343 7,7%	12 0,3%	2099 47,0%	80 1,8%	676 15,1%	29 0,6%	360 8,1%	1 0,0%	21 0,5%	0 0,0%	32 0,7%	0 0,0%	**4464**
Trochanteric fracture (2 fragments)	10 0,1%	0 0,0%	45 0,3%	0 0,0%	11757 68,9%	937 5,5%	308 1,8%	242 1,4%	3136 18,4%	9 0,1%	266 1,6%	0 0,0%	42 0,2%	2 0,0%	**17064**
Trochanteric fracture (multifragment)	3 0,0%	1 0,0%	105 0,7%	0 0,0%	5284 33,3%	5416 34,2%	144 0,9%	66 0,4%	3452 21,8%	36 0,2%	1000 6,3%	0 0,0%	195 1,2%	0 0,0%	**15847**
Subtrochanteric fracture	5 0,1%	1 0,0%	37 0,7%	0 0,0%	907 16,2%	1467 26,2%	18 0,3%	6 0,1%	467 8,3%	53 0,9%	2546 45,5%	0 0,0%	68 1,2%	0 0,0%	**5593**
Intracapsular fracture, unspecified *	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	2895 100,0%	0 0,0%	0 0,0%	**2895**
Trochanteric fracture unspecified *	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	46 100,0%	0 0,0%	0 0,0%	**46**
Intertrochanteric fracture **	0 0,0%	0 0,0%	12 0,7%	0 0,0%	158 9,5%	744 44,7%	5 0,3%	5 0,3%	277 16,7%	6 0,4%	422 25,4%	0 0,0%	29 1,7%	0 0,0%	**1663**
Other	11 1,1%	1 0,1%	191 19,0%	2 0,2%	143 14,2%	202 20,1%	44 4,4%	1 0,1%	73 7,3%	6 0,6%	226 22,5%	0 0,0%	61 6,1%	0 0,0%	**1005**
Missing	5 11,6%	0 0,0%	19 44,2%	1 2,3%	6 14,0%	3 7,0%	3 7,0%	0 0,0%	2 4,7%	0 0,0%	0 0,0%	0 0,0%	0 0,0%	1 2,3%	**43**
Total	**21043** **19,8%**	**651** **0,6%**	**35277** **33,1%**	**320** **0,3%**	**21050** **19,8%**	**8855** **8,3%**	**1452** **1,4%**	**360** **0,3%**	**7832** **7,4%**	**111** **0,1%**	**4497** **4,2%**	**2941** **2,8%**	**595** **0,6%**	**4** **0,0%**	**106445**

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: Hip compression screw system and additional anti-rotational screw
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

* Total hip prostheses reported to the Norwegian Arthroplasty Register

** The registration started in 2008

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

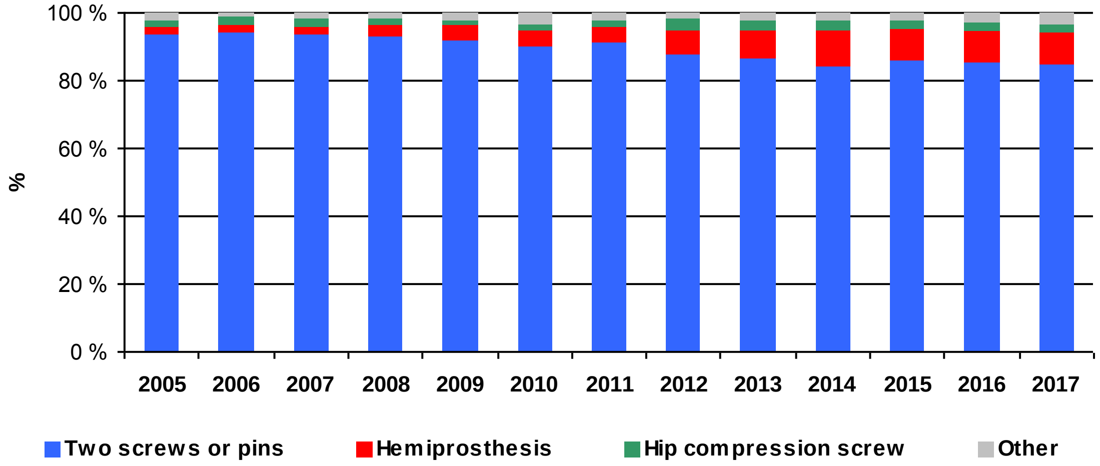
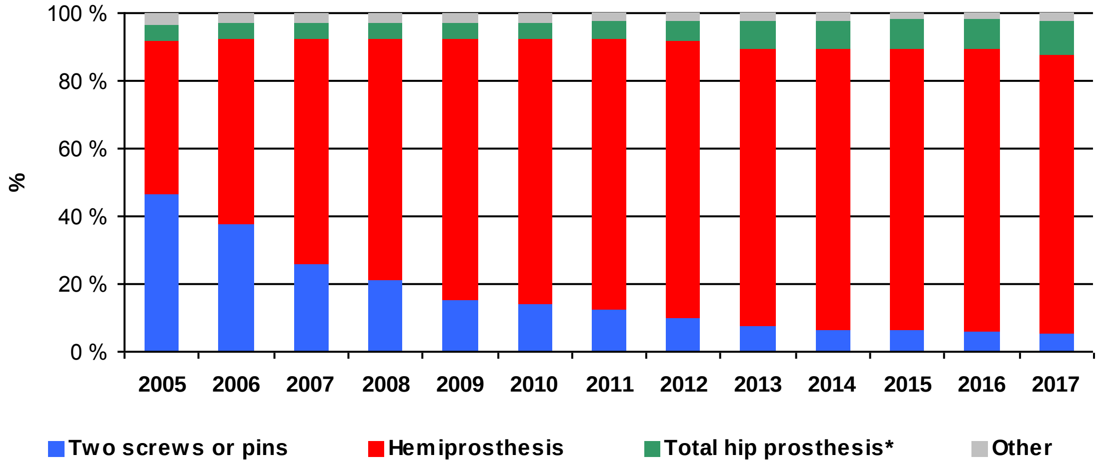


Figure 9b: Time trend for treatment of displaced femoral neck fractures



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

Figure 9c: Time trend for treatment of basocervical fracture

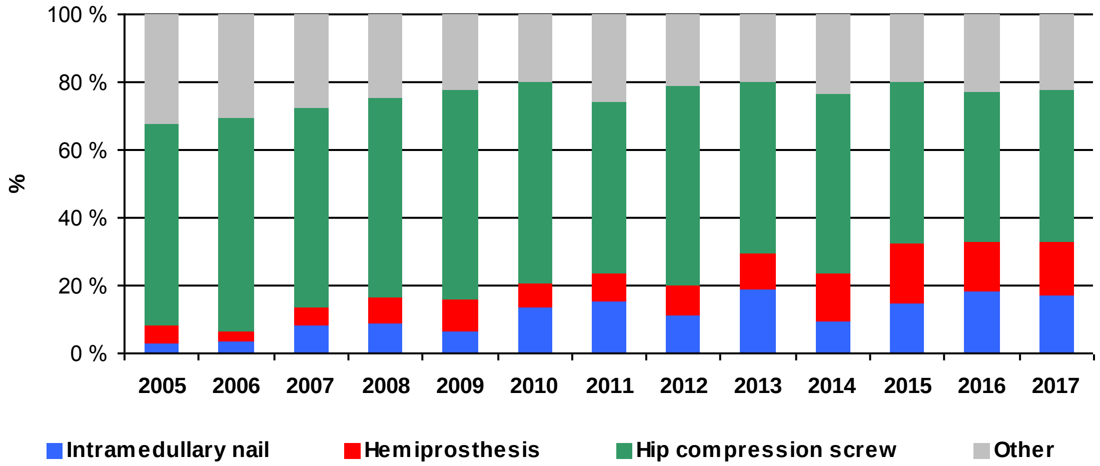


Figure 9d: Time trend for treatment of trochanteric fractures (AO OTA type A1)

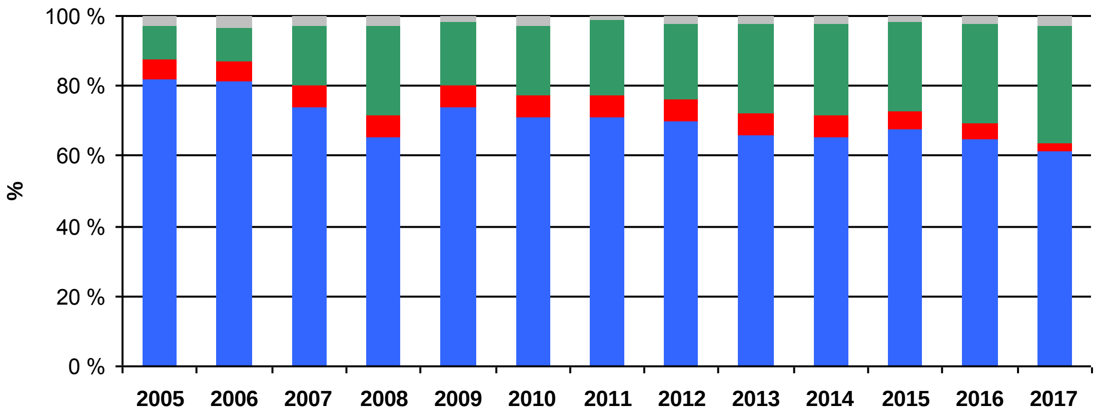


Figure 9e: Time trend for treatment of trochanteric fractures (AO OTA type A2)

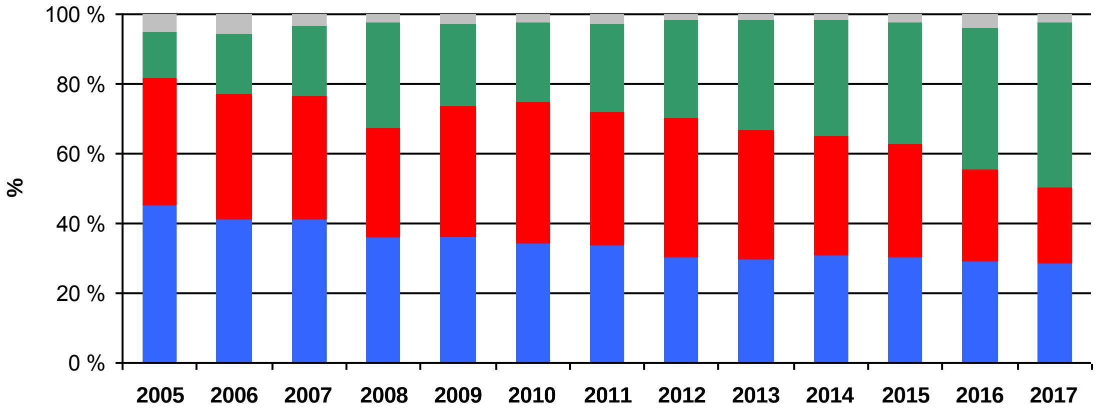
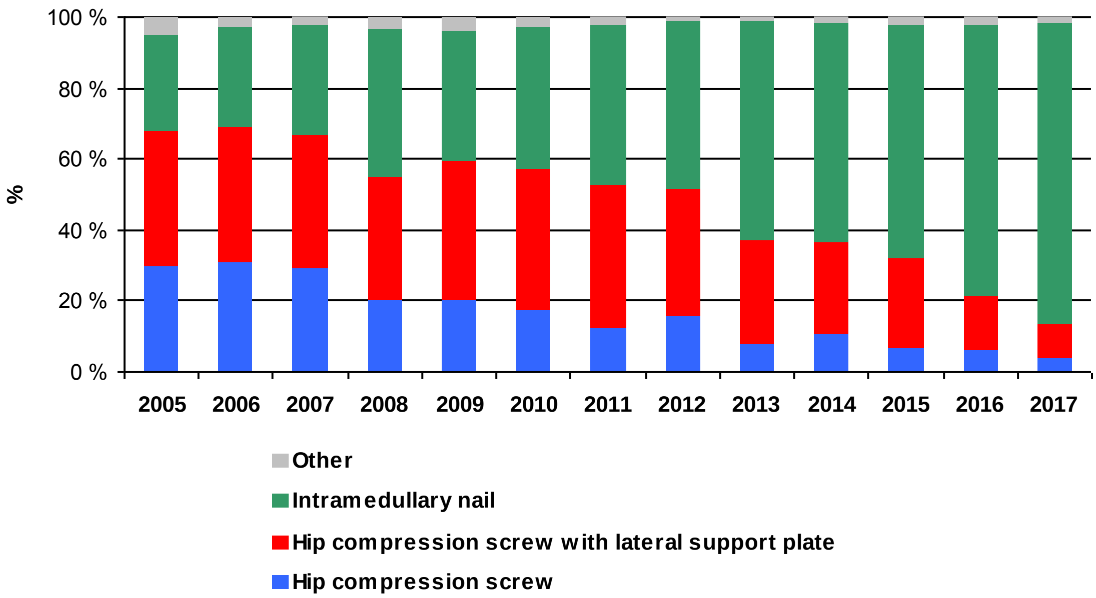


Figure 9f: Time trend for treatment of inter-* and subtrochanteric fractures



* Intertrochanteric fracture (AO OTA type A3)

Reoperations

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

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	Total
2017	106	46	17	60	10	8	196	14	37	16	82	5	50	377	**1024**
	10,4%	4,5%	1,7%	5,9%	1,0%	0,8%	19,1%	1,4%	3,6%	1,6%	8,0%	0,5%	4,9%	36,8%	
2016	141	49	17	77	9	9	200	17	32	36	74	13	43	434	**1151**
	12,3%	4,3%	1,5%	6,7%	0,8%	0,8%	17,4%	1,5%	2,8%	3,1%	6,4%	1,1%	3,7%	37,7%	
2015	160	71	34	65	8	10	180	18	35	33	83	11	47	383	**1138**
	14,1%	6,2%	3,0%	5,7%	0,7%	0,9%	15,8%	1,6%	3,1%	2,9%	7,3%	1,0%	4,1%	33,7%	
2014	111	58	31	50	7	4	156	14	20	20	66	17	23	367	**944**
	11,8%	6,1%	3,3%	5,3%	0,7%	0,4%	16,5%	1,5%	2,1%	2,1%	7,0%	1,8%	2,4%	38,9%	
2013	141	57	33	74	5	10	164	15	28	22	76	7	47	389	**1068**
	13,2%	5,3%	3,1%	6,9%	0,5%	0,9%	15,4%	1,4%	2,6%	2,1%	7,1%	0,7%	4,4%	36,4%	
2012	153	65	37	75	18	9	187	15	34	22	63	4	43	350	**1075**
	14,2%	6,0%	3,4%	7,0%	1,7%	0,8%	17,4%	1,4%	3,2%	2,0%	5,9%	0,4%	4,0%	32,6%	
2011	157	75	59	82	12	5	152	12	41	23	67	8	33	352	**1078**
	14,6%	7,0%	5,5%	7,6%	1,1%	0,5%	14,1%	1,1%	3,8%	2,1%	6,2%	0,7%	3,1%	32,7%	
2010	176	79	48	79	11	11	132	14	44	26	58	10	37	293	**1018**
	17,3%	7,8%	4,7%	7,8%	1,1%	1,1%	13,0%	1,4%	4,3%	2,6%	5,7%	1,0%	3,6%	28,8%	
2009	216	96	59	95	8	18	155	7	38	36	49	9	57	300	**1143**
	18,9%	8,4%	5,2%	8,3%	0,7%	1,6%	13,6%	0,6%	3,3%	3,1%	4,3%	0,8%	5,0%	26,2%	
2008	245	104	63	102	10	10	110	20	39	42	57	10	33	269	**1114**
	22,0%	9,3%	5,7%	9,2%	0,9%	0,9%	9,9%	1,8%	3,5%	3,8%	5,1%	0,9%	3,0%	24,1%	
2007	287	132	85	111	10	10	86	13	32	39	48	9	31	252	**1145**
	25,1%	11,5%	7,4%	9,7%	0,9%	0,9%	7,5%	1,1%	2,8%	3,4%	4,2%	0,8%	2,7%	22,0%	
2006	318	125	64	101	7	8	79	20	21	30	33	7	21	205	**1039**
	30,6%	12,0%	6,2%	9,7%	0,7%	0,8%	7,6%	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	79	**820**
	34,3%	13,0%	8,7%	10,4%	1,1%	1,5%	6,1%	2,0%	3,0%	3,3%	4,0%	0,2%	2,8%	9,6%	
Total	**2492**	**1064**	**618**	**1056**	**124**	**124**	**1847**	**195**	**426**	**372**	**789**	**112**	**488**	**4050**	**13757**
	18,1%	**7,7%**	**4,5%**	**7,7%**	**0,9%**	**0,9%**	**13,4%**	**1,4%**	**3,1%**	**2,7%**	**5,7%**	**0,8%**	**3,5%**	**29,4%**	

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: Penetration of osteosynthesis material through caput
R11: New fracture around implant
R12: Loosening of hemiprosthesis
R13: Other
R14: Reported reoperations to the Arthroplasty Register except ”Deep infection” which is included in R7: Infection – deep.

Table 10: Reasons for reoperation per type of primary fracture (more than one reason is possible) **

Type of primary fracture	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	Total
Intracapsular fracture, undisplaced	591	241	192	266	27	6	116	15	23	52	171	5	99	**1804**
	32,8%	13,4%	10,6%	14,7%	1,5%	0,3%	6,4%	0,8%	1,3%	2,9%	9,5%	0,3%	5,5%	
Intracapsular fracture, displaced	646	253	159	265	23	68	1020	108	342	53	226	71	99	**3333**
	19,4%	7,6%	4,8%	8,0%	0,7%	2,0%	30,6%	3,2%	10,3%	1,6%	6,8%	2,1%	3,0%	
Basocervical fracture	122	59	29	58	8	1	41	4	11	30	15	2	20	**400**
	30,5%	14,8%	7,3%	14,5%	2,0%	0,3%	10,3%	1,0%	2,8%	7,5%	3,8%	0,5%	5,0%	
Trochanteric fracture (2 fragments)	144	50	19	62	13	9	88	16	5	53	52	0	53	**564**
	25,5%	8,9%	3,4%	11,0%	2,3%	1,6%	15,6%	2,8%	0,9%	9,4%	9,2%	0,0%	9,4%	
Trochanteric fracture (multifragment)	307	124	27	103	18	15	243	28	9	87	76	3	69	**1109**
	27,7%	11,2%	2,4%	9,3%	1,6%	1,4%	21,9%	2,5%	0,8%	7,8%	6,9%	0,3%	6,2%	
Subtrochanteric fracture	145	79	4	52	5	6	102	9	5	18	32	3	51	**511**
	28,4%	15,5%	0,8%	10,2%	1,0%	1,2%	20,0%	1,8%	1,0%	3,5%	6,3%	0,6%	10,0%	
Intertrochanteric fracture*	54	19	4	18	3	1	32	5	2	12	8	0	10	**168**
	32,1%	11,3%	2,4%	10,7%	1,8%	0,6%	19,0%	3,0%	1,2%	7,1%	4,8%	0,0%	6,0%	
Other	22	9	2	3	2	3	22	2	4	7	8	2	12	**98**
	22,4%	9,2%	2,0%	3,1%	2,0%	3,1%	22,4%	2,0%	4,1%	7,1%	8,2%	2,0%	12,2%	
Missing	2	0	0	0	0	0	1	0	0	0	0	0	0	**3**
	66,7%	0,0%	0,0%	0,0%	0,0%	0,0%	33,3%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	
Total	**2033**	**834**	**436**	**827**	**99**	**109**	**1665**	**187**	**401**	**312**	**588**	**86**	**413**	**7990**
	25,4%	**10,4%**	**5,5%**	**10,4%**	**1,2%**	**1,4%**	**20,8%**	**2,3%**	**5,0%**	**3,9%**	**7,4%**	**1,1%**	**5,2%**	

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: Penetration of osteosynthesis material through caput
R11: New fracture around implant
R12: Loosening of hemiprosthesis
R13: Other

* The registration started in 2008

** Total hip prostheses are not counted

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

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2017	69	32	136	0	114	151	18	6	142	366	**1034**
	6,7%	3,1%	13,2%	0,0%	11,0%	14,6%	1,7%	0,6%	13,7%	35,4%	
2016	82	36	150	0	100	150	14	7	160	422	**1121**
	7,3%	3,2%	13,4%	0,0%	8,9%	13,4%	1,2%	0,6%	14,3%	37,6%	
2015	68	36	181	0	114	131	19	3	148	371	**1071**
	6,3%	3,4%	16,9%	0,0%	10,6%	12,2%	1,8%	0,3%	13,8%	34,6%	
2014	46	26	157	0	81	112	7	4	99	352	**884**
	5,2%	2,9%	17,8%	0,0%	9,2%	12,7%	0,8%	0,5%	11,2%	39,8%	
2013	70	32	159	0	117	116	14	6	118	376	**1008**
	6,9%	3,2%	15,8%	0,0%	11,6%	11,5%	1,4%	0,6%	11,7%	37,3%	
2012	73	42	188	0	91	137	14	9	109	342	**1005**
	7,3%	4,2%	18,7%	0,0%	9,1%	13,6%	1,4%	0,9%	10,8%	34,0%	
2011	71	34	214	0	97	105	19	13	113	358	**1024**
	6,9%	3,3%	20,9%	0,0%	9,5%	10,3%	1,9%	1,3%	11,0%	35,0%	
2010	86	40	220	2	89	105	15	11	103	290	**961**
	8,9%	4,2%	22,9%	0,2%	9,3%	10,9%	1,6%	1,1%	10,7%	30,2%	
2009	120	40	254	0	97	129	10	11	94	302	**1057**
	11,4%	3,8%	24,0%	0,0%	9,2%	12,2%	0,9%	1,0%	8,9%	28,6%	
2008	112	40	317	1	84	83	10	15	91	266	**1019**
	11,0%	3,9%	31,1%	0,1%	8,2%	8,1%	1,0%	1,5%	8,9%	26,1%	
2007	118	31	371	1	78	67	5	11	64	239	**985**
	12,0%	3,1%	37,7%	0,1%	7,9%	6,8%	0,5%	1,1%	6,5%	24,3%	
2006	97	37	371	6	82	63	8	5	56	206	**931**
	10,4%	4,0%	39,8%	0,6%	8,8%	6,8%	0,9%	0,5%	6,0%	22,1%	
2005	82	25	322	35	46	39	9	7	42	81	**688**
	11,9%	3,6%	46,8%	5,1%	6,7%	5,7%	1,3%	1,0%	6,1%	11,8%	
Total	**1094**	**451**	**3040**	**45**	**1190**	**1388**	**162**	**108**	**1339**	**3971**	**12788**
	8,6%	**3,5%**	**23,8%**	**0,4%**	**9,3%**	**10,9%**	**1,3%**	**0,8%**	**10,5%**	**31,1%**	

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

Table 12: Reoperation with primary screw osteosynthesis (reasons are not mutually exclusive)

	R1	R2	R3	R4	R5	R6	R9	R10	Total
2017	24 11,3%	4 1,9%	35 16,4%	0 0,0%	21 9,9%	2 0,9%	2 0,9%	125 58,7%	**213**
2016	33 11,8%	3 1,1%	52 18,6%	0 0,0%	27 9,7%	3 1,1%	4 1,4%	157 56,3%	**279**
2015	25 9,8%	3 1,2%	65 25,7%	0 0,0%	22 8,7%	3 1,2%	7 2,8%	128 50,4%	**253**
2014	16 6,4%	0 0,0%	70 27,9%	0 0,0%	25 10,0%	3 1,2%	3 1,2%	134 53,4%	**251**
2013	34 11,9%	2 0,7%	72 25,3%	0 0,0%	35 12,3%	1 0,4%	2 0,7%	139 48,8%	**285**
2012	31 10,2%	10 3,3%	98 32,1%	0 0,0%	27 8,9%	4 1,3%	3 1,0%	132 43,3%	**305**
2011	37 11,2%	9 2,7%	113 34,2%	0 0,0%	23 7,0%	2 0,6%	7 2,1%	139 42,1%	**330**
2010	43 13,2%	11 3,4%	113 34,8%	1 0,3%	26 8,0%	2 0,6%	4 1,2%	125 38,5%	**325**
2009	65 18,0%	8 2,2%	125 34,5%	0 0,0%	15 4,1%	7 1,9%	5 1,4%	137 37,8%	**362**
2008	54 13,9%	12 3,1%	161 41,4%	0 0,0%	21 5,4%	3 0,8%	3 0,8%	135 34,7%	**389**
2007	64 14,8%	8 1,8%	198 45,7%	1 0,2%	15 3,5%	1 0,2%	5 1,2%	141 32,6%	**433**
2006	34 8,8%	5 1,3%	193 49,9%	5 1,3%	21 5,4%	2 0,5%	2 0,5%	125 32,3%	**387**
2005	4 1,9%	6 2,9%	124 59,6%	12 5,8%	6 2,9%	4 1,9%	4 1,9%	48 23,1%	**208**
Total	**464** **11,5%**	**81** **2,0%**	**1419** **35,3%**	**19** **0,5%**	**284** **7,1%**	**37** **0,9%**	**51** **1,3%**	**1665** **41,4%**	**4020**

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
R9: Other
R10: Total hip prosthesis

Table 13: Reoperation with primary uni/bipolar hemiprosthesis (reasons are not mutually exclusive)

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total
2017	0	9	28	0	0	76	8	4	82	49	**256**
	0,0%	3,5%	10,9%	0,0%	0,0%	29,7%	3,1%	1,6%	32,0%	19,1%	
2016	0	12	20	0	0	80	9	6	97	42	**266**
	0,0%	4,5%	7,5%	0,0%	0,0%	30,1%	3,4%	2,3%	36,5%	15,8%	
2015	0	5	18	0	0	66	16	1	74	47	**227**
	0,0%	2,2%	7,9%	0,0%	0,0%	29,1%	7,0%	0,4%	32,6%	20,7%	
2014	0	9	19	0	0	48	5	4	61	37	**183**
	0,0%	4,9%	10,4%	0,0%	0,0%	26,2%	2,7%	2,2%	33,3%	20,2%	
2013	0	11	15	0	0	68	9	4	78	37	**222**
	0,0%	5,0%	6,8%	0,0%	0,0%	30,6%	4,1%	1,8%	35,1%	16,7%	
2012	0	11	23	0	0	55	10	8	56	31	**194**
	0,0%	5,7%	11,9%	0,0%	0,0%	28,4%	5,2%	4,1%	28,9%	16,0%	
2011	0	10	14	0	0	60	16	8	70	32	**210**
	0,0%	4,8%	6,7%	0,0%	0,0%	28,6%	7,6%	3,8%	33,3%	15,2%	
2010	0	8	17	0	0	58	10	9	68	17	**187**
	0,0%	4,3%	9,1%	0,0%	0,0%	31,0%	5,3%	4,8%	36,4%	9,1%	
2009	0	9	10	0	0	44	7	9	49	20	**148**
	0,0%	6,1%	6,8%	0,0%	0,0%	29,7%	4,7%	6,1%	33,1%	13,5%	
2008	0	10	7	0	0	46	5	12	45	20	**145**
	0,0%	6,9%	4,8%	0,0%	0,0%	31,7%	3,4%	8,3%	31,0%	13,8%	
2007	0	5	9	0	0	27	3	10	35	11	**100**
	0,0%	5,0%	9,0%	0,0%	0,0%	27,0%	3,0%	10,0%	35,0%	11,0%	
2006	0	6	2	0	0	28	4	3	29	10	**82**
	0,0%	7,3%	2,4%	0,0%	0,0%	34,1%	4,9%	3,7%	35,4%	12,2%	
2005	0	1	1	0	0	12	3	3	13	2	**35**
	0,0%	2,9%	2,9%	0,0%	0,0%	34,3%	8,6%	8,6%	37,1%	5,7%	
Total	**0**	**106**	**183**	**0**	**0**	**668**	**105**	**81**	**757**	**355**	**2255**
	0,0%	**4,7%**	**8,1%**	**0,0%**	**0,0%**	**29,6%**	**4,7%**	**3,6%**	**33,6%**	**15,7%**	

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 14: Specification of R9 - Others

	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cable Ready plate + cerclage	**6**	2				1		2			1
Cement spacer	**22**	1		1	2	1	3	3	4	4	3
Cerclage	**19**	3	1		2	1	3	2	3	2	2
Dall Miles plate + cerclage	**21**		1	3	3	1		4	4	3	2
DCP plate + possibly cerclage	**7**									3	4
Drainage of haematoma	**26**	18	1	3	2	1				1	
Exchange of caput/bipolar head	**594**	89	42	56	58	42	67	43	55	76	66
Exchange of caput/bipolar head + osteosynthesis with plate/cerclage	**5**			2			1	1	1		
Suture of muscle/fascie	**10**	1	1	3		1			1	2	1
Unspecified plate + cerclage	**18**	3			1	3	2	2	5		2
Other (n<5)	**28**	5	3		2	5	2	4	1	5	1
Total	**756**	**122**	**49**	**68**	**70**	**56**	**78**	**61**	**74**	**96**	**82**

Implants

Table 15: Cemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Charnley		Hastings bipolar head	**2768**	1688	368	290	143	120	98	61			
Charnley Modular	Elite	Hastings bipolar head	**1278**	388	227	208	142	160	152	1			
Charnley Modular	Elite	Landos bipolar cup (DePuy)	**24**	20	4								
Charnley Modular	Elite	Self-centering bipolar (DePuy)	**791**	3	28	31	23	36	55	241	258	71	45
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**468**		1	1	9	40	51	75	118	93	80
Corail	Articul/Eze CoCr	Vario-Cup (Link)	**176**			1	6	8	8	35	47	64	7
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						
CPT	Protasul/Metasul	Multipolar	**781**										781
CPT	Protasul/Metasul	Self-centering bipolar (DePuy)	**67**										67
CPT	Protasul/Metasul	UHR	**22**										22
CPT	Versys	Multipolar	**17**										17
CPT	Zimmer hoder	Multipolar	**31**										31
C-Stem	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**162**								5	88	69
C-Stem	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**208**								12	99	97
Elite	Elite	Hastings bipolar head	**23**	12	5	1	4		1				
ETS			**301**	173	79	23	16	3	2	2	2	1	
Exeter/V40	Exeter/V40	Multipolar	**40**										40
Exeter/V40	Exeter/V40	Self-centering bipolar (DePuy)	**916**		1	7	42	31	94	250	228	217	46
Exeter/V40	Exeter/V40	UHR	**12246**	1769	752	852	E+03	1241	1262	1318	1456	1568	889
Exeter/V40	Exeter/V40	Unknown bipolar head	**35**	5	2	4	8	3	2	2	1	6	2
MS-30	Protasul/Metasul	Multipolar	**112**	8									104
MS-30	Protasul/Metasul	UHR	**22**	21			1						
MS-30	Versys	Self-centering bipolar (DePuy)	**95**								11	46	38
SP II (Link)	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**34**					1		18	9	3	3
SP II (Link)	CoCrMo (Link)	Self-centering bipolar (DePuy)	**245**						7	49	70	99	20
SP II (Link)	CoCrMo (Link)	UHR	**1002**						62	204	218	258	260
SP II (Link)	CoCrMo (Link)	Vario-Cup (Link)	**2115**	347	292	279	251	233	263	71	90	112	177
Spectron	Cobalt Chrom (S&N)	Biarticular cup (Permedica)	**33**	22	7	2	2						
Spectron	Cobalt Chrom (S&N)	HIP Bipolar Cup	**134**		8	12	19	9	16	21	19	15	15
Spectron	Cobalt Chrom (S&N)	Landos bipolar cup (DePuy)	**112**	111	1								
Spectron	Cobalt Chrom (S&N)	Self-centering bipolar (DePuy)	**30**	7	14	9							
Spectron	Cobalt Chrom (S&N)	Tandem	**1090**	574	182	70	104	95	65				
Spectron	Cobalt Chrom (S&N)	Universal bipolar	**17**	17									
Spectron	Cobalt Chrom (S&N)	Vario-Cup (Link)	**81**	20	48	13							
Spectron	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**16**	16									
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**	652	19	1							
Titan	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**227**	55	135	36	1						
Titan	Unknown caput	Landos bipolar cup (DePuy)	**15**	15									
Other	(n < 15)		**391**	134	29	28	26	16	26	21	17	27	67
Unknown			**35**	19	8	2	1			1	2	1	1
Total			**26962**	**6093**	**2225**	**1932**	**1963**	**1963**	**2164**	**2370**	**2563**	**2768**	**2878**

Table 16: Uncemented hemiprostheses - primary operations

Femur	Caput	Bipolar head	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Accolade II	Exeter/V40	Vario-Cup (Link)	**27**						2	8	11	4	2
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**	112		5	1						
Corail	Articul/Eze CoCr	Multipolar	**20**										20
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**3497**	23	87	202	348	620	532	471	429	486	299
Corail	Articul/Eze CoCr	UHR	**409**			17	49	44	40	82	75	69	33
Corail	Articul/Eze CoCr	Vario-Cup (Link)	**159**			21	37	32	47	17	4	1	
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**406**				21	143	146	80	9	6	1
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**	751	21	7							
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**1144**	62	323	383	344	31	1				
Corail	Cobalt chrome (DePuy)	Tandem	**11**	5		4	2						
Corail	Cobalt chrome (DePuy)	UHR	**20**	9	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**	10									
Corail	Unknown caput	Unknown bipolar head	**16**	3	5	4	1	1	1				1
Filler	Biotechni fem. head	Biarticular cup (Permedica)	**24**	23	1								
Filler	Cobalt Chrom (S&N)	Biarticular cup (Permedica)	**19**	14	4			1					
Filler	Hipball Premium	Biarticular cup (Permedica)	**197**	140	50	7							
Filler	Hipball Premium	HIP Bipolar Cup	**633**		33	95	129	126	99	37	44	36	34
Filler	Hipball Premium	UHR	**41**						10	22	6	3	
Furlong	Furlong	UHR	**109**								21	57	31
HACTIV	HACTIV head	Moonstone	**22**	22									
HACTIV	HACTIV head	Tandem	**19**	13	2		1	2	1				
HACTIV	HACTIV head	UHR	**64**							41	22		1
Polarstem	Cobalt Chrom (S&N)	Tandem	**213**			18	64	74	39	16	2		
Polarstem	Cobalt Chrom (S&N)	UHR	**80**							25	34	9	12
SL-PLUS	HACTIV head	Bipolar Ball Head	**16**	16									
SL-PLUS	Metal Ball Head	Bipolar Ball Head	**155**	116	32	7							
Other	(n < 10)		**250**	69	26	41	13	18	13	20	16	15	19
Unknown			**6**	3	2					1			
Total			**8652**	**1392**	**612**	**879**	**1060**	**1060**	**939**	**820**	**673**	**686**	**453**

Table 17: Cemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Charnley		Hastings bipolar head	**490**	364	50	40	22	8	3	3			
Charnley Modular	Elite	Hastings bipolar head	**82**	32	17	12	11	2	8				
Charnley Modular	Elite	Landos bipolar cup (DePuy)	**7**	7									
Charnley Modular	Elite	Self-centering bipolar (DePuy)	**36**	2		1	3	7	1	12	8	1	1
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**35**				4	8	1	5	7	9	1
Corail	Articul/Eze CoCr	Vario-Cup (Link)	**6**				1			3	1	1	
Corail	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**11**		2	5	4						
CPS-PLUS	Metal Ball Head	Bipolar Ball Head	**8**	4		4							
CPS-PLUS Rev. stem	Metal Ball Head	Bipolar Ball Head	**7**	6	1								
CPT	Protasul/Metasul	Multipolar	**16**										16
C-Stem	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**9**									5	4
C-Stem	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**8**									5	3
Elite	Elite	Hastings bipolar head	**5**	2		1		2					
ETS			**23**	19	3				1				
Exeter/V40	Exeter/V40	Self-centering bipolar (DePuy)	**51**			1	3	8	7	14	11	6	1
Exeter/V40	Exeter/V40	UHR	**809**	342	57	42	55	64	52	47	73	46	31
Exeter/V40	Exeter/V40	Unknown bipolar head	**6**	2		1			1	2			
Fjord	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**7**	7									
MS-30	Protasul/Metasul	Multipolar	**6**	3									3
MS-30	Protasul/Metasul	UHR	**5**	5									
Restoration Modular (femur)	Exeter/V40	Self-centering bipolar (DePuy)	**11**		2	3	3	1	1		1		
Restoration Modular (femur)	Exeter/V40	UHR	**16**						4	2	2	3	5
SP II (Link)	CoCrMo (Link)	Self-centering bipolar (DePuy)	**12**								3	7	2
SP II (Link)	CoCrMo (Link)	UHR	**53**						2	12	15	12	12
SP II (Link)	CoCrMo (Link)	Vario-Cup (Link)	**161**	49	11	18	24	19	12	7	4	6	11
Spectron	Cobalt Chrom (S&N)	HIP Bipolar Cup	**6**			1	3				1		1
Spectron	Cobalt Chrom (S&N)	Landos bipolar cup (DePuy)	**11**	11									
Spectron	Cobalt Chrom (S&N)	Tandem	**128**	84	18	3	5	11	6	1			
Spectron	Cobalt Chrom (S&N)	Universal bipolar	**9**	9									
Titan	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**135**	131	4								
Titan	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**19**	6	9	3	1						
Other	(n < 5)		**105**	48	9	7	2	3	3	6	6	11	10
Unknown			**7**	4			1						2
Total			**2300**	**1137**	**183**	**142**	**142**	**142**	**102**	**114**	**132**	**112**	**103**

Table 18: Uncemented hemiprostheses - reoperations

Femur	Caput	Bipolar head	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Arcos	Modular Head (Biomet)	Multipolar	**5**										5
Arcos	Modular Head (Biomet)	Self-centering bipolar (DePuy)	**12**							2	5	5	
Corail	Articul/Eze CoCr	Landos bipolar cup (DePuy)	**23**	23									
Corail	Articul/Eze CoCr	Self-centering bipolar (DePuy)	**114**	2	4	19	10	15	19	12	14	13	6
Corail	Articul/Eze CoCr	UHR	**15**			3	4			2	2	3	1
Corail	Articul/Eze Ultamet (M-Spec)	Self-centering bipolar (DePuy)	**31**				4	13	10	2	2		
Corail	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**92**	88	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**	21									
Filler	Cobalt chrome (DePuy)	Biarticular cup (Permedica)	**6**	6									
Filler	Cobalt chrome (DePuy)	Landos bipolar cup (DePuy)	**5**	5									
Filler	Hipball Premium	Biarticular cup (Permedica)	**57**	50	7								
Filler	Hipball Premium	HIP Bipolar Cup	**88**		4	8	21	7	13	12	8	7	8
HACTIV	HACTIV head	Moonstone	**7**	7									
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**	18	1		1						
KAR	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**14**		6	5	2	1					
Polarstem	Cobalt Chrom (S&N)	UHR	**6**							2	1	1	2
REEF	Cobalt chrome (DePuy)	Self-centering bipolar (DePuy)	**6**	1	3	2							
Restoration-HA	C-Taper Head	Landos bipolar cup (DePuy)	**7**	7									
SL-PLUS	Metal Ball Head	Bipolar Ball Head	**12**	9	2	1							
TTHR	Articul/Eze CoCr	UHR	**6**							4	1	1	
TTHR	CoCrMo (Link)	UHR	**7**							1	4	2	
TTHR	TETE Inox	Self-centering bipolar (DePuy)	**5**			4	1						
Other	(n < 5)		**129**	42	13	9	12	10	9	5	13	6	10
Unknown			**4**	3									1
Total			**787**	**287**	**72**	**79**	**73**	**73**	**57**	**43**	**50**	**38**	**33**

Table 19: Screws - primary operations

Product	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Asnis III	**1475**	390	49	126	177	156	105	121	120	118	113
Hansson pin system (LIH)	**2141**	1224	235	212	112	69	60	41	60	49	79
Olmed	**10711**	5268	1123	790	675	660	563	448	483	431	270
Richards CHP	**7374**	2101	365	572	734	597	593	547	614	595	656
Other (n<10)	**8**				2			1		3	2
Total	**21709**	**8983**	**1772**	**1700**	**1700**	**1482**	**1321**	**1158**	**1277**	**1196**	**1120**

Table 20: Hip compression screws - primary operations

Product	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
DHS	**4289**	3658	337	108	58	28	8	13	25	25	29
LCP DHS	**6895**	34	705	476	485	458	468	662	1357	1161	1089
Omega	**111**	101	1	2	3	2	2				
Richards CHS	**18581**	5670	1510	2046	2021	1992	1764	1564	773	708	533
Swemac CHS System	**19**								8	5	6
Other (n<10)	**9**	3					1	1		2	2
Total	**29904**	**9466**	**2553**	**2632**	**2567**	**2480**	**2243**	**2240**	**2163**	**1901**	**1659**

Table 21: Intramedullary nails - primary operations

Product	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
ACE	**49**	42	7								
Gamma 3	**6250**	1025	505	656	672	657	765	710	467	428	365
IMHS	**27**	25	1	1							
IMHS CP	**10**	10									
LFN	**74**	9	10	12	8	8	8	7	4	3	5
PFN	**26**	26									
PFNA	**1125**	111	41	30	40	91	136	117	174	200	185
T2	**14**	4	2	1	3	1		2	1		
T2 recon	**267**	1	1	19	38	29	61	33	24	28	33
T-Gamma	**510**	482	22	3							3
Trigen Intertan	**3984**	555	150	133	190	186	198	283	560	742	987
Trigen TAN/FAN	**463**	104	35	17	14	22	34	22	62	65	88
Other (n<10)	**16**	5	2			1		2	1		5
Total	**12815**	**2399**	**776**	**872**	**965**	**995**	**1202**	**1176**	**1293**	**1466**	**1671**

Fixation of hemiprostheses

Table 22: Primary operations

	Uncemented		Cement with antibiotics		Cement without antibiotics		Missing		Total
2017	453	(13,6%)	2877	(86,4%)	0	(0,0%)	1	(0,0%)	**3331**
2016	687	(19,9%)	2766	(80,1%)	0	(0,0%)	1	(0,0%)	**3454**
2015	667	(20,6%)	2562	(79,2%)	1	(0,0%)	6	(0,2%)	**3236**
2014	811	(25,4%)	2360	(74,0%)	3	(0,1%)	16	(0,5%)	**3190**
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	**8337**	**(23,4%)**	**26622**	**(74,8%)**	**52**	**(0,1%)**	**603**	**(1,7%)**	**35614**

Figure 10: Time trend for fixation of primary hemiprostheses

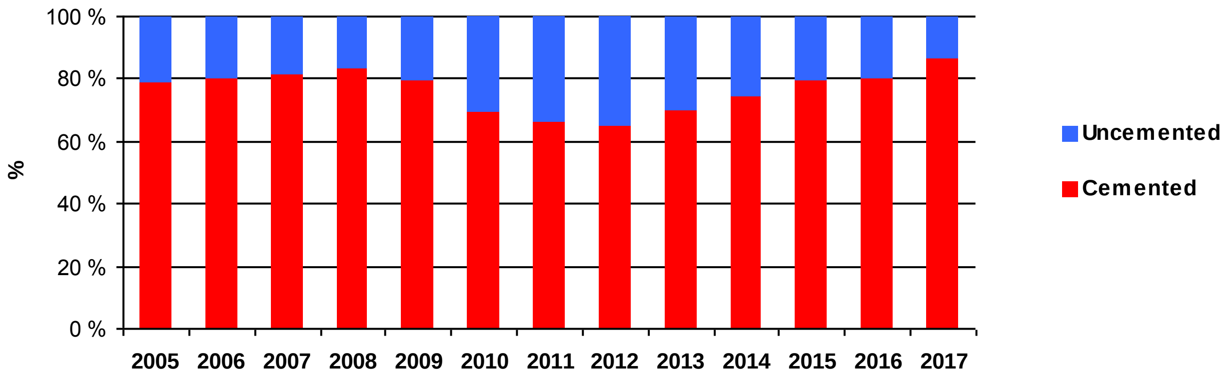


Table 23: Type of cement - primary operations

Product	Manufacturer	Total	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cemex w/gentamycin	Alere	**256**	49		1			11	10	71	111	3
Cemex System Genta FAST	Alere	**639**	80	101	102	83	74	84	86	29		
Cemex system genta ID green	Alere	**138**									16	122
Copal G+ V	Heraeus	**12**							1	1	2	8
Optipac Refobacin Bonecement R	Biomet	**7158**	42	223	518	718	790	725	911	1248	1040	943
Optipac Refobacin Revision	Biomet	**128**				2	1	58	67			
Palacos w/gentamicin	Heraeus/Sc	**353**	353									
Palacos R + G	Heraeus	**11639**	3392	1375	992	714	690	869	880	958	1006	763
Palacos R+G pro	Heraeus	**469**			1					1	93	374
Refobacin Bone Cement R	Biomet	**4829**	1578	396	246	357	368	394	380	220	366	524
Refobacin Revision	Biomet	**5**								1	1	3
Refobacin-Palacos	Biomet	**314**	314									
Simplex w/Tobramycin	Stryker	**2**	1	1								
Simplex unknown	Stryker	**75**	20	42	13							
SmartMix Cemvac + SmartSet GHV Genta	Ortomedic	**139**	62	4						3	39	31
Missing information		**466**	58	32	23	51	36	13	25	30	92	106
Total		**26622**	**5949**	**2174**	**1896**	**1925**	**1959**	**2154**	**2360**	**2562**	**2766**	**2877**

Table 24: Hydroxyapatite (HA) - uncemented prostheses

	With HA		Without HA		Missing		Total
2017	450	(99,3%)	0	(0,0%)	3	(0,7%)	**453**
2016	680	(99,0%)	5	(0,7%)	2	(0,3%)	**687**
2015	664	(99,6%)	3	(0,4%)	0	(0,0%)	**667**
2014	805	(99,3%)	5	(0,6%)	1	(0,1%)	**811**
2013	920	(99,9%)	1	(0,1%)	0	(0,0%)	**921**
2012	1062	(99,8%)	2	(0,2%)	0	(0,0%)	**1064**
2011	986	(99,9%)	1	(0,1%)	0	(0,0%)	**987**
2010	824	(98,4%)	13	(1,6%)	0	(0,0%)	**837**
2009	524	(92,3%)	44	(7,7%)	0	(0,0%)	**568**
2008	362	(90,7%)	37	(9,3%)	0	(0,0%)	**399**
2007	351	(90,7%)	36	(9,3%)	0	(0,0%)	**387**
2006	284	(87,9%)	39	(12,1%)	0	(0,0%)	**323**
2005	192	(82,4%)	41	(17,6%)	0	(0,0%)	**233**
Total	**8104**	**(97,2%)**	**227**	**(2,7%)**	**6**	**(0,1%)**	**8337**

Pathological fractures

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

	No		Yes		Missing		Total
2017	6832	(86,3%)	117	(1,5%)	964	(12,2%)	**7913**
2016	7056	(86,7%)	117	(1,4%)	970	(11,9%)	**8143**
2015	7077	(87,5%)	117	(1,4%)	891	(11,0%)	**8085**
2014	6919	(87,7%)	80	(1,0%)	891	(11,3%)	**7890**
2013	6986	(87,2%)	133	(1,7%)	892	(11,1%)	**8011**
2012	7191	(87,4%)	106	(1,3%)	928	(11,3%)	**8225**
2011	7485	(89,0%)	135	(1,6%)	788	(9,4%)	**8408**
2010	7611	(92,8%)	93	(1,1%)	496	(6,0%)	**8200**
2009	7307	(90,2%)	107	(1,3%)	686	(8,5%)	**8100**
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	**90598**	**(88,8%)**	**1356**	**(1,3%)**	**10098**	**(9,9%)**	**102052**

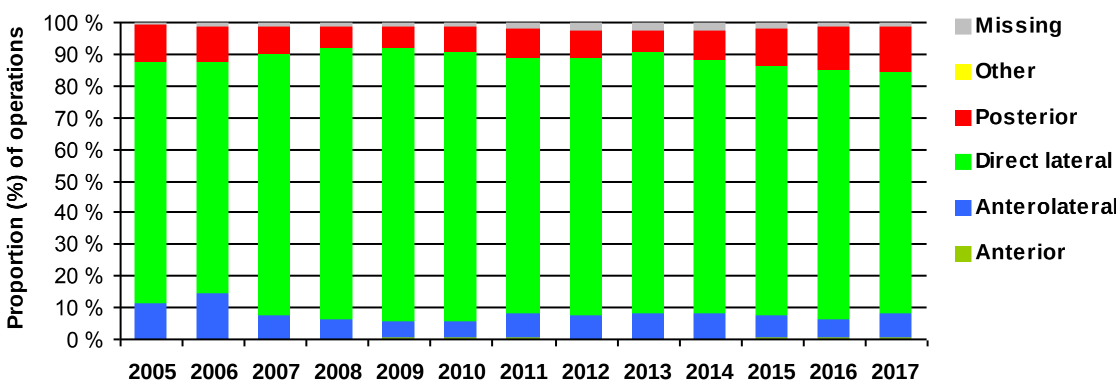
* Patients operated with total hip prostheses were excluded

Surgical approach used in hemiarthroplasty

Table 26: Surgical approach used in hemiarthroplasty

	Anterior		Anterolateral		Direct lateral		Posterior		Other		Missing		Total
2017	24	(0,7%)	246	(7,4%)	2532	(76,0%)	493	(14,8%)	0	(0,0%)	36	(1,1%)	**3331**
2016	11	(0,3%)	210	(6,1%)	2712	(78,5%)	486	(14,1%)	0	(0,0%)	35	(1,0%)	**3454**
2015	14	(0,4%)	232	(7,2%)	2544	(78,6%)	388	(12,0%)	1	(0,0%)	57	(1,8%)	**3236**
2014	3	(0,1%)	252	(7,9%)	2560	(80,3%)	291	(9,1%)	1	(0,0%)	83	(2,6%)	**3190**
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	**107**	**(0,3%)**	**2642**	**(7,4%)**	**28704**	**(80,6%)**	**3582**	**(10,1%)**	**3**	**(0,0%)**	**576**	**(1,6%)**	**35614**

Figure 11: 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
2017	264	(3,2%)	7840	(94,2%)	217	(2,6%)	**8321**
2016	333	(3,9%)	7900	(93,1%)	257	(3,0%)	**8490**
2015	305	(3,6%)	7811	(92,9%)	294	(3,5%)	**8410**
2014	308	(3,8%)	7585	(92,7%)	287	(3,5%)	**8180**
2013	306	(3,7%)	7745	(93,2%)	257	(3,1%)	**8308**
2012	340	(4,0%)	7770	(92,1%)	325	(3,9%)	**8435**
2011	353	(4,1%)	7959	(92,6%)	288	(3,4%)	**8600**
2010	322	(3,9%)	7762	(92,8%)	279	(3,3%)	**8363**
2009	302	(3,7%)	7684	(93,1%)	272	(3,3%)	**8258**
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	**3903**	**(3,7%)**	**97718**	**(93,1%)**	**3372**	**(3,2%)**	**104993**

Antibiotic prophylaxis

Table 28: Screw - primary fixation

	Yes		No		Missing		Total
2017	1058	(94,4%)	54	(4,8%)	9	(0,8%)	**1121**
2016	1127	(94,2%)	63	(5,3%)	7	(0,6%)	**1197**
2015	1166	(91,3%)	102	(8,0%)	9	(0,7%)	**1277**
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	(58,8%)	682	(40,1%)	18	(1,1%)	**1700**
2010	952	(56,0%)	721	(42,4%)	26	(1,5%)	**1699**
2009	885	(50,0%)	859	(48,6%)	25	(1,4%)	**1769**
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	**12380**	**(57,1%)**	**9044**	**(41,7%)**	**270**	**(1,2%)**	**21694**

Table 29: Hemiprosthesis - primary operations

	Yes		No		Missing		Total
2017	3311	(99,5%)	2	(0,1%)	14	(0,4%)	**3327**
2016	3429	(99,5%)	3	(0,1%)	14	(0,4%)	**3446**
2015	3228	(99,8%)	2	(0,1%)	5	(0,2%)	**3235**
2014	3183	(99,8%)	0	(0,0%)	6	(0,2%)	**3189**
2013	3090	(99,6%)	4	(0,1%)	9	(0,3%)	**3103**
2012	3135	(99,7%)	6	(0,2%)	2	(0,1%)	**3143**
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	**35445**	**(99,6%)**	**64**	**(0,2%)**	**88**	**(0,2%)**	**35597**

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

	Yes		No		Missing		Total
2017	1653	(99,6%)	2	(0,1%)	4	(0,2%)	**1659**
2016	1892	(99,5%)	1	(0,1%)	8	(0,4%)	**1901**
2015	2155	(99,6%)	3	(0,1%)	5	(0,2%)	**2163**
2014	2227	(99,4%)	7	(0,3%)	6	(0,3%)	**2240**
2013	2238	(99,7%)	4	(0,2%)	2	(0,1%)	**2244**
2012	2462	(99,2%)	14	(0,6%)	5	(0,2%)	**2481**
2011	2527	(98,4%)	28	(1,1%)	12	(0,5%)	**2567**
2010	2583	(98,1%)	37	(1,4%)	12	(0,5%)	**2632**
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	1823	(92,9%)	121	(6,2%)	18	(0,9%)	**1962**
Total	**29131**	**(97,4%)**	**652**	**(2,2%)**	**127**	**(0,4%)**	**29910**

Table 31: Intramedullary nail - primary operations

	Yes		No		Missing		Total
2017	1662	(99,6%)	2	(0,1%)	4	(0,2%)	**1668**
2016	1456	(99,5%)	1	(0,1%)	6	(0,4%)	**1463**
2015	1279	(99,2%)	6	(0,5%)	4	(0,3%)	**1289**
2014	1159	(98,6%)	5	(0,4%)	11	(0,9%)	**1175**
2013	1181	(98,3%)	15	(1,2%)	5	(0,4%)	**1201**
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	**12164**	**(95,0%)**	**567**	**(4,4%)**	**69**	**(0,5%)**	**12800**

Table 32: Reoperations

	Yes		No		Missing		Total
2017	761	(85,4%)	121	(13,6%)	9	(1,0%)	**891**
2016	855	(87,5%)	110	(11,3%)	12	(1,2%)	**977**
2015	855	(91,9%)	63	(6,8%)	12	(1,3%)	**930**
2014	743	(94,2%)	44	(5,6%)	2	(0,3%)	**789**
2013	822	(91,5%)	66	(7,3%)	10	(1,1%)	**898**
2012	814	(90,8%)	76	(8,5%)	6	(0,7%)	**896**
2011	814	(88,2%)	95	(10,3%)	14	(1,5%)	**923**
2010	739	(85,8%)	111	(12,9%)	11	(1,3%)	**861**
2009	801	(82,6%)	151	(15,6%)	18	(1,9%)	**970**
2008	794	(84,3%)	131	(13,9%)	17	(1,8%)	**942**
2007	800	(85,7%)	125	(13,4%)	8	(0,9%)	**933**
2006	754	(84,4%)	122	(13,7%)	17	(1,9%)	**893**
2005	548	(82,5%)	108	(16,3%)	8	(1,2%)	**664**
Total	**10100**	**(87,3%)**	**1323**	**(11,4%)**	**144**	**(1,2%)**	**11567**

Table 33: Type of antibiotics - primary operations

Antibiotics (generic name)	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Cefalotin (Keflin)	19 332	6 202	6 430	6 418	6 543	6 744	6 946	7 305	7 828	7 006
	83,9%	85,3%	85,3%	81,8%	81,7%	83,3%	85,8%	87,1%	92,0%	84,5%
Cefazolin (Cephazolin)		1		1	1		1		2	745
		0,0%		0,0%	0,0%		0,0%		0,0%	9,0%
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	1 274	308	300	321	385	193	87	31	26	21
	5,5%	4,2%	4,0%	4,1%	4,8%	2,4%	1,1%	0,4%	0,3%	0,3%
Dikloksacillin (Diclocil, Dicillin)	1 285	297	132	176	201	141	18	18	14	3
	5,6%	4,1%	1,8%	2,2%	2,5%	1,7%	0,2%	0,2%	0,2%	0,0%
Klindamycin (Dalacin, Clindamycin)	488	185	207	269	288	325	338	366	397	393
	2,1%	2,5%	2,7%	3,4%	3,6%	4,0%	4,2%	4,4%	4,7%	4,7%
Kloksacillin (Ekvacillin)	201	173	358	497	422	511	532	510	80	14
	0,9%	2,4%	4,7%	6,3%	5,3%	6,3%	6,6%	6,1%	0,9%	0,2%
Other *	364	84	87	144	148	139	133	121	130	75
	1,6%	1,2%	1,2%	1,8%	1,8%	1,7%	1,6%	1,4%	1,5%	0,9%
Missing information	106	23	26	22	19	41	38	34	28	30
	0,5%	0,3%	0,3%	0,3%	0,2%	0,5%	0,5%	0,4%	0,3%	0,4%
Total	**23 050**	**7 273**	**7 540**	**7 848**	**8 007**	**8 094**	**8 093**	**8 385**	**8 505**	**8 287**

* Drugs used less than 1% of operations last year or less than 1% of total surgery

Pharmacological antithrombotic prophylaxis

Table 34: Primary operation

	Yes		No		Missing		Total
2017	8119	(97,6%)	182	(1,9%)	20	(0,5%)	**8321**
2016	8272	(97,4%)	186	(1,9%)	31	(0,6%)	**8490**
2015	8209	(97,6%)	168	(1,8%)	33	(0,6%)	**8410**
2014	7965	(97,4%)	191	(1,9%)	24	(0,7%)	**8180**
2013	8161	(98,2%)	139	(1,3%)	8	(0,4%)	**8308**
2012	8308	(98,5%)	125	(1,1%)	2	(0,4%)	**8435**
2011	8488	(98,7%)	92	(1,0%)	20	(0,3%)	**8600**
2010	8238	(98,5%)	94	(1,1%)	31	(0,4%)	**8363**
2009	8150	(98,7%)	78	(0,9%)	30	(0,4%)	**8258**
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	**102845**	**(98,0%)**	**1816**	**(1,7%)**	**331**	**(0,3%)**	**104993**

Table 35: Number of drugs in antithrombotic prophylaxis

	One drug		Two drugs		Total
2017	7935	(97,7%)	184	(2,3%)	**8119**
2016	8089	(97,8%)	183	(2,2%)	**8272**
2015	7962	(97,0%)	247	(3,0%)	**8209**
2014	7748	(97,3%)	217	(2,7%)	**7965**
2013	7901	(96,8%)	260	(3,2%)	**8161**
2012	8134	(97,9%)	174	(2,1%)	**8308**
2011	8402	(99,0%)	86	(1,0%)	**8488**
2010	8204	(99,6%)	34	(0,4%)	**8238**
2009	8132	(99,8%)	18	(0,2%)	**8150**
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	**101375**	**(98,6%)**	**1470**	**(1,4%)**	**102845**

Table 36: Antithrombotic prophylaxis if one drug - primary operation (n=101377)

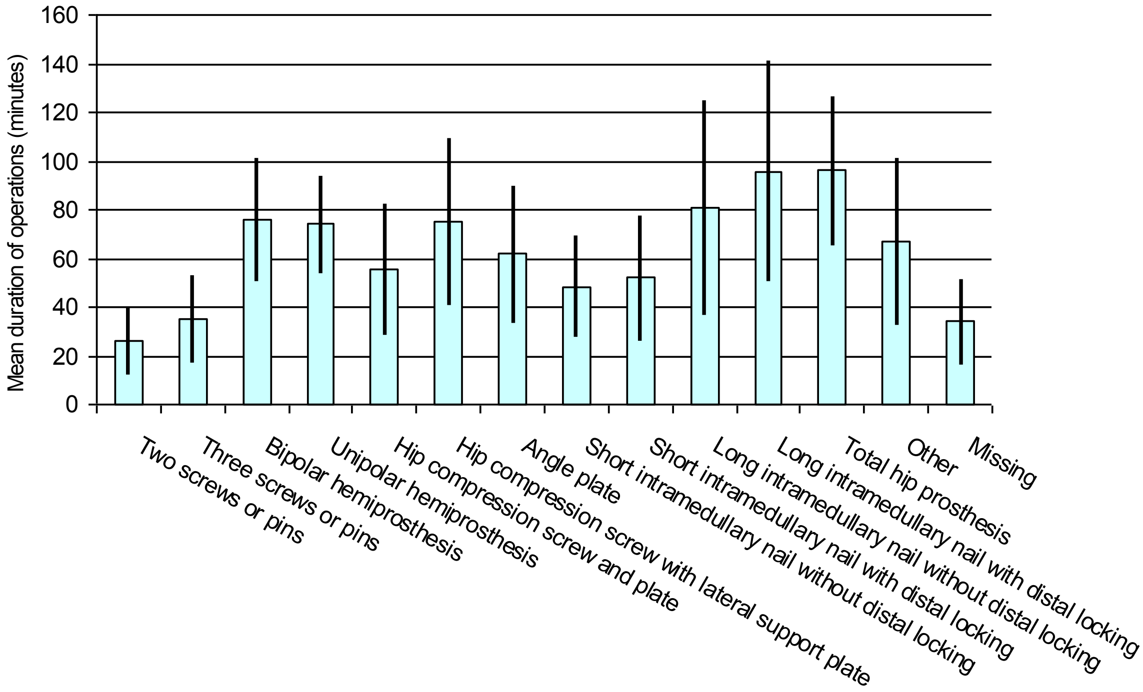
	2005-08	2009	2010	2011	2012	2013	2014	2015	2016	2017
Dalteparin (Fragmin)	55,19%	51,94%	61,32%	62,97%	62,93%	53,35%	51,05%	59,82%	64,75%	70,54%
Enoksaparin (Klexane)	44,53%	47,70%	38,37%	36,62%	36,33%	45,69%	48,03%	39,11%	34,27%	28,19%
Other	0,08%	0,18%	0,18%	0,09%	0,05%	0,26%	0,37%	0,46%	0,41%	0,53%
Missing information	0,19%	0,17%	0,12%	0,31%	0,70%	0,68%	0,55%	0,62%	0,59%	0,73%

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

	Preoperatively		Postoperatively		Missing		Total
2017	2338	(28,9%)	4828	(59,5%)	953	(11,7%)	**8119**
2016	2594	(31,4%)	4756	(57,5%)	923	(11,1%)	**8273**
2015	2633	(32,1%)	4697	(57,2%)	879	(10,7%)	**8209**
2014	2618	(32,9%)	4477	(56,2%)	870	(10,9%)	**7965**
2013	2818	(34,6%)	4351	(53,3%)	992	(12,1%)	**8161**
2012	3108	(37,4%)	4132	(49,8%)	1068	(12,9%)	**8308**
2011	3322	(39,2%)	4060	(47,8%)	1106	(9,8%)	**8488**
2010	3309	(40,2%)	3585	(43,5%)	1344	(10,5%)	**8238**
2009	3760	(46,2%)	3046	(37,4%)	1344	(12,1%)	**8150**
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	**38053**	**(37,0%)**	**45975**	**(44,7%)**	**18818**	**(18,3%)**	**102846**

DURATION OF SURGERY

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



The vertical bars indicate the mean duration ± a standard deviation.

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	20066	26	14
Three screws or pins	602	35	18
Bipolar hemiprosthesis	33987	76	25
Unipolar hemiprosthesis	300	74	20
Hip compression screw and plate	20106	56	27
Hip compression screw with lateral support plate	8499	75	34
Angle plate	5	62	28
Short intramedullary nail without distal locking	331	48	21
Short intramedullary nail with distal locking	7454	52	26
Long intramedullary nail without distal locking	105	81	44
Long intramedullary nail with distal locking	4292	96	45
Total hip prosthesis	2867	96	31
Other	1948	67	34
Missing	4	34	18

PROM (Patient Reported Outcome Measures)

Table 39: Number of issued and answered patient questionnaires

	4 months *			12 months *			36 months *			Total		
	Issued	Answered (%)		Issued	Answered (%)		Issued	Answered (%)		Issued	Answered (%)	
2017	7012	4057	(57,9%)	5954	3417	(57,4%)	4091	2254	(55,1%)	**17057**	**9728**	(57,0%)
2016	7015	3963	(56,5%)	6077	3519	(57,9%)	4206	2325	(55,3%)	**17298**	**9807**	(56,7%)
2015	6919	3980	(57,5%)	5844	3346	(57,3%)	4384	2393	(54,6%)	**17147**	**9719**	(56,7%)
2014	6818	3825	(56,1%)	6003	3271	(54,5%)	4332	2350	(54,2%)	**17153**	**9446**	(55,1%)
2013	6903	3955	(57,3%)	6095	3516	(57,7%)	4443	2439	(54,9%)	**17441**	**9910**	(56,8%)
2012	7575	4202	(55,5%)	6784	3816	(56,3%)	1789	1050	(58,7%)	**16148**	**9068**	(56,2%)
2011	6459	3555	(55,0%)	5553	3118	(56,1%)	1411	816	(57,8%)	**13423**	**7489**	(55,8%)
2010	4985	2826	(56,7%)	2264	1308	(57,8%)	3752	2134	(56,9%)	**11001**	**6268**	(57,0%)
2009	2554	1484	(58,1%)	2360	1363	(57,8%)	4095	2207	(53,9%)	**9009**	**5054**	(56,1%)
2008	2273	1305	(57,4%)	1903	1085	(57,0%)	3180	1817	(57,1%)	**7356**	**4207**	(57,2%)
2007	3503	1967	(56,2%)	5068	2836	(56,0%)				**8571**	**4803**	(56,0%)
2006	6160	3607	(58,6%)	4848	2787	(57,5%)				**11008**	**6394**	(58,1%)
2005	2817	1640	(58,2%)							**2817**	**1640**	(58,2%)
Total	70993	40366	(56,9%)	58753	33382	(56,8%)	35683	19785	(55,4%)	165429	93533	(56,5%)

* The register sends questionnaires to patients 4, 12 and 36 months post-operatively

Figure 13: EQ-5D-3L index score before fracture.
Change over time of mean pre-fracture EQ-5D-3L index score for different types of fractures. 1 represents the best possible quality of life and 0 represents quality of life equivalent to death.

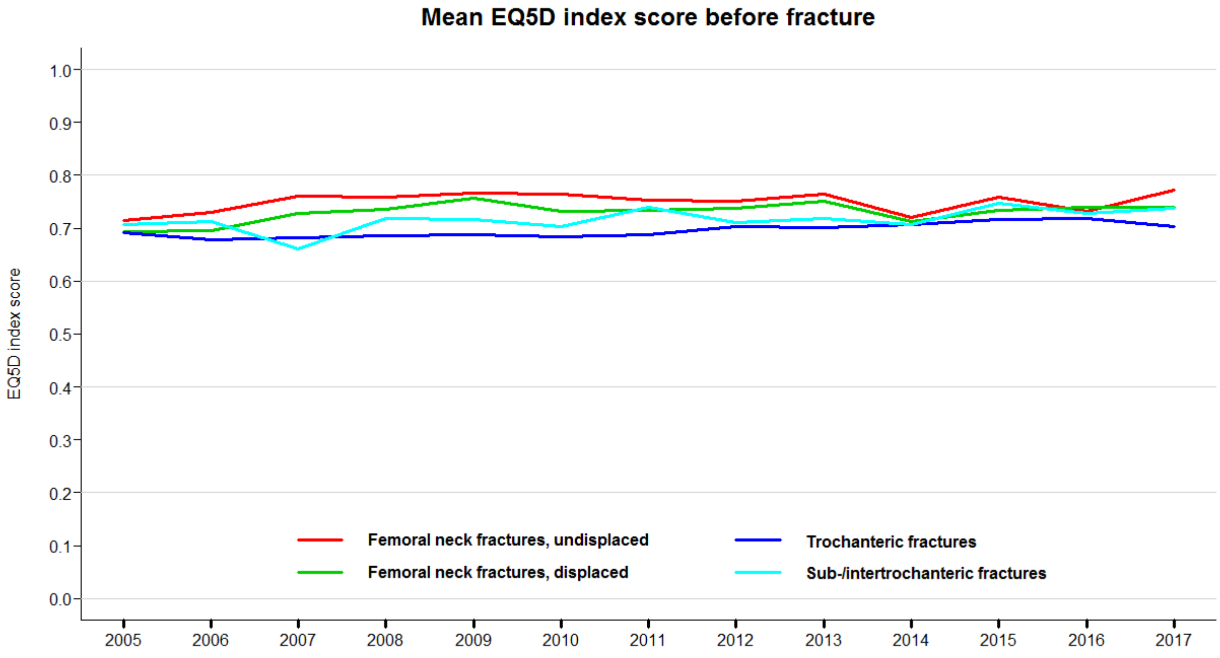


Figure 14: EQ-5D-3L index score 12 months postoperatively.
Change over time of mean EQ-5D-3L index score for different types of fractures 12 months postoperatively. 1 represents the best possible quality of life and 0 represents quality of life equivalent to death.

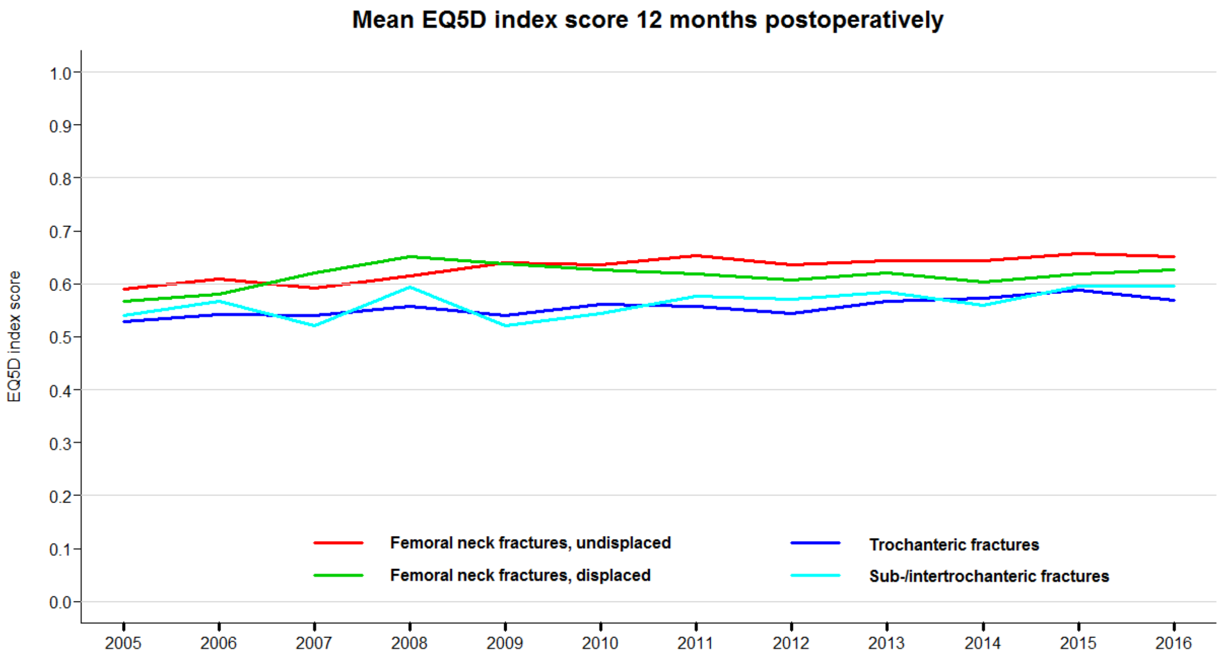


Figure 15: EQ-5D-3L Walking ability before fracture.
Change over time of walking ability before fracture for different types of fractures evaluated using the first question in EQ-5D-3L. The figure shows the proportion of patients reporting “I have problems in walking around” or “I am confined to bed”.

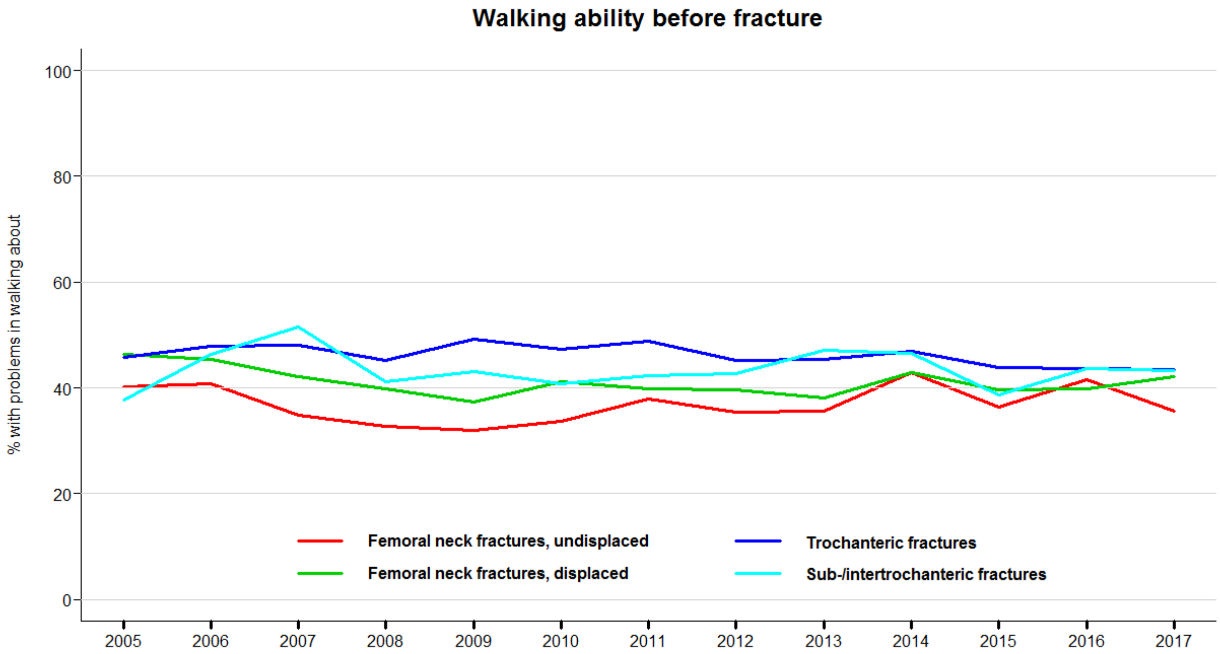


Figure 16: EQ-5D-3L Walking ability 12 months postoperatively.
Change over time of walking ability 12 months postoperatively for different types of fractures evaluated using the first question in EQ-5D-3L. The figure shows the proportion of patients reporting “I have problems in walking around” or “I am confined to bed”.

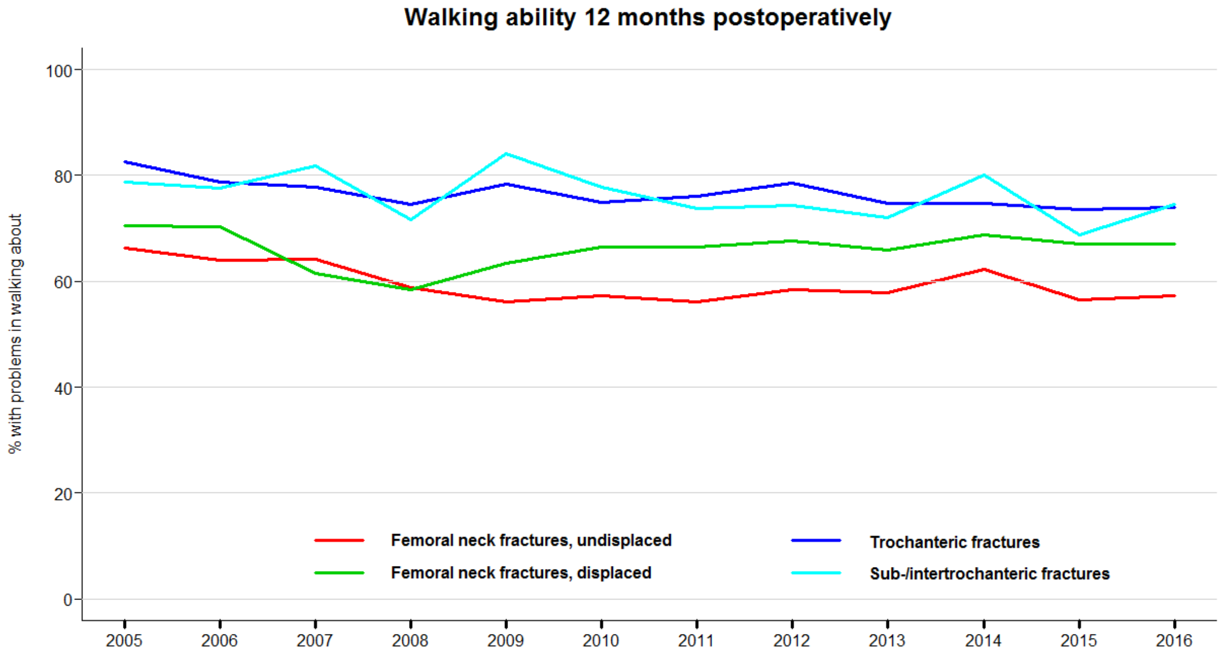


Figure 17: EQ-5D-3L Ability to perform self-care before fracture.
Change over time of ability to perform self-care before fracture for different types of fractures evaluated using the second question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have problems with self-care" or "I am unable to wash or dress myself".

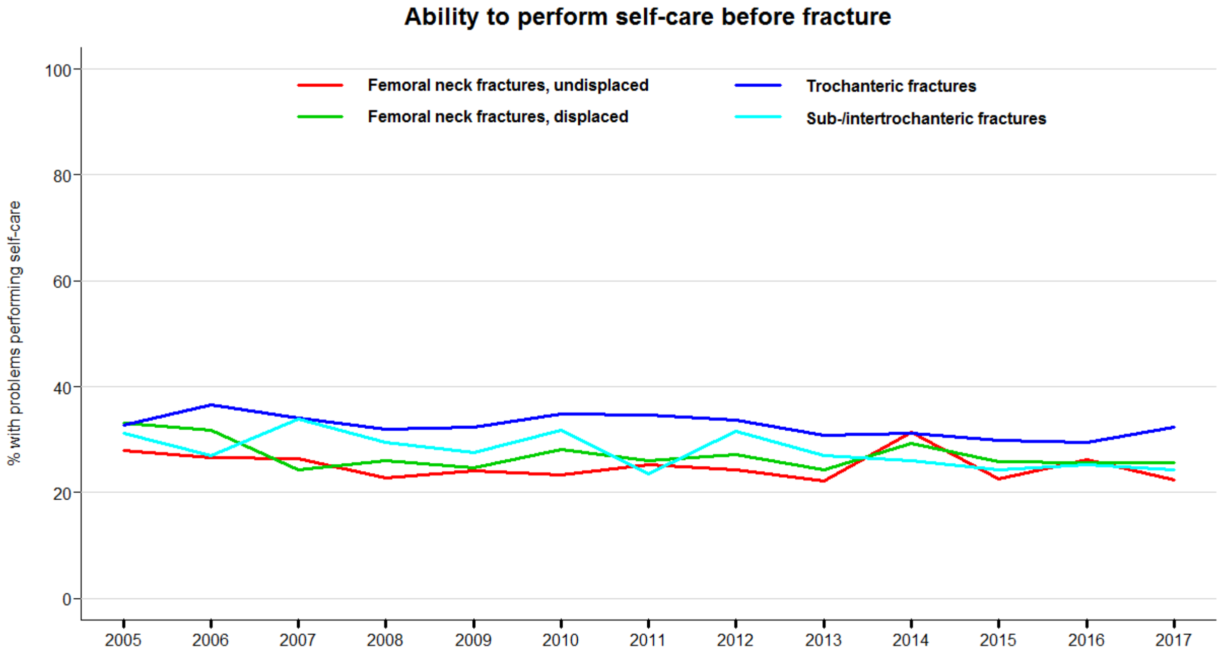


Figure 18: EQ-5D-3L Ability to perform self-care 12 months postoperatively.
Change over time of ability to perform self-care 12 months postoperatively for different types of fractures evaluated using the second question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have problems with self-care" or "I am unable to wash or dress myself".

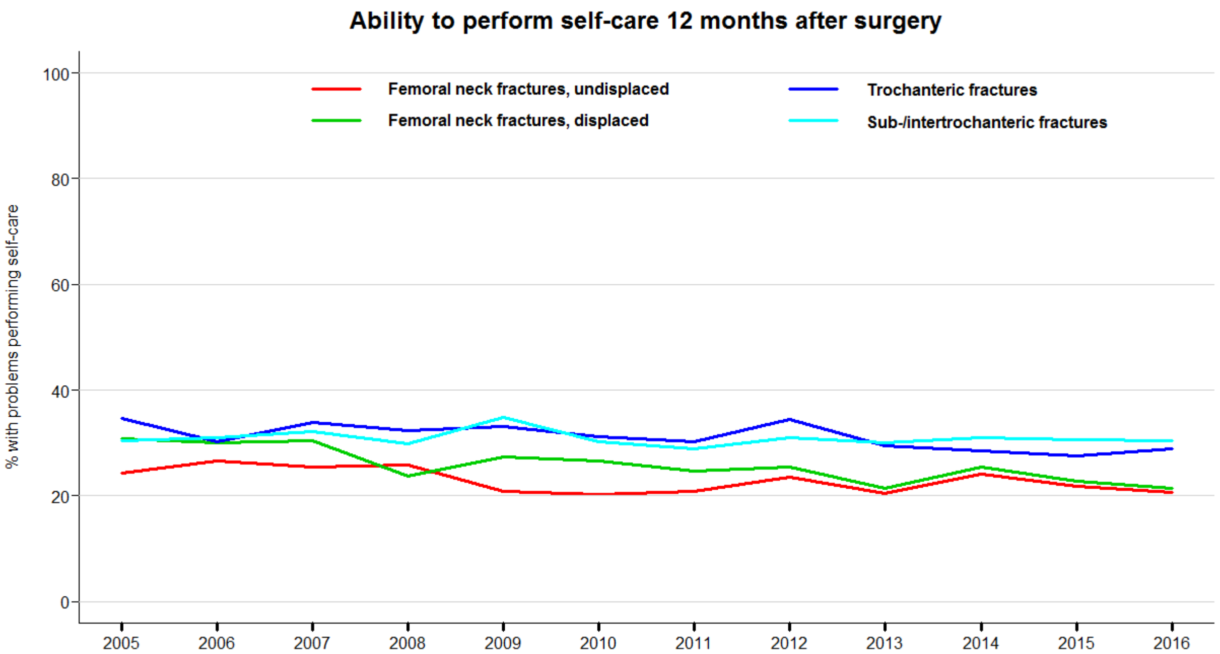


Figure 19: EQ-5D-3L Ability to perform usual activities before fracture.
Change over time of ability to perform usual activities (e.g. work, study, housework, family or leisure activities) before fracture for different types of fractures evaluated using the third question in EQ-5D-3L. The figure shows the proportion of patients reporting “I have problems with performing my usual activities” or “I am unable to perform my usual activities”.

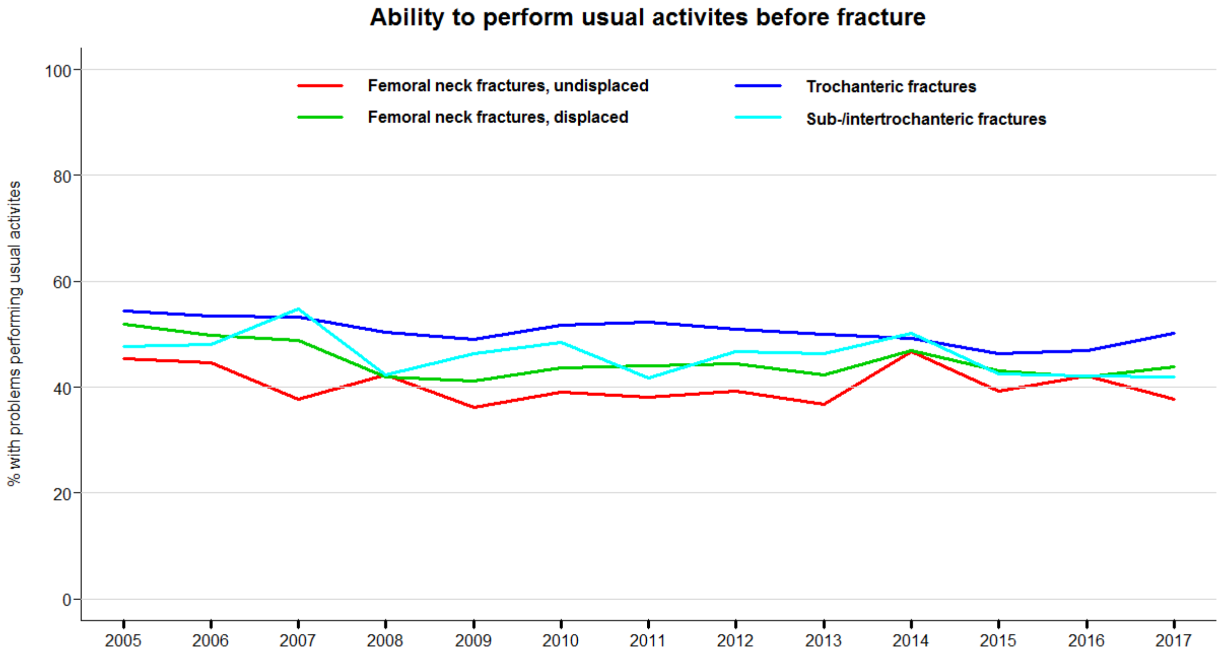


Figure 20: EQ-5D-3L Ability to perform usual activities 12 months postoperatively.
Change over time of ability to perform usual activities (e.g. work, study, housework, family or leisure activities) 12 months postoperatively for different types of fractures evaluated using the third question in EQ-5D-3L. The figure shows the proportion of patients reporting “I have problems with performing my usual activities” or “I am unable to perform my usual activities”.

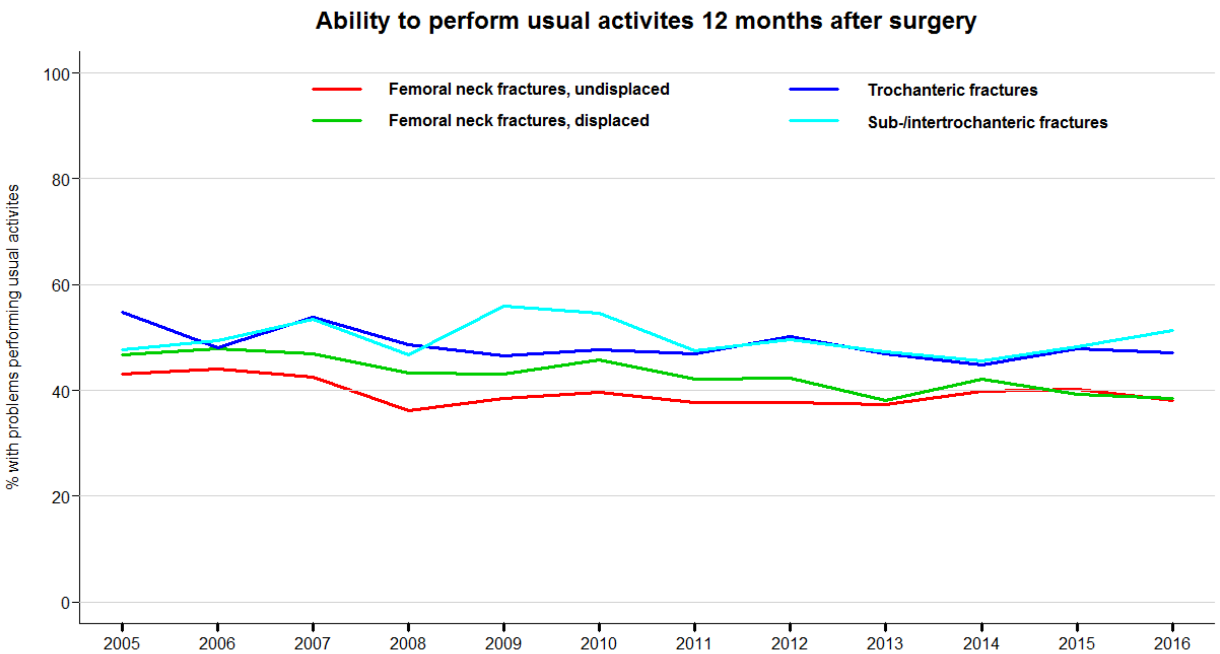


Figure 21: EQ-5D-3L Pain / discomfort before fracture.
Change over time of pain/discomfort before fracture for different types of fractures evaluated using the forth question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have moderate pain or discomfort" or "I have extreme pain or discomfort".

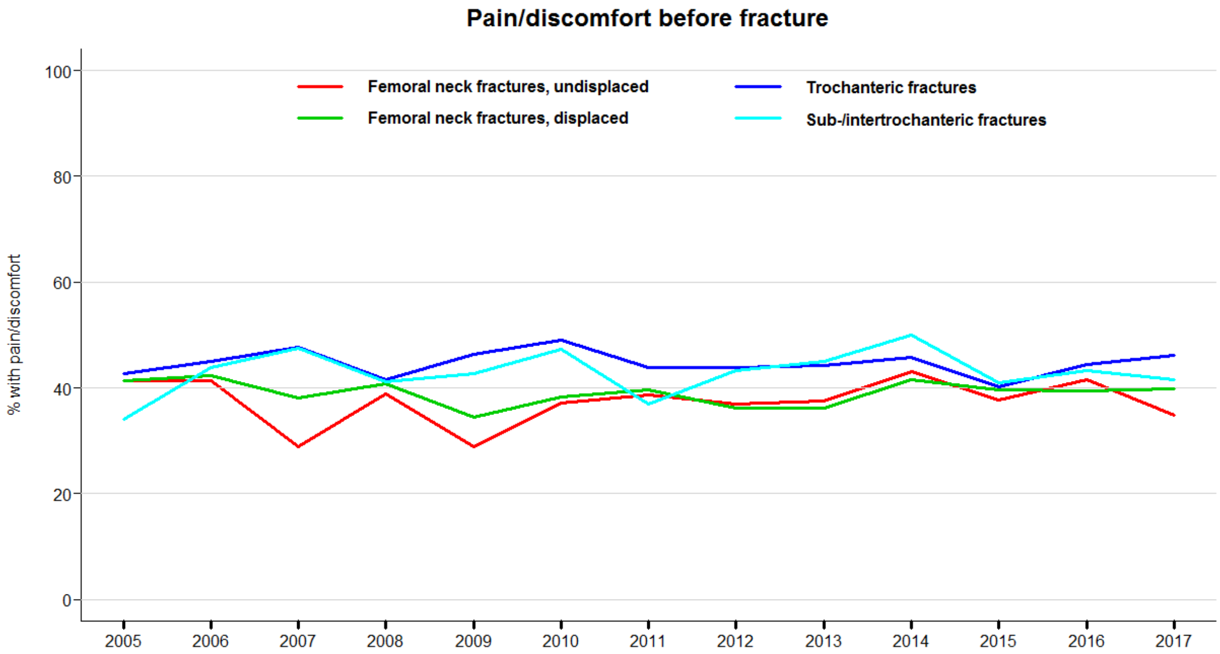
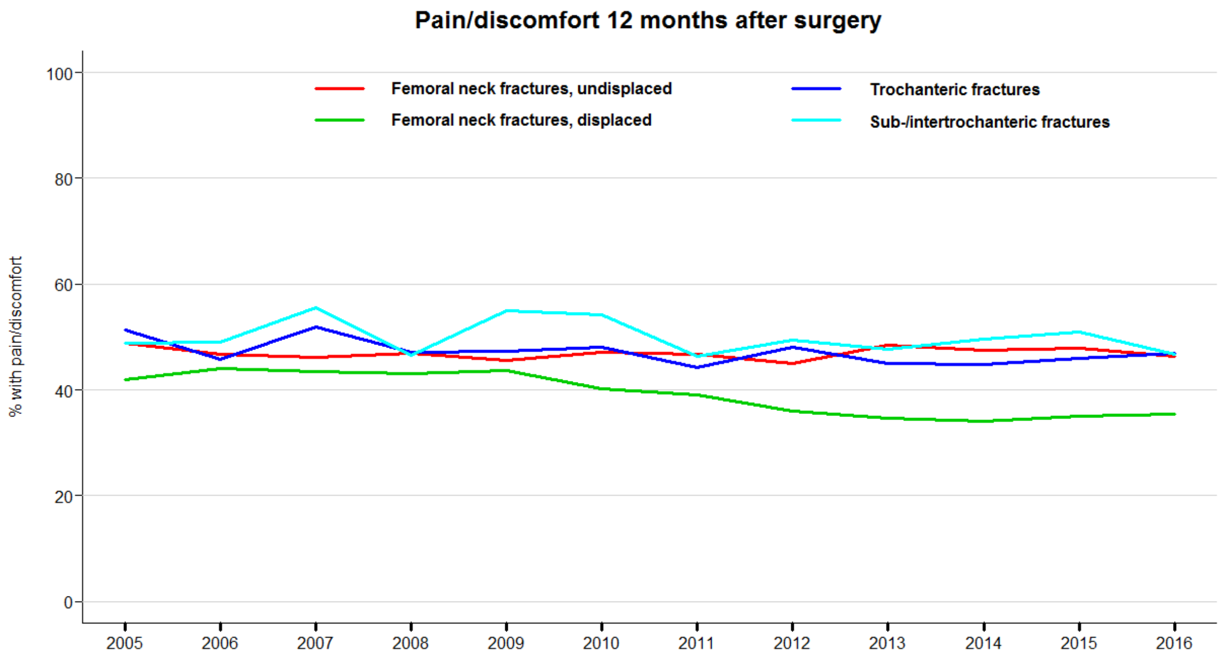


Figure 22: EQ-5D-3L Pain / discomfort 12 months postoperatively.
Change over time of pain/discomfort 12 months postoperatively for different types of fractures evaluated using the forth question in EQ-5D-3L. The figure shows the proportion of patients reporting "I have moderate pain or discomfort" or "I have extreme pain or discomfort".



Hospital data

The Norwegian Hip Fracture register is required to publish hospital data. These data are presented in the annual report to SKDE which is available on www.kvalitetsregistre.no. Figures 24 to 28 present updated results for the different hospitals for operations performed in the period 2015-2017.

Figure 23: Number of primary operations in 2017.

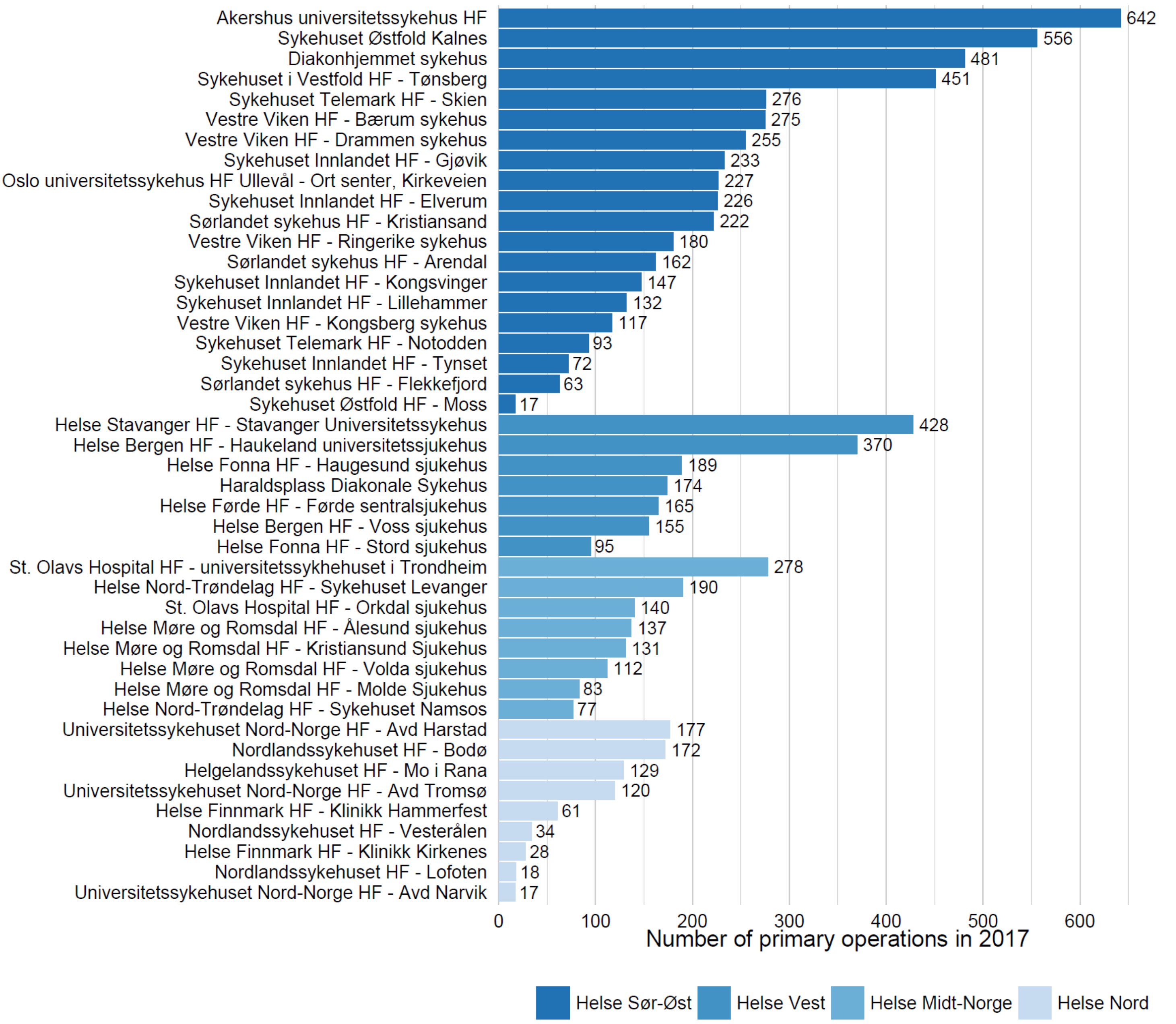


Figure 24: Treatment of displaced femoral neck fracutre in patients over 70 years of age.
The figure shows the proportion of patients treated with screw osteosynthesis/heimprosthesis/total hip prosthesis at each hospital in the period 2015-2017. Hospitals with n<10 have been excluded.

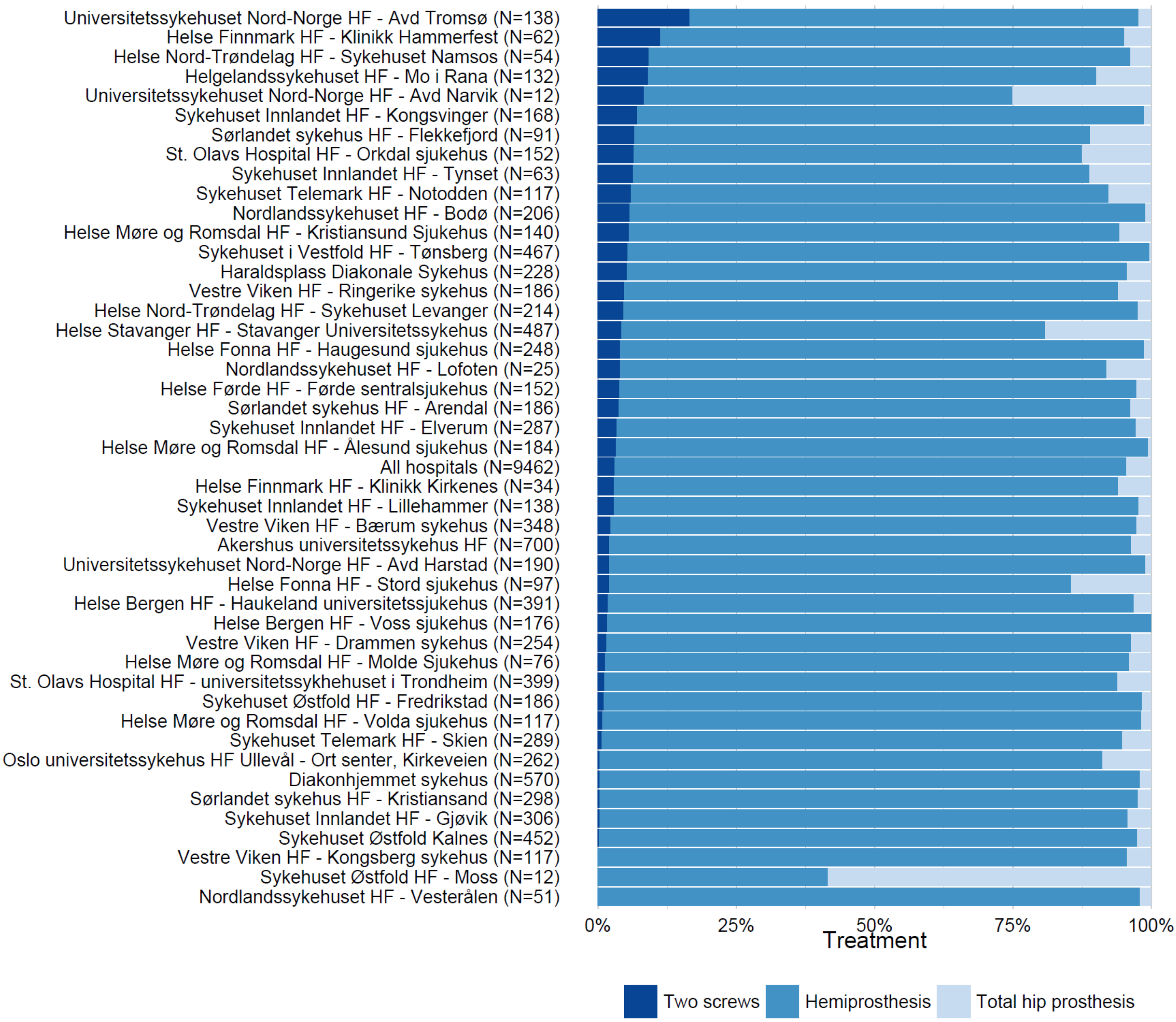


Figure 25: Fixation of hemiprosthesis in patients over 70 years of age.

The figure shows the proportion of patients treated with uncemented/cemented hemiprosthesis at each hospital in the period 2015-2017. Hospitals with n<10 have been excluded.

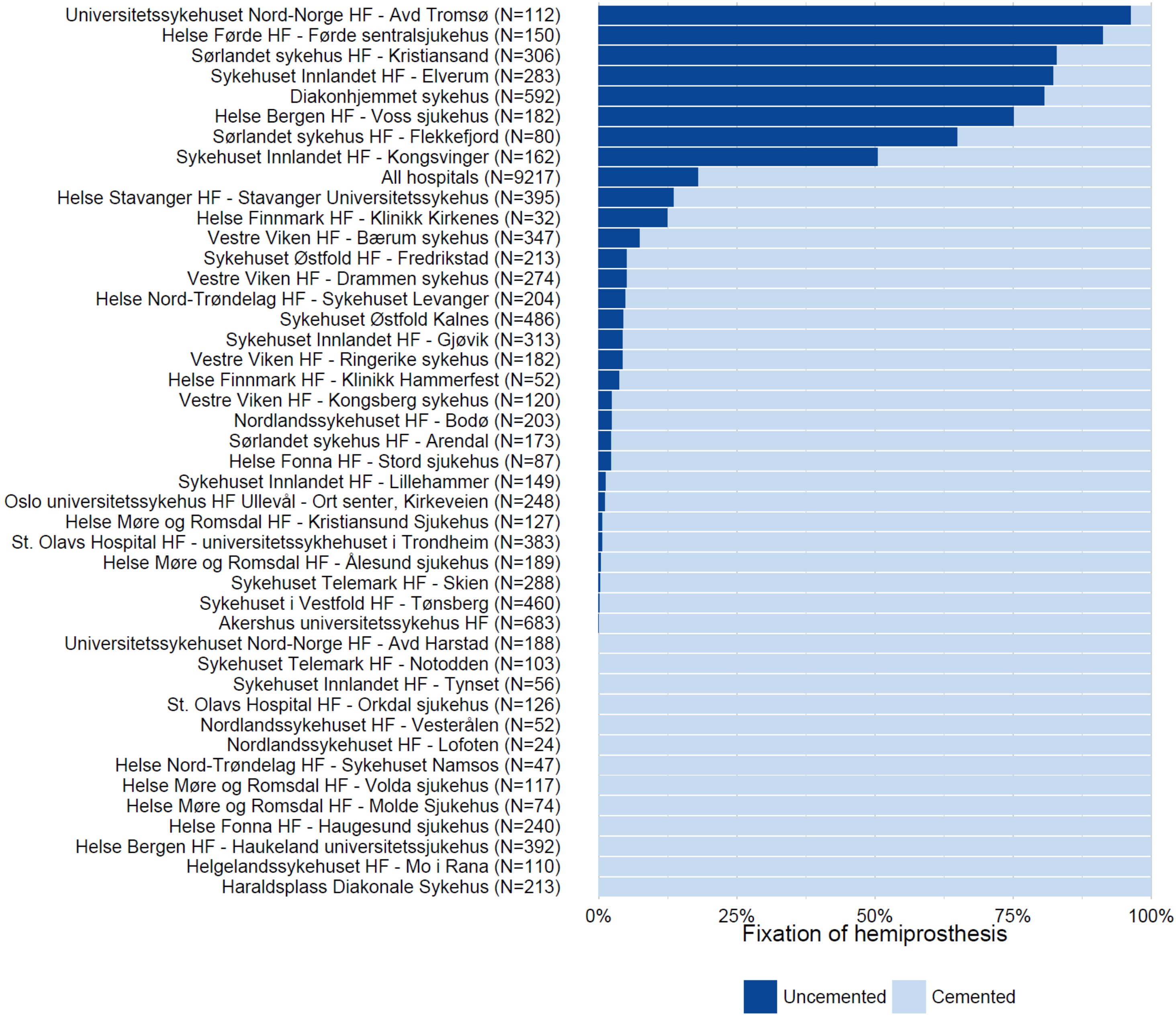


Figure 26: Waiting time from fracture to surgery.

The figure shows waiting time, sorted by proportion of fractures treated within 24 hours after the fracture at the different hospitals in the period 2015-2017. Hospitals with n<10 have been excluded.

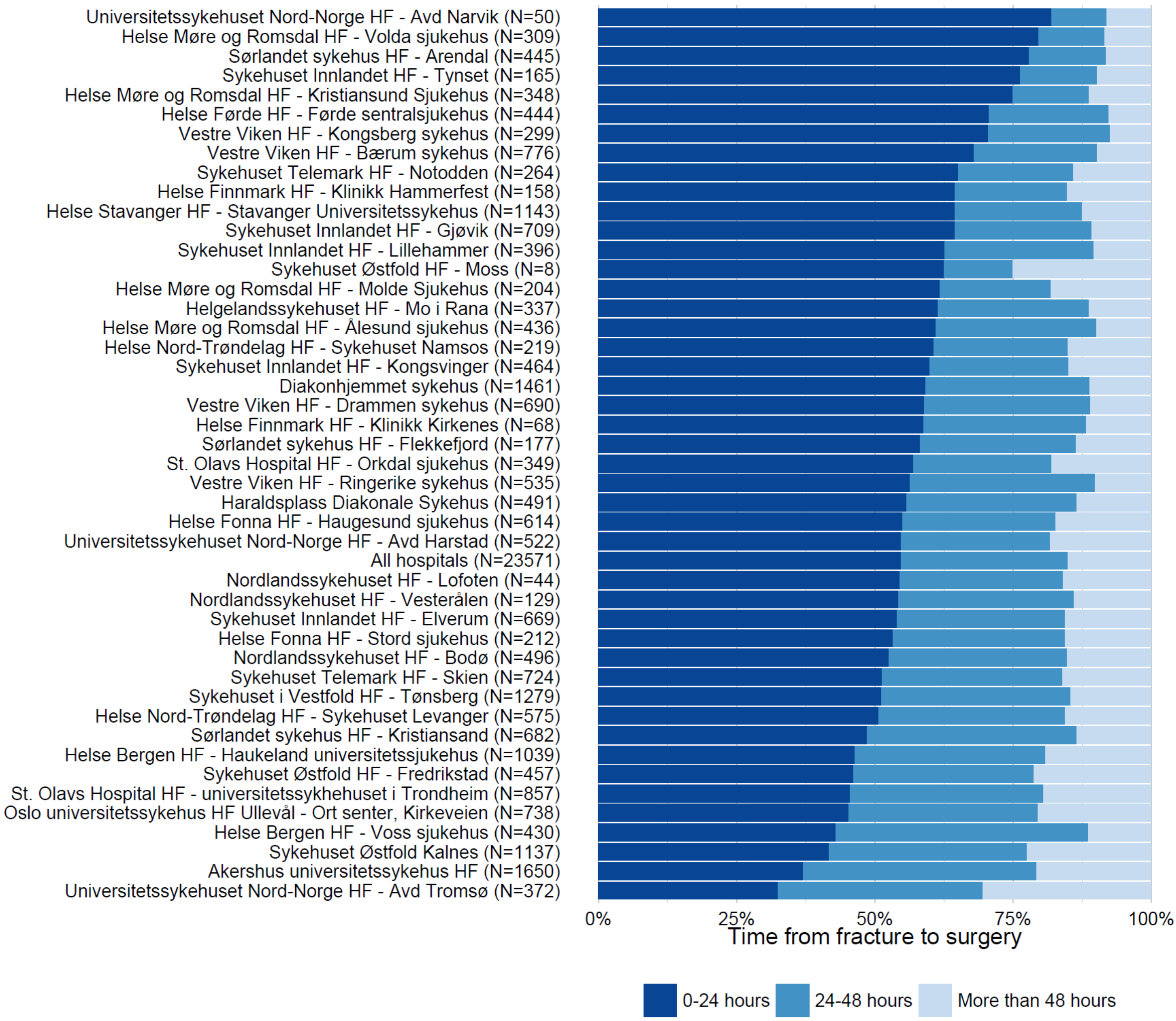


Figure 27: Reoperations after all types of hip fractures 2015-2017.

The figure shows the proportion of patients not reoperated at each hospital. Hospitals with n<10 have been excluded.

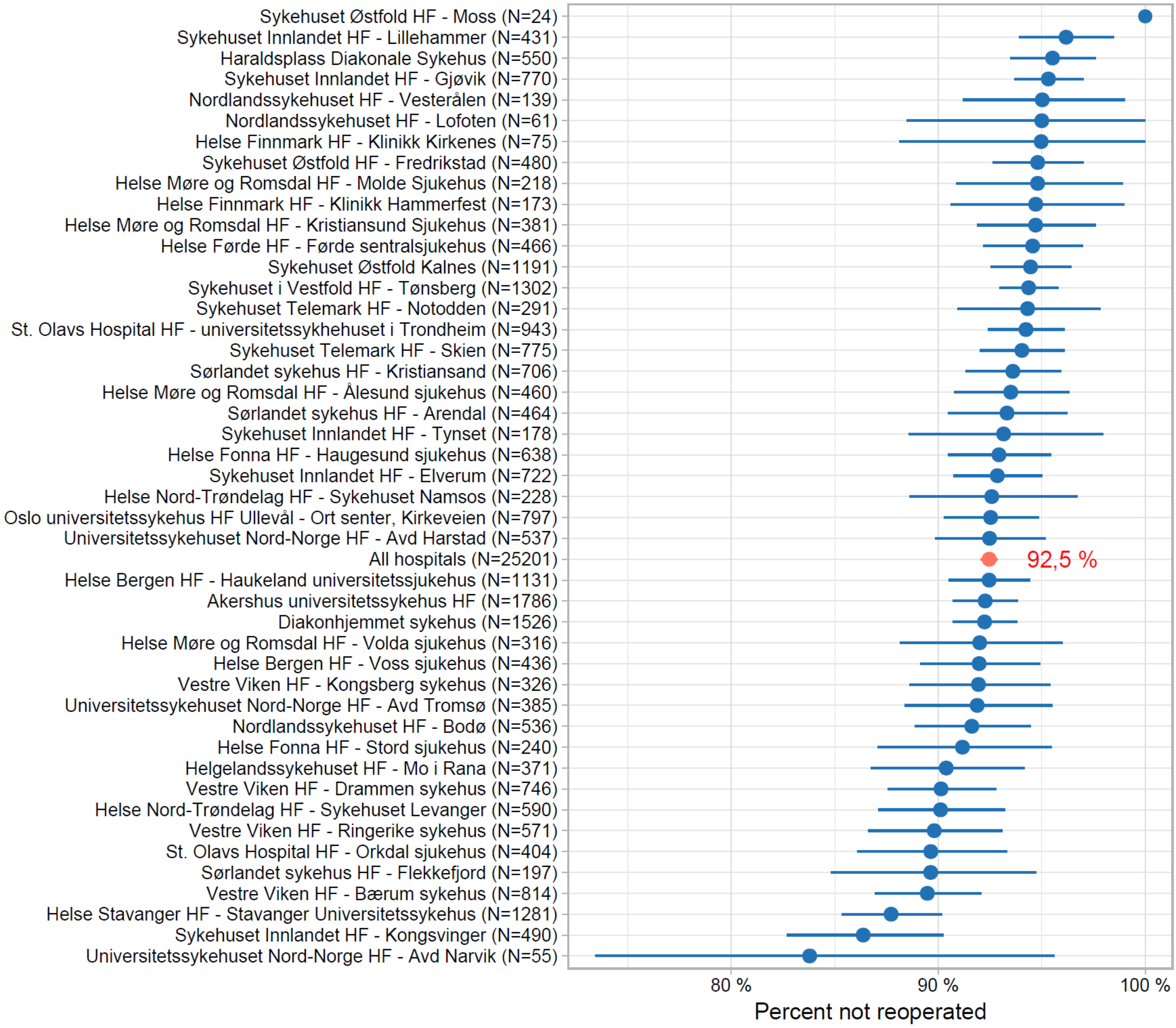
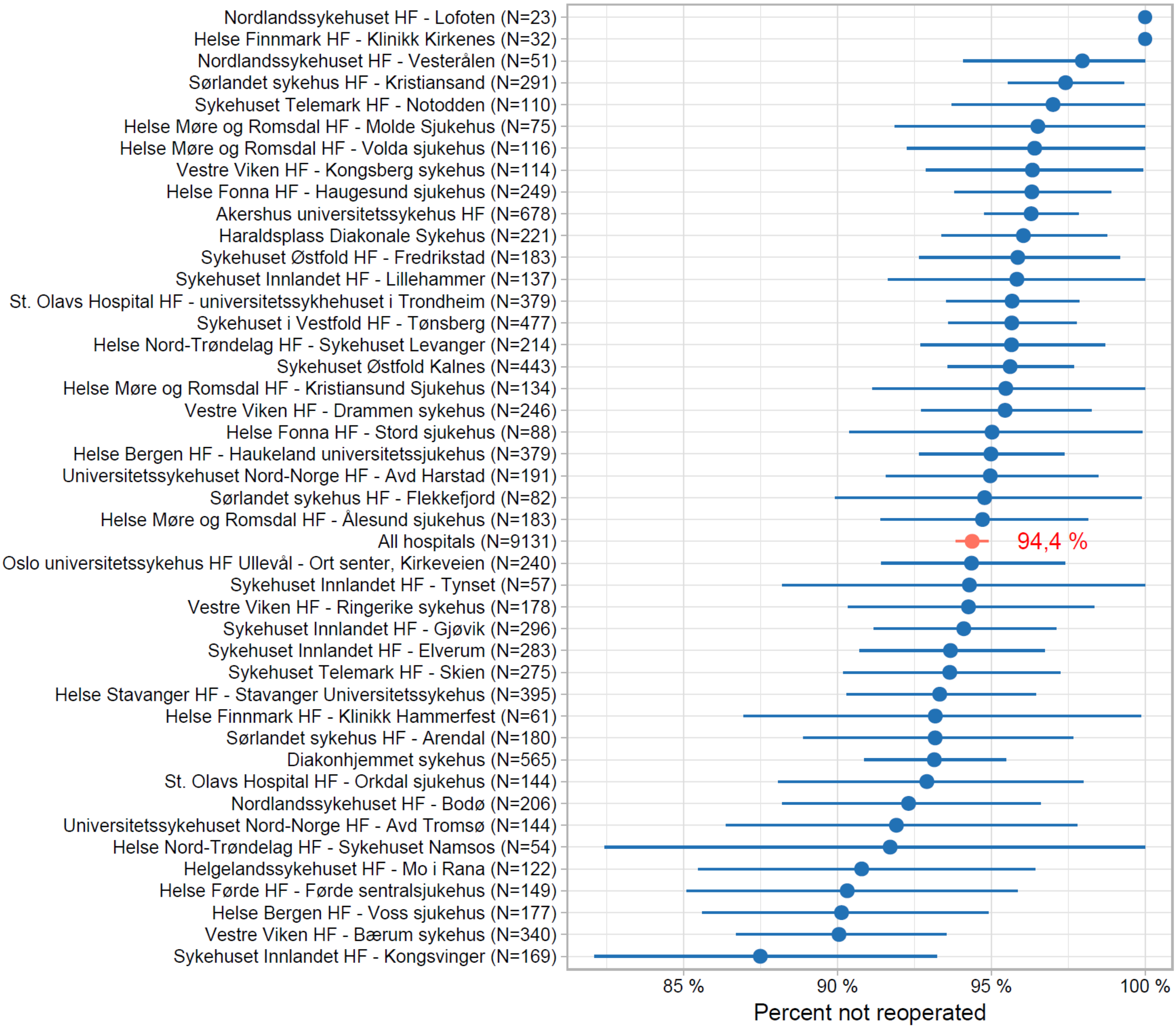


Figure 28: Reoperations after displaced femoral neck fractures in patients over 70 years of age, regardless of type of primary operation.

The figure shows the proportion of patients not reoperated at each hospital. Hospitals with n<10 have been exclueded.



Completeness analysis for the Norwegian Hip Fracture Register, 2015-2016

A completeness analysis has been conducted for the Norwegian Hip Fracture Register (NHFR) for primary operations (osteosynthesis, partial and total arthroplasty) and revisions (following primary osteosynthesis, partial and total arthroplasty for hip fractures) performed in the period 2015-16. A report and analysis have been prepared by the Norwegian Patient Register (NPR) in cooperation with the NHFR. A report on the implementation and results will be published at www.helsedirektoratet.no.

Formulae for completeness rates:

$$\textbf{Completeness rate NHFR} = \frac{\textbf{Only NHFR} + \textbf{Inclusion in both registers}}{\textbf{Only NPR} + \textbf{Only NHFR} + \textbf{Inclusion in both registers}}$$

$$\textbf{Completeness rate NPR} = \frac{\textbf{Only NPR} + \textbf{Inclusion in both registers}}{\textbf{Only NHFR} + \textbf{Only NPR} + \textbf{Inclusion in both registers}}$$

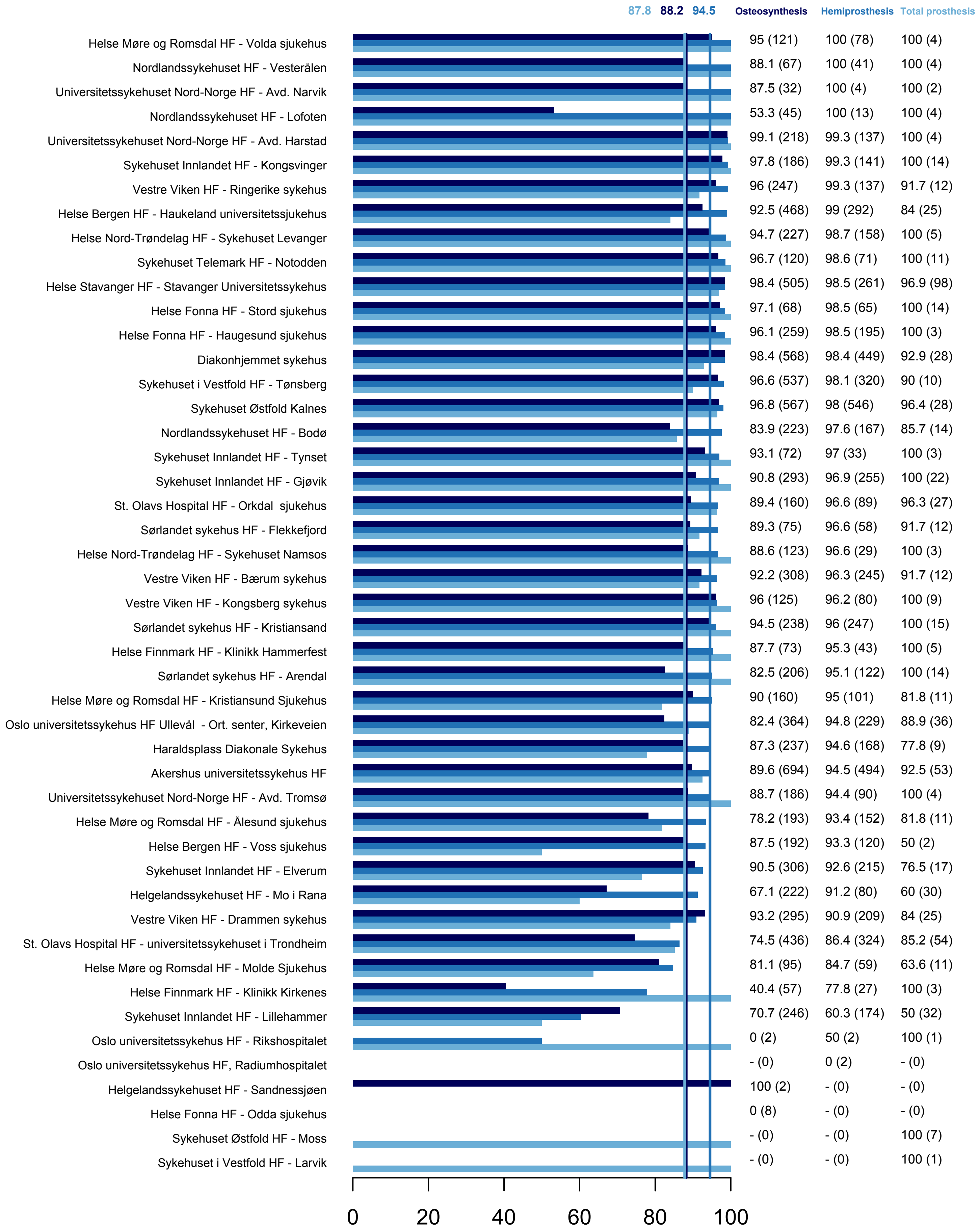
For details of the NSCP and ICD-10 codes used when extracting data from the NPR for comparison of primary and revision surgery in the NHFR and for the complete results, please consult the Completeness Analysis Report, which will be published at www.helsedirektoratet.no.

Primary hip fracture surgery. Information in the NHFR showed a high degree of agreement with the information in the NPR. Completeness for osteosynthesis was 88%, for hemiarthroplasty 95% and for total arthroplasty 88%. However, there are considerable variations in completeness between hospitals. Many of the hospitals have completeness under 80%, which we consider very low. One explanation for low completeness rates in NHFR may be patients not giving consent to registration of the data. The differences between rates for primary osteosynthesis, hemiarthroplasty and total arthroplasty show that this cannot be the only cause and that hospitals must improve their reporting of primary hip fracture surgery with the correct diagnostic and procedure codes. Completeness for primary total hip arthroplasty for fractures is lower than completeness for all total arthroplasties reported to the Norwegian Arthroplasty Register (NAR). We believe that part of the reason is coding practices and we are currently investigating this further.

Revisions. The information in the NHFR did not agree with NPR data as well as for primary surgery. Completeness for reoperations after osteosynthesis was 65%, after hemiarthroplasty 66%, and after total arthroplasty 90%. It has been particularly challenging to perform completeness analyses for reoperations. The fact that the NPR does not specify left or right side leads to some uncertainty in the analysis. Furthermore, coding of revisions reported to the NPR is often imprecise or incorrect. Low completeness may mean that the revision form was not sent to the NHFR or that the surgery was incorrectly coded in the NPR. We would like to point out that all revisions of partial and total arthroplasty due to infection (including those where prosthetic parts are not changed or removed) must be reported on a form to the NHFR or NRL. These must be given the codes **NFS 19, NFS 49 or NFW 69**.

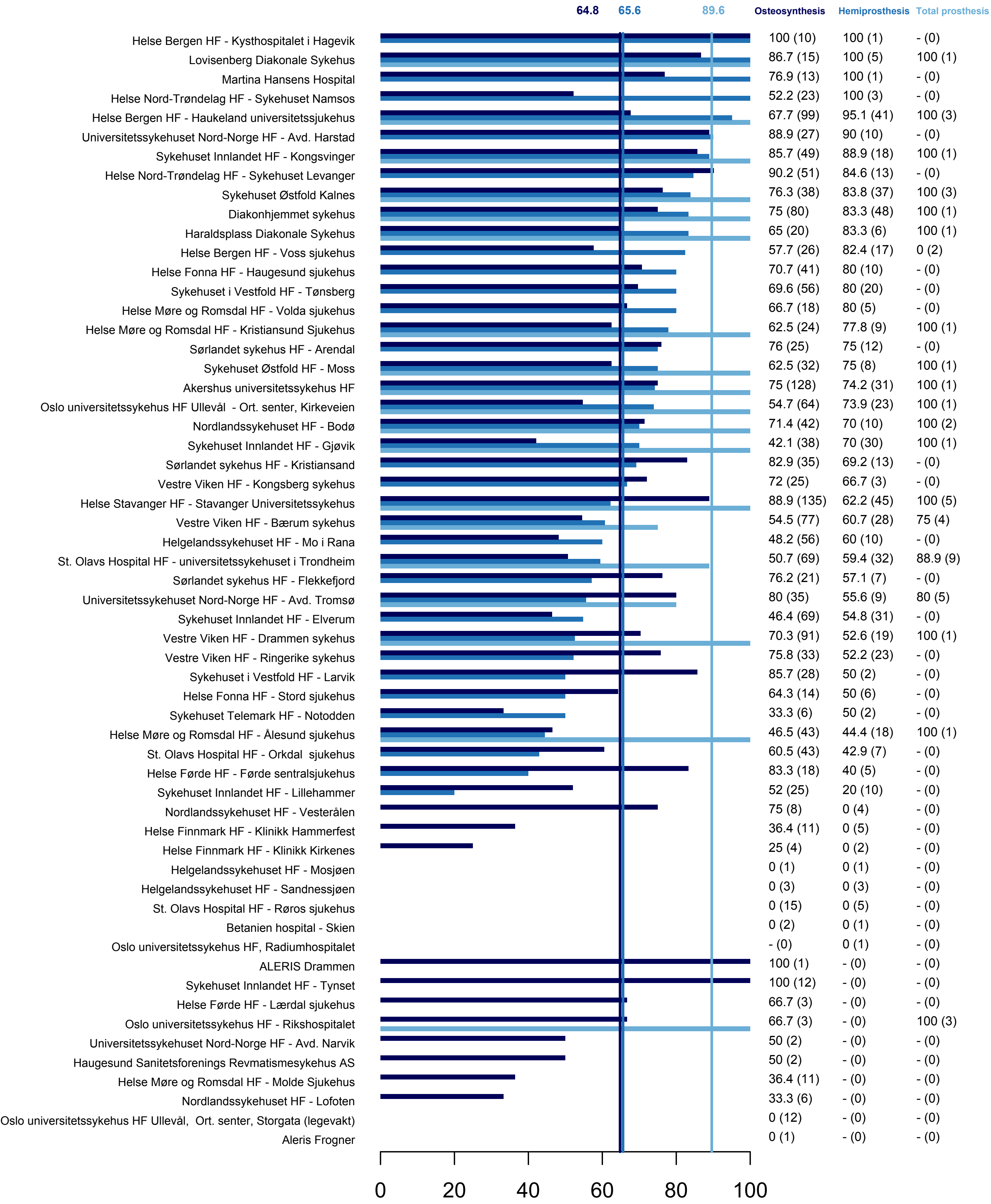
The following pages show the hospital-based completeness analysis for primary operations and reoperations. We urge hospitals with low completeness to review their coding practices and routines in reporting to the registers.

Completeness of reporting, primary hip fractures 2015-2016



Dark blue bars and first number to the right of the bars gives completensess of reporting for osteosynthesis. Medium blue bars and second number to the right of the bars gives completensess of reporting for hemiprosthesis. Light blue bars and third number to the right of the bars gives completensess of reporting for total prosthesis. The numbers in paranthesis gives the number of operations registered at both NHFR and NPR. Vertical lines shows the national averages.

Completeness of reporting, revision of hip fractures 2015-2016



Dark blue bars and first number to the right of the bars gives completensess of reporting for osteosynthesis. Medium blue bars and second number to the right of the bars gives completensess of reporting for hemiprosthesis. Light blue bars and third number to the right of the bars gives completensess of reporting for total prosthesis. The numbers in paranthesis gives the number of operations registered at both NHFR and NPR. Vertical lines shows the national averages.

CONTENTS

Norwegian Cruciate Ligament Register

NORWEGIAN CRUCIATE LIGAMENT REGISTER

2017 ANNUAL REPORT

The management and administration of the Cruciate Ligament Register are proud to present the 2017 report from the Register. This report contains many of the same tables and figures as previous reports. The advantage of this is that the report can act as a reference tool, allowing the reader to study particular details. Data from the Cruciate Ligament Register is also available in a report presented by SKDE (the Centre for Clinical Documentation and Evaluation) each autumn, which aims to simplify the information a little and make it easier to read for interested patients.

Work on the electronic ACL form is making good progress. In 2017, it was introduced at the Section for Orthopaedic Emergency of Ullevål Hospital and there are plans to start using it elsewhere in 2018. We have spent considerable time preparing a new version of the digital form, which also records some new variables. The content may be discussed, but the new version will now be introduced. We would especially like to thank Andreas Persson for his efforts on the technical aspects.

Please remember that it is obligatory to submit the ACL form to the Cruciate Ligament Register. Compliance was 84.4% in the years 2015-2016, which is acceptable, although the target is definitely higher. It is important to have good procedures at every hospital; the high-volume hospitals have traditionally been best at reporting. This year, all hospitals have received an email from us containing feedback on reporting and we hope this has increased awareness. In 2017, 1860 primary ACL reconstructions and 210 revisions were recorded. These figures are similar to those of last year (1857/203). We have previously commented on volume and we see that last year there were 14 hospitals with 1-5 ACL reconstructions per year. The Cruciate Ligament Register will maintain its focus on this area in the coming year.

Surgeons' graft choices are relatively unchanged; patellar tendon graft accounts for almost 60%. It is worth noting that direct suture is visible in the figures from 2016 and 2017. This took place in a limited period of time at Haukeland University Hospital in 33 patients whose treatment is now completed and who are now being monitored closely. Preliminary results were presented at the meeting of the Norwegian Orthopaedic Association in autumn 2017, and further use of this technique should take place as part of a study.

In primary ACL reconstructions with meniscus repair, it has become more common in recent years to suture the damaged meniscus (Figure 7). In 2011, just over 20% were sutured, but this has gradually increased to about 45% in 2017. We do not know whether this is because surgeons have changed their assessment of individual injuries.

The proportion of day surgeries is increasing and for primary operations the figure was 76.2% in 2017. Since hospitals now receive the same payment for both inpatients and outpatients, this figure may well increase in 2018.

Research is important and in 2017 good research was again produced.

Aga C et al. published a study in 2017 based on the three Nordic registries, showing that the technique of double-bundle ACL reconstruction does not reduce the risk of revision in comparison with the more usual single-bundle reconstruction.

Ulstein S et al., in a study from 2017, showed that patients with ACL reconstruction and simultaneous cartilage injury had equally good PROM results after 5-9 years as patients with isolated ACL reconstruction.

The Cruciate Ligament Register is intended to be of use to surgeons. Each hospital receives its own figures, and we will be happy to answer any questions you may have.

A special thank you to everyone who submits the forms.

Bergen, 6.6.2018

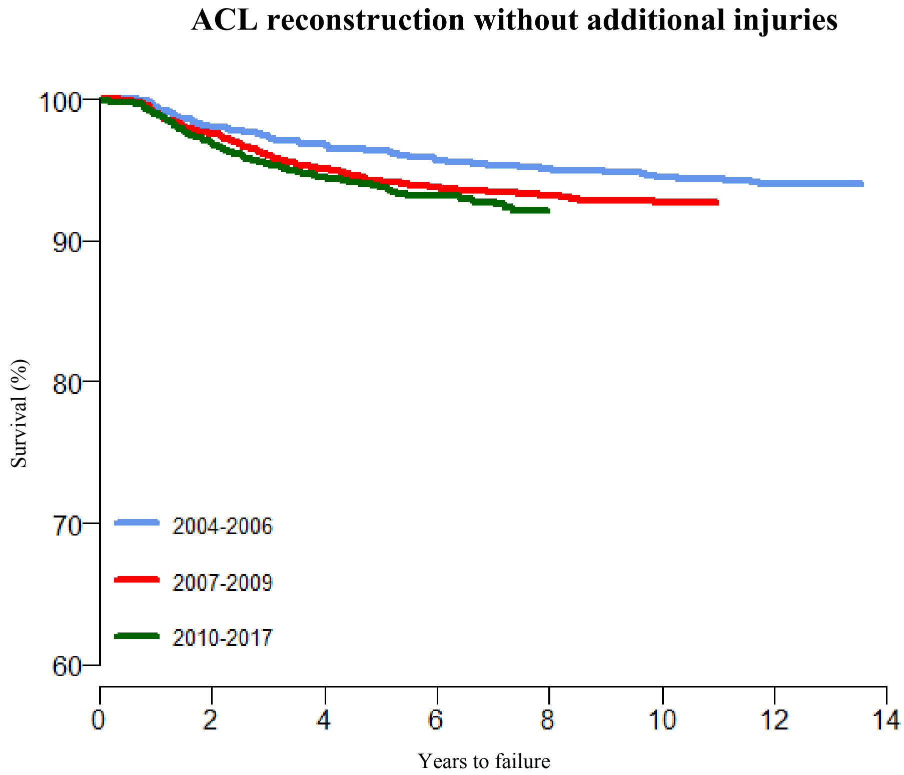
Lars Engebretsen
Chairman of the Steering Committee

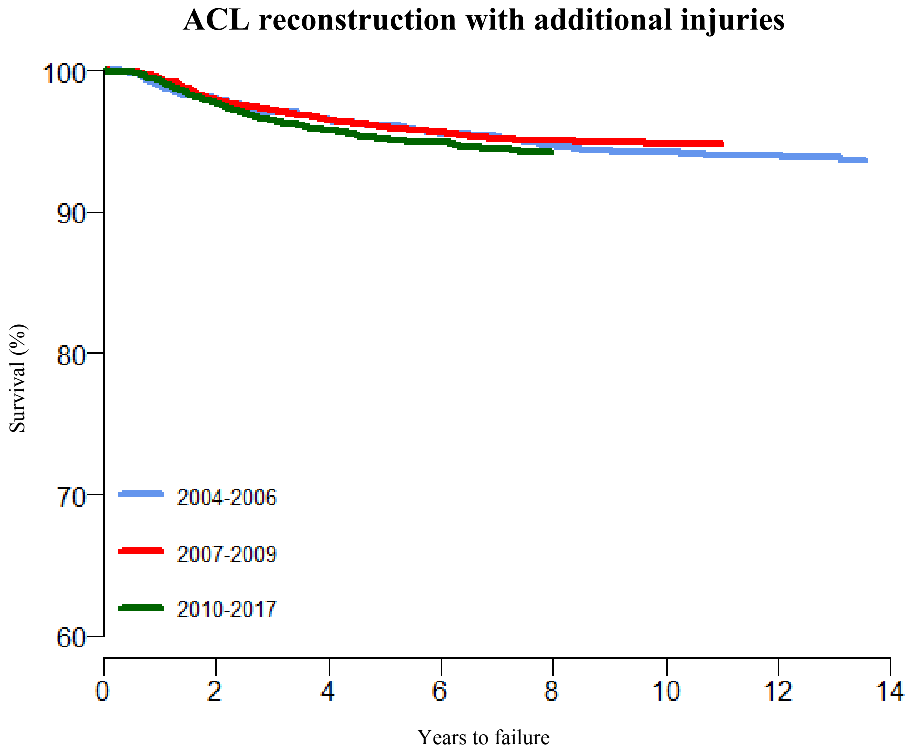
Håvard Visnes
Legespesialist

Irina Kvinnesland
IT Consultant

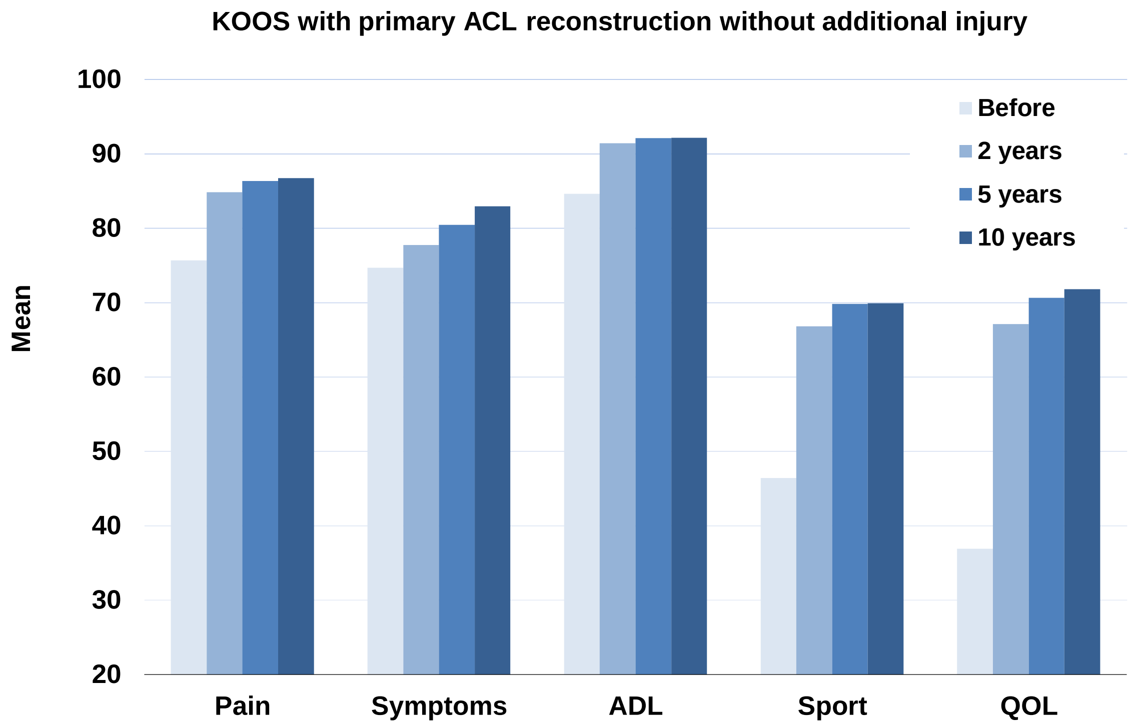
Stein Håkon Låstad Lygre
Biostatistician

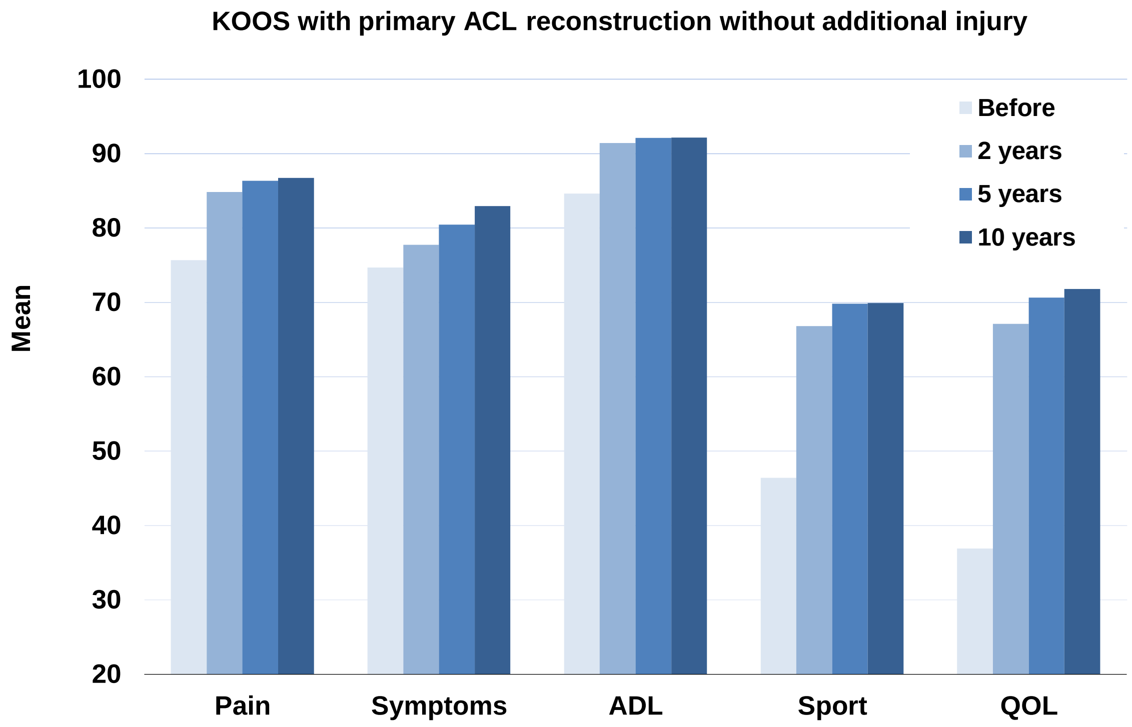
Survival of crucicate ligaments operations



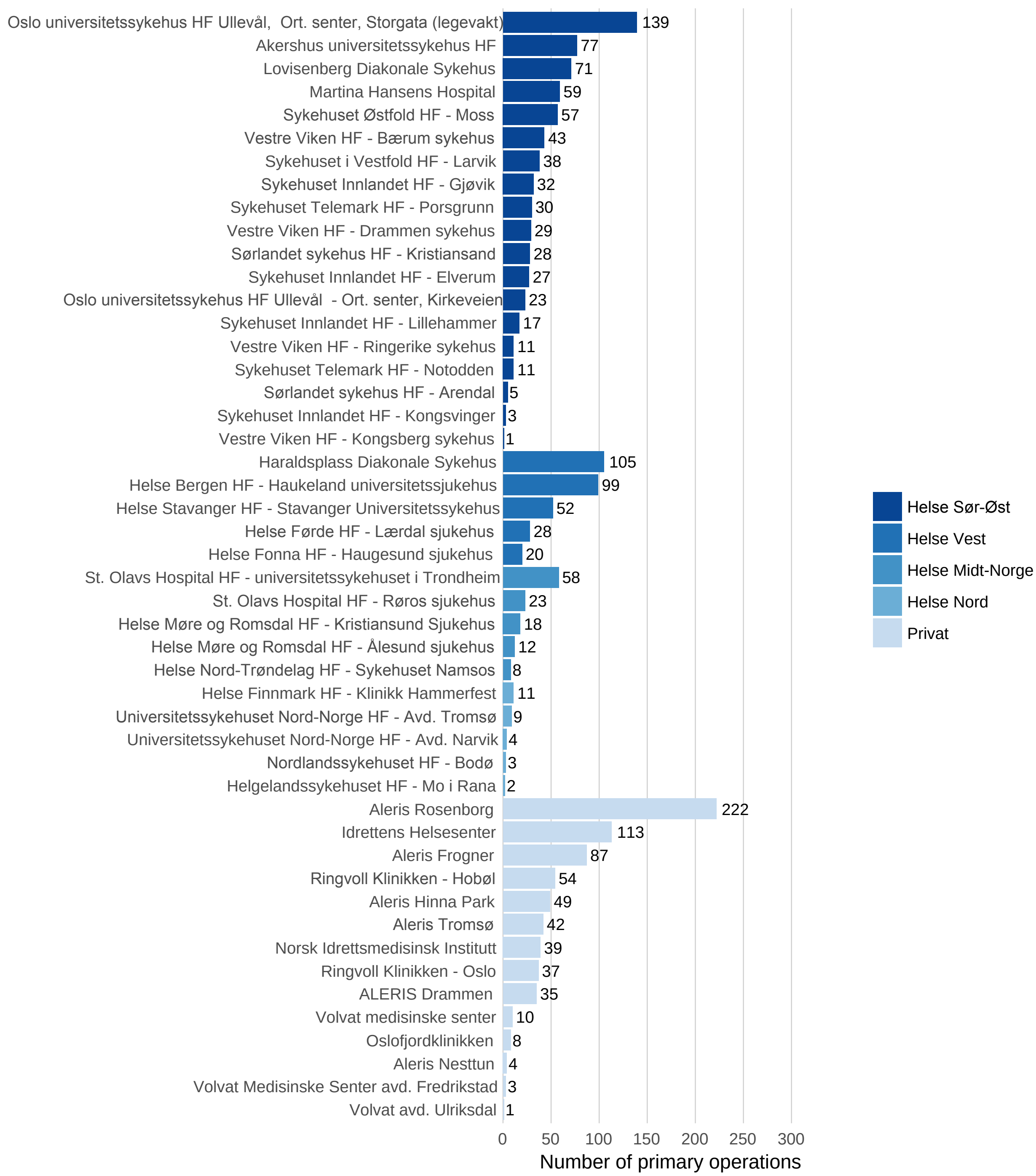


Survival estimate is given as long as >20 reconstructions remains at risk


KOOS with primary ACL reconstruction without additional injury
Mean
100
90
80
70
60
50
40
30
20
Before
2 years
5 years
10 years
Pain
Symptoms
ADL
Sport
QOL


KOOS with primary ACL reconstruction without additional injury
Mean
100
90
80
70
60
50
40
30
20
Before
2 years
5 years
10 years
Pain
Symptoms
ADL
Sport
QOL

Annual numbers of cruciate ligament primary operations in 2017



Cruciate Ligament

All categories of operations

Table 1: Annual numbers of operations

	Primary reconstruction		Revision reconstruction		Only other procedures		Total
2017	1860	(82,7%)	210	(9,3%)	178	(7,9%)	**2248**
2016	1857	(81,7%)	203	(8,9%)	212	(9,3%)	**2272**
2015	1772	(82,2%)	224	(10,4%)	161	(7,5%)	**2157**
2014	1737	(81,4%)	251	(11,8%)	147	(6,9%)	**2135**
2013	1773	(84,1%)	207	(9,8%)	129	(6,1%)	**2109**
2004-12	14338	(87,2%)	1192	(7,3%)	914	(5,6%)	**16444**
Total	**23337**	**(85,3%)**	**2287**	**(8,4%)**	**1741**	**(6,4%)**	**27365**

Registration complete from 2005. 49,3% of the operations were performed on the right side. 44,1% of the operations were performed on females. 7,4% of the patients had a previous ACL/PCL-injury in the opposite knee. (11,3% was missing). Mean age was 28,6 years, 27,2 years for women and 29,7 years for men. Standard deviation of age was 10,6 years, 11,2 years for women and 9,9 years for men.
Median value for duration of primary ACL reconstruction was 70 minutes.

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

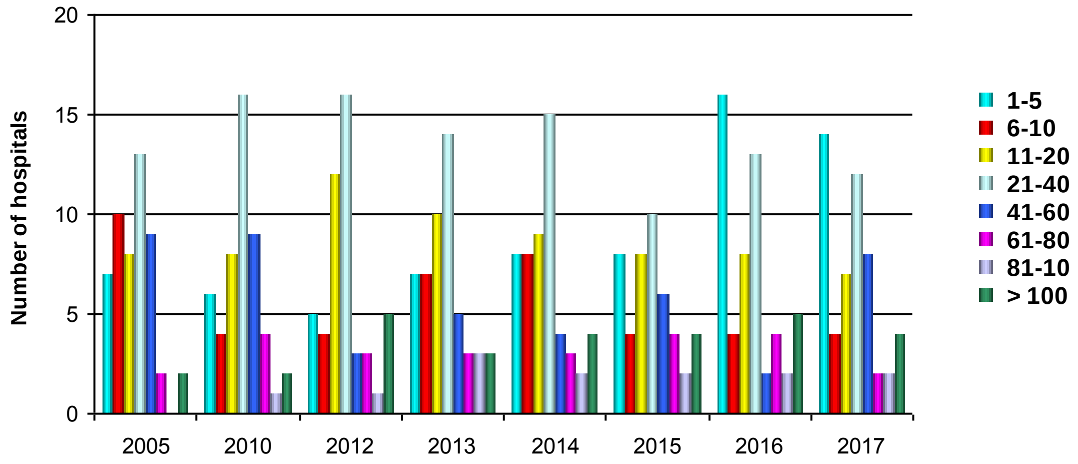


Figure 2: Distribution of hospitals by surgery volumes, revision reconstructions ACL

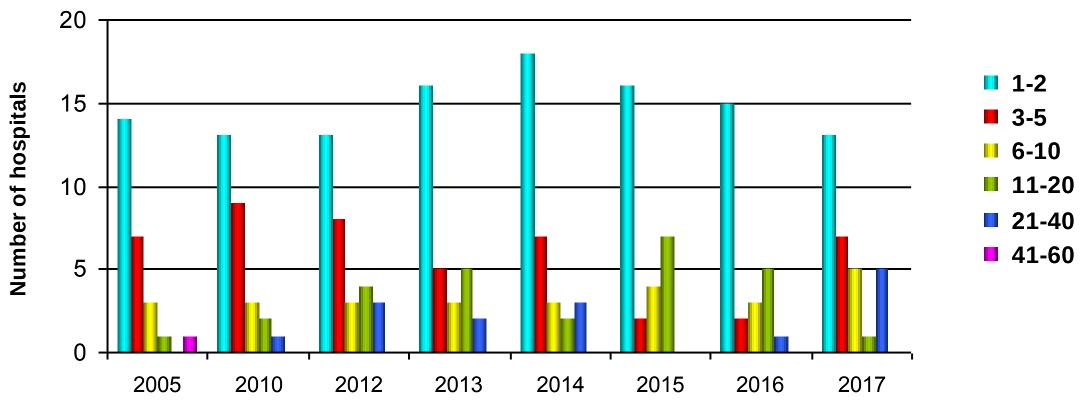
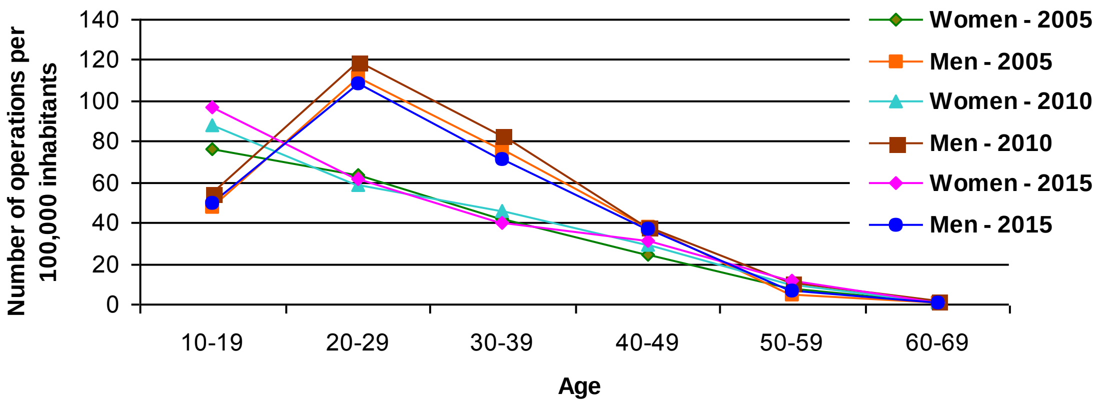


Figure 3: Incidence of primary reconstruction of cruciate ligament for 2005, 2010 and 2015



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
2017	1066	24	32	53	12	5	56	24	3	24	6	0
2016	1043	51	47	67	11	9	57	19	2	27	2	0
2015	1016	65	43	63	7	4	51	31	5	31	5	0
2014	944	80	86	60	8	12	46	43	1	28	1	0
2013	879	103	45	66	6	10	40	31	2	16	4	0
2004-12	6882	681	239	519	61	42	348	177	14	463	18	0
Total	**11830**	**1004**	**492**	**828**	**105**	**82**	**598**	**325**	**27**	**589**	**36**	**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)
9488	x					
420	x	x				
247		x				
174						x
148	x					x
86				x		
83	x		x			
82			x			
61	x			x		
29	x	x		x		
22					x	
21	x			x		x
21				x		x
16		x		x		
13		x				x
11	x	x				x
10	x		x			x

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

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)
555	x				
121			x		
78			x	x	
67				x	
51	x		x		
46		x			
32	x			x	
26	x		x	x	
26					x
26	x	x			
17	x				x
13			x		x
12	x		x		x
10		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 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
582	x							
187				x				
112							x	
62	x			x				
60		x						
59			x					
44						x		
40	x		x					
38				x	x			
25	x	x						
24							x	x
24			x	x				
19				x			x	
17	x		x	x				
17				x			x	x
16			x		x			
15					x			
14		x		x				
13			x	x	x			
12				x		x		
11	x						x	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.

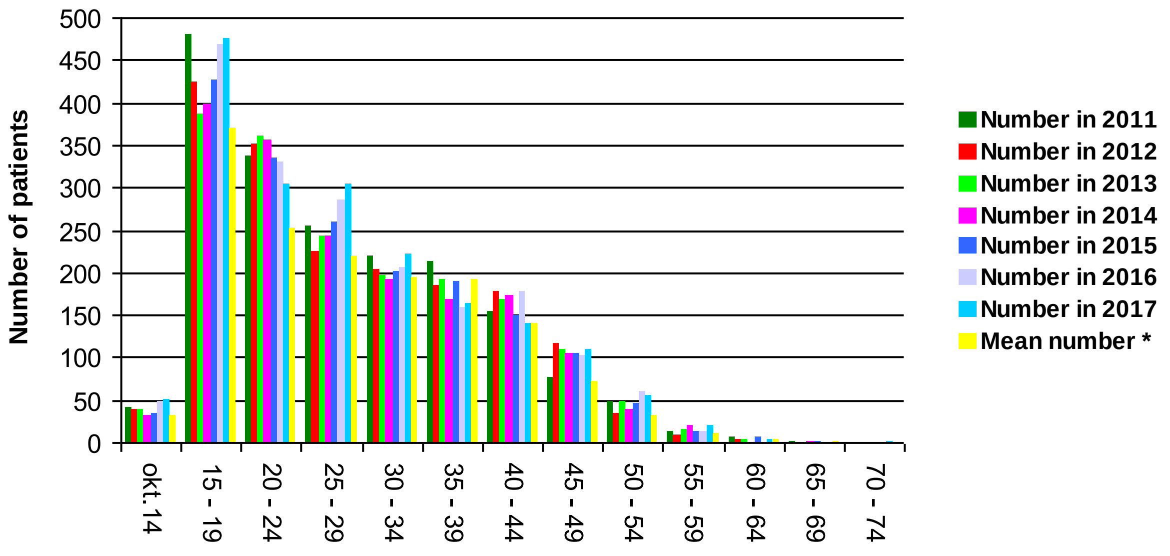
Intraoperative complications

Table 6: Intraoperative complications for all categories of surgeries

	Yes		No		Missing		Total
2017	64	(2,8%)	2136	(95,0%)	47	(2,1%)	**2248**
2016	51	(2,2%)	2155	(94,9%)	65	(2,9%)	**2272**
2015	62	(2,9%)	2035	(94,3%)	60	(2,8%)	**2157**
2014	59	(2,8%)	1994	(93,4%)	82	(3,8%)	**2135**
2013	60	(2,8%)	1965	(93,2%)	84	(4,0%)	**2109**
2004-12	511	(3,1%)	15622	(95,0%)	311	(1,9%)	**16444**
Total	**807**	**(2,9%)**	**25907**	**(94,7%)**	**649**	**(2,4%)**	**27365**

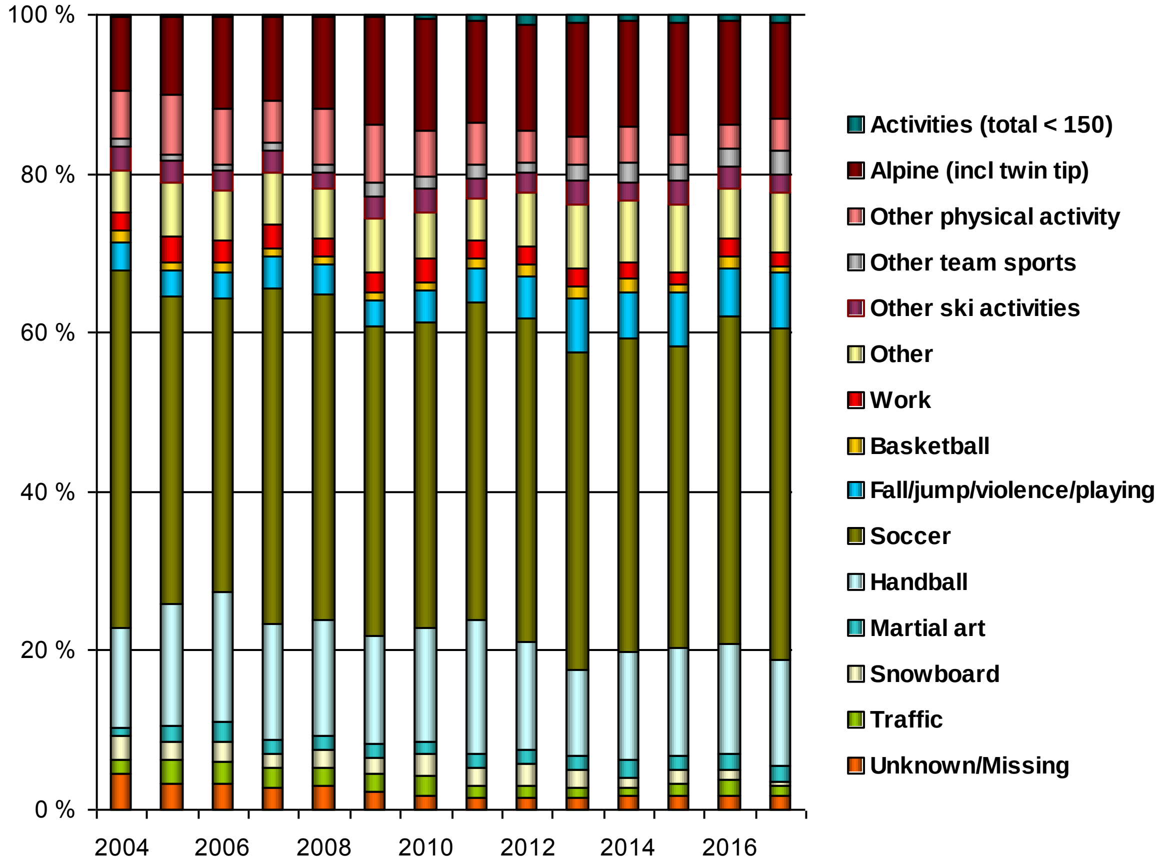
Primary reconstruction of cruciate ligament

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
2017	1845	33	179	38	17	440	1102
2016	1831	47	189	52	19	415	1059
2015	1745	56	167	39	23	354	995
2014	1712	58	171	35	20	367	931
2013	1755	38	169	54	23	379	868
2004-12	14198	372	950	211	158	3513	7062
Total	**23086**	**604**	**1825**	**429**	**260**	**5468**	**12017**

* 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
8366	x						
7774	x					x	
3155	x					x	x
1533	x						x
585	x		x				
469	x		x			x	
285	x		x			x	x
174	x		x				x
86	x			x			
80	x	x	x				
52	x			x	x		
43	x	x	x				x
29	x	x					
24	x				x		
22	x			x			x

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

Table 9: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
108		x					
80	x	x	x				
43	x	x	x				x
35		x					x
31	x	x	x			x	
29	x	x					
23	x	x	x			x	x
23		x	x				
21	x	x				x	
16	x	x		x	x		
16	x	x				x	x
14	x	x			x		
10	x	x		x	x	x	x
10		x	x				x

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

Choice of graft for injuries registered in primary reconstructions

Table 10: BPTB

	ACL	PCL	MCL	LCL	PLC
2017	1115	0	0	0	0
2016	1126	0	0	0	0
2015	974	1	0	0	0
2014	736	1	0	0	0
2013	572	2	0	0	0
2004-12	4063	23	1	0	0
Total	**8586**	**27**	**1**	**0**	**0**

Table 11: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2017	586	5	11	8	2
2016	591	23	23	15	5
2015	726	29	17	6	3
2014	951	20	19	7	4
2013	1166	21	14	8	7
2004-12	10039	234	118	14	12
Total	**14059**	**332**	**202**	**58**	**33**

Table 12: ALLOGRAFT

	ACL	PCL	MCL	LCL	PLC
2017	3	14	4	1	5
2016	4	20	7	4	6
2015	5	21	6	6	12
2014	4	20	3	8	10
2013	7	8	1	8	5
2004-12	28	34	8	41	50
Total	**51**	**117**	**29**	**68**	**88**

Table 13: Suture

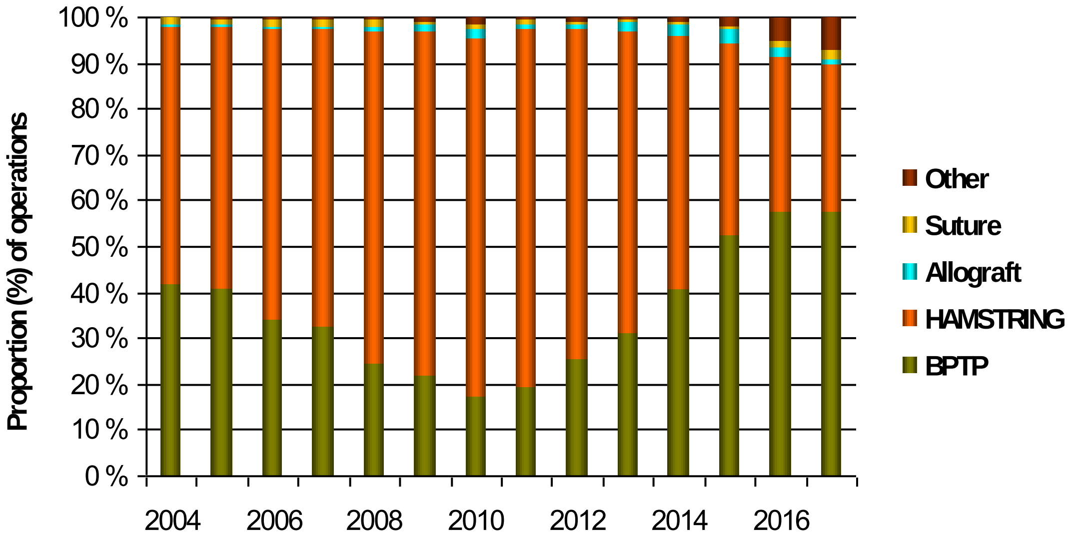
	ACL	PCL	MCL	LCL	PLC
2017	19	4	10	3	1
2016	10	1	6	4	4
2015	0	1	7	3	2
2014	1	1	4	2	1
2013	0	0	8	7	3
2004-12	3	7	74	50	43
Total	**33**	**14**	**109**	**69**	**54**

Table 14: Other

	ACL	PCL	MCL	LCL	PLC
2017	122	1	10	1	1
2016	99	0	4	0	1
2015	37	1	1	0	0
2014	17	5	0	0	0
2013	3	2	0	0	0
2004-12	55	28	7	8	5
Total	**333**	**37**	**22**	**9**	**7**

There are 21 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 for the last 5 years)

Product	Total	2004-12	2013	2014	2015	2016	2017
Endobutton CL Ultra	**6919**	3953	887	729	521	437	392
SoftSilk	**3019**	1358	168	281	369	428	415
EZLoc	**1753**	1698	13	16	10	5	11
EndoButton CL	**1591**	1546	8	7	14	5	11
Transfix II	**1094**	1027	17	5	8	11	26

Table 16: Tibia ACL (The 5 most common for the last 5 years)

Product	Total	2004-12	2013	2014	2015	2016	2017
RCI Screw	**4330**	3090	285	277	224	229	225
SoftSilk	**3515**	1351	235	343	503	576	507
Biosure HA Interferenc	**2111**	1064	288	234	207	178	140
WasherLoc Screw	**1858**	1808	15	17	10	7	1
WasherLoc Washers	**1822**	1769	15	18	12	6	2

Table 17: Femur PCL (The 5 most common for the last 5 years)

Product	Total	2004-12	2013	2014	2015	2016	2017
Endobutton CL Ultra	**211**	115	20	29	24	16	7
EndoButton CL	**111**	109		1		1	
SoftSilk	**75**	27	2	7	17	18	4
RCI Screw	**52**	19			14	15	4
Peek Interference Scre	**20**	4	6	5	4	1	

Table 18: Tibia PCL (The 5 most common for the last 5 years)

Product	Total	2004-12	2013	2014	2015	2016	2017
RCI Screw	**245**	188	9	9	20	17	2
AO Skrue	**79**	61	1	5	3	8	1
Biosure HA Interferenc	**30**	5	4	5	8	2	6
SoftSilk	**29**	18	2	3	1	4	1
BioRCI-HA	**27**	9	4	6	4	3	1

Table 19: Femur and tibia ACL (The 5 most common for the last 5 years)

Femur	Tibia	Total	2004-12	2013	2014	2015	2016	2017
SoftSilk	SoftSilk	**2614**	1231	148	248	297	359	331
Endobutton CL Ultra	RCI Screw	**2237**	1252	243	241	175	170	156
Endobutton CL Ultra	Biosure HA Interference screw	**1925**	984	273	214	160	162	132
EZLoc	WasherLoc Screw	**1428**	1386	11	16	9	5	1
EZLoc	WasherLoc Washers	**1419**	1374	12	16	10	5	2

Meniscal lesion

Table 20: Actual treatment of meniscal lesion

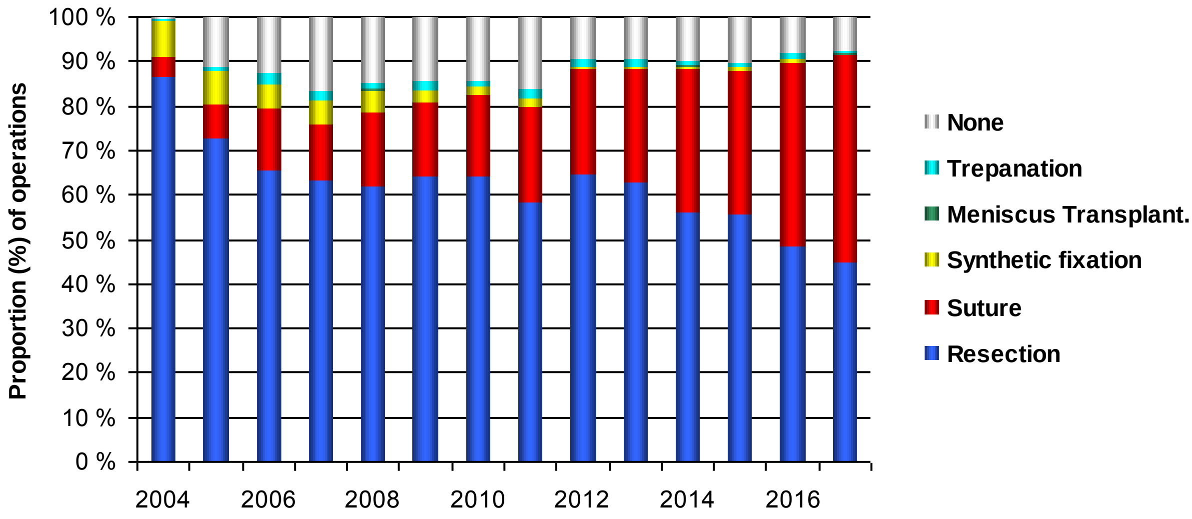
		Resection				Synthetic	Meniscus			
		OLD	Total	Partial	Suture	fixation	Transplant.	Trepanation	None	Total
2017	Lateral	0	2	307	249	1		4	49	**612**
2017	Medial	0	5	288	375	3	1	3	55	**730**
2016	Lateral	0	2	314	206	8	2	10	59	**601**
2016	Medial	0	9	318	335	6		8	45	**721**
2015	Lateral	0	3	342	144	3		7	68	**567**
2015	Medial	0	3	349	262	9		3	60	**686**
2014	Lateral	0	2	292	130	4	1	7	68	**504**
2014	Medial	0	7	324	232	4	1	4	42	**614**
2013	Lateral	0	2	294	99	2		11	49	**457**
2013	Medial	0	7	348	166	3		8	50	**582**
2004-12	Lateral	2040	3	472	445	66	2	78	565	**3671**
2004-12	Medial	2371	11	513	935	240	3	69	537	**4679**
Total		**4411**	**56**	**4161**	**3578**	**349**	**10**	**212**	**1647**	**14424**

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 -05	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Contour Meniscus arrow	**143**	47	24	38	25	8	1							
FAST-FIX	**17**						1	7	3		1		4	1
Meniscal Dart	**19**	3	8	6	2									
Meniscal Dart Stick	**24**	7	4	1	6	5		1						
Meniscus arrow	**31**	24	1			2	1	2		1				
Unknown	**62**	6	2	3	3	2		11	4	4	8	10	9	
Total	**296**	**87**	**39**	**48**	**36**	**17**	**3**	**21**	**7**	**5**	**9**	**10**	**13**	**1**

Table 22: Suture

Product	Total	2004 -05	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Other	**29**												6	23
BioComposite SwiveLock C w Fiber Tape	**9**													9
FAST-FIX	**2534**	28	45	61	99	118	127	192	208	203	280	319	406	448
Meniscal Dart Stick	**1**						1							
Meniscus arrow	**7**						3	4						
Rapidloc	**74**	19	19	24	8	2				2				
Unknown	**332**		2	1	1	3	3	48	40	43	49	54	65	23
Total	**2986**	**47**	**66**	**86**	**108**	**123**	**134**	**244**	**248**	**248**	**329**	**373**	**477**	**503**

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
2017	43,9%	36,1%	15,9%	2,5%	1,6%
2016	37,5%	44,2%	14,4%	3,1%	0,7%
2015	31,4%	43,5%	19,1%	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%
2004-12	37,0%	41,6%	15,6%	4,4%	1,4%

Table 24: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2017	7,0%	1,1%	81,5%	0,5%	9,9%
2016	9,3%	2,0%	76,8%		11,9%
2015	12,3%	3,6%	80,1%		3,9%
2014	13,3%	3,8%	77,7%	0,9%	4,2%
2013	19,7%	3,9%	73,1%	0,2%	3,2%
2004-12	11,1%	3,1%	59,9%	1,3%	24,6%

Cartilage injuries registered in primary reconstructions

Figure 8: All Cartilage injuries (total)

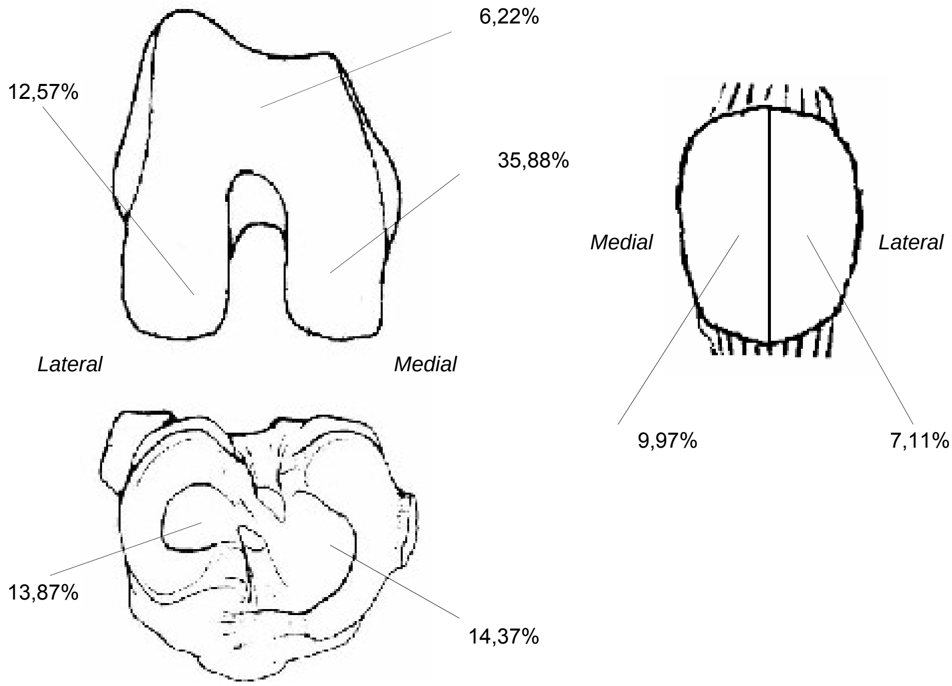
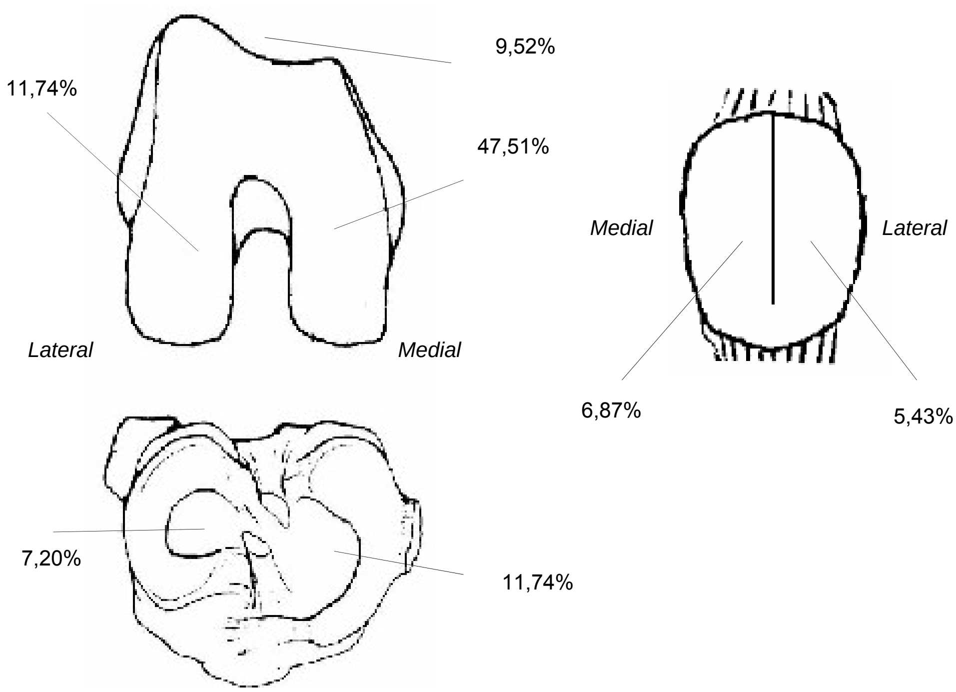


Figure 9: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 25: Outpatient surgery

	Yes		No		Missing		Total
2017	1422	(76,5%)	434	(23,3%)	4	(0,2%)	**1860**
2016	1326	(71,4%)	521	(28,1%)	10	(0,5%)	**1857**
2015	1244	(70,2%)	515	(29,1%)	13	(0,7%)	**1772**
2014	1166	(67,1%)	555	(32,0%)	16	(0,9%)	**1737**
2013	1144	(64,5%)	616	(34,7%)	13	(0,7%)	**1773**
2004-12	7005	(48,9%)	7271	(50,7%)	62	(0,4%)	**14338**
Total	**13307**	**(57,0%)**	**9912**	**(42,5%)**	**118**	**(0,5%)**	**23337**

Intraoperative complications

Table 26: Intraoperative complications

	Yes		No		Missing		Total
2017	50	(2,7%)	1773	(95,3%)	36	(1,9%)	**1860**
2016	43	(2,3%)	1762	(94,9%)	52	(2,8%)	**1857**
2015	54	(3,0%)	1673	(94,4%)	45	(2,5%)	**1772**
2014	55	(3,2%)	1621	(93,3%)	61	(3,5%)	**1737**
2013	53	(3,0%)	1657	(93,5%)	63	(3,6%)	**1773**
2004-12	462	(3,2%)	13621	(95,0%)	255	(1,8%)	**14338**
Total	**717**	**(3,1%)**	**22107**	**(94,7%)**	**512**	**(2,2%)**	**23337**

Systemic antibiotic prophylaxis

Table 27: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2017	1855	(99,7%)	2	(0,1%)	3	(0,2%)	**1860**
2016	1855	(99,9%)	0	(0,0%)	2	(0,1%)	**1857**
2015	1767	(99,7%)	1	(0,1%)	4	(0,2%)	**1772**
2014	1734	(99,8%)	1	(0,1%)	2	(0,1%)	**1737**
2013	1762	(99,4%)	2	(0,1%)	9	(0,5%)	**1773**
2004-12	14205	(99,1%)	98	(0,7%)	35	(0,2%)	**14338**
Total	**23178**	**(99,3%)**	**104**	**(0,4%)**	**55**	**(0,2%)**	**23337**

Table 28: Drug

	2004-12	2013	2014	2015	2016	2017
Benzylpenicillin (Penicillin G)		0,11%	0,06%			0,05%
Cefaleksin (Keflex, Cefalexin)	0,02%					
Cefalotin (Keflin)	90,31%	92,91%	92,45%	94,91%	97,04%	93,64%
Cefazolin (Cephazolin)						3,07%
Cefotaksim (Claforan)			0,17%			
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	1,87%	0,45%	0,23%		0,05%	
Ciprofloksasin (Ciproxin)	0,01%		0,06%			
Dikloksacillin (Diclocil, Dicillin)	3,70%	0,91%	0,75%	0,06%	0,16%	0,16%
Doksysyklin (Vibramycin, Dumoxin, Doxylin)	0,01%					
Erytromycin (Ery-max, Abboticin)	0,01%		0,06%			
Gentamicin (Garamycin, Gensumycin)	0,01%				0,16%	0,16%
Klindamycin (Dalacin, Clindamycin)	2,58%	2,16%	2,08%	1,30%	1,99%	2,48%
Kloksacillin (Ekvacillin)	1,37%	2,67%	3,23%	3,11%	0,32%	0,22%
Linkomycin (Lincocin)	0,01%					
Oxacillin (Unspecified)		0,17%	0,17%			
Tobramycin (Nebcina, Nebcin, Tobi)		0,11%				
Missing	0,11%	0,51%	0,75%	0,62%	0,27%	0,22%

Thrombosis prophylaxis

Table 29: Thrombosis prophylaxis

	Yes		No		Missing		Total
2017	1459	(78,4%)	398	(21,4%)	3	(0,2%)	**1860**
2016	1522	(82,0%)	327	(17,6%)	8	(0,4%)	**1857**
2015	1528	(86,2%)	240	(13,5%)	4	(0,2%)	**1772**
2014	1427	(82,2%)	301	(17,3%)	9	(0,5%)	**1737**
2013	1489	(84,0%)	270	(15,2%)	14	(0,8%)	**1773**
2005-12	10907	(80,6%)	2438	(18,0%)	224	(1,7%)	**13569**
Total	**18332**	**(81,2%)**	**3974**	**(17,6%)**	**262**	**(1,2%)**	**22568**

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

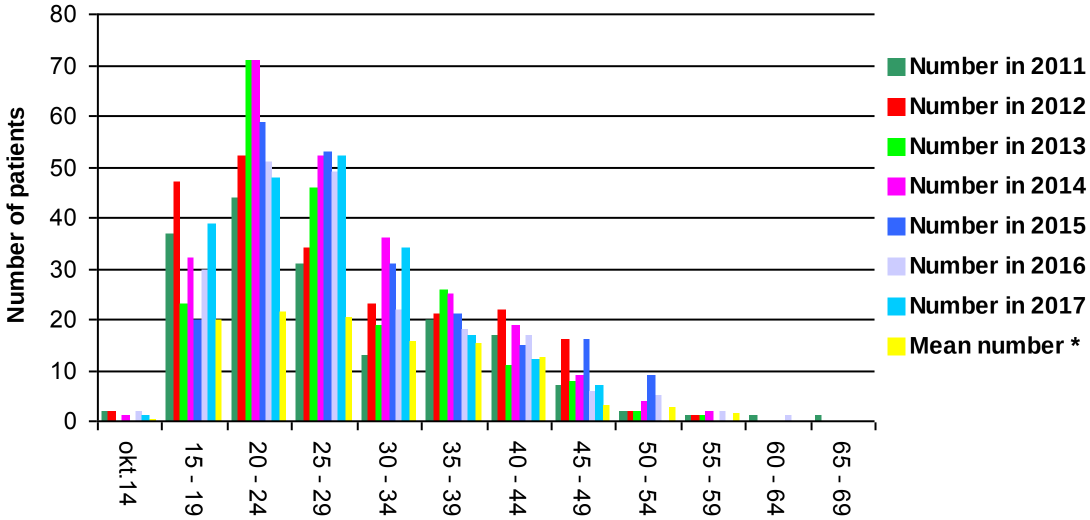
	One drug		Two drugs		Total
2017	1451	(99,5%)	8	(0,5%)	**1459**
2016	1504	(98,8%)	18	(1,2%)	**1522**
2015	1519	(99,4%)	9	(0,6%)	**1528**
2014	1415	(99,2%)	12	(0,8%)	**1427**
2013	1468	(98,6%)	21	(1,4%)	**1489**
2005-12	10849	(99,5%)	58	(0,5%)	**10907**
Total	**18206**	**(99,3%)**	**126**	**(0,7%)**	**18332**

Table 31: Drug

	2004-12	2013	2014	2015	2016	2017
Acetylsalicylsyre (Albyl-E, Globoid, Acetyratio, Magnyl E)			0,07%		0,07%	
Dabigatranetixalat (Re-Novate, Pradaxa)	0,02%					
Dalteparin (Fragmin)	61,12%	64,88%	56,20%	58,64%	60,78%	59,22%
Dekstran (Macrodex, Dextran)	0,04%	0,27%	0,35%	0,20%	0,07%	0,07%
Enoksaparin (Klexane)	34,56%	32,03%	41,98%	39,92%	37,25%	39,48%
Heparin (Heparin)	0,01%					
Rivaroksaban (Xarelto)	0,03%	0,27%		0,07%	0,07%	0,07%
Warfarin (Marevan)	0,01%		0,14%		0,20%	0,07%
Ximelagatran (Exanta, Malagatran)	0,28%					
Missing		0,07%				
No drugs	3,25%	0,74%				
Missing	0,17%	0,34%	0,42%	0,59%	0,39%	0,55%
Two drugs	0,53%	1,41%	0,84%	0,59%	1,18%	0,55%

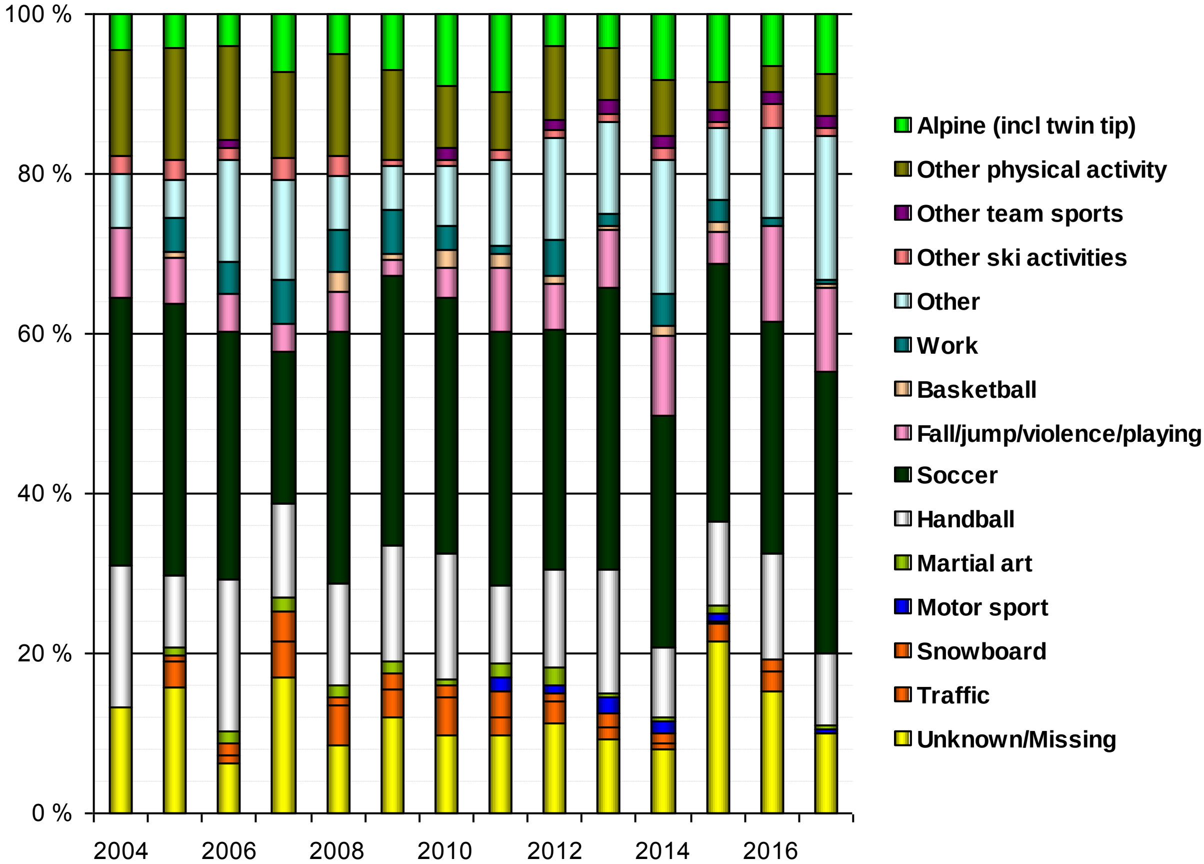
Revision reconstruction

Figure 10: Age by primary operation



* Mean number of primary operations for 2004 - 2010

Figure 11: Activity that lead to injury



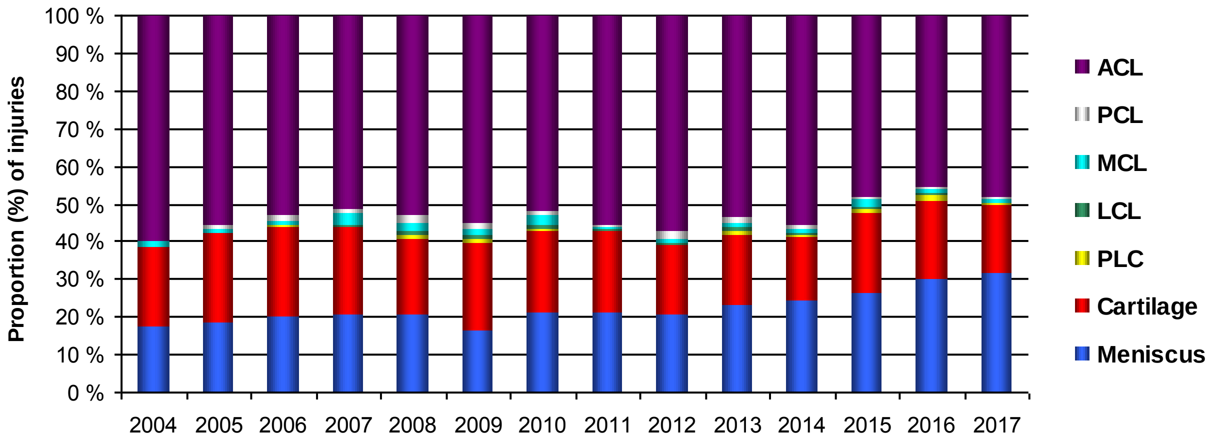
Actual injury

Table 32: Actual injury*

	ACL	PCL	MCL	LCL	PLC	Cartilage	Meniscus
2017	200	1	5	1	1	76	131
2016	155	2	3	3	4	71	103
2015	165	2	7	2	3	73	91
2014	195	3	4	2	1	59	86
2013	184	6	4	3	5	63	81
2004-12	1120	26	33	11	9	449	409
Total	**2019**	**40**	**56**	**22**	**23**	**791**	**901**

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

Figure 12: Actual injury



Additional injuries

Table 33: ACL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
837	x						
432	x					x	
362	x					x	x
308	x						x
17	x		x				
8	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 34: PCL with additional injuries

Number	ACL	PCL	MCL	LCL	PLC	Meniscus	Cartilage
11		x					
7		x					x
4	x	x	x				x
3	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 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 35: Reason for revision reconstruction

	Cause 1	Cause 2	Cause 3	Cause 4	Cause 5	Cause 6	Other	Total
2017	3	7	1	102	94	8		207
2016	4	9	5	110	78	4	1	207
2015	6	12	3	116	81	1	1	219
2014	3	4	1	109	120	6		237
2013	1	11	1	123	74	5		210
2004-12	17	42	10	333	346	9	33	781
Total	**34**	**85**	**21**	**893**	**793**	**33**	**35**	**1894**

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 36: BPTB

	ACL	PCL	MCL	LCL	PLC
2017	103	0	0	0	0
2016	87	0	0	0	0
2015	92	0	0	0	0
2014	120	0	0	0	0
2013	91	0	0	0	0
2004-12	453	2	0	0	0
Total	**946**	**2**	**0**	**0**	**0**

Table 37: HAMSTRING

	ACL	PCL	MCL	LCL	PLC
2017	39	1	1	0	1
2016	38	1	0	1	1
2015	50	0	0	1	1
2014	50	1	1	0	0
2013	50	1	1	0	0
2004-12	550	4	14	2	0
Total	**777**	**8**	**17**	**4**	**1**

Table 38: ALLOGRAFT

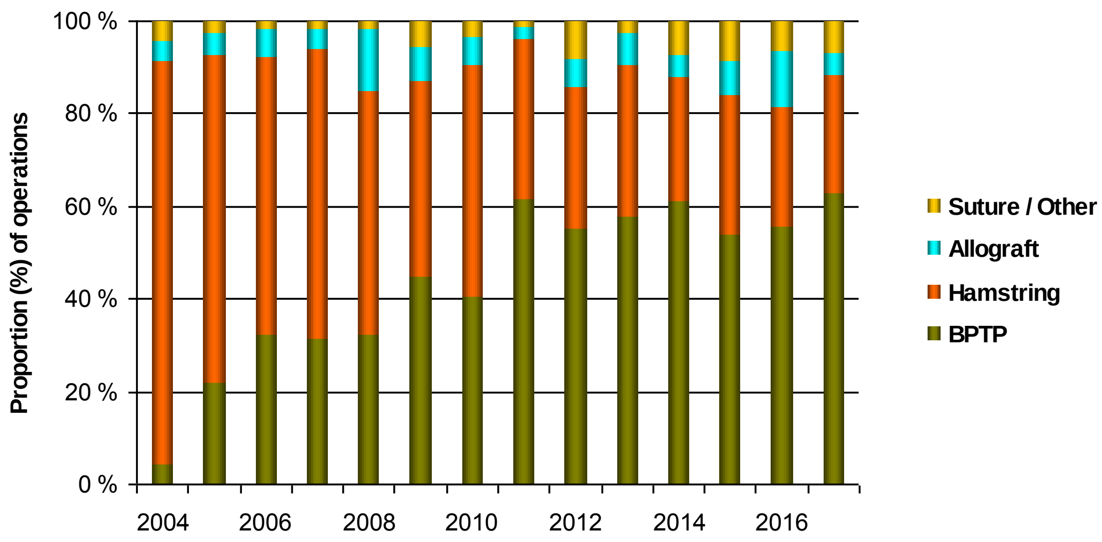
	ACL	PCL	MCL	LCL	PLC
2017	6	0	2	0	0
2016	12	1	1	2	3
2015	7	2	3	0	0
2014	7	1	0	1	1
2013	4	3	1	1	2
2004-12	35	16	5	6	8
Total	**71**	**23**	**12**	**10**	**14**

Table 39: Suture / Other

	ACL	PCL	MCL	LCL	PLC
2017	11	0	0	0	0
2016	10	0	0	0	0
2015	15	0	0	0	0
2014	13	0	0	1	0
2013	3	0	0	0	1
2004-12	34	4	3	0	0
Total	**86**	**4**	**3**	**1**	**1**

There were 1 forms where it was registered product for ACL but not checked for choice of graft. It was registered direct suture for two cases (PLC, MCL).

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



Fixation

Table 40: Femur ACL (The 5 most common for the last 5 years)

Product	Total	2004-12	2013	2014	2015	2016	2017
SoftSilk	**475**	229	44	61	44	48	49
Endobutton CL Ultra	**408**	188	48	50	49	36	37
Endobutton CL BTB	**92**	11	9	30	17	15	10
Sheated Cannulated Interference Screw	**75**	1	13	10	13	16	22
Peek Interference Screw	**28**	3	5	4	8	1	7

Table 41: Femur PCL (The 5 most common for the last 5 years)

Product	Total	2004-12	2013	2014	2015	2016	2017
Endobutton CL Ultra	**12**	7	3	2			
RCI Screw	**12**	11				1	
SoftSilk	**7**	2	1		1	2	1
EndoButton CL	**2**	2					
Propel Cannulated	**2**	2					

Table 42: Tibia ACL (The 5 most common for the last 5 years)

Product	Total	2004-12	2013	2014	2015	2016	2017
SoftSilk	**438**	199	44	59	39	48	49
RCI Screw	**339**	257	18	22	11	15	16
Biosure HA Interference screw	**209**	68	31	29	40	24	17
WasherLoc Screw	**115**	109	2	2	1		1
WasherLoc Washers	**113**	107	2	2	1		1

Table 43: Tibia PCL (The 5 most common for the last 5 years)

Product	Total	2004-12	2013	2014	2015	2016	2017
RCI Screw	**25**	16	4	1	1	2	1
AO Skrue	**7**	4	1			2	
Propel Cannulated	**3**	3					
Intrafix Screw	**1**			1			
Intrafix hylse	**1**			1			

Table 44: Femur and tibia ACL (The 5 most common for the last 5 years)

Femur	Tibia	Total	2004-12	2013	2014	2015	2016	2017
SoftSilk	SoftSilk	**394**	188	36	52	33	43	42
Endobutton CL Ultra	Biosure HA Interference screw	**151**	35	27	23	31	21	14
Endobutton CL Ultra	RCI Screw	**128**	82	10	12	8	7	9
EndoButton CL	RCI Screw	**106**	105				1	
EZLoc	WasherLoc Washers	**82**	76	2	2	1		1
EZLoc	WasherLoc Screw	**82**	76	2	2	1		1

Meniscal lesion

Table 45: Actual treatment of meniscal lesion

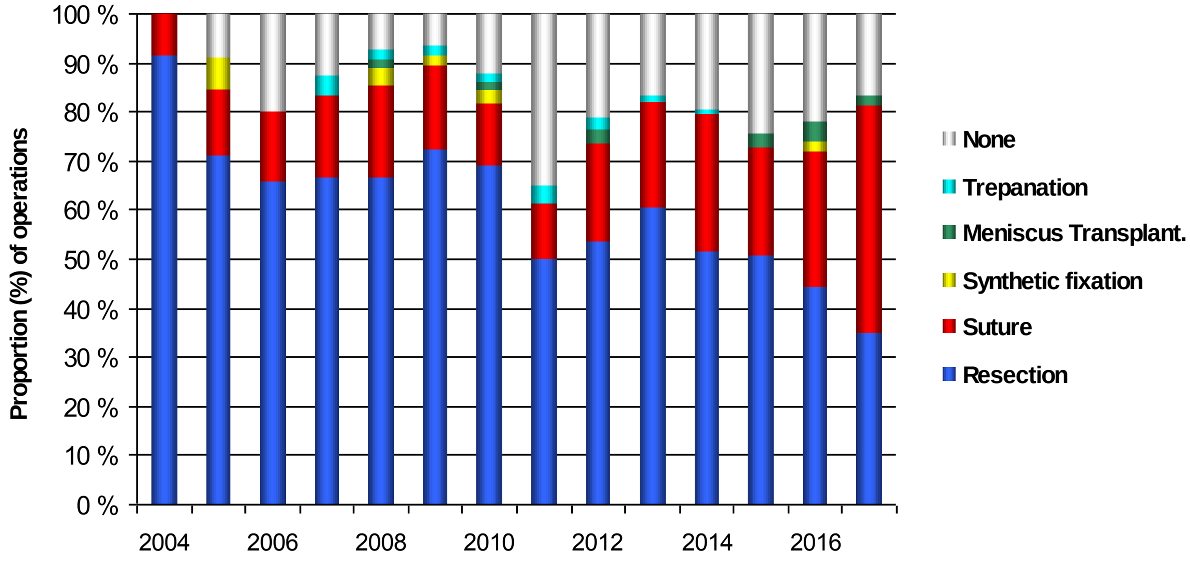
		Resection				Synthetic	Meniscus			
		OLD	Total	Partial	Suture	fixation	Transplant.	Trepanation	None	Total
2017	Lateral		1	22	29				9	**61**
2017	Medial			29	40		3		16	**88**
2016	Lateral			20	22	1	1		11	**55**
2016	Medial		2	36	14	2	4		18	**76**
2015	Lateral			19	8				16	**43**
2015	Medial			39	17		3		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**
2004-12	Lateral	85	1	21	21	4	2	6	40	**180**
2004-12	Medial	149	4	46	52	4	2	4	40	**301**
Total		**234**	**8**	**346**	**254**	**11**	**15**	**12**	**199**	**1079**

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 32: 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 46: Synthetic

Product	Total	2004-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Contour Meniscus arrow	**3**	2			1									
Meniscus arrow	**1**	1												
Unknown	**4**					1							3	
Total	**8**	**3**			**1**	**1**							**3**	

Table 47: Suture

Product	Total	2004-05	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ANNET	**29**												6	23
BioComposite SwiveLock C w Fiber Tape	**9**													9
FAST-FIX	**2534**	28	45	61	99	118	127	192	208	203	280	319	406	448
Meniscal Dart Stick	**1**						1							
Meniscus arrow	**7**						3	4						
Rapidloc	**74**	19	19	24	8	2				2				
Unknown	**332**		2	1	1	3	3	48	40	43	49	54	65	23
Total	**2986**	**47**	**66**	**86**	**108**	**123**	**134**	**244**	**248**	**248**	**329**	**373**	**477**	**503**

Cartilage lesion all localizations

Table 48: 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
2017	44,3%	35,7%	11,9%	4,3%	3,8%
2016	33,3%	40,4%	18,2%	7,6%	0,5%
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%
2004-12	20,4%	51,4%	22,2%	4,7%	1,3%

Table 49: Treatment codes for all localizations

	Debridement	Micro fracture	No treatment	Other	Missing
2017	8,1%	1,1%	79,5%		11,4%
2016	8,6%	2,0%	85,9%		3,5%
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%
2004-12	7,2%	2,3%	68,5%	1,3%	20,7%

Cartilage injuries registered in revision reconstructions

Figure 15: All Cartilage injuries (total)

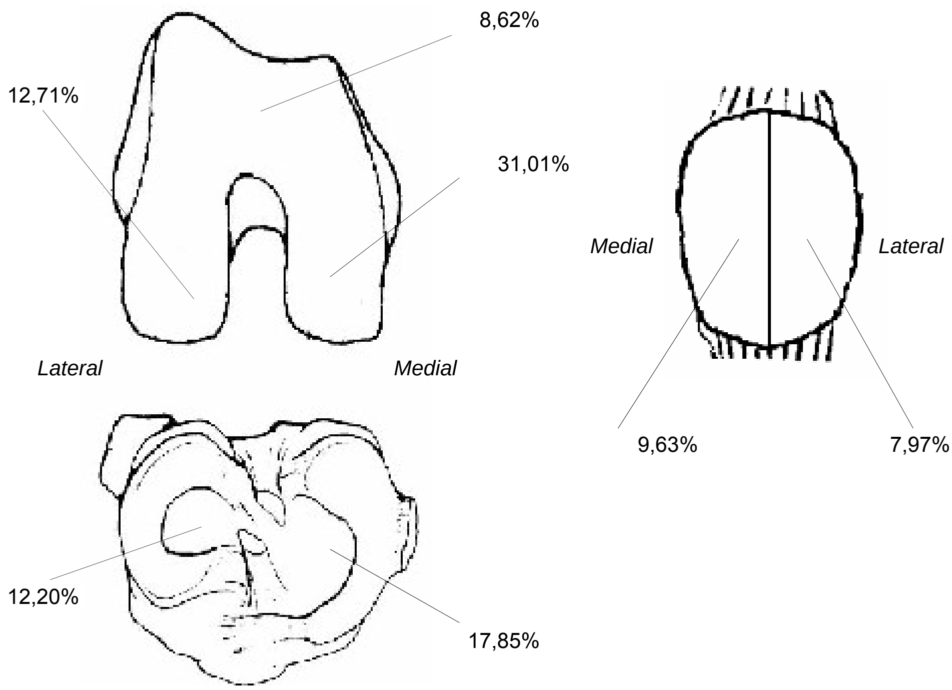


Figure 16: All Cartilage injuries with area greater than 2 cm² (total)

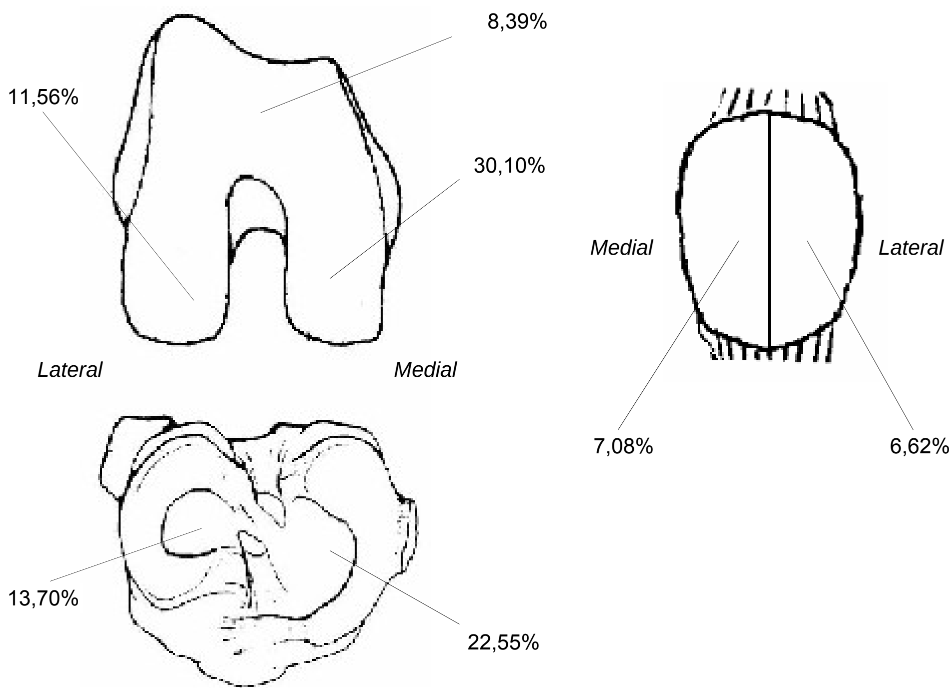
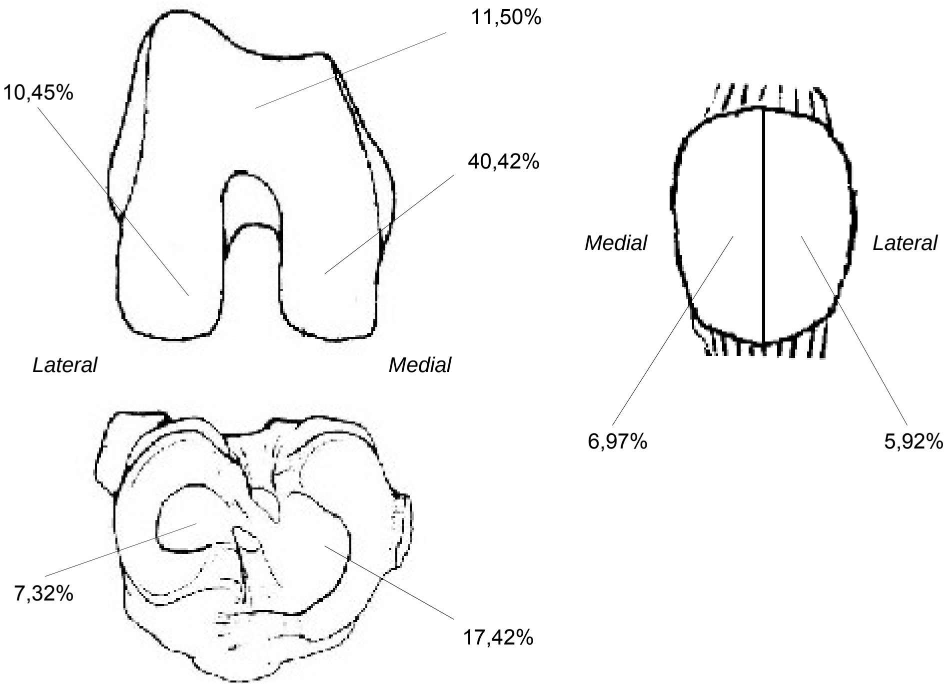


Figure 17: All Cartilage injuries with area greater than 2 cm² and ICRS equal 3 or 4 (total)



Outpatient surgery

Table 50: Outpatient surgery

	Yes		No		Missing		Total
2017	92	(43,8%)	115	(54,8%)	3	(1,4%)	**210**
2016	93	(45,8%)	109	(53,7%)	1	(0,5%)	**203**
2015	117	(52,2%)	101	(45,1%)	6	(2,7%)	**224**
2014	125	(49,8%)	124	(49,4%)	2	(0,8%)	**251**
2013	96	(46,4%)	106	(51,2%)	5	(2,4%)	**207**
2004-12	475	(39,8%)	712	(59,7%)	5	(0,4%)	**1192**
Total	**998**	**(43,6%)**	**1267**	**(55,4%)**	**22**	**(1,0%)**	**2287**

Intraoperative complications

Table 51 : Intraoperative complications

	Yes		No		Missing		Total
2017	13	(6,2%)	190	(90,5%)	7	(3,3%)	**210**
2016	7	(3,4%)	192	(94,6%)	4	(2,0%)	**203**
2015	8	(3,6%)	206	(92,0%)	10	(4,5%)	**224**
2014	3	(1,2%)	235	(93,6%)	13	(5,2%)	**251**
2013	7	(3,4%)	189	(91,3%)	11	(5,3%)	**207**
2004-12	45	(3,8%)	1118	(93,8%)	29	(2,4%)	**1192**
Total	**83**	**(3,6%)**	**2130**	**(93,1%)**	**74**	**(3,2%)**	**2287**

Systemic antibiotic prophylaxis

Table 52: Systemic antibiotic prophylaxis

	Yes		No		Missing		Total
2017	206	(98,1%)	3	(1,4%)	1	(0,5%)	**210**
2016	194	(95,6%)	6	(3,0%)	3	(1,5%)	**203**
2015	220	(98,2%)	3	(1,3%)	1	(0,4%)	**224**
2014	249	(99,2%)	2	(0,8%)			**251**
2013	204	(98,6%)	2	(1,0%)	1	(0,5%)	**207**
2004-12	1174	(98,5%)	14	(1,2%)	4	(0,3%)	**1192**
Total	**2247**	**(98,3%)**	**30**	**(1,3%)**	**10**	**(0,4%)**	**2287**

Table 53: Drug

	2004-12	2013	2014	2015	2016	2017
Benzylpenicillin (Penicillin G)	0,09%					
Cefalotin (Keflin)	92,25%	91,67%	90,76%	92,73%	98,45%	94,17%
Cefazolin (Cephazolin)						2,43%
Ceftriakson (Rocefalin)			0,40%			
Cefuroksim (Zinacef, Cefuroxim, Lifurox)	0,77%					
Ciprofloksasin (Ciproxin)			0,40%			
Dikloksacillin (Diclocil, Dicillin)	2,13%	1,47%	0,40%			
Gentamicin (Garamycin, Gensumycin)	0,09%					
Klindamycin (Dalacin, Clindamycin)	2,56%	3,43%	3,21%	3,18%	1,55%	2,43%
Kloksacillin (Ekvacillin)	1,70%	2,45%	4,02%	2,27%		0,49%
Oxacillin (Unspecified)			0,40%			
Vankomycin (Vancomycin, Vancocin)	0,09%					
Missing	0,34%	0,98%	0,40%	1,82%		0,49%

Thrombosis prophylaxis

Table 54: Thrombosis prophylaxis

	Yes		No		Missing		Total
2017	158	(75,2%)	50	(23,8%)	2	(1,0%)	**210**
2016	141	(69,5%)	58	(28,6%)	4	(2,0%)	**203**
2015	176	(78,6%)	47	(21,0%)	1	(0,4%)	**224**
2014	201	(80,1%)	49	(19,5%)	1	(0,4%)	**251**
2013	173	(83,6%)	32	(15,5%)	2	(1,0%)	**207**
2005-12	924	(80,7%)	207	(18,1%)	16	(1,4%)	**1147**
Total	**1773**	**(79,1%)**	**443**	**(19,8%)**	**26**	**(1,2%)**	**2242**

There are 2 old forms that are filled out so that thrombosis prophylaxis can not be registered. These are added to missing.
There are 8 forms with two drugs and 1765 forms with one drug.

Table 55: Drug

	2004-12	2013	2014	2015	2016	2017
Apixiban (Eliquis)			0,50%			
Dalteparin (Fragmin)	65,48%	73,41%	58,21%	56,25%	60,28%	68,35%
Dekstran (Macrodex, Dextran)	0,11%	0,58%				
Enoksaparin (Klexane)	32,14%	25,43%	39,30%	42,61%	38,30%	29,75%
Rivaroksaban (Xarelto)			0,50%			
Warfarin (Marevan)				0,57%		
Ximelagatran (Exanta, Malagatran)	0,32%					
No drugs	1,52%					
Missing	0,11%		1,00%		0,71%	1,27%
Two drugs	0,22%	0,58%	0,50%	0,57%	0,71%	0,63%

Completeness analysis for the Cruciate Ligament Register

A completeness analysis for the Cruciate Ligament Register has been conducted by combining the data in the Register with data from the Norwegian Patient Register (NPR). The report and analysis were prepared by the NPR in collaboration with the Cruciate Ligament Register.

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

Code	Description
NGE 11 and S83.5/M23.5	Transcision or excision of ligament of knee; anterior cruciate, open, in connection with sprain of cruciate ligament/chronic instability of knee
NGE 12 and S83.5/M23.5	Transcision or excision of ligament of knee; posterior cruciate, open, in connection with sprain of cruciate ligament/chronic instability of knee
NGE 15	Transcision or excision of ligament of knee; anterior cruciate, arthroscopic
NGE 16	Transcision or excision of ligament of knee; posterior cruciate, arthroscopic
NGE 21	Fixation of fragment of surface of knee; anterior cruciate, open
NGE 22	Fixation of fragment of surface of knee; posterior cruciate, open
NGE 25	Fixation of fragment of surface of knee; anterior cruciate, arthroscopic
NGE 26	Fixation of fragment of surface of knee; posterior cruciate, arthroscopic
NGE 31	Transposition of ligament of knee; anterior cruciate, open
NGE 32	Transposition of ligament of knee; posterior cruciate, open
NGE 35	Transposition of ligament of knee; anterior cruciate, arthroscopic
NGE 36	Transposition of ligament of knee; posterior cruciate, arthroscopic
NGE 41	Plastic repair of ligament of knee not using prosthetic material; anterior cruciate, open
NGE 42	Plastic repair of ligament of knee not using prosthetic material; posterior cruciate, open
NGE 45	Plastic repair of ligament of knee not using prosthetic material; anterior cruciate, arthroscopic
NGE 46	Plastic repair of ligament of knee not using prosthetic material; posterior cruciate, arthroscopic
NGE 51	Plastic repair of ligament of knee using prosthetic material; anterior cruciate, open
NGE 52	Plastic repair of ligament of knee using prosthetic material; posterior cruciate, open
NGE 55	Plastic repair of ligament of knee using prosthetic material; anterior cruciate, arthroscopic
NGE 56	Plastic repair of ligament of knee using prosthetic material; posterior cruciate, arthroscopic
NGE 91	Other operation on capsule or ligament of knee; anterior cruciate, open
NGE 92	Other operation on capsule or ligament of knee; posterior cruciate, open
NGE 95	Other operation on capsule or ligament of knee; anterior cruciate, arthroscopic
NGE 96	Other operation on capsule or ligament of knee; posterior cruciate, arthroscopic
NGT 19 and S83.5/M23.5	Forcible manipulation of knee joint, in connection with sprain of cruciate ligament/chronic instability of knee

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

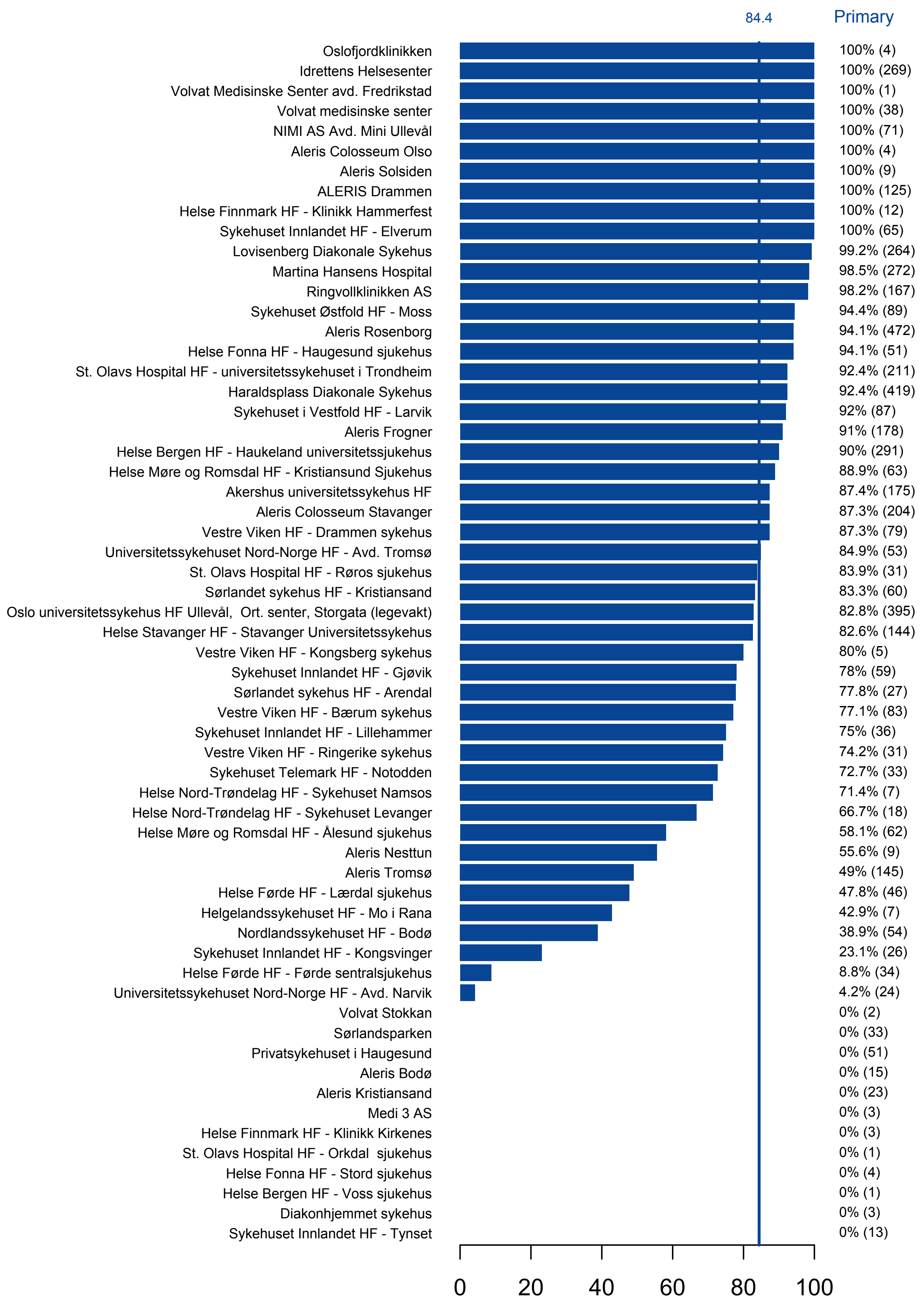
$$\frac{(Only\ Cruc.\ Lig.\ Reg. + Inclusion\ in\ both\ registers)}{(Only\ NPR + Only\ Cruc.\ Lig.\ Reg. + Inclusion\ in\ both\ registers)}$$

Completeness for the NPR was calculated in a similar way:

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

In 2015 and 2016, 5239 cruciate ligament operations were reported to one or both of the registers. 84.4% of these were reported to the Cruciate Ligament Register, while 77.0% were reported to the NPR. The coverage for the Cruciate Ligament Register shows considerable variation between hospitals. In the case of hospitals with a low coverage rate for the Cruciate Ligament Register, either the forms were not submitted or other interventions than cruciate ligament surgery were incorrectly coded.

Completeness of reporting for primary cruciate ligament operations, 2015-2016



Vertical line shows the national averages. The numbers in brackets gives the number of operations registered at both NAR and NPR.

CONTENTS

Norwegian Paediatric Hip Register

PAEDIATRIC HIP REGISTER
2017 ANNUAL REPORT

The Paediatric Hip Register is now in its eighth year of collecting data and has established itself as one of a number of national quality registers. This has helped to increase focus on the register amongst other professionals, and we are currently assessed as a stage 2 register.

With further effort, we hope to reach stage 3 in a few years' time, which means we have to achieve a coverage rate of over 80%. In 2017, we were somewhat below this figure, and unfortunately we see the same trend as in 2016, namely that reporting is slightly down on the previous year. We hope to change this trend in 2018 when we start using the electronic reporting form.

The form has been evaluated and tested during 2017 and is now being produced. All hospitals will therefore start electronic reporting in 2018.

The preparation of the electronic reporting form has involved close collaboration with the team that designed the form for open and arthroscopic hip surgery in young adults. Hospital reporting on these patients has varied, but we hope it will improve with the new electronic form.

During the year, we have had several face-to-face and online meetings with the other Nordic paediatric registers. The Norwegian and Swedish registers are the most advanced, and we make adjustments as far as possible for the purpose of comparison and linkage of data from the different national registers. We are also pleased to note that Finland, Poland, Iceland and the Netherlands wish to create similar registers using the same variables. This will allow for larger patient cohorts in the future with regard to these relatively rare conditions, especially for the comparison of different treatment methods.

We are looking forward to using the electronic form in 2018 and we hope that all paediatric orthopaedic surgeons in Norway will remember to report their patients to the Register.

Bergen, 6.6.2018

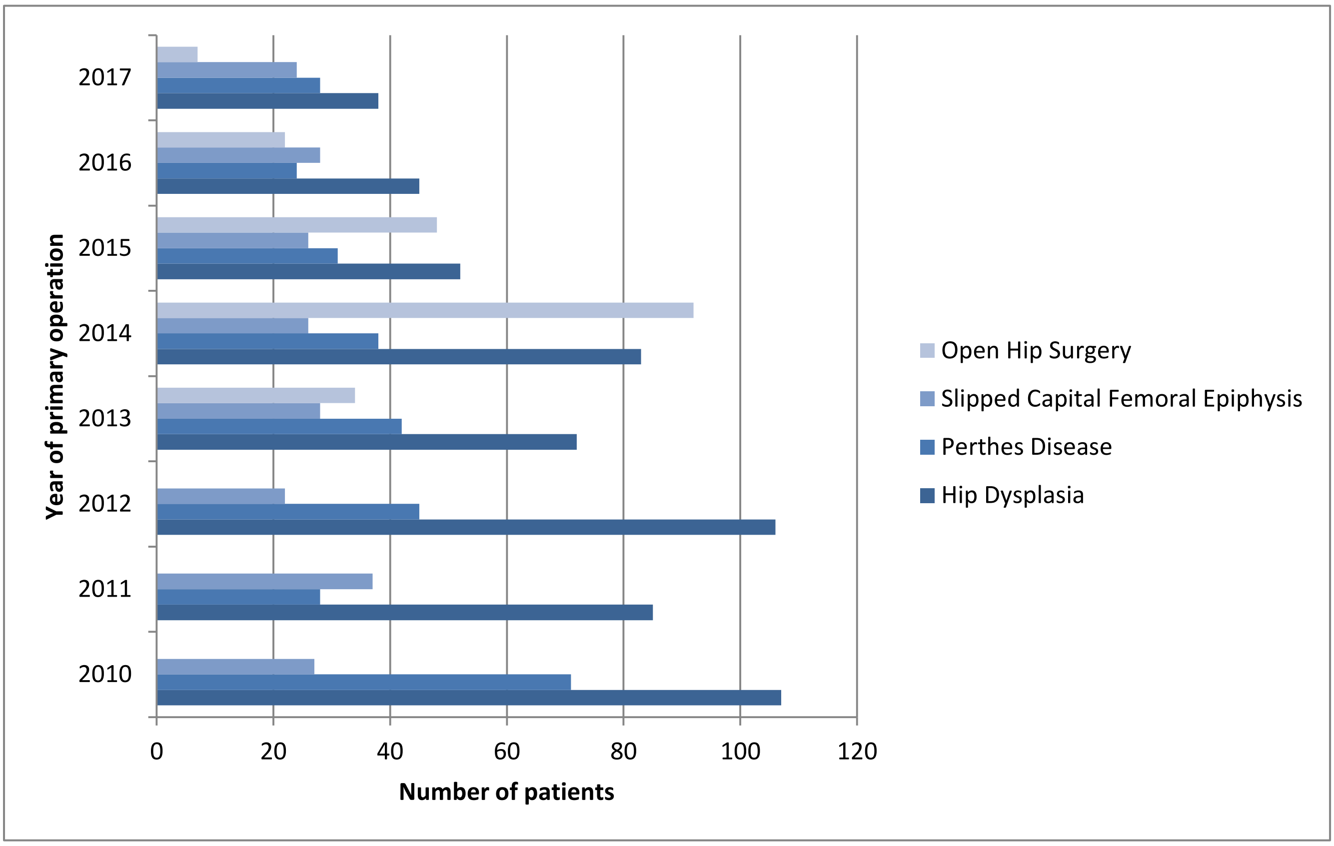
Trude Gundersen

Trude Gundersen
General Manager

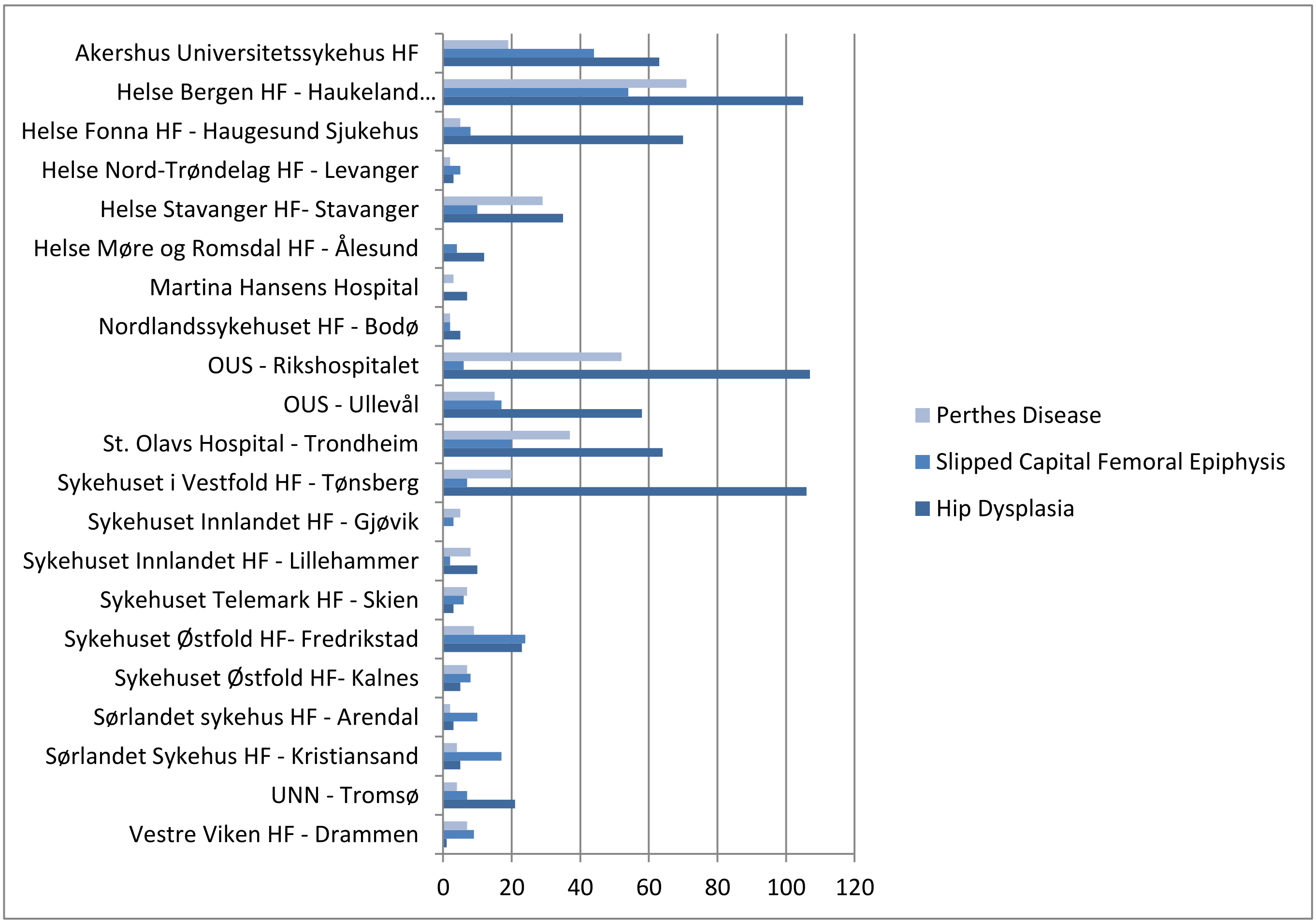
Ola Wiig

Ola Wiig
Head of the Steering Committee

Number of treated patients in the Pediatric Hip Register



Number of operations by diagnosis at each operating hospital



PAEDIATRIC HIP DISEASE

Hip Dysplasia

Table 1: HD - New cases per year

Year diagnosed	Unilateral	Bilateral	Missing	Total
2017	28	10	0	**38**
2016	29	16	0	**45**
2015	38	14	0	**52**
2014	56	26	1	**83**
2013	53	19	0	**72**
2012	75	31	0	**106**
2011	66	19	0	**85**
2010	89	18	0	**107**
Unknown	27	4	8	**39**
Total	**461**	**157**	**9**	**627**

Table 2: HD - Earlier treatment

Treatment year	None	Pillow / abd. orthosis	Other	Missing	Total
2017	32	30	12	3	**77**
2016	31	36	9	6	**82**
2015	39	24	15	28	**106**
2014	38	40	14	27	**119**
2013	30	16	9	40	**95**
2012	6	4	0	126	**136**
2011	0	1	0	96	**97**
2010	2	2	0	123	**127**
Total	**178**	**153**	**59**	**449**	**839**

More than one form for patient per side is possible.

Table 3: HD - Hip status

Year treated	Located	Partially dislocated	Luksert	Missing	Total
2017	48	10	18	1	**77**
2016	43	11	20	8	**82**
2015	54	26	17	9	**106**
2014	67	15	35	2	**119**
2013	50	19	18	8	**95**
2012	68	21	34	13	**136**
2011	54	13	23	7	**97**
2010	66	23	29	9	**127**
Total	**450**	**138**	**194**	**57**	**839**

More than one form for patient per side is possible

Table 4: HD - Acetabular index

Year diagnosed	< 30°	< 40°	>= 40°	Missing	Total
2017	7	14	11	6	**38**
2016	5	10	21	9	**45**
2015	4	17	23	8	**52**
2014	12	30	28	13	**83**
2013	8	27	22	15	**72**
2012	16	37	40	13	**106**
2011	15	36	26	8	**85**
2010	31	37	26	13	**107**
Unknown	6	10	4	19	**39**
Total	**104**	**218**	**201**	**104**	**627**

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
2017	5	3	27	0	4	9	**48**
2016	10	2	28	0	12	3	**55**
2015	5	6	44	2	9	3	**69**
2014	13	12	27	6	24	7	**89**
2013	20	8	41	3	9	3	**84**
2012	36	27	46	6	12	5	**132**
2011	24	14	43	5	6	2	**94**
2010	38	20	58	9	6	1	**132**
Total	**151**	**92**	**314**	**31**	**82**	**33**	**703**

Table 6: HD - Reduction - Surgical

Treatment year	Yes
2017	**9**
2016	**9**
2015	**10**
2014	**12**
2013	**10**
2012	**6**
2011	**12**
2010	**14**
Total	**82**

Table 7: HD - Femoral osteotomy

Treatment year	Varising	Rotation	Shortening	Total
2017	4	2	2	**8**
2016	7	5	0	**12**
2015	5	3	2	**10**
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	**28**	**21**	**9**	**58**

Table 8: HD - Pelvic osteotomy

Treatment year	Salter	Dega	Triple	Periacetab.	Periacetab. osteotomy	Other	Total
2017	3	9	0	0	0	1	**13**
2016	2	8	0	1	0	1	**12**
2015	5	7	0	0	0	3	**15**
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	**32**	**28**	**0**	**3**	**1**	**5**	**68**

Epifysiolysis Capitis Femoris

Table 9: ECF - New cases per year

Year diagnosed	Unilateral	Bilateral	Total
2017	19	5	**24**
2016	22	6	**28**
2015	19	7	**26**
2014	23	3	**26**
2013	17	11	**28**
2012	17	5	**22**
2011	27	10	**37**
2010	21	6	**27**
Unknown	20	13	**33**
Total	**185**	**66**	**251**

Table 10: ECF - Classification

Year diagnosed	Acute	Chronic	Acute on chronic	Stable (Able to bear weight)	Unstable (Unable to ambulate)
2017	2	13	6	16	7
2016	7	15	4	18	10
2015	5	17	2	21	4
2014	1	17	6	13	10
2013	3	16	5	19	5
2012	2	9	5	10	5
2011	6	15	7	21	4
2010	4	14	3	17	7
Unknown	4	16	0	16	3
Total	**34**	**132**	**38**	**151**	**55**

Table 11: ECF - Symptoms duration

Year diagnosed	< 4 weeks	4 - 8 weeks	9 - 26 weeks	27-52 weeks	> 52 weeks	Total
2017	1	1	0	0	0	**2**
2016	0	1	0	0	0	**1**
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	2	6	4	3	**20**
2010	3	8	8	2	0	**21**
Unknown	2	0	0	0	0	**2**
Total	**15**	**21**	**22**	**10**	**4**	**72**

Table 12: ECF - Degree of slippage

Year diagnosed	< 30°	30 - 50°	> 50°	Total
2017	9	7	5	**21**
2016	12	8	7	**27**
2015	13	8	3	**24**
2014	8	6	9	**23**
2013	11	11	4	**26**
2012	7	3	5	**15**
2011	11	8	6	**25**
2010	15	4	7	**26**
Unknown	8	5	6	**19**
Total	**94**	**60**	**52**	**206**

Table 13: ECF - Type of primary operation

Year treated	Screw osteosynthesis	Femoral osteotomy	Pin osteosynthesis	Total
2017	30	0	2	**32**
2016	30	0	5	**35**
2015	23	1	10	**34**
2014	30	1	4	**35**
2013	33	0	11	**44**
2012	15	0	9	**24**
2011	26	1	15	**42**
2010	22	1	13	**36**
Total	**209**	**4**	**69**	**282**

Table 14: ECF - Primary operation - Osteosynthesis with screws

Year treated	---------- Brand ----------		
	Olmed	Richards	Smith+N.
2017	15	1	1
2016	12	1	1
2015	11	4	3
2014	11	7	3
2013	13	7	1
2012	7	0	0
2011	16	3	1
2010	13	4	0
Total	**98**	**27**	**10**

Smith+N. = Smith and Nephew

Table 15: ECF - Primay operation - Osteosynthesis with pins

Year treated	---------- Number of pins ----------			
	1	2	3	> 3
2017	0	2	0	0
2016	1	3	1	0
2015	0	8	2	0
2014	1	2	1	0
2013	0	10	0	0
2012	0	7	1	0
2011	0	12	3	0
2010	0	12	1	0
Total	**2**	**56**	**9**	**0**

Calvè-Legg-Perthes

Table 16: CLP - Number of new cases per year

Year diagnosed	Unilateral	Bilateral	Total
2017	25	3	**28**
2016	22	2	**24**
2015	27	4	**31**
2014	37	1	**38**
2013	41	1	**42**
2012	42	3	**45**
2011	24	4	**28**
2010	59	12	**71**
Unknown	44	7	**51**
Total	**321**	**37**	**358**

Table 17: CLP - Catterall

Year diagnosed	I/II	III/IV	Missing	Total
2017	10	14	4	**28**
2016	6	15	3	**24**
2015	9	21	2	**32**
2014	7	25	6	**38**
2013	11	24	7	**42**
2012	14	25	6	**45**
2011	11	16	1	**28**
2010	22	42	7	**71**
Unknown	2	18	36	**56**
Total	**92**	**200**	**72**	**364**

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

Table 18: CLP - Treatment

Year treated	None/ physiotherapy	Abduction orthosis	Femoral osteotomy	Salter	Dega	Periacetabular	Other pelvic osteotomy	Total
2017	34	0	6	0	0	0	2	**42**
2016	21	0	21	0	0	0	1	**43**
2015	30	0	12	0	0	0	2	**44**
2014	37	2	11	0	0	0	0	**50**
2013	32	0	14	0	0	0	0	**46**
2012	34	0	3	0	0	0	3	**40**
2011	31	0	15	0	0	0	0	**46**
2010	42	0	10	0	0	0	0	**52**
Unknown	0	0	1	0	0	0	0	**1**
Total	**261**	**2**	**93**	**0**	**0**	**0**	**8**	**364**

Table 19: CLP - Plates and screws

Year treated	Prebent plate	Angel plate	Special plate
2017	0	0	5
2016	2	2	14
2015	1	2	8
2014	0	0	10
2013	2	1	10
2012	1	0	7
2011	0	0	19
2010	1	7	3
Unknown	0	1	1
Total	**7**	**13**	**77**

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Oral presentations/Abstracts/Posters 2017-2018 (42 in total)

Norwegian Arthroplasty Register (33 in total)

Furnes O. Nasjonale medisinske kvalitetsregistre i ortopedi: noen «highlights» og potensiale for samarbeidsprosjekter på tvers av fag og institutter. Instituttledermøte. 2018 April 10;Haukeland Universitetssykehus, Bergen

Furnes O. Fagregistre kontra NPR-melding. DRG vårkonferansen. 2018 Mars 12-13;Scandic Ørnen, Bergen

Wilkinson M, Macinnes SJ, Hatzikotoulas K, Fenstad AM, Shan K, Southam L, Tachmazidou I, Hallan G, Dale H, Panoutsopoulou K, Furnes O, Zeggini E. The genetics of osteolysis after total hip arthroplasty. The 2018 Otto Aufranc Award. The annual AAOS meeting. 2018 March 6-10;New Orleans, USA

Tsikandylakis G, Kärrholm JN, Hailer NP, Hallan G, Furnes O, Eskelinen A, Mäkelä K, Pedersen AB, Overgaard S, Mohaddes M. The risk of revision in total hip arthroplasty performed with 28 mm, 32 mm, or 36 mm heads. Data from 248,827 patients in an arthroplasty register association. The annual AAOS meeting. 2018 March 6-10;New Orleans, USA

Furnes O. Implant selection and new technology: NARA (Nordic Arthroplasty Register Association). Symposium: What can registries do for me? The annual AAOS meeting 2018 March 6-10;New Orleans, USA

Furnes O. Hofteregisteret 30 år. Ortomedia; 2017 Desember: Nr.91, 29.Årgang

Furnes O. Beste faglige praksis- hvordan står det til i Helse-Midt? Resultater for sykehusene i Helse-Midt med vekt på fiksering av femurproteser. Midt-Norsk ortopedimøte; 2017 9.-10. November; Trondheim

Krukhaug Y, Hallan G, Dybvik E, Lie SA, Furnes O. Resultater av 838 albueproteser: En rapport fra Nasjonalt Register For Leddproteser i perioden 1994-2016. Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Hoem V, Dybvik E, Hallan G. Smerter og funksjon hos pasienter som har gjennomgått en proteserevisjon i 2 trinn for infisert hofteprotese. Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Leta TH, Lygre SHL, Høvding P, Hallan G, Gjertsen JE, Dale H, Furnes O. Resultater ved revisjon for infisert kneprotese. En observasjons studie fra Nasjonalt Register For Leddproteser (1994-2016) Høstmøtet i Norsk Ortopedsisk Forening; 2017 25.-27. oktober; Oslo

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Badawy M, Fenstad AM, Furnes O. Hvordan går det med primære constrained og hengslede kneproteser? Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Badawy M, Lygre SH, Furnes O. Den unge norske kneprotese pasienten. Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Furnes O, Fenstad AM, Havelin LI. Forekomst og livstidsrisiko av kneproteser i Norge. En presentasjon av 3 studier med 3 ulike tilnærminger. Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Furnes O, Dybvik E, Småbrekke A, Fenstad AM, Hallan G, Havelin LI. Ceramic on ceramic bearings in 4926 uncemented total hip replacements with up to 15 years follow up reported to the Norwegian arthroplasty register. International Hip Society; 2017 Sep 6-9; London

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Badawy M, Espehaug B, Fenstad AM, Indrekvam K, Dale H, Havelin LI, Furnes O. Does procedure duration affect the revision risk due to deep infection in total knee arthroplasty? 6th International Congress of Arthroplasty Registries; 2017 May 20 – 22; San Francisco, USA

Furnes O. Data completeness and validity of outcome presentation of registry data. 6th International Congress of Arthroplasty Registries; 2017 May 20 – 22; San Francisco, USA

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Furnes O, Gøthesen Ø, Lygre SH, Lorimer M, Graves S. Risk of aseptic loosening for 43525 rotating platform total knee replacements. A combined registry study from Norway and Australia, 2003-2014. 6th International Congress of Arthroplasty Registries; 2017 May 20 – 22; San Francisco, USA

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Dale H, Børsheim S, Gjertsen JE, Hallan G, Fenstad AM, Fevang JM, Havelin LI, Furnes O. Fixation in contemporary primary total hip arthroplasty- Is cemented still better? 6th International Congress of Arthroplasty Registries; 2017 May 20 – 22; San Francisco, USA

Dybvik E, Furnes O, Havelin LI, Fosså SD, Trovik C, Lie SA. Increased risk of cancer for uncemented total hip replacementes. A study of 60.374 patients in the Norwegian arthroplasty register linked to the Cancer registry of Norway. 6th International Congress of Arthroplasty Registries; 2017 May 20 – 22; San Francisco, USA

Wilkinson M, Bartz-Johannessen C, Furnes O, Havelin L, Fenstad AM, Lie SA, Pedersen A, Overgaard S, Kärrholm J, Garellick G, Nemes S, Malchau H, Mäkelä KT, Eskelinen A, Wilkinson

JM. Risk stratification algorithms for hip replacement outcomes: An evaluation of the heterogeneity in prosthesis survivorship between Scandinavian countries using the NARA database. 6th International Congress of Arthroplasty Registries; 2017 May 20 – 22; San Francisco, USA

Fenstad AM. Multippel testing. Kurs i analyse av registerdata; 2017 April 24-26; Tromsø

Fenstad AM. Statistikk- et nyttig verktøy! ENT3R- elevkveld; 2017 April 4; Universitetet i Bergen

Engesæter I, Engesæter LB, Halvorsen VB, Nordsletten L, Røhrl S, Tsukanaka M. Total hip replacement in young patients under 20 years of age: Survival, revisions, and quality of life. Poster presented at the Annual AAOS meeting; 2017 March 14 – 18; San Diego, USA

Kreipke R, Hallan G, Havelin LI, Kärrholm JN, Mäkelä K, Overgaard S, Pedersen AB, Rogmark C. Revision risks of dual mobility cups in total hip arthroplasty – a study from the Nordic arthroplasty register association. Poster presented at the Annual AAOS meeting; 2017 March 14 – 18; San Diego, USA

Furnes O, Dyrhovden G, Badawy M, Lygre SH, Gøthesen Ø. Improved survival for uni and total knee arthroplasty the last decade, but more early infections in total knee arthroplasty. Annual AAOS meeting; 2017 March 14 – 18; San Diego, USA

Gøthesen Ø, Lygre SH, Graves S, Furnes O, Lorimer M. Higher risk of aseptic loosening in mobile non-posterior-stabilized total knee arthroplasty. Annual AAOS meeting; 2017 March 14 – 18; San Diego, USA

Eskelinen A, Furnes O, Garellick G, Havelin LI, Kärrholm JN, Laaksonen I, Mäkelä K, Malchau H, Overgaard S. Implant survival of the most common cemented total hip devices from the Nordic arthroplasty register association database. Annual AAOS meeting; 2017 March 14 – 18; San Diego, USA

Furnes O. Nytt fra Nasjonalt register for leddproteser. Videokonferanse; 2017 18 januar; Bergen

Norwegian Hip Fracture Register (5 in total)

Gjertsen JE, Dybvik E, Furnes O, Fevang J, Kristensen T, Havelin LI, Matre K, Engesæter LB. Improved outcome after hip fracture surgery in Norway. Results from the Norwegian Hip Fracture Register. Scientific exhibition presented at the annual AAOS meeting. 2018 March 6-10;New Orleans, USA

Dybvik E. Norwegian Arthroplasty Register and Norwegian Hip Fracture Register- Interactive results. The annual AAOS meeting. 2018 March 6-10;New Orleans, USA

Leer-Salvesen S, Dybvik E, Dahl OE, Gjertsen JE, Engesæther LB. Lavmolekylært heparin (LMWH) ved osteosyntese i behandling av hoftebrudd; Skal en starte preoperativt eller postoperativt? Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Kristensen TB, Dybvik E, Furnes O, Engesæter LB, Gjertsen JE. Stem survival of cemented hemiarthroplasty for femoral neck fractures. A report from the Norwegian hip fracture register. 6th International Congress of Arthroplasty Registries; 2017 May 20 – 22; San Francisco, USA

Gjertsen JE, Dybvik E, Furnes O, Fevang JM, Havelin LI, Matre K, Engesæter LB. Improved outcome after hip fracture surgery in Norway. 10-years results from the Norwegian hip fracture register. 6th International Congress of Arthroplasty Registries; 2017 May 20 – 22; San Francisco, USA

Norwegian Cruciate Ligament Register (3 in total)

Ulstein S, Årøen A, Forssblad M, Engebretsen L, Lygre SHL, Røtterud JH. Effekt av mikrofraktur eller debridement av ledsagende dyp bruskskade ved ACL-rekonstruksjon- En landsomfattende kohortstudie fra Norge og Sverige med 368 pasienter med 5- års oppfølging. Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Aga C, Lygre SHL, Granan LP, Kartus J, Lind M, Engebretsen L. Revisjon av double bundle korsbåndsopererte knær i Skandinavia; En registerstudie med over 60 000 pasienter. Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Ulstein S, Årøen A, Forssblad M, Engebretsen L, Lygre SHL, Røtterud JH. ACL-rekonstruksjon i knær med ledsagende bruskskade - En landsomfattende kohortstudie fra Norge og Sverige med 8470 pasienter med 5- års oppfølging. Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Clinical trials relatet to the Norwegian National Advisory Unit on Arthroplasty (1 in total)

Rieber-Mohn M, Dybvik E, Seip A, Sagstad SA, Hanestad T, Nilsen PT, Austevoll I. Levetid ved ryggmetastaser – 321 pasienter vurdert ved Haukeland Universitetssjukehus. Høstmøtet i Norsk Ortopedisk Forening; 2017 25.-27. oktober; Oslo

Opertation 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.

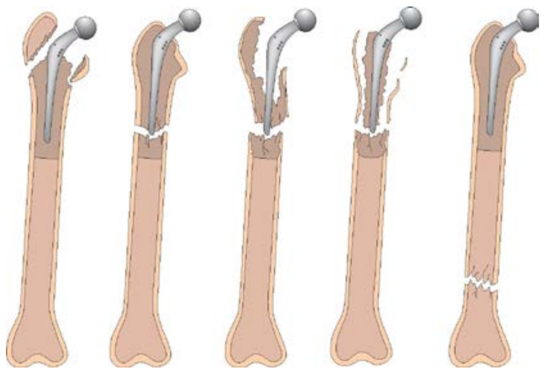
Type IIIA: Betydelig komponentvandring, osteolyse og bentap. Bentap fra kl.10 til 2.

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.

HOOS
Spørreskjema for hoftepasienter

Dato: ______________________ Personnummer: ___________________________

Navn: ____

Instruksjoner: Dette spørreskjemaet inneholder spørsmål om hvordan du opplever hofteleddet ditt. Informasjonen skal hjelpe til med å kartlegge hvordan du har det og hvordan du fungerer i dagliglivet. Besvar spørsmålene ved å krysse av for det alternativet du synes passer best for deg (kun ett kryss for hvert spørsmål). Er du usikker, kryss likevel av for det alternativet som føles riktigst.

Symptomer
Tenk på symptomene og vanskelighetene du har hatt fra hoften din den siste uken når du besvarer følgende spørsmål

S1. Har du kjent murringer eller hørt knepping eller andre lyder fra hoften?

Aldri	Sjelden	Iblant	Ofte	Alltid
☐	☐	☐	☐	☐

S2. Har du vanskeligheter med å spre bena langt ut til siden?

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

S3. Har du vanskeligheter med å ta steget fullt ut når du går?

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Stivhet
Følgende spørsmål omhandler leddstivhet. Stivhet innebærer vanskeligheter med å komme i gang, eller økt motstand ved bevegelser i hofteleddet. Angi graden av stivhet du har opplevd i hoften din den siste uken.

S4. Hvor stiv har hoften din vært rett etter at du har våknet om morgenen?

Ikke i det hele tatt	Noe	Moderat	Meget	Ekstremt
☐	☐	☐	☐	☐

S5. Hvor stiv har hoften din vært etter at du har sittet eller ligget og hvilt, senere på dagen?

Ikke i det hele tatt	Noe	Moderat	Meget	Ekstremt
☐	☐	☐	☐	☐

Smerter
P1. Hvor ofte har du vondt i hoften?

Aldri	Hver måned	Hver uke	Hver dag	Alltid
☐	☐	☐	☐	☐

Følgende spørsmål handler om de hoftesmertene du eventuelt har opplevd den siste uken. Angi graden av smerte du har kjent i følgende situasjoner.

P2. Strekke hoften helt

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P3. Bøye hoften helt

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P4. Gå på jevnt underlag

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P5. Gå opp eller ned trapper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P6. Om natten, i sengeleie (smerte som forstyrrer søvnen)

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P7. Sittende eller liggende

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P8. Stående

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P9. Gå på hardt underlag f.eks. asfalt, betong

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

P10. Gå på ujevnt underlag

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Fysisk funksjon

Følgende spørsmål handler om din fysiske funksjon. Angi graden av vanskeligheter du har opplevd den siste uken under følgende aktiviteter på grunn av dine hofteproblemer.

A1. Gå ned trapper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A2. Gå opp trapper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Angi graden av vanskeligheter du har opplevd den siste uken på grunn av dine hofteproblemer.

A3. Reise deg opp fra sittende

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A4. Stå stille

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A5. Bøye deg, for å for eksempel plukke opp noe fra gulvet

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A6. Gå på jevnt underlag

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A7. Gå inn og ut av en bil

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A8. Handle/ gjøre innkjøp

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A9. Ta på sokker/strømper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A10. Stå opp fra sengen

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A11. Ta av sokker/strømper

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A12. Ligge i sengen (snu deg, holde hoften i samme stilling over lengre tid)

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A13. Gå opp i, og ut av, et badekar/ dusj

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A14. Sitte

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A15. Sette deg og reise deg fra toalettet

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A16. Utføre tungt husarbeid (snømåking, gulvvask, støvsuging etc.)

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

A17. Utføre lett husarbeid (matlaging, støvtørking etc.)

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Funksjon, fritid og idrett

Følgende spørsmål handler om din fysiske funksjon. Angi graden av vanskeligheter du har opplevd den siste uken under følgende aktiviteter på grunn av dine hofteproblemer.

SP1. Sitte på huk

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

SP2. Løpe

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

SP3. Snu deg på belastet ben

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

SP4. Gå på ujevnt underlag

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Livskvalitet

Q1. Hvor ofte gjør hoften din seg bemerket?

Aldri	Hver måned	Hver uke	Hver dag	Alltid
☐	☐	☐	☐	☐

Q2. Har du forandret levemåte for å unngå å belaste hoften?

Ikke i det hele tatt	Noe	Moderat	Meget	Ekstremt
☐	☐	☐	☐	☐

Q3. I hvor stor grad kan du stole på hoften din?

Fullstendig	I stor grad	Moderat	Delvis	Ikke i det hele tatt
☐	☐	☐	☐	☐

Q4. Hvor store problemer har du med hoften din generelt sett?

Ingen	Lette	Moderate	Store	svært store
☐	☐	☐	☐	☐

Takk for at du tok deg tid til å besvare samtlige spørsmål!

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 ☐[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.)…………………………………………

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)	B. Reoper. pga (ev. flere kryss)
☐[1] Idiopatisk artrose	☐[1] Løs prox.protesedel
☐[2] Rheumatoid artritt	☐[2] Løs distal protesedel
☐[3] Fraktursequele…………..	☐[3] Løs patellaprotese
☐[4] Mb. Bechterew	☐[4] Luksasjon av patella
☐[5] Sequele ligamentskade	☐[5] Luksasjon (ikke patella)
☐[6] Sequele meniskskade	☐[6] Instabilitet
☐[7] Akutt fraktur	☐[7] Aksefeil
☐[8] Infeksjonssequele	☐[8] Dyp infeksjon
☐[9] Spondylose	☐[9] Fraktur av bein (nær protesen)
☐[10] Sequele prolaps kirurgi	☐[10] Smerter
☐[11] Degenerativ skivesykdom	☐[11] Slitt eller defekt plastforing Hvilken………………………
☐[12] Rotarcuff artropati	☐[12] Progresjon av artrose
☐[13] Annet …………………………….	☐[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 (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 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

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)

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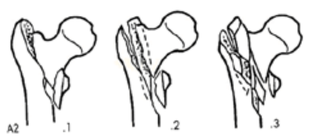
ASA-klasse 2: Pasienter med en asymptomatisk tilstand som behandles medikamentelt (f.eks hypertensjon) eller med kost (f.eks diabetes mellitus type 2) og ellers friske pasienter som røyker 5 sigaretter eller mer daglig.
ASA-klasse 3: Pasienter med en tilstand som kan gi symptomer, men som holdes under 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

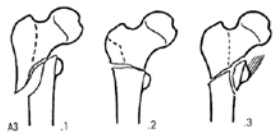
GARDENS KLASSIFISERING AV LÅRHALSBRUDD

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 Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

PASIENTSPØRRESKJEMA NASJONALT HOFTEBRUDDREGISTER

1. Dato for utfylling av skjema: |__|__| |__|__| |__|__|

2. Spørreskjemaet er besvart av:

☐ 1 Meg selv

eller ved hjelp av….(kryss av i ruten som gjelder)

☐ 2 Slektning (ektefelle, barn)
☐ 3 God venn eller annen nærstående
☐ 4 Annen privat person
☐ 5 Hjemmesykepleier/hjemmehjelp
☐ 6 Annen person, angi hvem:___________________________

NASJONALT HOFTEBRUDDREGISTER
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5021 BERGEN

I de neste 5 spørsmålene ønsker vi å vite hvordan livssituasjonen din var FØR du fikk hofte/lårhalsbruddet som du ble operert for.

3. Hvordan opplevde du gangevnen din?

☐ 1 Jeg hadde ingen problemer med å gå omkring
☐ 2 Jeg hadde litt problemer med å gå omkring
☐ 3 Jeg var sengeliggende

4. Hvordan klarte du personlig stell?

☐ 1 Jeg hadde ingen problemer med personlig stell
☐ 2 Jeg hadde litt problemer med å vaske meg eller kle meg
☐ 3 Jeg klarte ikke å vaske meg eller kle meg

5. Hvordan klarte du dine vanlige gjøremål (f.eks. arbeid, studier, husarbeid, familie- og fritidsaktiviteter)?

☐ 1 Jeg hadde ingen problemer med å utføre mine vanlige gjøremål
☐ 2 Jeg hadde litt problemer med å utføre mine vanlige gjøremål
☐ 3 Jeg var ute av stand til å utføre mine vanlige gjøremål

6. Smerter eller ubehag?

☐ 1 Jeg hadde verken smerte eller ubehag
☐ 2 Jeg hadde moderat smerte eller ubehag
☐ 3 Jeg hadde sterk smerte eller ubehag

7. Angst eller depresjon?

☐ 1 Jeg var verken engstelig eller deprimert
☐ 2 Jeg var noe engstelig eller deprimert
☐ 3 Jeg var svært engstelig eller deprimert

Nasjonalt Register for Leddproteser

NASJONALT HOFTEBRUDDREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

I de 5 neste spørsmålene ønsker vi å vite hvordan livssituasjonen din er NÅ:

8. Hvordan opplever du gangevnen din?

☐ 1 Jeg har ingen problemer med å gå omkring
☐ 2 Jeg har litt problemer med å gå omkring
☐ 3 Jeg er sengeliggende

9. Hvordan klarer du personlig stell?

☐ 1 Jeg har ingen problemer med personlig stell
☐ 2 Jeg har litt problemer med å vaske meg eller kle meg
☐ 3 Jeg klarer ikke å vaske meg eller kle meg

10. Hvordan klarer du dine vanlige gjøremål (f.eks. arbeid, studier, husarbeid, familie- og fritidsaktiviteter)?

☐ 1 Jeg har ingen problemer med å utføre mine vanlige gjøremål
☐ 2 Jeg har litt problemer med å utføre mine vanlige gjøremål
☐ 3 Jeg er ute av stand til å utføre mine vanlige gjøremål

11. Smerter eller ubehag?

☐ 1 Jeg har verken smerte eller ubehag
☐ 2 Jeg har moderat smerte eller ubehag
☐ 3 Jeg har sterk smerte eller ubehag

12. Angst eller depresjon?

☐ 1 Jeg er verken engstelig eller deprimert
☐ 2 Jeg er noe engstelig eller deprimert
☐ 3 Jeg er svært engstelig eller deprimert

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5021 BERGEN

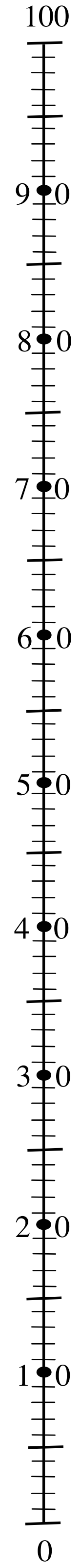
13. Din helsetilstand i dag.

For å hjelpe folk til å si hvor god eller dårlig en helsetilstand er, har vi laget en skala (omtrent som et termometer) hvor den beste tilstanden du kan tenke deg er merket 100 og den verste tilstanden du kan tenke deg er merket 0.

Vi vil gjerne at du viser på denne skalaen hvor god eller dårlig helsetilstanden din er i dag, etter din oppfatning. Vær vennlig å gjøre dette ved å trekke en linje fra boksen nedenfor til det punktet på skalaen som viser hvor god eller dårlig din helsetilstand er i dag.

Din egen helsetilstand i dag

Best tenkelige helsetilstand



Verst tenkelige helsetilstand

NASJONALT HOFTEBRUDDREGISTER
Nasjonalt Register for Leddproteser
Helse Bergen HF, Ortopedisk klinikk
Haukeland Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

SMERTE

14. Sett ett kryss på den streken som du synes tilsvarer din gjennomsnittlige smerteopplevelse fra den opererte hoften den siste måneden:

Ingen smerte Maksimal smerte

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

lett moderat middels sterk uutholdelig

TILFREDSHET

15. Sett ett kryss på den streken som du synes tilsvarer hvor fornøyd du er med operasjonsresultatet:

Fornøyd Misfornøyd

IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII

svært fornøyd fornøyd middels fornøyd misfornøyd svært misfornøyd

NASJONALT HOFTEBRUDDREGISTER
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Haukeland Universitetssykehus
Møllendalsbakken 11
5021 BERGEN

16. Har du besvær fra den andre hoften?

☐ 1 Ja ☐ 2 Nei

17. Er det andre årsaker til at du har problemer med å gå? (For eksempel smerter fra andre ledd, ryggsmerter, hjerte-karsykdom eller andre sykdommer som påvirker gangevnen din)

☐ 1 Ja ☐ 2 Nei

18. Har du hatt nye operasjoner i den samme hoften som ble operert for hoftebrudd?

☐ 1 Ja ☐ 2 Nei

Takk for at du tok deg tid til å svare på spørsmålene. Dine svar er svært nyttige for oss. Vennligst send spørreskjemaet i retur til oss i den ferdig frankerte svarkonvolutten.

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 ☐ ¹ N. 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
☐ Annet ....
☐ Graftsvikt
☐ Nytt traume
☐ Smerte

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 ....

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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 (cm²) ≤2	Areal (cm²) >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 ☐ < 30º ☐ 30-50º ☐ > 50º *(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: ....

Pinnefiksasjon: ☐ 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

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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: .... mm² Dybde (ICRS): ☐ 1 ☐ 2 ☐ 3 ☐ 4
Lokalisasjon: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

Ligamentum teres skade: ☐ N ☐ J ☐ Partiell ruptur ☐ Total ruptur

Frie legemer: ☐ N ☐ J ☐ Perifert ☐ Sentralt

Os acetabuli: ☐ N ☐ J ☐ Som forbening av labrum ☐ Som del av leddflaten Synovitt: ☐ N ☐ J

KIRURGISK BEHANDLING Labrumruptur: ☐ Debridement ☐ Sutur. Antall ankre: ....

Type ankre: .... ☐ Labrumrekonstruksjon, spesifiser: ....
(Klistrelapp på baksiden)

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.

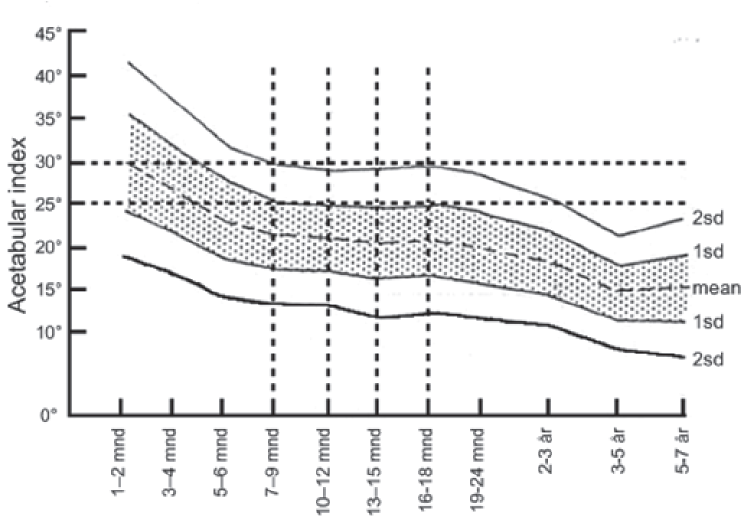
Reoperasjonsårsak, spesifiser: ....

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

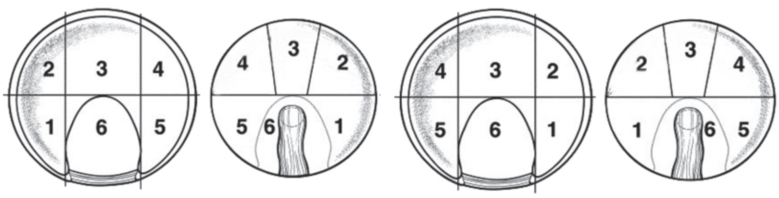
- **Registreres første gang ved diagnose/primærbehandling**
- **Registreres ved senere behandling som krever anestesi** Osteosyntese, femurosteotomier, reoperasjoner.

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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