



# **SWESPINE THE SWEDISH SPINE REGISTER**

## **2014 REPORT**

**SEPTEMBER 2014**

**SWEDISH SOCIETY OF SPINAL SURGEONS**

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## Introduction

This publication is the 15th report from Swespine, the National Swedish Spine Register, which was initiated in 1993. This year's report includes 9572 patients and as previously, entails an increase over the previous year. In this issue we will also introduce other diagnostic groups as a complement to those previously included. Spine register work over the past year has followed several lines that are briefly presented below.

The primary focus continues to be both the coverage and the completeness of the follow-up data, since we gather patient-reported outcomes after 1, 2, 5 and 10 years postoperatively. The Register Center, which started operating 3 years ago, is now in full operation and will probably need to add several secretaries moving forward. The main objectives are twofold: to collect patient-reported data from facilities that are not linked to the surgical department, and to increase the completeness of data reporting. The latter objective appears to have been achieved; significantly better completeness can be found in the register entries from those clinical departments affiliated with the register center, compared with those from departments that take care of their own patient follow-up.

The analysis section for the current year has focused on outcome over time for surgical treatment of segmental pain/SP/DDD. It shows a gradual improvement of patient-reported Global Assessment and an improvement compared with the Swedish Spine Study, a randomized study comparing fusion and non-surgical treatment. Although a straight comparison between a clinical trial and registry results offers some methodological challenges, we believe that the improved outcomes can be attributed to quality improvement initiatives based on register data. Another such improvement is the reduction of hospital days for disc herniation surgery reported by the spine unit at Skåne University Hospital, Malmö.

The model of value-based reimbursement for spine surgery based on Swespine that resulted from collaboration involving the Swedish Society of Spinal Surgeons /Swespine, Stockholm County Council and IVBAR (health economists) was presented in detail in last year's report and implemented in 2014. The model is based on a case-mix assessment that is calculated from the register data to predict the outcome of the individual patient's surgical treatment and is used to reimburse the individual clinic based on whether the expected patient-reported results are achieved after one year. Three private clinics in the Stockholm region have been using this model since October 2013 and in October 2014 it will be implemented when patient-reported outcomes are received via the Register Center. The model is being monitored and modified as experience accumulates.

This report also includes an assessment conducted by the company Indikator, Institutet för Kvalitetsindikatorer (the Institute for Quality Indicators), which studies Patient-Reported Experience Measurement (PREM), to analyze patient satisfaction with care and treatment associated with back surgery. This initiative has been concluded and is presented in this report. In general, patients are satisfied, though with margins for improvement at individual departments, and such work has already been initiated. Potential for improvement can also be found with respect to waiting time.

To validate the completeness of the register, data files were matched with the assistance of the National Board of Health and Welfare's register center against the National Patient Register (PAR) with respect to ICD diagnosis codes and KVA (Swedish Classification of Health Interventions) procedure codes. This report presents preliminary data, and the differences between the total number of patients included in Swespine versus the National Patient Register will be further analyzed during the current year since there

are problems with the participation rate in both Swespine and PAR; in addition, this patient population also has many different conditions (ICD diagnosis codes) and treatment options (KVÅ procedure codes).

Efforts to implement patient participation in the register are underway in collaboration with Qulturum in Jönköping and the first focus group interviews with spine surgery patients at NOC Ryhov have been conducted.

Several scientific studies based on the register were presented in 2013 (see reference list). The results were also presented both nationally (Swedish Society of Spinal Surgeons, the Swedish Orthopaedic Association) and internationally (International Society for the Study of the Lumbar Spine, Eurospine, North American Spine Society, International Society for Advancement of Spinal Surgery).

The international initiative presented in the previous report to establish a common “core data set” that would allow international comparisons of spine surgery has made progress. The treating clinical departments around the world achieved consensus on this “core data set” under the leadership of ICHOM ([www.ichom.org](http://www.ichom.org)) in 2013, and we are pleased to report that it is largely based on the Swespine protocol. To date it focuses on degenerative lumbar surgery, and entails some minor modifications in registration compared with previously. Among other things, the educational level of the patient is now included as a proxy for economy, which we know can have significance for the outcome, as is the Glassman score, a morphological definition of the current spine disease that also allows for comparison with nonoperatively treated patients.

All Swespine register questionnaires for spinal disorders were extensively revised during the year as a logical continuation of these changes. The modified protocols will be implemented beginning at the turn of 2014/15.

As a concrete result of international collaboration, we are planning a pilot project in which we intend to pool register data on herniated discs and spinal stenosis of the lumbar spine from Norway, Denmark and Sweden. The database can be used both to compare patient populations in the three countries to see whether we operate on the same case-mix of patients and to see whether the outcomes are equivalent. This project may be considered to be unique worldwide. Some legal considerations must be taken into account, but if we solve them, we can with look forward to the results with great anticipation.

Sept. 30, 2014

Peter Fritzell Olle Hägg    Björn Knutsson

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The study was carried out with support from the National Board of Health and Welfare/Swedish Association of Local Authorities and Region 2013 grant for national quality registers.

## I. Preoperative and surgical data on lumbar spine procedures in 2013

A total of 8116 patients who had lumbar spine surgery at a total of 44 departments were entered in the register in 2013. In 2012, 8012 patients from 38 departments were entered in the register.

The distribution of diagnoses for patients operated in 2013 was as follows: Disc herniation 28%, central spinal stenosis 47%, lateral spinal stenosis 7%, spondylolisthesis 5%, segmental pain/DDD (disc degenerative disorder) 8% and other 5%; see figure 1.

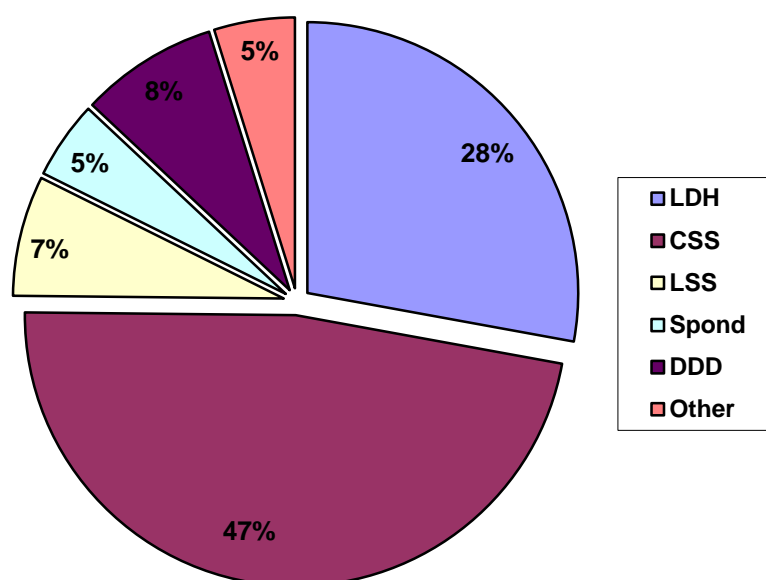


Fig. 1. Breakdown by diagnosis in the total material 2013, 7999 patients.

Diagnosis-related patient demographics and surgical data are presented below.

### Disc herniation

#### *Demographic data*

In 2013, 2262 disc herniation surgeries were registered. The patients included 55% men and 45% women. The proportion of smokers was 14%. Mean patient age was 46 (15–91) years and figure 2 shows the age distribution.

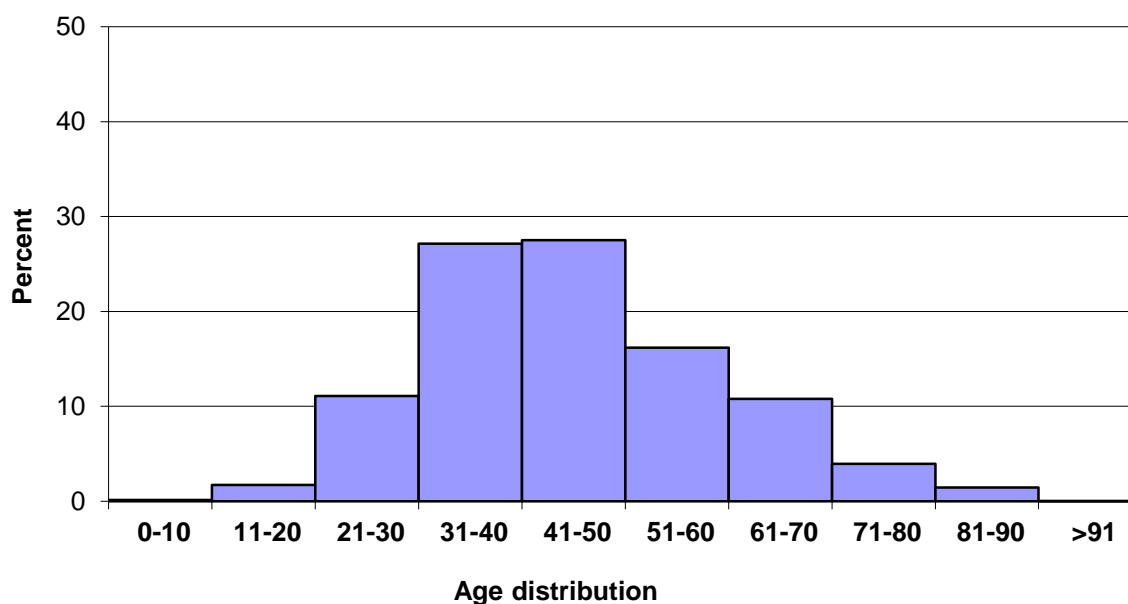


Fig. 2. Distribution by age, disc herniation, n = 2262.

This disc herniation operation was the first lumbar spine surgery for 87% of patients, while 13% had been previously operated.

Preoperative duration of back pain was as follows: 7% had no back pain, 10% had a history of back pain for less than 3 months, 49% 3-12 months, 15% 1-2 years and 20% more than 2 years. Preoperative duration of leg pain/sciatica was as follows: 1% had no leg pain, 16% had leg pain for less than 3 months, 56% for 3-12 months, 14% for 1-2 years and 12% had pain for more than 2 years. Mean patient-reported back pain on the visual analog scale (VAS) was 48 with a spread from 0–100, while mean leg pain/sciatica on the VAS was 69 with the same spread from 0–100. Distribution regarding both back and leg pain can be seen in figures 3 and 4.

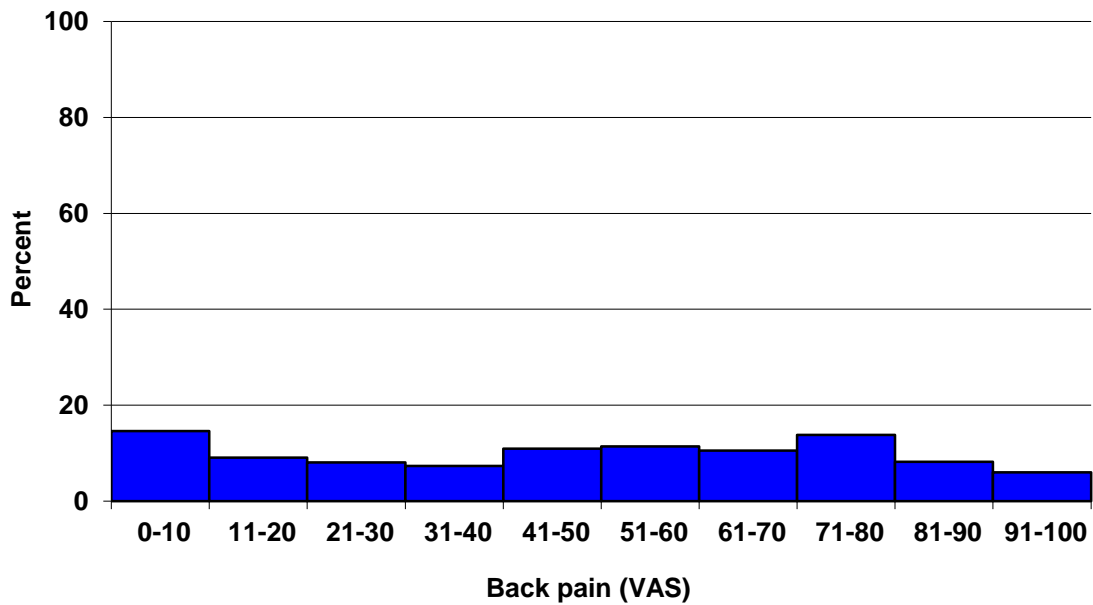


Fig. 3. Back pain on the visual analog scale preoperatively in patients with disc herniation (%).

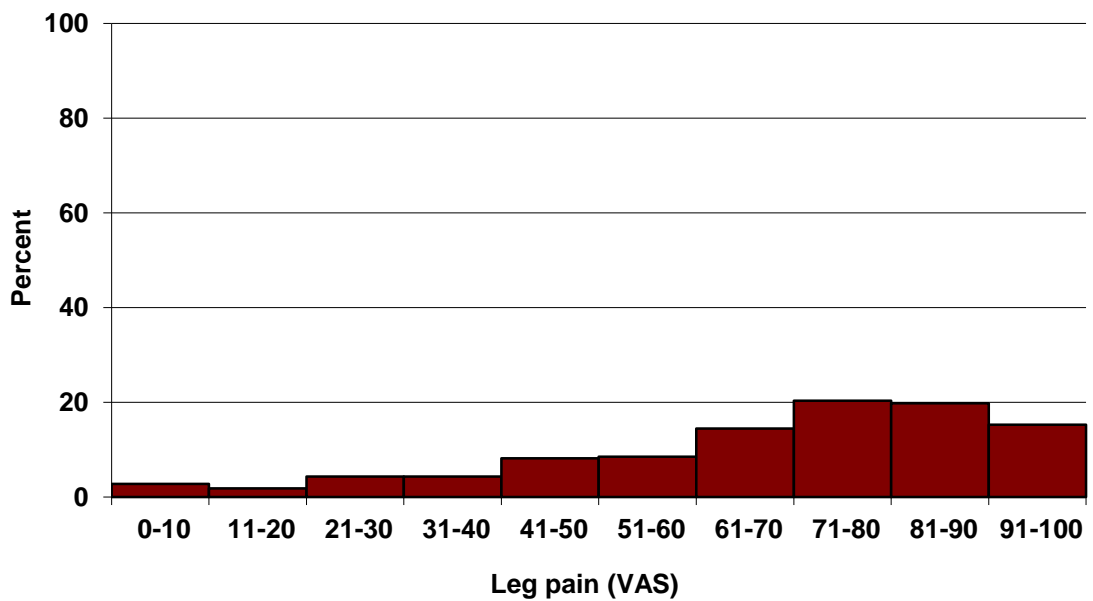


Fig. 4. Leg pain on the visual analog scale preoperatively in patients with disc herniation (%).

Regular analgesic use was reported by 63% of patients, intermittent use by 25%, while 12% reported that they did not take any form of analgesics.



Walking distance was estimated at less than 100 m by 32% of patients, 100–500 m by 22% of patients, 500 m–1 km for 15% of patients and more than 1 km by 32% of patients.

#### *Surgical data*

Conventional disc surgery was carried out in 43% of cases and microscopic disc surgery in 42%. The remaining procedures consisted of various combinations mainly involving decompressive surgery for patients with disc herniation with spinal stenosis. Mean length of stay in days, i.e., time from admission through discharge, was 2.41 (0-30).

### **Central spinal stenosis**

#### *Demographic data*

A total of 3838 patients were registered for operations for central spinal stenosis in 2012. The patients included 46% men and 54% women. Mean age was 68 (21–96) years. Figure 5 shows the age distribution.

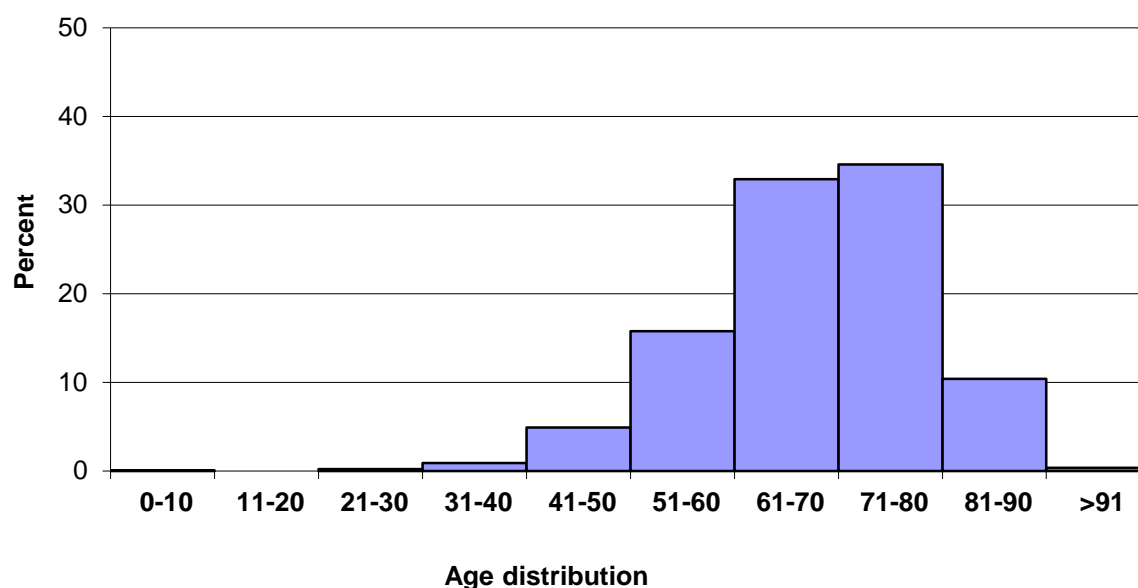


Fig. 5. Distribution by age, central spinal stenosis, n = 3838 patients.

The proportion of smokers was 9%. For 80% of patients this operation was their first surgery, while 20% had been previously operated one to three times.

Preoperative duration of back pain was as follows: 6% had no back pain, 2% had a history of back pain for less than 3 months, 21% 3-12 months, 22% 1-2 years and 51% more than 2 years. Regarding leg pain, 3% of patients had no leg pain, 3% of patients with central spinal stenosis reported leg problems for less than 3 months, 30% for 3-12 months, 27% for 1-2 years and 37% reported problems for more than 2 years.

Mean back pain on the VAS in the group was 58 (0-100) and mean leg pain/sciatica (VAS) 64 (0–100). Figures 6 and 7 present the distribution of reported VAS pain scores.

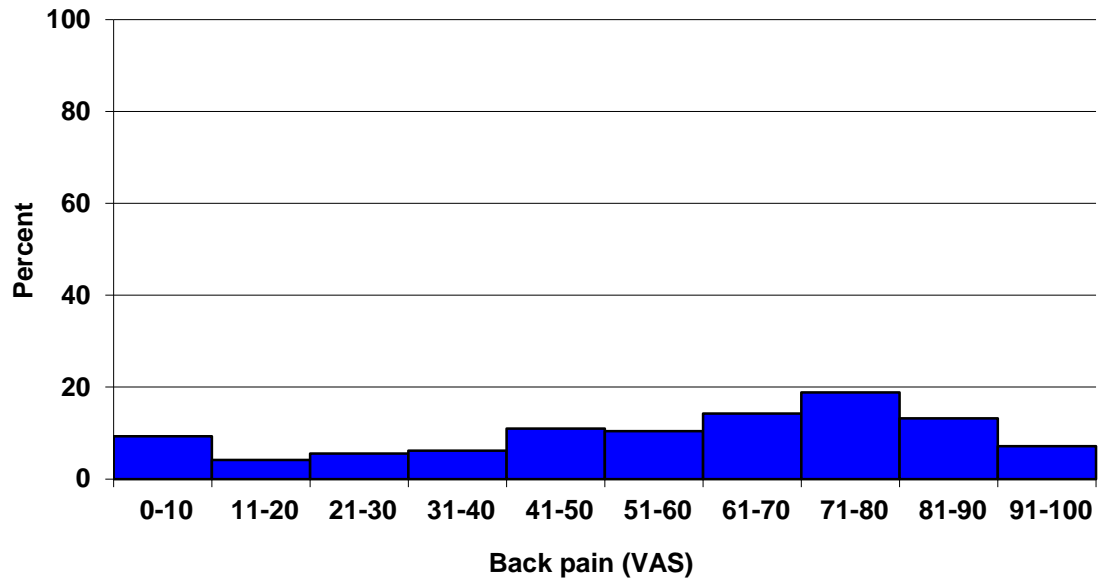


Fig. 6. Back pain on the visual analog scale preoperatively in patients with central spinal stenosis (%).

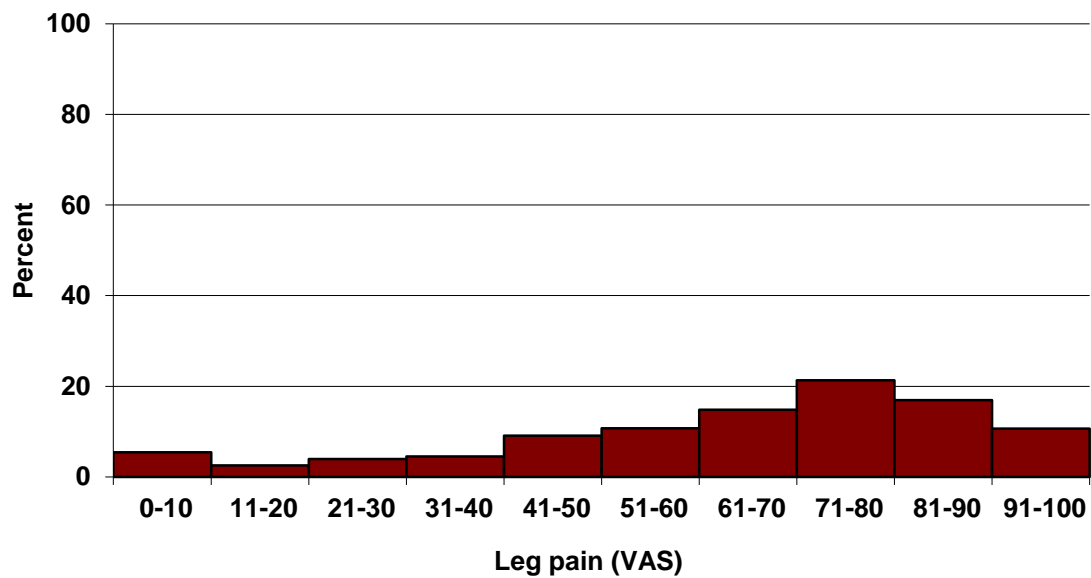


Fig. 7. Leg pain on the visual analog scale preoperatively in patients with central spinal stenosis (%).

Among patients with central spinal stenosis, 55% reported regular use of analgesics, 29% reported intermittent use and 15% reported that they did not take any analgesic medication.

Walking distance was estimated at less than 100 m by 39% of patients, 100–500 m by 31% of patients, 500 m–1 km for 15% of patients and more than 1 km by 15% of patients.

### *Surgical data*

In 77% of cases only decompressive surgery was carried out, in 57% conventional surgery and in 20% of cases microscopic surgery. Decompression combined with posterior instrumented fusion was carried out in 17% of cases, decompression + posterior non-instrumented fusion in 3%, Decompression + TLIF in 1% and other procedures in 2%.

Mean length of stay in days was 3.74 (0-30).

## **Lateral spinal stenosis**

### *Demographic data*

During the year 583 patients were operated for lateral spinal stenosis. The patients included 46% men and 54% women. The group included 11% smokers.

Mean age was 62 (21–88) years and Figure 8 shows the age distribution.

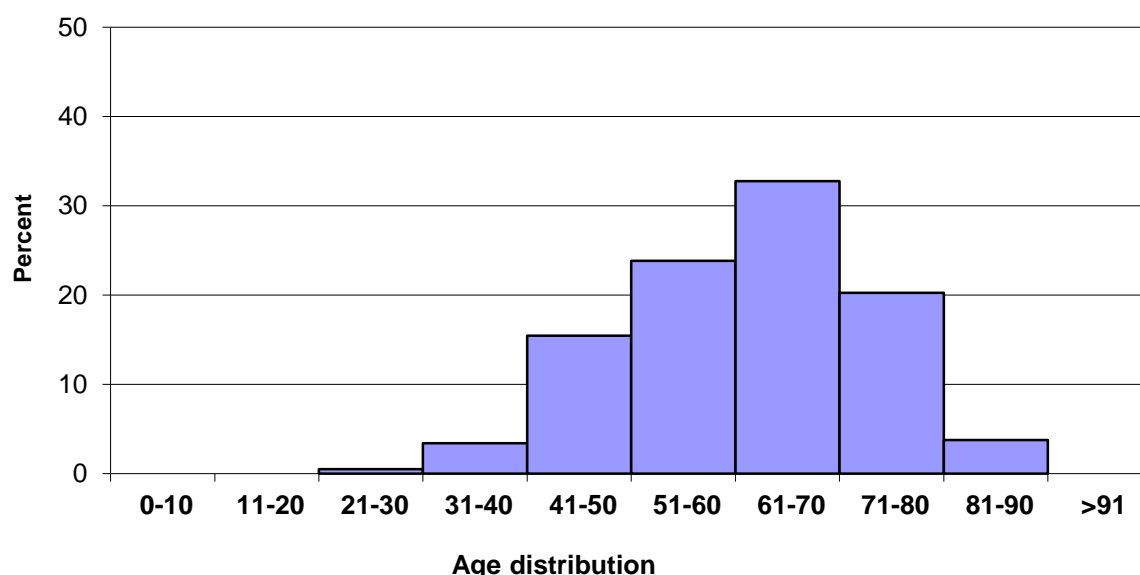


Fig. 8. Distribution by age, lateral spinal stenosis, n = 583.

The majority of patients with lateral spinal stenosis, 72%, had no previous spine surgery while 28% had been operated on one or more times before the current procedure.

Preoperative duration of back pain was as follows: 5% had no back pain, 2% had a history of less than 3 months of back pain, 24% 3-12 months, 22% 1-2 years and 47% more than 2 years. Regarding leg pain, 1% of patients with lateral spinal stenosis had no leg pain, 2% of patients reported leg problems for less than 3 months, 30% for 3-12 months, 31% for 1-2 years and 36% reported problems for more than 2 years. Mean back pain on the VAS in the group was 56 (0–100) and mean leg pain (VAS) 68 (0–100). Figures 9 and 10 present the distribution of reported VAS pain scores.

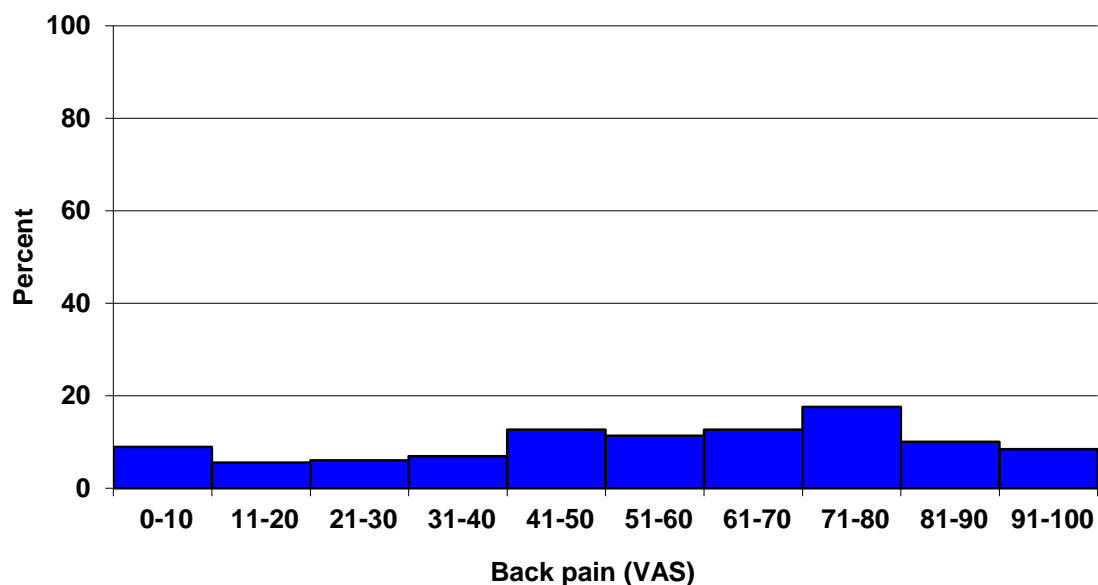


Fig. 9. Back pain on the visual analog scale preoperatively in patients with lateral spinal stenosis (%).

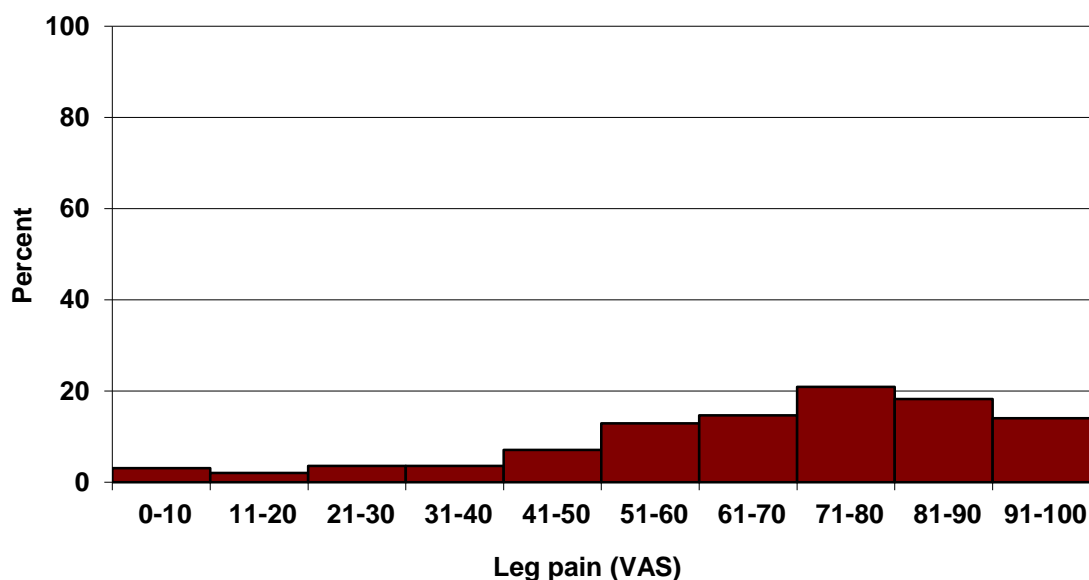


Fig. 10. Leg pain on the visual analog scale preoperatively in patients with lateral spinal stenosis (%).

Regular analgesic use was reported by 58% of patients, intermittent use by 30%, and 13% reported they did not take any analgesics. The majority of patients reported limited walking ability, 30% reported they were able to walk less than 100 m, 26% were able to walk 100–500 m, 17% 500 m–1 km and 28% had a walking distance of more than 1 km.

### *Surgical data*

Decompression surgery was the type of procedure in the majority of cases, 70% including 43% conventional, 28% microscopic decompression, 19% had decompression + posterior instrumented fusion and 4% decompression + TLIF. Mean length of stay (total) was 2.96 (0-24).

## **Spondylolisthesis**

### *Demographic data*

A total of 255 patients, including 45% men and 55% women, were reported for 2013. This group included 7% smokers. Mean age was 50 (12–86) years and figure 11 shows the age distribution.

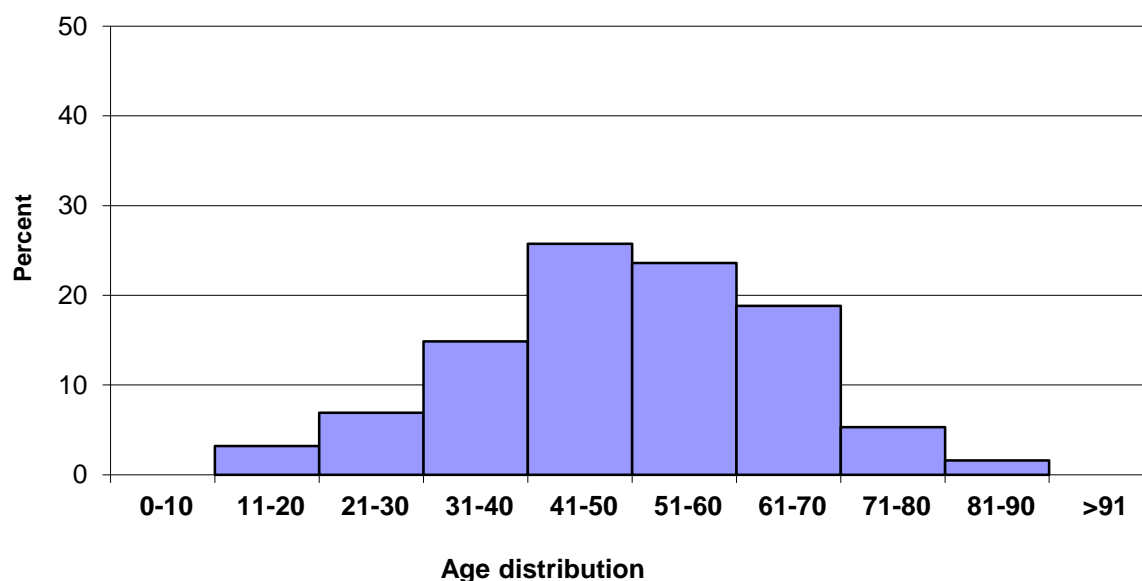


Fig. 11. Distribution by age, spondylolisthesis, n = 377 patients.

For 91% of patients the current procedure was the first time they had surgery, while the remainder had one or two previous procedures.

Preoperative duration of back pain was as follows: 3% had no back pain, 1% had a history of back pain for less than 3 months, 15% 3-12 months, 18% 1-2 years and 63% more than 2 years. Regarding leg pain, 9% of patients with spondylolisthesis had no leg pain, 2% of patients with spondylolisthesis reported leg problems for less than 3 months, 23% 3-12 months, 23% 1-2 years and 43% reported problems for more than 2 years.

Patients reported that preoperative lumbar pain on the VAS was 59 (0–100) and preoperative leg pain was 55 (0–100). Figures 12 and 13 present the distribution of pain on the VAS.

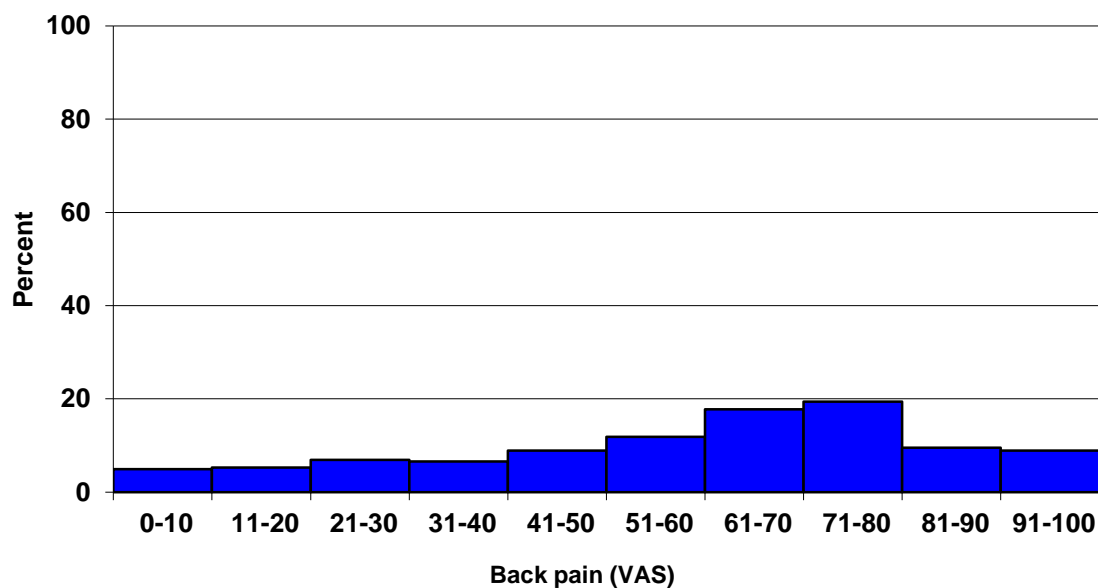


Fig. 12. Back pain on the visual analog scale preoperatively in patients with spondylolisthesis (%).

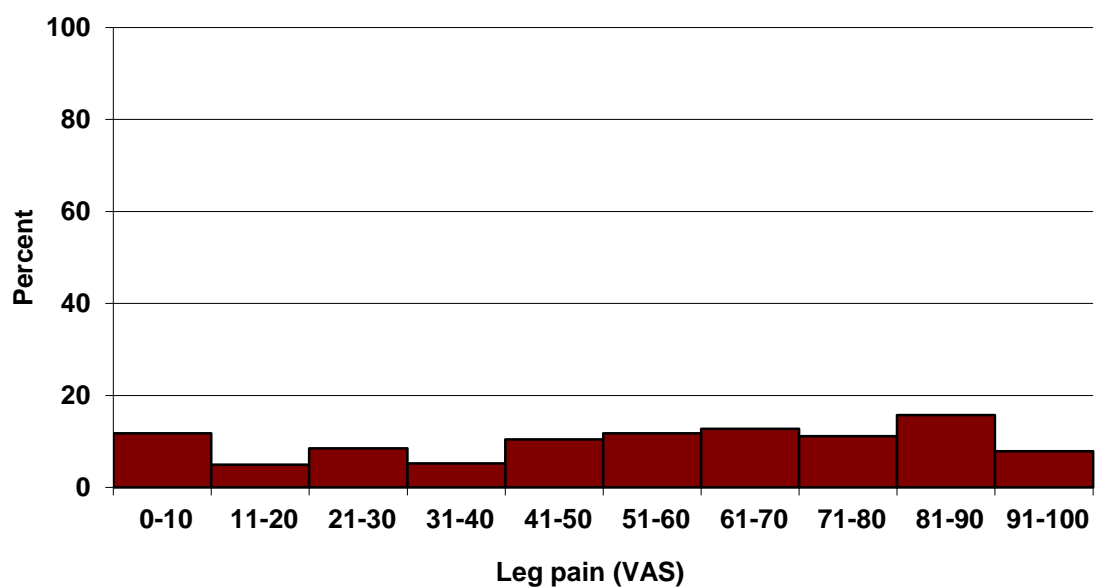


Fig. 13. Leg pain on the visual analog scale in patients with spondylolisthesis (%).

Regular analgesic use was reported by 44% of patients, intermittent use by 36% of patients while 19% did not use analgesics.

Walking distance was estimated at less than 100 m by 20% of patients, 100–500 m by 27% of patients, 500 m–1 km for 17% of patients and more than 1 km by 37% of patients.

#### *Surgical data*

Patients with spondylolisthesis had a variety of different procedures. They are presented in descending order of frequency: Decompression + instrumented fusion 54%, posterior instrumented fusion 16%, PLIF with or without foreign implant 13%, Decompression + TLIF 4%, decompression + PLIF 3%, posterior non-instrumented fusion 2%, decompression + non-instrumented fusion 1%, and decompressive interventions in the remaining cases.

Mean length of stay in days was 4.65 (1-12).

### **DDD (disc degenerative disorder)/segmental pain**

#### *Demographic data*

A total of 461 patients were registered for surgical intervention for DDD in 2013, including 44% men and 56% women. The proportion of smokers was 9%. Mean age was 46 (17–87) years and figure 14 shows the age distribution.

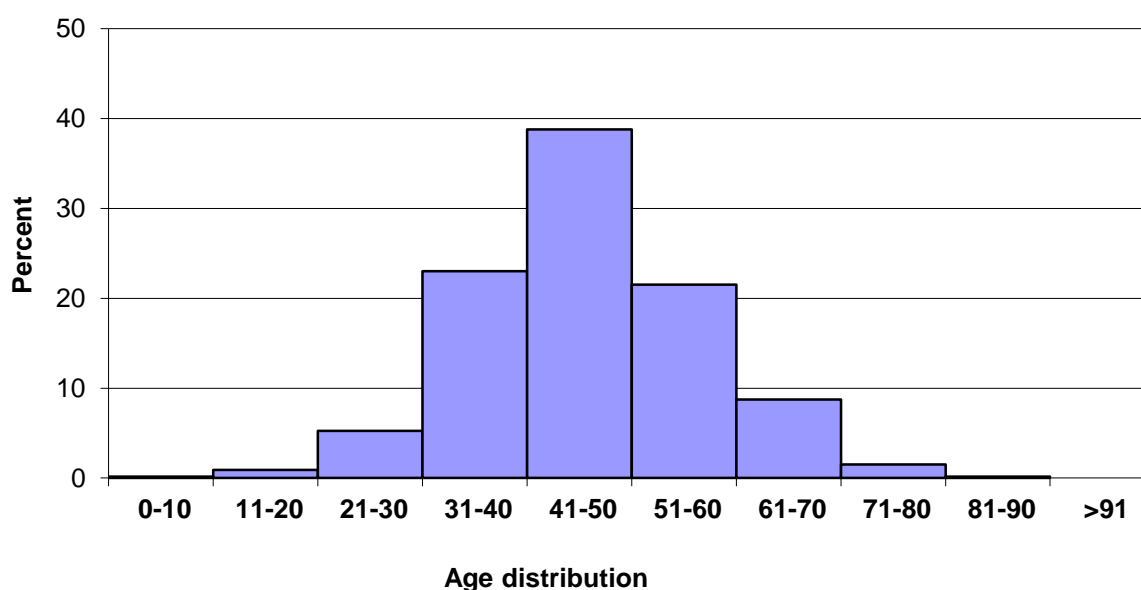


Fig. 14. Distribution by age, DDD, N = 665 patients.

In this group of patients, 64% had surgery for the first time, while 36% had been operated one or more times previously.

Preoperative duration of back pain in patients with DDD was as follows: 10% 3-12 months, 21% 1-2 years and 69% had a history of back pain for more than 2 years. Regarding leg pain, 19% of patients with DDD had no leg pain, 2% reported leg problems for less than 3 months, 15% 3-12 months, 21% 1-2 years and 43% reported problems for more than 2 years.

Estimation on the VAS scale for back pain showed a mean of 65 (0–100) and leg pain, 42 (0-100). Figures 15 and 16 present the distribution of pain on the VAS.

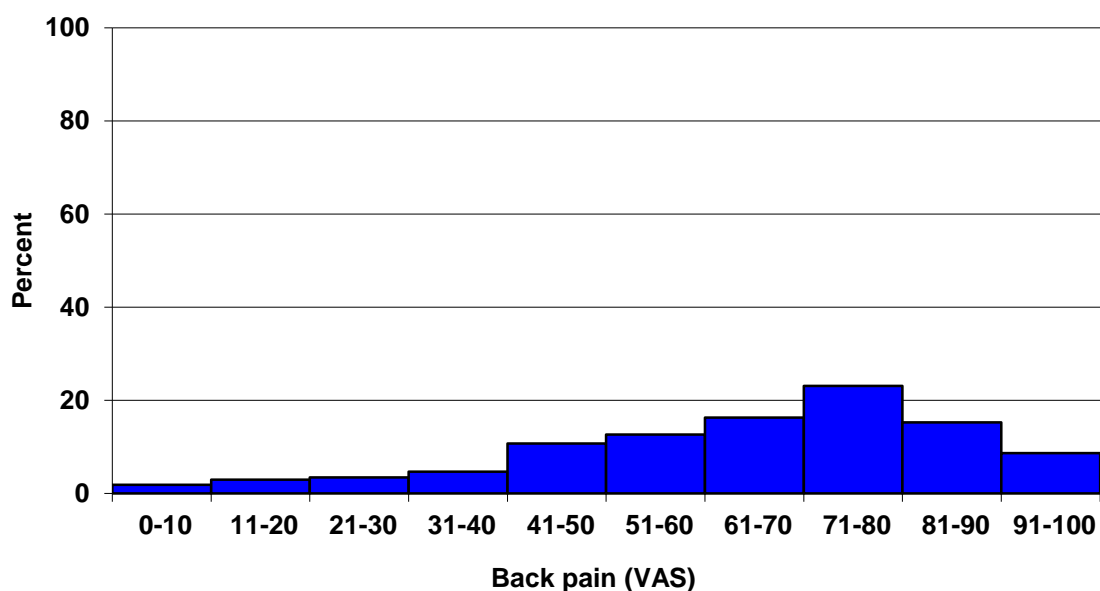


Fig. 15. Back pain on the visual analog scale preoperatively in patients with DDD (%).

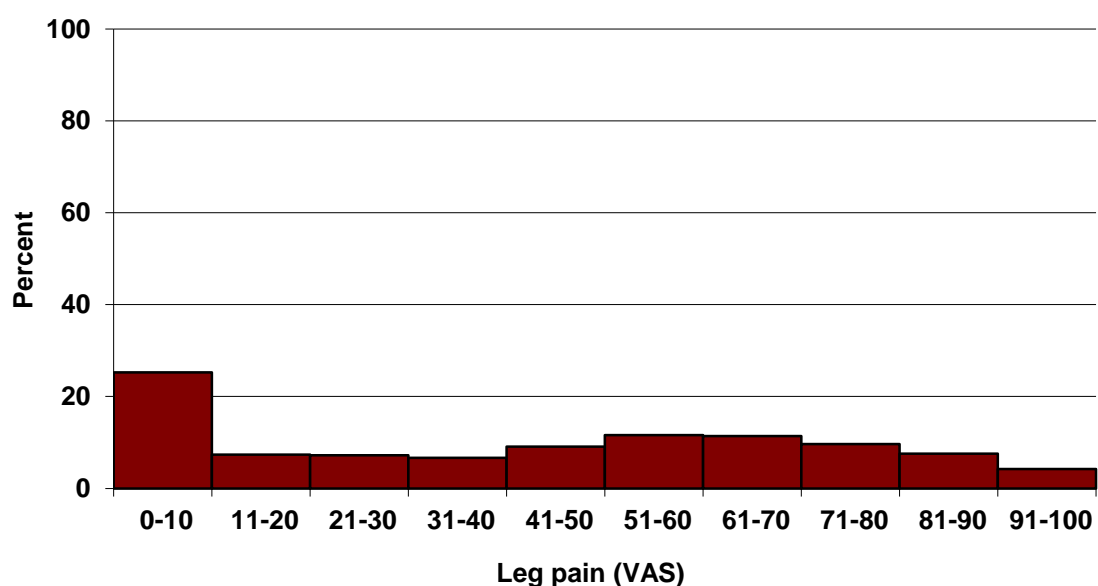


Fig. 16. Leg pain on the visual analog scale preoperatively in patients with DDD (%).



Regular analgesic use was reported by 61% of patients, intermittent use by 30% while 9% never took analgesics.

Walking distance was estimated at less than 100 m by 14% of patients, 100–500 m by 20% of patients, 500 m–1 km for 20% of patients and more than 1 km by 46% of patients.

#### Surgical data

A heterogeneous surgical treatment spectrum was also seen for this diagnosis as follows: Posterior instrumented fusion 30%, PLIF 21%, disc replacement 16%, decompression + posterior instrumented fusion 15%, decompression + TLIF 6%, TLIF 4%, decompression + PLIF 3%, ALIF with instrument 2%, posterior non-instrumented fusion 2%, decompression + posterior non-instrumented fusion 1%, as well as a small quantity of other interventions. Mean length of stay was 4.66 (1-14).

## II. 1-year follow-up of lumbar spine procedures in Sweden in 2013

A total of 8120 patients were operated in 2012 and 5649 (70%) completed 1-year of follow-up. The distribution is as follows: disc herniation 1540, central spinal stenosis 2760, lateral spinal stenosis 407, spondylolisthesis 205 and DDD 461. Patients with “other operations” (226) are not presented in the following results.

### Disc herniation

Of 1540 patients who were operated for lumbar disc herniation and completed 1-year follow-up, 54% were men and 46% women, with a mean age of 45 (14–90) years.

Mean preoperative VAS for back pain was 50, compared with 26 postoperatively. The corresponding figures for leg pain were 68 preoperatively, and 23 postoperatively. Figures 17 and 18 show preoperative and postoperative estimates of VAS for back and leg pain, respectively.

Surgical interventions: 47% conventional herniated disc surgery, 41% microscopic disc surgery, 7% decompression surgery alone and 5% other procedures.

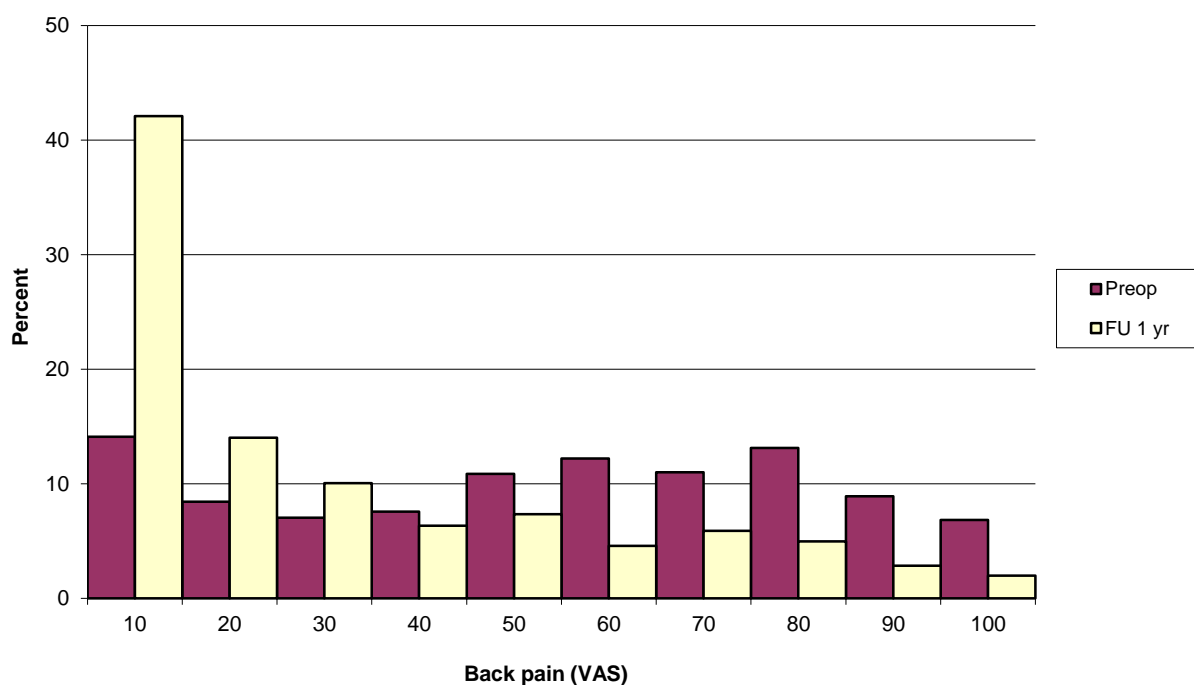


Fig. 17. Back pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for lumbar disc herniation in 2012 (%).

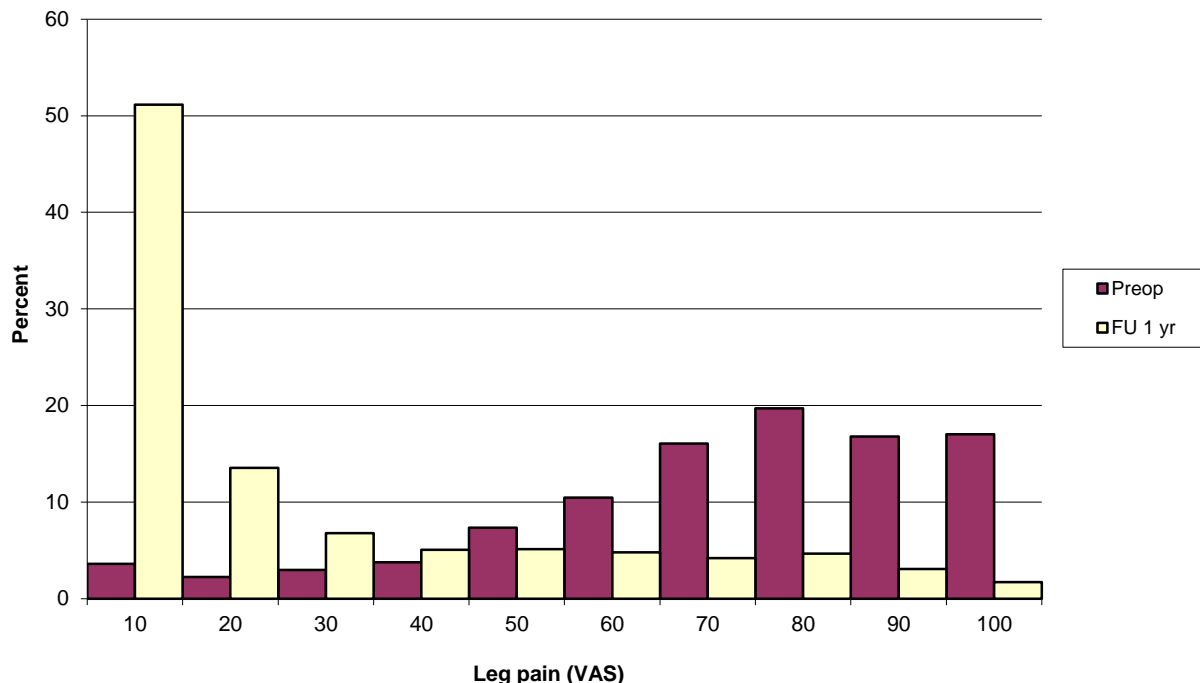


Fig. 18. Leg pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for lumbar disc herniation in 2012 (%).

Perceived improvement relating to back pain: Completely pain-free 21%, significantly improved 45%, somewhat improved 15%, unchanged 8% and deteriorated 5%; 7% did not have preoperative back pain.

Perceived improvement relating to leg pain: Completely pain-free 34%, significantly improved 38%, somewhat improved 14%, unchanged 6% and deteriorated 5%; 3% had no preoperative leg pain.

Overall patient satisfaction with surgical outcome: 75% were satisfied, 17% uncertain and 9% dissatisfied.

Use of analgesics one year postoperatively: Regular 19%, intermittent 31%, none 51%.

Ability to walk one year postoperatively: < 100 m 5%, 100-500 m 9%, 500 m-1 km 10%, >1 km 77%, a substantial improvement compared with preoperatively.

Figure 19 shows preoperative and one-year postoperative status regarding health-related quality of life as measured by the SF-36. Significant improvement is seen in all domains except “General health.”

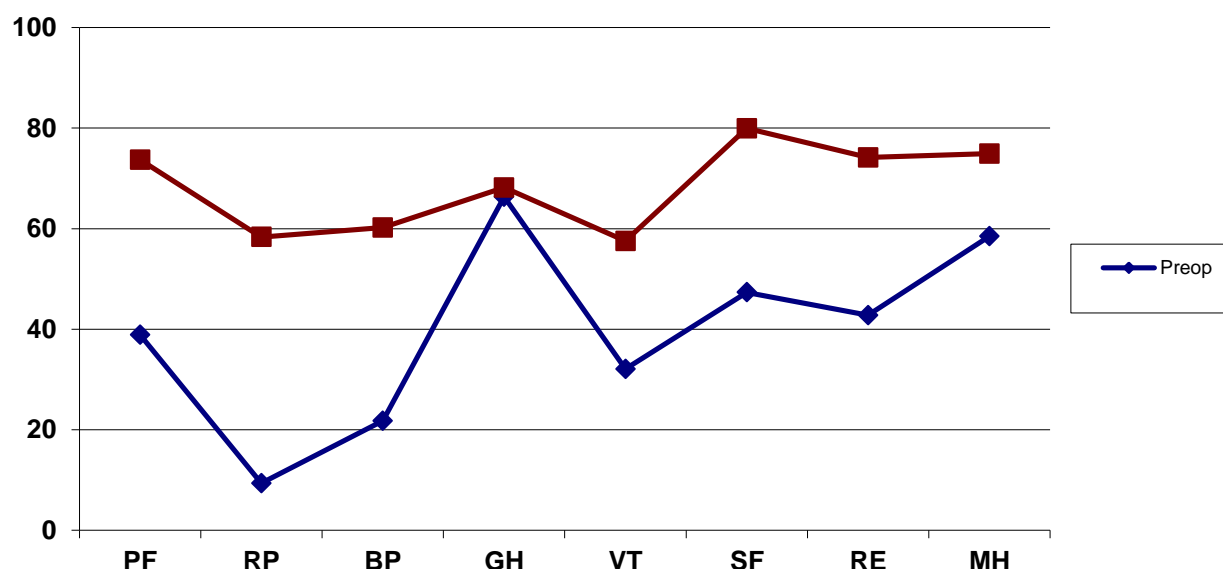


Fig. 19. SF-36 preoperatively and 1 year postoperatively for patients operated for lumbar disc herniation in 2012.

The results of the EQ-5D-analysis are presented both as EQ-5D 5, i.e. the answers to the 5 questions included in the questionnaire, and also on the VAS scale, the “thermometer.” The results for lumbar disc herniation are as follows: Mean figure for EQ-5D 5 preoperatively: 0.27, 1 year postoperatively 0.70. Mean VAS preoperatively (max 100): 44, 1 year postoperatively 70.

### Central spinal stenosis

This group includes 2760 patients with a mean age of 68 (19–97) years.

Gender distribution: 46% men, 54% women.

Surgical intervention: Decompression alone 76%, decompression + posterior instrumented fusion 18%, decompression + posterior non-instrumented fusion 2%, decompression + PLIF 1%, decompression + TLIF 1% and other interventions 2%.

Mean preoperative VAS for back pain was 58, compared with 35 one year postoperatively. The corresponding figures for leg pain were 63 and 35, respectively. Figures 20 and 21 show pre- and postoperative VAS for back and leg pain, respectively.

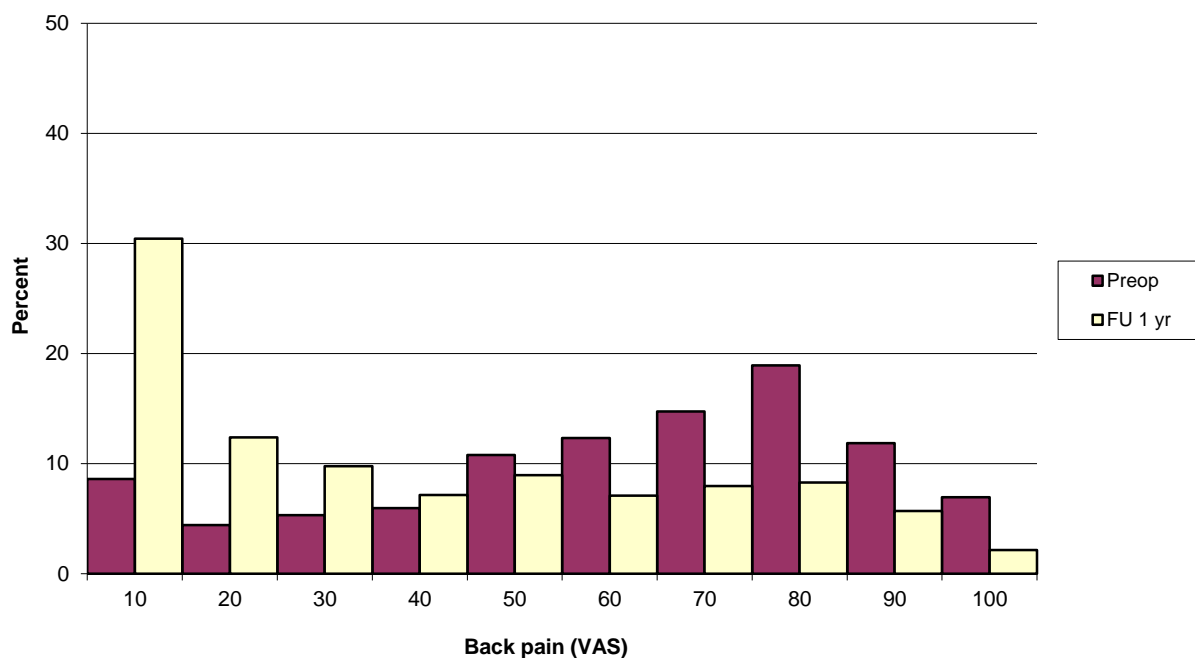


Fig. 20. Back pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for lumbar central spinal stenosis in 2012 (%).

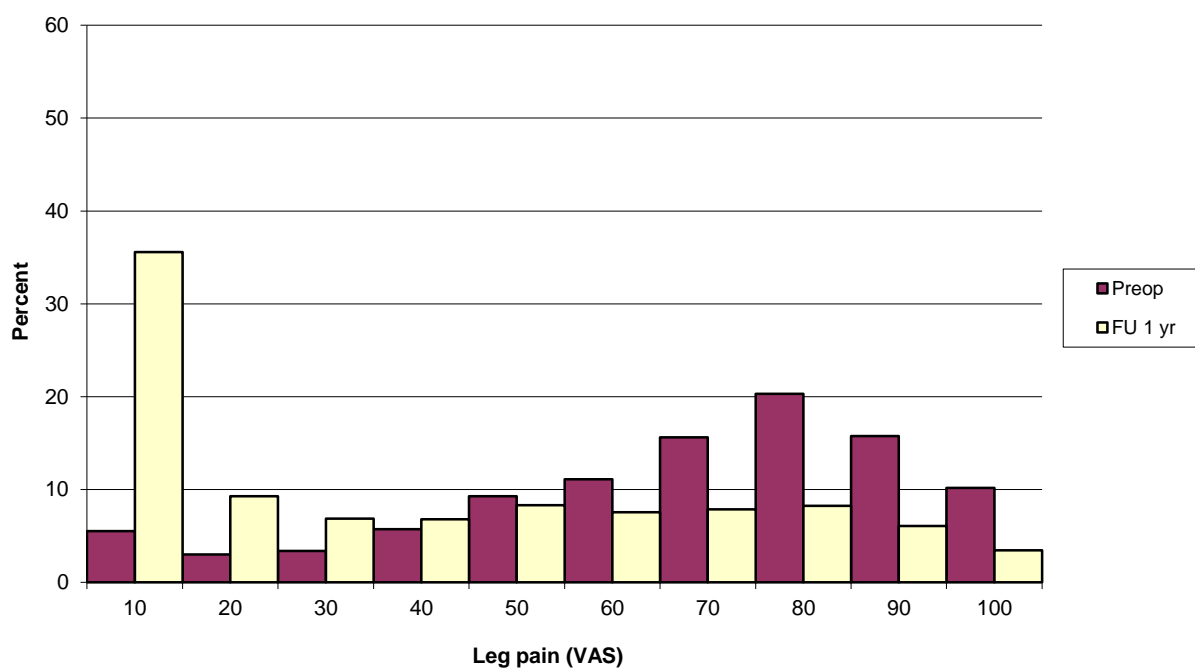


Fig. 21. Leg pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for lumbar central spinal stenosis in 2011 (%).

One year postoperatively, 15% of patients felt they were completely pain-free, 36% significantly improved, 20% somewhat improved, 12% unchanged and 9% deteriorated with regard to back pain; 8%

had no preoperative back pain. The corresponding figures for leg pain were 25% completely pain-free, 28% significantly improved, 19% somewhat improved, 13% unchanged and 11% deteriorated; 6% reported no preoperative leg pain.

Overall patient satisfaction with the procedure was as follows: 64% were satisfied, 23% uncertain and 13% dissatisfied with the surgical outcome.

Analgesic use one year postoperatively: Regular 31%, intermittent 33%, none 37%.

Ability to walk one year postoperatively: < 100 m 20%, 100-500 m 20%, 500 m-1 km 17%, >1 km 44%, a substantial improvement compared with preoperatively.

One year postoperatively patients in the central spinal stenosis category also demonstrated improvement of SF-36 score on all points except “General health”. The improvement was less pronounced than in disc herniation, but was probably similar when adjusted for age; see figure 22.

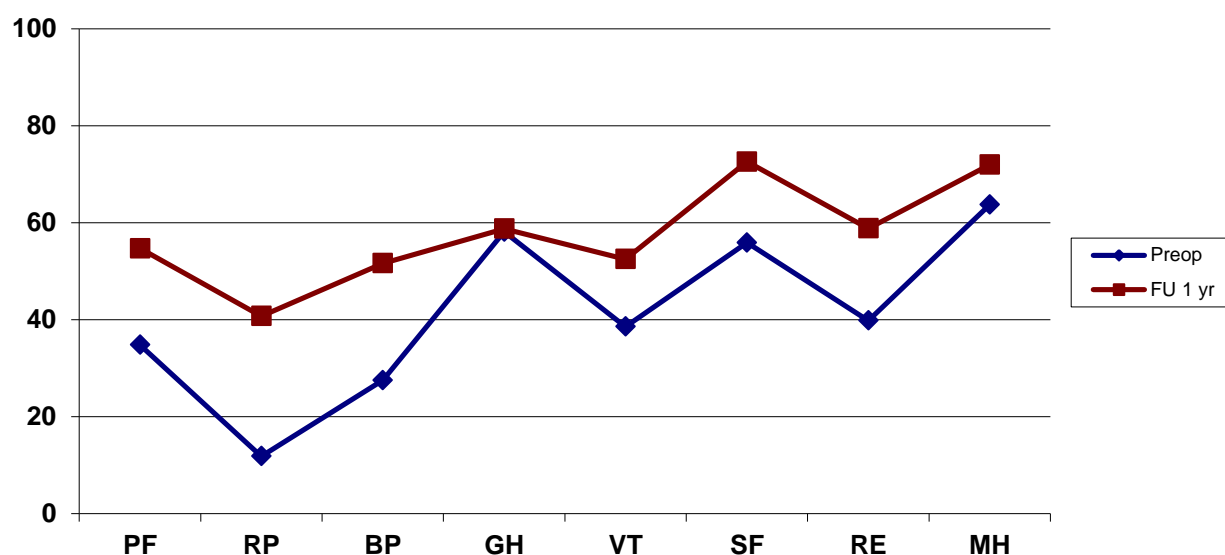


Fig. 22. SF-36 preoperatively and 1 year postoperatively for patients operated for lumbar central spinal stenosis 2012.

Mean figure for EQ-5D 5 preoperatively: 0.36, 1 year postoperatively 0.62. Mean VAS preoperatively (max 100): 48, 1 year postoperatively 63.

### Lateral spinal stenosis

This patient group included 407 patients with a mean age of 61 (21–92) years. Gender distribution was 48% men and 52% women. Decompression alone was used in 70% of cases, decompression + posterior fusion in 21% (20% instrumented and 1% non-instrumented), decompression + TLIF 3%, decompression + PLIF 2% and other procedures 4%.

Mean preoperative VAS for back pain was 56, compared with 35 one year postoperatively. The corresponding figures for leg pain were 66 and 37, respectively. Figures 23 and 24 show the distribution of pre- and postoperative VAS for back and leg pain.

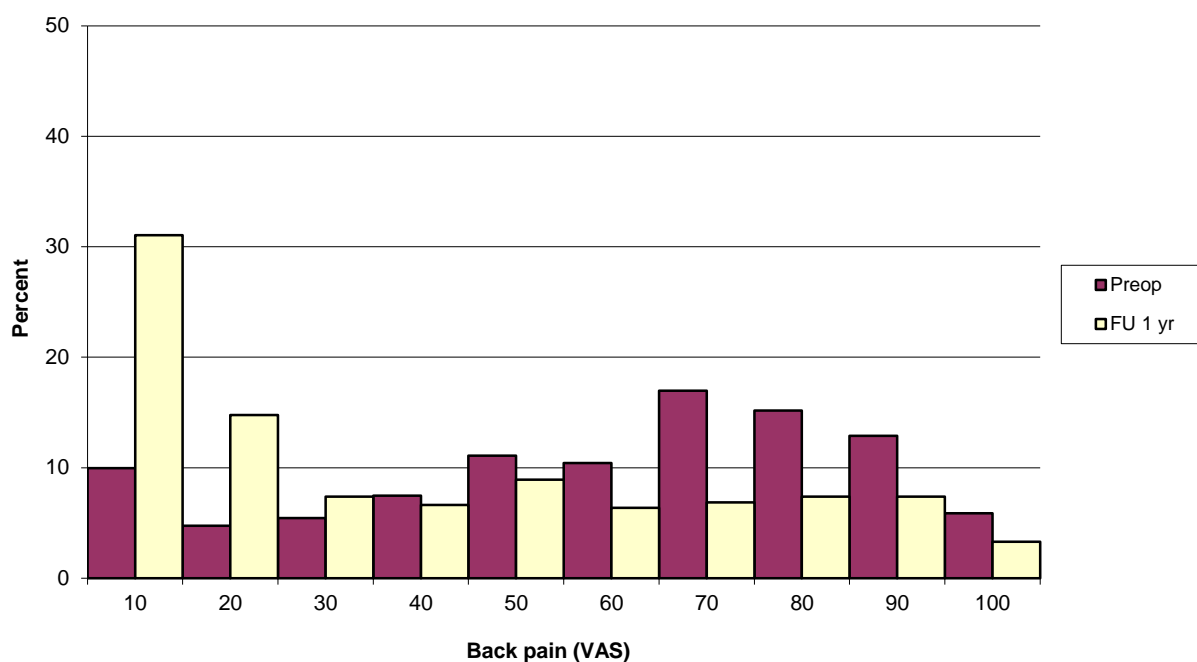


Fig. 23. Back pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for lumbar lateral spinal stenosis in 2012 (%).

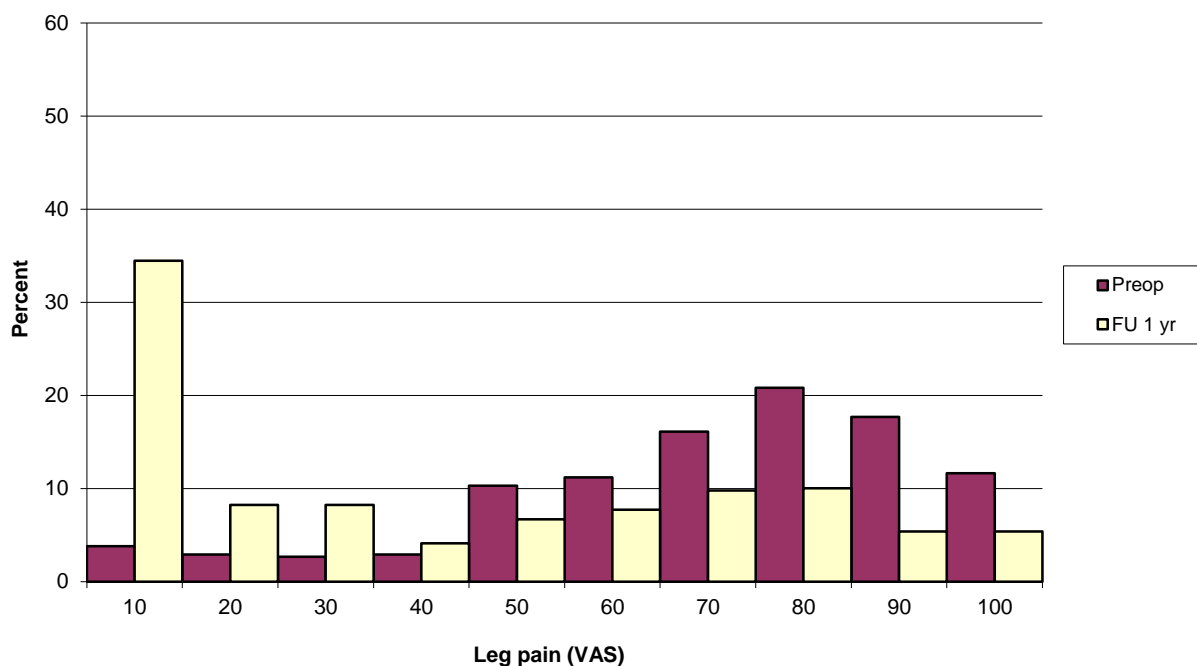


Fig. 24. Leg pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for lumbar lateral spinal stenosis in 2012 (%).

One year postoperatively 13% of patients were completely pain-free, 34% significantly improved, 18% somewhat improved, 15% unchanged and 13% deteriorated with regard to back pain; 7% had no preoperative back pain. The corresponding figures for leg pain were 23% completely pain-free, 28% significantly improved, 16% somewhat improved, 15% unchanged and 13% deteriorated; 5% had no previous leg pain.

Estimated patient satisfaction with surgical outcome: 62% satisfied, 20% uncertain and 18% dissatisfied.

Medication use 1 year postoperatively: 30% regularly, 34% intermittently and 36% took no medication.

Ability to walk one year postoperatively: walking distance of < 100 m 14%, 100–500 m 19%, 500 m–1 km 16% and >1 km 52%.

The patient group operated for lateral spinal stenosis also showed improvement in SF-36 scores, though somewhat less pronounced; see figure 25.



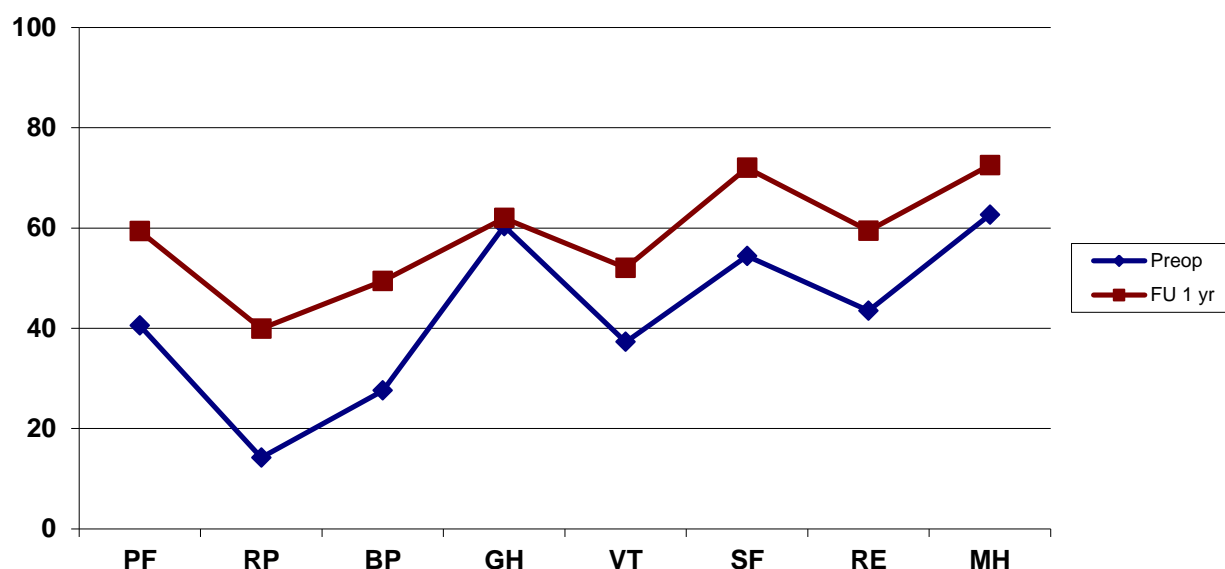


Fig. 25. SF-36 preoperatively and 1 year postoperatively for patients operated for lumbar lateral spinal stenosis in 2012.

Mean figure for EQ-5D 5 preoperatively: 0.34, 1 year postoperatively 0.61. Mean VAS preoperatively (max 100): 48, 1 year postoperatively 64.

### Isthmic spondylolisthesis

In all, 363 patients operated during the period for spondylolisthesis completed 1-year follow-up. Mean age was 49 (12–92) years; gender distribution 46% men and 54% women.

Among the patients with spondylolisthesis, 57% were operated with decompression and posterior instrumented fusion, 16% with posterior instrumented fusion alone, 11% with PLIF, 4% with decompression + PLIF, 3% with decompression + posterior non-instrumented fusion, 2% with decompression alone, 2% with decompression + TLIF, 1% with posterior non-instrumented fusion, and 4% other procedures.

Mean preoperative VAS for back pain was 62, compared with 31 one year postoperatively. The corresponding figures for leg pain were 56 and 29, respectively. Figures 26 and 27 show preoperative and postoperative VAS pain scores relating to back and legs.

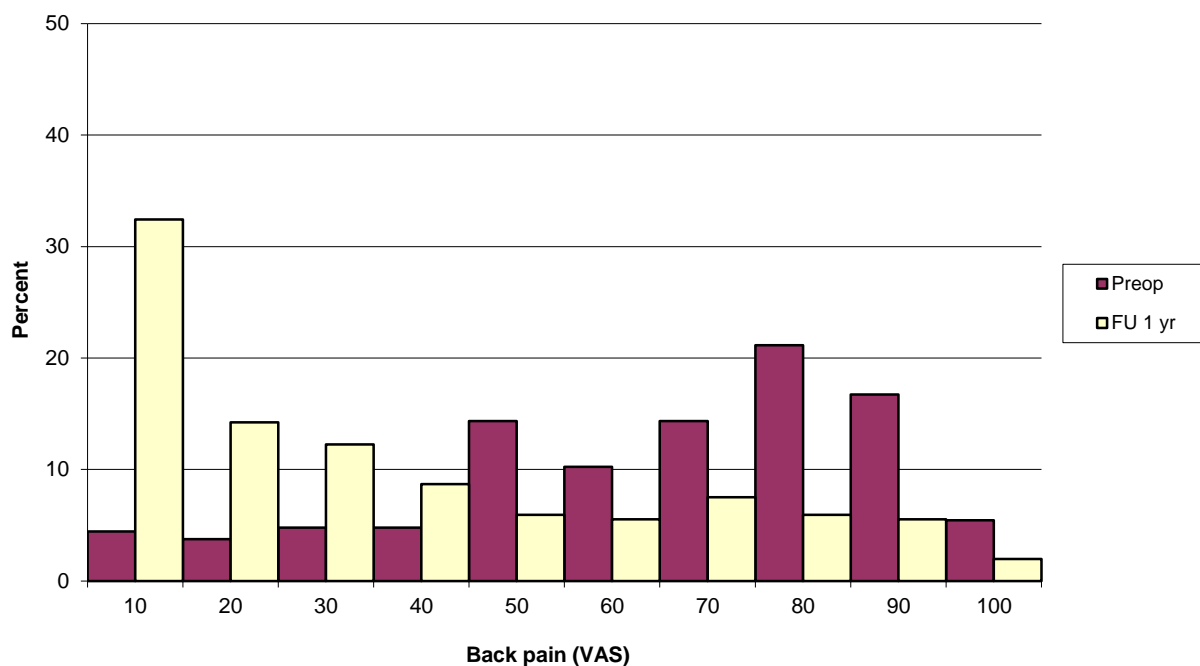


Fig. 26. Back pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for spondylolisthesis in 2012 (%).

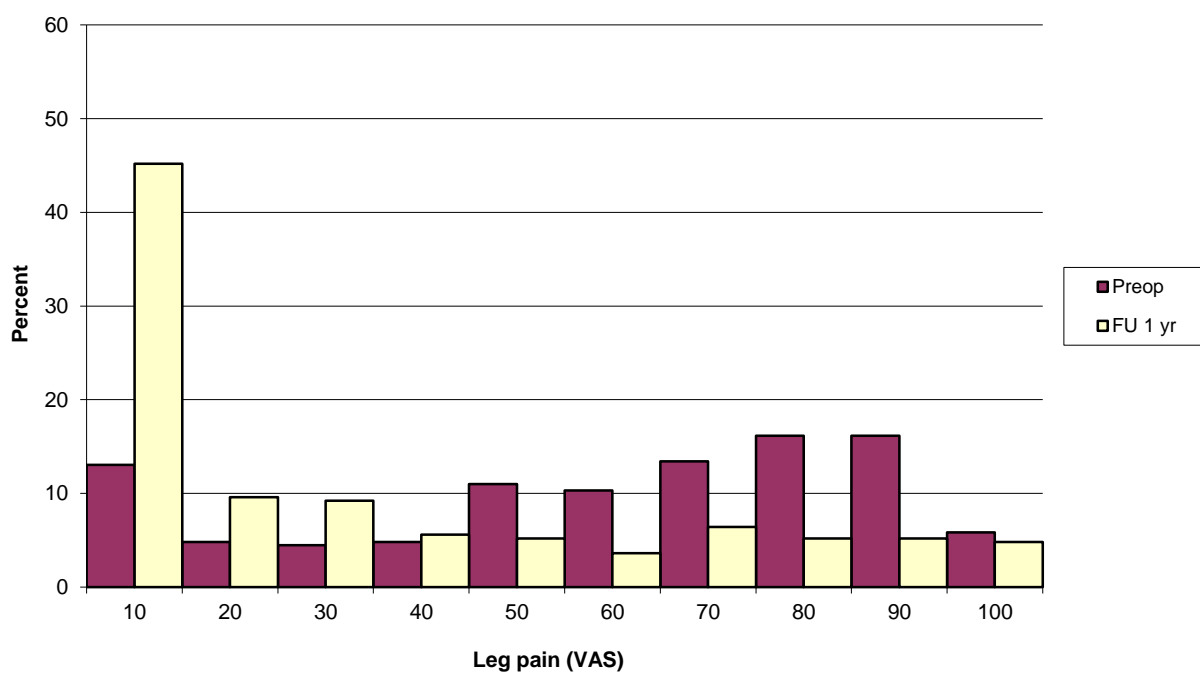


Fig. 27. Leg pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for spondylolisthesis in 2012 (%).

At the 1-year follow-up, 14% of patients felt they were completely pain-free, 42% significantly improved, 22% somewhat improved, 7% unchanged and 11% deteriorated with regard to back pain; 5%

did not have back pain previously. The corresponding figures for leg pain were 29% completely pain-free, 28% significantly improved, 17% somewhat improved, 8% unchanged and 10% deteriorated; 8% reported no preoperative leg pain.

Overall patient satisfaction with the operation: 68% satisfied, 23% uncertain and 9% dissatisfied.

Regular intake of analgesics one year postoperatively was reported by 30%, intermittent use by 28% and no intake of analgesics at all by 42%.

Ability to walk one year postoperatively: < 100 m 6%, 100-500 m 10%, 500 m-1 km 14%, >1 km 69%, a substantial improvement compared with preoperatively.

Spondylolisthesis patients showed good improvement in their SF-36 scores one year postoperatively compared with preoperatively; see figure 28.

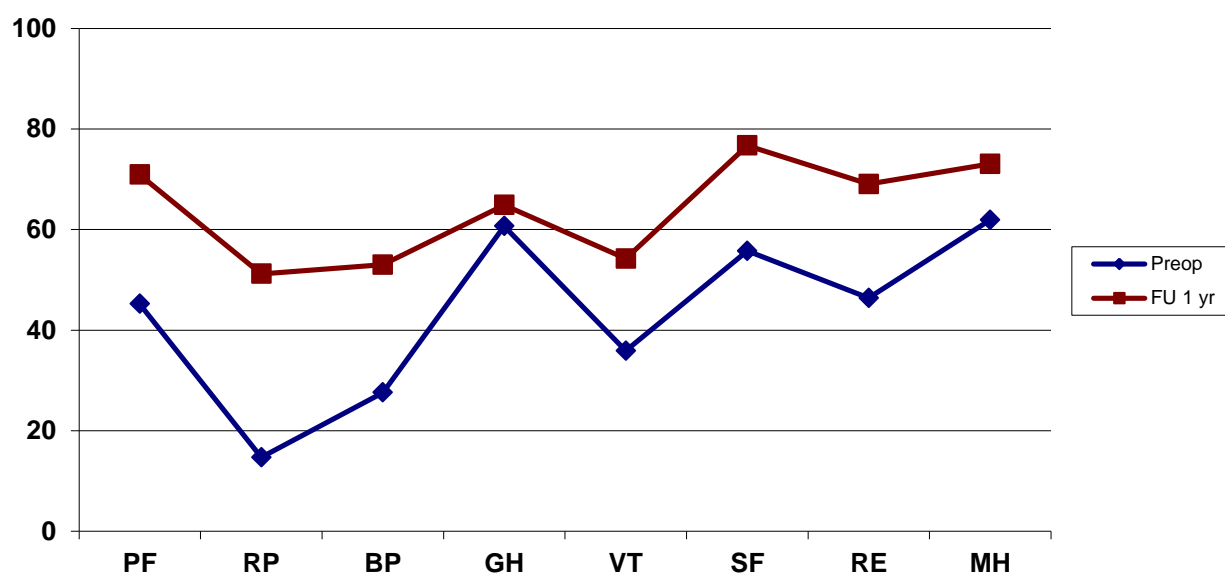


Fig. 28. SF-36 preoperatively and 1 year postoperatively for patients operated for spondylolisthesis in 2012.

Mean EQ-5D score preoperatively: 0.33, 1 year postoperatively 0.65. Mean VAS preoperatively (max 100): 50, 1 year postoperatively 67.

### **DDD (disc degenerative disorder)/segmental pain**

In all, 1-year follow-up was completed by 618 patients operated during the period. Mean age was 47 (20–81) years, gender distribution 45% men and 55% women.

In 33% of cases patients with DDD were operated with posterior instrumented fusion, in 20% with PLIF, in 16% with disc replacement, in 12% with decompression + posterior instrumented fusion, in 5% with

decompression + TLIF, in 3% with TLIF, in 3% with decompression + PLIF, in 1% with posterior non-instrumented fusion and in 7% with other procedures.

Mean preoperative VAS for back pain was 65, compared with 31 one year postoperatively. The corresponding figures for leg pain were 43 and 28, respectively. Figures 29 and 30 show pre- and postoperative VAS for back and leg pain.

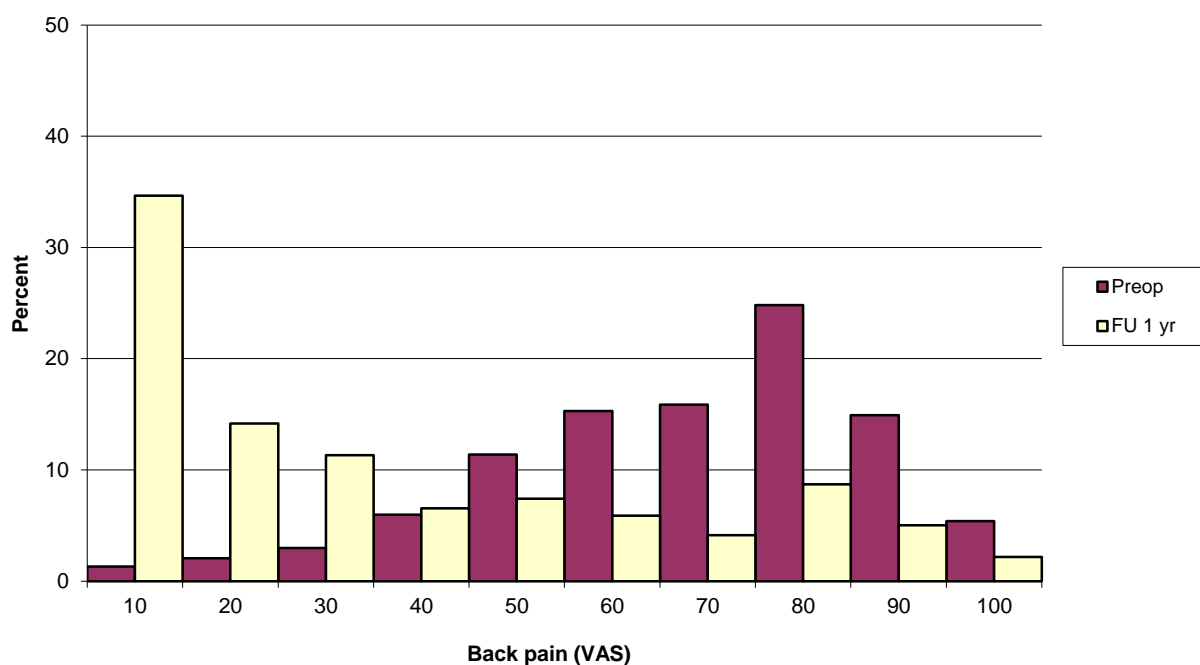


Fig. 29. Back pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for DDD in 2012 (%).

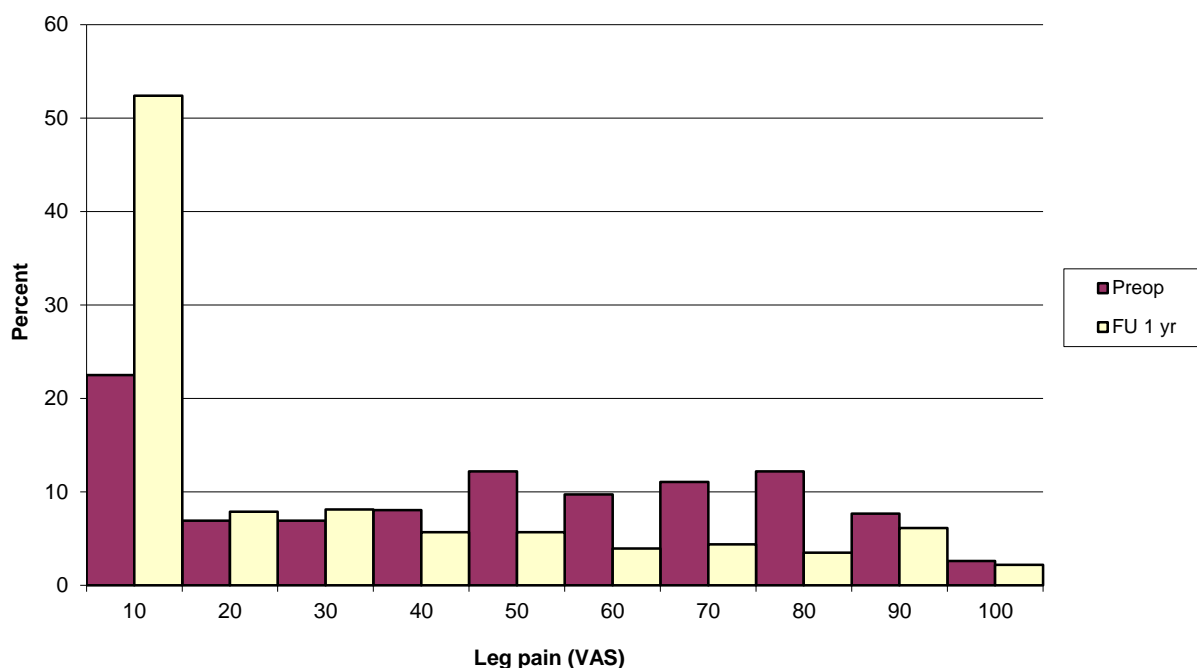


Fig. 30. Leg pain on the visual analog scale preoperatively and 1 year postoperatively in patients operated for DDD in 2012 (%).

One year postoperatively, patients operated for DDD perceived back pain as follows: Completely pain-free 17%, significantly improved 49%, somewhat improved 18%, unchanged 7% and deteriorated 8%; 1% did not have back pain previously.

Corresponding figures for leg pain: Completely pain-free 24%, significantly improved 28%, somewhat improved 16%, unchanged 7% and deteriorated 10%; 15% reported no preoperative leg pain.

Regarding patient satisfaction with the operation, 73% were satisfied, 16% uncertain and 12% dissatisfied.

Among these patients, 29% took analgesics regularly one year postoperatively, 29% did so intermittently and 42% reported that they did not use any analgesics.

Ability to walk one year postoperatively: < 100 m 5%, 100-500 m 10%, 500 m-1 km 14%, >1 km 72%, a substantial improvement compared with preoperatively.

Figure 31 presents the pre- and postoperative SF-36 profiles for patients operated for DDD; the profiles are similar to the other diagnoses. Both the physical and mental domains show improvement.

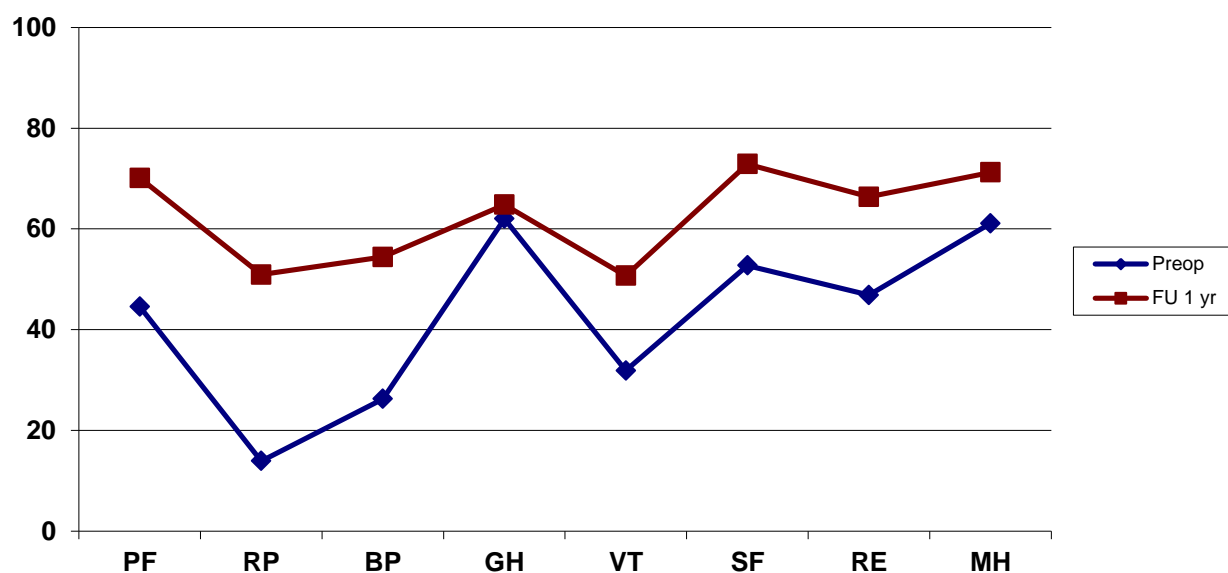


Fig. 31. SF-36 preoperatively and 1 year postoperatively for patients operated for DDD in 2012.

Mean figure for EQ-5D 5 preoperatively: 0.33, 1 year postoperatively 0.63. Mean score on the scale preoperatively (max 100): 44, 1 year postoperatively 67.

### Oswestry Disability index (ODI) pre-operatively and 1 year postoperatively for all diagnoses

Below is a comparison of pre- and postoperative “disability” as measured by the Oswestry index (ODI). All diagnoses show a significant reduction in measured functional limitation; most pronounced is disc herniation; see figure 32. A score of 0-20 is usually regarded as no or insignificant “disability.”

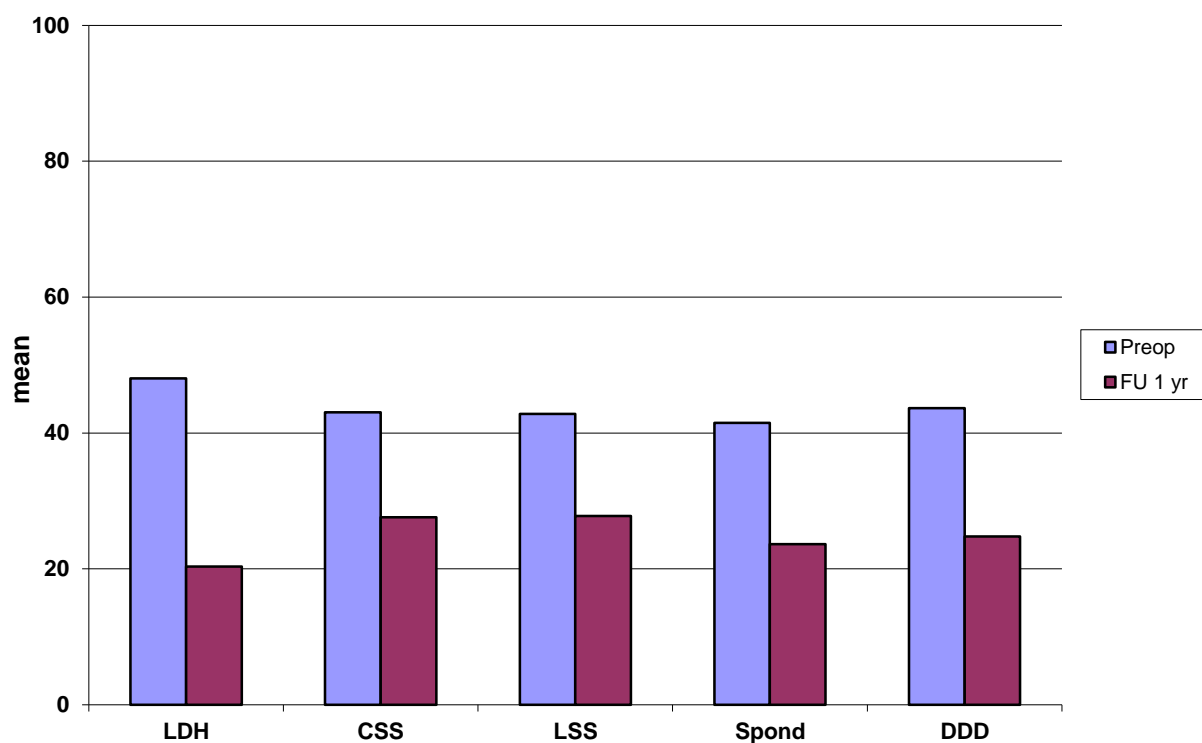


Fig. 32. ODI score before and one year after lumbar spine surgery, related to diagnosis, for patients operated in 2012.

### III. 2-year follow-up of lumbar spine procedures in Sweden in 2013

A total of 4544 patients operated on in 2011 have completed 1-year and 2-year postoperative follow-up protocols. The most common diagnoses are disc herniation, 1147, and central spinal stenosis, 2260 patients. In all, 352 patients had been operated for lateral spinal stenosis, 218 for spondylolisthesis and 386 for DDD. The remaining 181 had other diagnoses. Below is a comparison of several parameters assessed at 1-year and 2-year follow-up. Only patients who responded on all 3 occasions are included. Table 3 presents pain on the VAS, diagnosis-related, over time.

Table 3. Pain on the VAS (mean), diagnosis-related.

	Back			Leg		
	Preop	1 year	2 years	Preop	1 year	2 years
Disc herniation	46	23	24	67	20	23
Central stenosis	57	35	36	63	34	35
Lateral stenosis	55	35	38	67	35	37
Spondylolisthesis	60	27	31	55	24	28
DDD	63	30	33	41	24	26

Tables 4-8 present walking distance after the different procedures preoperatively, as well as 1 and 2 years postoperatively.

Table 4. Walking distance, disc herniation (%)

	Preoperatively	1 year	2 years
< 100 m	32	4	5
100 m–500 m	23	6	6
500 m–1 km	14	10	10
>1 km	31	81	79

Table 5. Walking distance, central spinal stenosis (%)

	Preoperatively	1 year	2 years
< 100 m	37	18	21
100 m–500 m	32	21	19
500 m–1 km	15	14	17
>1 km	15	47	44

Table 6. Walking distance, lateral spinal stenosis (%)

	Preoperatively	1 year postoperatively	2 years postoperatively
< 100 m	26	14	13
100 m–500 m	33	17	16
500 m–1 km	19	18	17
>1 km	22	51	54



Table 7. Walking distance, spondylolisthesis (%)

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
< 100 m	22	5	8
100 m–500 m	24	7	7
500 m–1 km	22	14	12
>1 km	33	73	73

Table 8. Walking distance, DDD (%)

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
< 100 m	15	5	6
100 m–500 m	19	10	10
500 m–1 km	20	14	11
>1 km	46	71	72

Tables 9-13 present consumption of analgesics preoperatively and 1 and 2 years postoperatively, related to diagnosis for surgery.

Table 9. Consumption of analgesics, disc herniation, preoperatively, 1 and 2 years postoperatively (%).

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
Regular	64	15	16
Intermittent	27	30	33
None	9	54	51

Table 10. Consumption of analgesics, central spinal stenosis preoperatively, 1 and 2 years postoperatively (%).

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
Regular	55	29	31
Intermittent	29	33	32
None	16	38	38

Table 11. Consumption of analgesics, lateral spinal stenosis preoperatively, 1 and 2 years postoperatively (%).

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
Regular	58	31	33
Intermittent	31	34	34
None	12	36	34

Table 12. Consumption of analgesics, spondylolisthesis preoperatively, 1 and 2 years postoperatively (%).

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
Regular	44	19	23
Intermittent	41	32	30
None	16	49	48

Table 13. Consumption of analgesics DDD preoperatively, 1 and 2 years postoperatively (%).

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
Regular	60	30	28
Intermittent	33	30	31
None	7	41	41

Table 14 presents patient-assessed satisfaction with surgical outcome after 1 and 2 years.

Table 14. Attitude toward surgical outcome 1 and 2 years postoperatively, diagnosis-related.

	<b>1 year postop</b>			<b>2 years postop</b>		
	<b>Satisfied</b>	<b>Uncertain</b>	<b>Dissatisfied</b>	<b>Satisfied</b>	<b>Uncertain</b>	<b>Dissatisfied</b>
Disc herniation	80	14	6	80	14	6
Central stenosis	66	22	11	63	24	13
Lateral stenosis	67	21	12	63	19	18
Spondylolisthesis	74	18	8	70	16	14
DDD	74	18	9	72	16	12

Tables 15-16 and figure 73 present quality of life as measured by EQ-5D, in part as the EQ-5D score and in part as the VAS thermometer. All patient groups experience a significant improvement in quality of life postoperatively.

Table 15. EQ-5D means preoperatively, 1 year and 2 years postoperatively, diagnosis-related.

	<b>Preop</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
Disc herniation	0.28	0.75	0.74
Central spinal stenosis	0.39	0.64	0.63
Lateral spinal stenosis	0.35	0.62	0.62
Spondylolisthesis	0.36	0.73	0.66
DDD	0.33	0.65	0.64

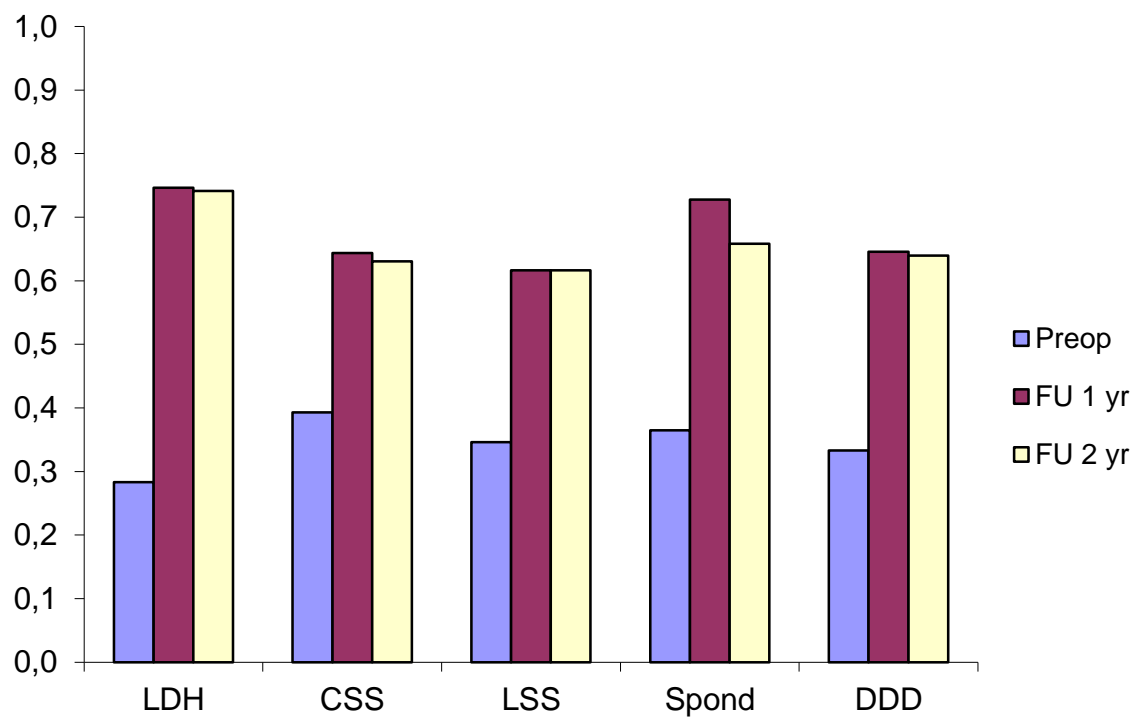


Fig. 73. Quality of life preoperatively, 1 and 2 years postoperatively, as measured by EQ-5D.

Table 16. EQ-5D health assessment according to the VAS thermometer, means.

	<b>Preop</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
Disc herniation	46	72	73
Central spinal stenosis	49	65	63
Lateral spinal stenosis	46	64	63
Spondylolisthesis	47	72	68
DDD	46	68	66

### Oswestry Disability index (ODI) preoperatively, 1 and 2 years postoperatively for all diagnoses

Table 17 ODI results preoperatively, 1 and 2 years after lumbar spine surgery, diagnosis-related.

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>
Disc herniation	47	18	18
Central spinal stenosis	43	26	28
Lateral spinal stenosis	43	25	26
Spondylolisthesis	42	20	22
DDD	44	23	24

#### IV. 5-year follow-up of lumbar spine procedures in Sweden in 2013

A total of 2522 patients completed 1, 2 and 5-year follow-up after having undergone lumbar spine surgery in 2007. The most common diagnoses are disc herniation, 714, and central spinal stenosis, 1134 patients. In all, 179 patients had been operated for lateral spinal stenosis, 131 for spondylolisthesis and 301 for segmental pain (DDD). The remaining 63 had other diagnoses. Below is a comparison of several parameters at 1, 2 and 5-year follow-up. Only patients who responded on all 4 occasions are presented. Table 18 presents pain on the VAS, diagnosis-related, over time.

Table 18. Pain on the VAS (mean), diagnosis-related.

	Back				Leg			
	Preop	1 year	2 years	5 years	Preop	1 year	2 years	5 years
Disc herniation	45	20	22	23	67	19	22	22
Central stenosis	53	28	31	36	61	30	32	35
Lateral stenosis	51	30	31	35	61	28	31	34
Spondylolisthesis	59	23	27	27	49	19	22	23
DDD	62	27	29	33	41	21	22	28

Tables 19-23 present walking distance after the different procedures preoperatively as well as 1, 2 and 5 years postoperatively.

Table 19. Walking distance, disc herniation (%)

	Preoperatively	1 year	2 years	5 years
< 100 m	36	4	5	4
100 m–500 m	18	8	7	8
500 m–1 km	14	10	9	7
>1 km	32	78	79	81

Table 20. Walking distance, central spinal stenosis (%)

	Preoperatively	1 year	2 years	5 years
< 100 m	39	13	16	219
100 m–500 m	31	20	20	20
500 m–1 km	14	16	18	17
>1 km	17	51	46	44

Table 21. Walking distance, lateral spinal stenosis (%)

	Preoperatively	1 year	2 years	5 years
< 100 m	27	10	11	19
100 m–500 m	32	17	17	12
500 m–1 km	15	13	15	17
>1 km	26	60	5	53

Table 22. Walking distance, spondylolisthesis (%)

	<b>Preoperatively</b>	<b>1 year</b>	<b>2 years</b>	<b>5 years</b>
< 100 m	18	6	8	3
100 m–500 m	27	5	12	12
500 m–1 km	13	12	10	12
>1 km	42	77	70	73

Table 23. Walking distance, DDD (%)

	<b>Preoperatively</b>	<b>1 year</b>	<b>2 years</b>	<b>5 years</b>
< 100 m	11	3	4	5
100 m–500 m	18	8	7	9
500 m–1 km	24	14	14	11
>1 km	47	75	75	75

Tables 24-28 present consumption of analgesics preoperatively and 1, 2 and 5 years postoperatively, related to diagnosis for surgery.

Table 24. Consumption of analgesics, disc herniation, preoperatively, 1, 2 and 5 years postoperatively (%).

	<b>Preoperatively</b>	<b>1 year</b>	<b>2 years</b>	<b>5 years</b>
Regular	60	15	16	14
Intermittent	26	31	32	33
None	14	55	53	54

Table 25. Consumption of analgesics, central spinal stenosis preoperatively, 1, 2 and 5 years postop (%).

	<b>Preoperatively</b>	<b>1 year</b>	<b>2 years</b>	<b>5 years</b>
Regular	54	24	28	30
Intermittent	31	32	31	29
None	15	44	42	41

Table 26. Consumption of analgesics, lateral spinal stenosis preoperatively, 1, 2 and 5 years postop (%).

	<b>Preoperatively</b>	<b>1 year</b>	<b>2 years</b>	<b>5 years</b>
Regular	48	26	25	25
Intermittent	33	32	34	34
None	19	42	41	41

Table 27. Consumption of analgesics, spondylolisthesis preoperatively, 1, 2 and 5 years postop (%).

	<b>Preoperatively</b>	<b>1 year</b>	<b>2 years</b>	<b>5 years</b>
Regular	50	18	22	18
Intermittent	33	30	28	33
None	17	53	50	50

Table 28 Consumption of analgesics DDD preoperative, 1, 2 and 5 years postop (%).

	<b>Preoperatively</b>	<b>1 year</b>	<b>2 years</b>	<b>5 years</b>
Regular	52	20	21	27
Intermittent	35	38	34	35
None	13	42	45	39

Table 29 presents patient-assessed satisfaction with surgical outcome after 1, 2 and 5 years.

Table 29 Attitude toward surgical outcome 1, 2 and 5 years postop, diagnosis-related.

	<b>1 year postoperatively</b>			<b>2 years postoperatively</b>			<b>5 years postoperatively</b>		
	<b>Satis- fied</b>	<b>Uncer- -tain</b>	<b>Dis- satisfied</b>	<b>Satis- fied</b>	<b>Uncer- -tain</b>	<b>Dis- satisfied</b>	<b>Satis- fied</b>	<b>Uncer- -tain</b>	<b>Dis- satisfied</b>
Disc herniation	80	14	7	80	13	7	83	11	6
Central stenosis	70	20	10	69	21	10	67	20	13
Lateral stenosis	68	22	10	69	21	9	68	25	7
Spondy- lolisthesis	79	14	8	74	15	12	78	13	9
DDD	78	15	7	76	17	6	75	17	8

Tables 30-31 and figure 74 present quality of life as measured by EQ-5D, in part as the EQ-5D score and in part as the VAS thermometer. All patient groups experience a significant improvement in quality of life postoperatively.

Table 30 EQ-5D means preoperatively, 1, 2 and 5 years postoperatively, diagnosis-related.

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>	<b>5 years postoperatively</b>
Disc herniation	0.27	0.75	0.74	0.75
Central stenosis	0.39	0.68	0.66	0.63
Lateral stenosis	0.40	0.69	0.66	0.65
Spondylolisthesis	0.40	0.73	0.70	0.70
DDD	0.36	0.68	0.66	0.65

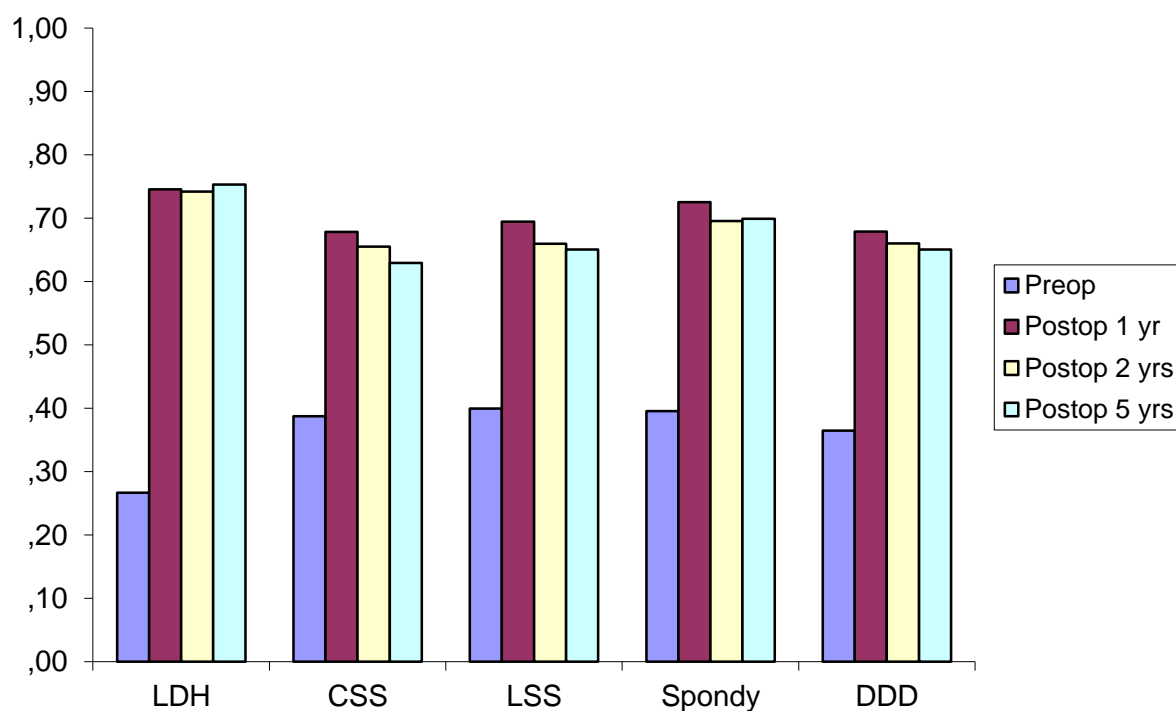


Fig. 74. Quality of life preoperatively, 1, 2 and 5 years postoperatively, as measured by EQ-5D.

Table 31. EQ-5D health assessment according to the VAS thermometer, means.

	<b>Preoperatively</b>	<b>1 year postoperatively</b>	<b>2 years postoperatively</b>	<b>5 years postoperatively</b>
Disc herniation	45	74	73	74
Central stenosis	50	68	65	63
Lateral stenosis	53	69	66	66
Spondylolisthesis	48	74	71	68
DDD	45	69	68	67



## V. Surgery for degenerative cervical spine disease

In 2013, 983 patients were operated for degenerative cervical spine disease, including 50% men and 50% women. In all, 20% of the patients (769 had answered the question) were smokers and 10% had previously had cervical spine surgery.

Preoperative duration of pain was as follows: <3 months 4%, 3-12 months 28%, 1-2 years 18% and more than 2 years 40%, while 9% denied any neck pain. Patients experienced radiation of pain to the arm(s) as follows: 5% of patients for <3 months, 35% for 3-12 months, 22% for 1-2 years and 31% for more than 2 years, while 7% denied any arm pain.

Regular consumption of analgesics was confirmed by 53% of patients, intermittent by 29% and none by the remaining 18%.

Current walking distance was assessed by 12% of patients to be <100 m, 12% 100-500 m, 16% 500 m – 1 km and 60% >1 km. In all, 73% reported subjective deterioration of fine motor function in their hands.

Co-morbidity was reported in the form of heart disease 2%, neurological disease 5%, cancer 1%, other disease affecting ability to walk 11%, or other disease causing pain 12%; 71% denied co-morbidity.

Mean neck pain on the VAS was 56 with a spread from 0-100. The corresponding figures for arm pain were 52 with a spread from 0-100.

Mean EQ-5D was 0.38 for patients, while the results of the Neck Disability Index (NDI) were as follows: mean 62. Distribution on the European myelopathy score was 15.

### *Data on the procedure*

In all, 44% of patients were operated for cervical disc herniation, 25% for cervical spinal stenosis, 28% for cervical foraminal stenosis, 1%, for segmental neck pain, 1% for rheumatoid arthritis, and 0% for ankylosing spondylitis; 2% were operated for some other diagnosis.

With respect to the neurological clinical picture, 15% of patients had no neurological findings, 56% radicular involvement, 21% medullary involvement and the remaining 8% combined radicular and medullary involvement. On the Ranawat score, patients were distributed as follows: I: 26%, II: 46%, IIIa: 25% and IIIb: 3% Neurological deficit according to the Frankel Classification system was distributed as follows: A 3%, B 3%, C 25%, D 48%, E 21%.

Horizontal instability between C1-C2 was seen in 0.9% of cases, vertical between C0 and C2 in 0.4% of cases and subaxial between C2 and Th1 in 3.3% of cases. Combined instability was assessed to be present in 0.4% of cases.

Surgical interventions were as follows:

- Disc removal without fusion 0.2%,
- Disc removal with fusion without plate 6.0%,
- Disc removal with fusion with plate 4.6%,
- Disc removal with fusion cage without plate 30.5%,
- Disc removal with fusion cage with plate 21.5%,

Corpectomy 3.3%,  
 Disc replacement 1.3%,  
 Transoral decompression 0.1%,  
 Laminectomy without fixation 7.5%,  
 Laminectomy with fixation 7.1%,  
 SKIP laminectomy 0.6%,  
 Laminoplasty 0.6%,  
 Foraminotomy 11.5%,  
 Combination laminectomy/laminoplasty and foraminotomy 1.2%,  
 Posterior fixation without decompression 1.8%,  
 Other procedure without implant 0.3% and  
 Other procedure with implant 1.9%.

Anterior implant was used in 69% of cases and posterior in 10% of cases.

*Results after 1-year follow-up*

About 68% of the 758 patients operated in 2012 also had 1-year follow-up.

Mean preoperative NDI in Sweden was 61 and postoperative 47.

Rhizopathy/arm pain improved from an average of 52 preoperatively to an average of 29 postoperatively.

Corresponding subjective scoring of change in arm pain one year postoperatively: Greatly improved 49%, somewhat improved 17%, unchanged 12% and 10% perceived worsening.

Patient assessment of walking distance one year postoperatively: <100 m 10%, 100-500 m 12%, 0.5-1 km 13%, >1 km 65%.

Quality of life as measured by EQ-5D improved from 0.38 preoperatively to 0.60 postop at one year.

## VI. Spine fracture surgery

In 2013, 412 surgeries were registered for spinal column fractures. Without any compensation for population age distribution, surgery for fracture was most common in the age group 60-69 years, and 67% were men, while 93% of the registered procedures were carried out at University Hospitals. According to AO classification, 18% of the fractures were type A, 60% type B and 22% type C (table 32).

Table 32. Fracture types according to AO classification percent).

Type A	Type B	Type C
18	60	22

The single largest group of fractures in the register involved Th11 – L2 fractures. Of the fractures registered to date, 82% were operated with posterior fusion with or without decompression and 1% with vertebroplasty. Even here, the most common age group was 60-69 years, but these fractures also have a peak at age 20-29 years. These fractures include both high-energy injuries in younger and middle-aged patients and osteoporotic fractures in older patients.

Neurological involvement in the form rhizopathy was seen in 17% of cases and in the form myelopathy in 22% of cases with the following distribution according to the Frankel Scale: A 27%, B 11%, C 27%, D 15% and E 20% (table 33).

Table 33. Neurological function according to the Frankel Classification system (percent)

Classification	Percent
A	27
B	11
C	27
D	15
E	20

Two years after surgery, 76% of patients were satisfied with the procedure, 18% uncertain and 6% dissatisfied. However, many of the patients probably had no or very moderate back pain before the fracture and have difficulty assessing what the status would have been without surgery. In all, 25% of patients took analgesics regularly and 30% occasionally. EQ-5D was 0.62 two years after the procedure.

## VII. Surgery for spinal metastases

In all, 178 patients are registered for spinal metastasis surgery; 15% were smokers. Indications for surgery are as follows: Neurological involvement 47.3%, back/leg pain 8.9%, progressive deformity 0.9%, neurological involvement + back/leg pain 32.1%, neurological involvement + progressive deformity 1.8%, back/leg pain + progressive deformity 2.7%, neurological involvement + back/leg pain + progressive deformity 36.3%; no indication for surgery was recorded for 37% of 178 patients.

The primary tumor was known in 74% of cases and unknown in 26%. Among known primary tumors, the following were most common: prostate 39%, breast 14.6%, kidney 6.1%, thyroid 1.2%, lung 6.1%, blood-forming organs 12.2%, GI tract 7.3%, other 13.4% (table 34).

Table 34. Primary tumor in spinal metastasis (percent)

Primary tumor	Percent
Prostate	39
Lung	6
Breast	14
Kidney	6
GI tract	7
Blood-forming organs	12
Thyroid	1
Other known primary tumor	13
Unknown primary tumor	54

In 37% of cases a pathologic fracture was seen. Neurological involvement was distributed as follows on the Frankel Scale: A 3%, B 5%, C 37%, D 40%, E 16%. Preoperative analgesic consumption was as follows: 77.1% morphine analgesics, 18.1% non-morphine analgesics and 4.8% no analgesic consumption.

Surgical procedures included posterior and anterior decompression as well as with or without instrumentation. In all, 93.1% had posterior decompression, at the following levels: cervical, thoracic and lumbar levels, while 4.5% had anterior decompression at the following levels: cervical, thoracic and lumbar. Instrumentation was carried out in 42.4% of cases.

Resection of tumor was carried out in 84% of cases; in 4.1% of cases as wide excision, 13% marginal excision, 82.9% intralesional excision and in 0% RF ablation.

## VIII. Report: focus group interviews Jönköping Aug. 20, 2014

Qulturum – a patient report ordered by the Steering Committee of Swespine, the Swedish Society of Spinal Surgeons ([www.4s.nu](http://www.4s.nu)).

### Background

In the spring of 2014 we (Anna Kvarnefors, Berith Hedberg, associate professor, Anna Claesson Songsong, nurse, and Robert Gustavsson, resident physician) were tasked by the Swedish Spine Register, Swespine (through registrar Peter Fritzell) to initiate a project to focus more on the patient perspective and to increase patient participation in the Swedish spine register. We decided to conduct focus group interviews in an attempt to gather and develop patient reflections about the care they received, and when possible to capture Patient-Reported Experience Measurement (PREM) aspects in particular that could be a valuable measurement parameter for the registry, which is otherwise mainly structured for measurement of Patient-Reported Outcome Measures (PROM).

We conducted these interviews at three types of medical facilities: County Hospitals, University Hospitals and Private Clinics. To date, we have interviewed the patients who were operated at one county hospital, NOC at Ryhov. We plan to work with patients at the other medical facilities from autumn 2014 to spring 2015.

County Hospital: The patients were recruited at the Orthopedics Department at Ryhov, Jönköping County Hospital, from a group of patients who had undergone elective cervical and lumbar spine surgery. Initially a total of ten patients were enrolled, but due to attrition, ultimately only 3 patients participated in this first group interview. All of them had recently undergone cervical spine surgery.

### Results

Below is an analysis of the interview that examines some of the principal themes that were addressed. It should be noted that this is an interim report.

The common denominator is that all patients describe severe problems prior to surgery, which when combined with heavy use of strong medications had a negative impact on quality of life. They are satisfied with their care in general and do not regret the procedures they have undergone.

Long complex process/time to schedule appointment for specialist/surgery: All patients commented to varying degrees on the long drawn-out problematic period before surgery was finally carried out, especially the lengthy process before getting to meet the orthopedic surgeon. Some stated that they had been bounced around between various care facilities; one had problems with a referral to the neuro-orthopedist and/or problems scheduling an MRI. In general, the patients felt that they had to contend with their problems for an unnecessarily long period of time. Two of the patients felt that they had to “make a fuss” in order to advance in the chain of care before reaching the specialist.

*“So I also had to be a bit assertive to get a referral for an MRI of the cervical spine”*

*“You had to fight a bit in order to get help”*

*“had to nag... to get my problems addressed”*

*“it took quite a long time before they knew what was wrong”*

*“But it’s just that it was supposed to have been scheduled in July of last year actually... but they had either lost or not sent the referral, so it was in May this year instead”*

Continuity: Two patients lacked continuity when seeing doctors at the clinic during initial assessment and postoperative follow-up.

*"So then I had to meet a new specialist and explain all of this again and then he says something completely different, which left me feeling very confused"*

*"Of course it feels better to meet the doctor who operated"*

*"The whole thing was a bit disorganized, I think"*

Information: In general the patients were satisfied with the information concerning the actual surgery, and some expressed that maybe they didn't want to know every detail beforehand. Potential risks also seem to be well known. However, they lacked information about the postoperative course concerning restrictions, medications and the effects on everyday life.

*"I was not allowed to take my anti-rheumatic drugs....a bit of a shock when I was discharged that I couldn't take them for three months"*

*"Long period of sick leave at three and a half months.... essential to find this out well in advance so I can inform my employer"*

*"I received information about the operation itself ... nothing afterwards"*

*"But once a decision is made to have surgery, it's probably a good idea to get that kind of information ahead of time" (regarding postoperative restrictions)*

Confidence: A couple of patients expressed a need to feel confident in the person who is going to do the surgery, and to obtain "references" in various ways about the prospective surgeon.

*"you have to have confidence in the doctor who's going to do this... and that's what I felt the first time that I met the surgeon and just out of habit, as a healthcare worker I snooped a bit too"*

*"confidence in the person who is going to operate before I let anyone in there.. inside the nerve center"*

## **Conclusions**

Based on the few patients interviewed to date, the largest problem raised is the long and difficult time they went through before getting to meet a back specialist and having what they consider to be a relevant work-up and surgical treatment. Some lack of continuity and information about the postoperative regimen with restrictions, sick leave, etc., also emerged.

The next step is to conduct a number of telephone interviews with patients from Ryhov to see if we can identify additional themes and confirm the areas we have already identified, or describe new ones.

The issue of continuity of medical care could possibly be implemented in Swespine already now, but it remains to be discussed.

## **IX. Complications and PREM – Questionnaire in collaboration with Indikator concerning results and care from a patient perspective, 2013-2014**

### **Assignment**

This report summarizes the results from follow-up of the patient questionnaire given to patients who underwent spine surgery at Sweden's surgical departments during the autumn of 2013 and spring of 2014. The survey was conducted using a postal questionnaire to patients randomly selected from lists of patients reported to the Swedish Spine Register, Swespine.

### **Implementation**

The survey was conducted by Institutet för Kvalitetsindikatorer AB (Indikator), which also authored the report.

The survey was conducted using postal questionnaires with the option to complete the questionnaire online. Up to two reminders were sent to those respondents who had not yet completed the questionnaire.

The results were published in Indikator's login-driven online tool, where each clinic can access its own results and compare them with all participating units in Sweden.

### **Scope**

The survey includes 40 units in Sweden that have conducted back surgery and reported patients to the Swedish Spine Register during the period August 2013-May 2014. Based on lists, a maximum of 100 patients per participating unit were randomly selected with respect to flow so that an equal numbers of patients had the opportunity to participate for each month. The questionnaire was sent to 2256 patients. A total of 1709 responses were received, including 96 questionnaires completed online, representing a response rate of 76.2%.

## **Appendix 1 - Indikator**

### **TECHNICAL REPORT**

**SWESPINE:  
POSTOPERATIVE FOLLOW-UP  
AUTUMN 2013- SPRING 2014**



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### *Introduction*

The Swedish Spine Register has tasked Indikator with following up on spinal surgery patients who have been registered in the Swedish spine register, Swespine. The aim was to follow up on postoperative complications that entailed seeking medical care, possibly prescribing of antibiotics in primary care and patient-reported experience of healthcare services – PREM. Indikator has carried out this initiative with support from Peter Fritzell (registrar) and Carina Blom (administrator) from the Swedish Spine Register.

### *About Institutet för Kvalitetsindikatorer (Indikator)*

Indikator has worked with follow-up of patient-experienced health care since the early 2000s and has developed validated survey tools for postal patient questionnaires in collaboration with international research experts, patient groups and professionals. We have experience capturing patient experiences through methods such as postal questionnaires, telephone interviews, focus groups, interactive survey stations, and observational studies. We also help clients to understand the results and create conditions for effective improvement. Indikator can be reached most easily by email: [info@indikator.org](mailto:info@indikator.org)

### *Project organization*

Anne Jansson was project manager at Indikator for the questionnaire on patient-experienced care in spinal surgery, autumn 2013 and spring 2014. Anne Jansson and Katarzyna Daniec were the contacts at Swespine. Andreas Gill was responsible for data collection and Maria Eriksson carried out the calculations.

### *Definitions in the report*

The report used the following concepts:

*Ward*: the unit to which patients were admitted for surgery.

*The entire survey*: participating units included in the survey.

## **Technical report**

### *Scope*

The survey included 893 inpatient wards in Sweden. The survey sample includes up to 100 patients who were operated at each unit from August to November 2013 or February to May 2014.

### *Sample*

Swespine provided information to Indikator about patients who underwent surgery at the participating units. Each unit has reported to Swespine's register, but reporting of patients has varied from unit to unit. Indikator carried out total or random selection of patients. A total of 2256 questionnaires were sent to patients. A total of 1709 questionnaires were returned; attrition from the sample was 27, for an adjusted response rate of 76.2%. Note that several of the care units had fewer than ten respondents and are therefore not reported in Indikator's online report for autumn 2013. Only units with a total of 10 respondents for the entire period are reported.

### *Variables*

The variables can be divided into three groups: stay-specific variables, demographic background variables and variables for perceived quality, which are specified below. The questionnaire is attached.

*Stay-specific variables*: These variables refer to the details of healing after surgery. Included are quantitative variables, such as number of days during which antibiotics were prescribed.

*Variables of perceived quality*: Qualitative variables on overall impression, in which the respondent indicates the subjective experience of various parts of the hospital stay.

*Background variables*: age, gender, self-perceived health, native language, and education.

*Statistical measures*

The results are reported under Patient-Perceived Quality in those cases where this is feasible. For other questions, the results are presented in percentages. For a detailed description of the statistical measures and calculation methods used, please see the calculation methods section.

*Reporting groups*

In general, the lowest level reported in the survey is the ward. All results can be accessed through Indikator's report generator at [www.indikator.org](http://www.indikator.org).

*Completeness*

The survey largely measures patient-perceived quality. The results for units with over ten responses are compared. Results from units with fewer than ten respondents do not appear in Indikator's online reports.

*Data collection*

Data were collected from August 2013 to August 2014. According to the scientific method that Indikator uses in surveys – Total Design Method (TDM) (Dillman D, Smyth J, Christian L, 2009; *Internet, Mail and Mixed-mode Survey; the tailored design method*) – the questionnaire is sent a short period following discharge from the ward; in this specific survey not later than 40 days following discharge. This procedure reduces the risk of inadequate accuracy because the respondent's memories of the experience have faded. After the first mailing, up to two reminders are sent to those respondents who have not yet completed the questionnaire. The first reminder is a letter sent two weeks after the questionnaire has been mailed out; a second reminder letter and a new questionnaire are sent two weeks later. All mailings include information that the survey could also be completed online.

*Response rate*

The total corrected response rate for the entire survey was 76.2%. The response rate comprises the total number of questionnaires received divided by the net sample.

Response rate for wards and the entire survey

	Sent	Returned	Returned, %	Correct ed respons e rate	Attrition	Did not want to partici pate	Not returned
Total	2257	1709	75.7%	76.2%	13	14	521
Akademiska UAS	4	3	75%	75%			1
Aleris Ängelholm	90	72	80%	80%			18
Art Clinic Jönköping	63	51	81%	81%			12
Blekinge Hospital	48	39	81.3%	83%	1	2	6
Borås	7	7	100%	100%			
Eskilstuna	77	52	67.5%	67.5%			25
Falun	94	69	73.4%	75%	2	1	22
Gävle	49	35	71.4%	72.9%	1		13
Halmstad	98	77	78.6%	79.4%	1		20
Hudiksvall	18	13	72.2%	72.2%			5
Hässleholm	57	44	77.2%	78.6%	1		12
Jönköping	81	61	75.3%	76.3%	1	1	18
Kalmar	77	65	84.4%	84.4%			12
Karlskoga	14	11	78.6%	78.6%			3
Karlstad	35	30	85.7%	85.7%			5
Karolinska	96	70	72.9%	74.5%	2		24
Kungälv	14	10	71.4%	71.4%			4
Linköping	100	80	80%	80%		3	17
MAS	4	3	75%	75%			1
Motala Proxima	25	19	76%	76%			6
Neur Akademiska Uppsala	6	6	100%	100%			
Proxima Stockholm Nacka	100	73	73%	73%			27
RSÖ	72	50	69.4%	71.4%	2	1	19
St. Göran	69	45	65.2%	66.2%	1		23
Sahlgrenska	76	58	76.3%	76.3%			18
Skövde	68	54	79.4%	80.6%	1		13
Spine Center Göteborg	100	80	80%	80%			20
Stockholm Spine Center	100	74	74%	74%			26
Sportsmed Carlanderska	55	38	69.1%	69.1%		1	16
Strängnäs	100	81	81%	81%		1	18
Sunderby Hospital	62	45	72.6%	72.6%			17
Sundsvall	57	45	78.9%	78.9%		1	11
SÖS	94	62	66%	66%		2	30

Umeå	77	57	74%	74%			20
Visby	21	18	85.7%	85.7%			3
Västervik	17	16	94.1%	94.1%			1
Västerås	57	41	71.9%	71.9%			16
Växjö	1	1	100%	100%			
Östersund	67	48	71.6%	71.6%		1	18
Bollnäs Aleris	7	6	85.7%	85.7%			1

Response rates for survey, by age and gender

For	Sent	Received	Valid reason	Corrected response rate	Uncorrected response rate
<b>All</b>	<b>2256</b>	<b>1709</b>	<b>12</b>	<b>76.20%</b>	<b>75.80%</b>
under 45	467	235	4	50.80%	50.30%
45-64.	756	557	3	74%	73.70%
65-75.	678	606	2	89.60%	89.40%
Over 75	355	311	3	88.40%	87.60%
All women	1207	944	6	78.60%	78.20%
Women under 45	246	133	3	54.70%	54.10%
Women 45-64.	394	307	0	77.90%	77.90%
Women 65-75.	355	321	0	90.40%	90.40%
Women 76-150.	212	183	3	87.60%	86.30%
All men	1049	765	6	73.30%	72.90%
Men under 45	221	102	1	46.40%	46.20%
45-64.	362	250	3	69.60%	69.10%
Men 65-75.	323	285	2	88.80%	88.20%
Men over 75	143	128	0	89.50%	89.50%

#### *Partial attrition*

The proportion of respondents who skipped a question which, according to the questionnaire instructions, they are to fill in, is generally low. However, the proportion who answered "Not applicable" to certain questions is high. The survey includes all questionnaires received in which at least one question was answered.

#### *Surveys received over time*

The return pattern for respondents is similar throughout Sweden. Online replies were received a day or so after the survey reached the respondent. This rate decline within a few days. About two weeks after the first mailing, 80% of the total number of received questionnaires were registered at Indikator. There is a slight increase in the number of responses received after reminders one and two.

A total of 5.6% of respondents chose to complete the survey online (96 respondents).

#### *Accuracy of statistics and measurement difficulties*

The statistics are based on a sample survey with a probability sample of respondents. Both this report and the report generator at [www.indikator.org](http://www.indikator.org) present all data with confidence intervals or coding to show statistically significant differences.

### *Processing*

Questionnaires are registered as they are received and the responses are scanned and entered in the database. The data is processed through automatic calculations in Indikator's reporting system. Verification, review and plausibility check are carried out in accordance with Indikator's quality system. Open responses in the survey can be provided as feedback to the respective units. The processing procedure is not considered to affect the reliability of the statistics.

### *Raw data*

Swespine owns the data from the survey, which is provided by Indikator in the desired file format as agreed. Data are not distributed to third parties without written approval from Swespine.

### *Calculation methods*

#### *Patient-perceived quality*

The results are reported in Patient-perceived quality. Relevant responses to each question that are positive in nature are assigned a value between 1 and 0.25, where 1 represents the most positive response option. The proportion of respondents for each relevant option is then multiplied by the value of the option.

The calculation method for patient-perceived quality results in a figure between 0 and 1. For simplification, the results are reported in whole numbers in the range 0-100, where the highest numbers possible are desirable.

Some questions are not appropriate for reporting under patient-perceived quality; for example, questions about antibiotic prescribing are therefore only reported as rates.

The measurement instrument contains three separate response scales for which the assigned values differ. In example A below, the response scale consists of five relevant options for calculating results. Example B has three relevant options and example C has two relevant options.

#### *Example A - Five relevant responses*

Response	Number of respondents	Number of relevant responses	Proportion of relevant responses	Value	Proportion* Value
Excellent	10	10	0.2	1	0.2
Very good	15	15	0.3	0.75	0.225
Good	10	10	0.2	0.5	0.1
Fair	10	10	0.2	0.25	0.05
Poor	5	5	0.1	0	0
Not applicable	5	NOT INCLUDED			
<b>Total</b>	<b>55</b>	<b>50</b>			<b>0.575</b>

In the above example the score for reported patient-perceived quality is 58.

#### *Example B - Three relevant responses*

Response	Number of respondents	Number of relevant responses	Proportion of relevant responses	Value	Proportion* Value
Yes, completely	15	15	0.375	1	0.375

Partially	15	15	0.375	0.5	0.1875
No	10	10	0.25	0	0
I did not talk to the staff	10	NOT INCLUDED			
<b>Total</b>	<b>50</b>	<b>40</b>			<b>0.5625</b>

In the above example the score for reported patient-perceived quality is 56.

#### Example C - Two relevant responses

Response	Number of respondents	Number of relevant responses	Proportion of relevant responses	Value	Proportion* Value
Yes	20	20	0.67	1	0.67
No	10	10	0.33	0	0
I did not have an appointment with a specific person	10	NOT INCLUDED			0
<b>Total</b>	<b>40</b>	<b>30</b>			<b>0.67</b>

In the above example the score for reported patient-perceived quality is 67.

Questions that are not appropriate for reporting under patient-perceived quality, such as antibiotic prescribing, are reported as rates or proportions.

#### Further information

Each unit can display and work with its results in Indikator's online report at [www.indikator.org](http://www.indikator.org). Units have the opportunity to carry out cross-tabulation and comparisons against the total results. Swespine can compare the various units.

For more information about the results, or for assistance interpreting the results Indikator can be contacted at +46(0)31-730 31 00 or [info@indikator.org](mailto:info@indikator.org)

For more information about Indikator's patient questionnaires and survey methods, please see:

M, Gerteis (1993) *Through the Patient's Eyes: Understanding and Promoting Patient-Centered Care* Jossey-Bass, San Francisco

Jenkinson C, Coulter A, Bruster S, Chandola T, Jones P. (2003) *Factors relating to patients' reports about hospital care for coronary heart disease in England*. Journal of Health Services Research and Policy, 8, 83-86.

Perneger TV, Kossovsky MP, Cathieni F, di Florio V, Burnand B. *A randomized trial of four patient satisfaction questionnaires*. Med Care. 2003 Dec;41(12):1343-52.

Jenkinson C, Coulter A, Bruster S. (2002) *The Picker Patient Experience Questionnaire: development and validation using data from in-patient surveys in five countries*. International Journal for Quality in Health Care, 14, 353-358. ([Appendix 9:5](#))

Jenkins C et. al. *Properties of the Picker Patient Experience questionnaire in a randomized controlled trial of long versus short form survey instruments*. Journal of Public Health Medicine 2003;25:197-201. (Appendix 9:6)

Dillman D, Smyth J, Christian L, (2009); *Internet, Mail and Mixed-mode Survey; the tailored design method*, John Wiley New Jersey



## Appendix 2 - Indikator

### PATIENT SATISFACTION IN RELATION TO BACKGROUND FACTORS – SWESPINE Q3 2013 – Q2 2014

#### *ABOUT THE ANALYSIS*

An initial evaluation of patient satisfaction with respect to background factors in the survey was carried out in January 2014. It was based on a small selection of surveys from August - September 2013. This analysis is a direct continuation of the previous one, and is based on survey responses from patients during Q3 2013 - Q2 2014, with a total of 1697 responses.

As previously, the analysis is aimed at identifying differences related to the survey background variables (gender, age, native language, health, education) for the following questions in the survey:

A1	Has the wound healed without any problems?
A2	Have you been treated with antibiotics for infection in the wound?
A3	Have you had to seek medical care for any other complication after your surgery?
B3	Did you feel that the doctors were respectful and considerate toward you?
B5	Did you feel involved in decisions about your care and treatment, as much as you wanted?
B6	Were you satisfied with the treatment of pain and discomfort during your hospital stay?
B8	Did you get enough information and guidance when you were discharged?
B10	How do you value the care/treatment you received overall?

The questions have primarily been examined at an overall level. For units with 15 responses or more, an analysis was also carried out at the unit level, but only for the background factors gender and native language.

Statistical testing was carried out using the chi-square test. Chi-square compares the actual distribution of responses among response options with a hypothesized distribution. In cases where the distribution deviates from the expected, the difference is considered to be significant. This means that the difference is not considered to be due to chance, but to actual differences between the compared groups.

Whether or not a difference can be considered significant is related to the number of survey responses. Consequently more differences were identified in this analysis compared with the last one, which was based on only 377 responses.

Maria Eriksson from Institutet för Kvalitetsindikatorer carried out the analysis in August 2014.

#### Results

Please see the next page for an overview.

- As previously, the strongest predictive variable is health. In general, patients who describe their health as worse are also less satisfied patients. However, it should be noted that it is difficult to assess the causality of this relationship.
- Younger patients are also more dissatisfied than older patients. This pattern is commonly found in all types of measurements of patient- perceived quality.
- It should be noted that significantly more men receive antibiotics to treat infection in the wound than women, while significantly more women than men have had to seek medical care for other complications after surgery.
- Patients who have a native language other than Swedish experience poorer involvement than patients whose native language is Swedish. Their overall impression is also worse.

The results are reported under Patient-Perceived Quality. Relevant responses to each question that are positive in nature are assigned a value between 1 and 0.25, where 1 represents the most positive response option. The proportion of respondents for each relevant option is then multiplied by the value of the option.

The calculation method for patient-perceived quality results in a figure between 0 and 1. For simplification, the results are reported in whole numbers in the range 0-100, where the highest numbers possible are desirable.

Some questions are not appropriate for reporting under Patient-Perceived Quality; for example, questions about antibiotic prescribing are therefore only reported as rates.

**Table 1. Results by background variable.** Gray indicates that the result represents a statistically significant difference

		Gender		Age				Native language		Education			Health		
	All	Male	Female	16-44 years	45-64 years	65-74 years	75 or older	Swedish	Other	Nine-year compulsory school or equivalent	Upper secondary school or equivalent	University or college	Very good or better	Good	Somewhat worse or worse
<i>Number of respondents</i>	1697	764	933	233	554	540	369	1516	173	553	696	452	548	645	486
Has the wound healed without any problems?	94%	93%	94%	93%	93%	94%	95%	94%	92%	95%	93%	92%	96%	93%	92%
Have you been treated with antibiotics for infection in the wound?	6%	8%	5%	7%	6%	7%	5%	6%	9%	5%	6%	8%	4%	5%	10%
Have you had to seek medical care for any other complication after your surgery?	16%	14%	19%	17%	14%	18%	18%	16%	19%	14%	17%	19%	10%	12%	29%
<b>PUK</b>															
Did you feel that the doctors were respectful and considerate toward you?	96	96	95	93	95	96	97	96	97	98	95	95	97	96	93
Did you feel involved in decisions about your care and treatment, as much as you wanted?	91	92	90	88	90	92	91	90	86	92	89	89	95	92	83
Were you satisfied with the treatment of pain and discomfort during your hospital stay?	90	90	91	84	89	92	93	90	88	94	90	87	93	91	85
Did you get enough information and guidance when you were discharged?	82	84	79	75	83	83	81	82	84	86	82	78	87	83	74
How do you value the care/treatment you received overall?	83	83	82	77	84	84	82	83	78	84	83	82	91	82	73

The results are reported under Patient-Perceived Quality. Relevant responses to each question that are positive in nature are assigned a value between 1 and 0.25, where 1 represents the most positive response option. The proportion of respondents for each relevant option is then multiplied by the value of the option.

The calculation method for patient-perceived quality results in a figure between 0 and 1. For simplification, the results are reported in whole numbers in the range 0-100, where the highest numbers possible are desirable.

Some questions are not appropriate for reporting under Patient-Perceived Quality; for example, questions about antibiotic prescribing are therefore only reported as rates.

**Table 2. Results by unit. (continued on next page)**

	TOTAL	Aleris Ängelholm	Art Clinic Jönköping	Blekinge Hospital	Eskilstuna	Falun	Gävle	Halmstad	Hässleholm	Jönköping	Kalmar	Karlstad	Karolinska	Linköping	Motala Proxima	Proxima Stockholm Nacka
<i>Number of respondents</i>	<b>1697</b>	72	51	39	52	69	35	77	44	61	65	30	70	80	19	73
Has the wound healed without any problems?	<b>94%</b>	100%	98%	100%	96%	100%	100%	90%	93%	92%	92%	93%	90%	96%	79%	99%
Have you been treated with antibiotics for infection in the wound?	<b>6%</b>	1%	6%	0%	4%	2%	3%	1%	2%	10%	7%	4%	16%	1%	17%	3%
Have you had to seek medical care for any other complication after your surgery?	<b>16%</b>	7%	6%	3%	18%	18%	12%	12%	19%	18%	21%	10%	22%	18%	11%	13%
<b>PUK</b>																
Did you feel that the doctors were respectful and considerate toward you?	<b>96</b>	97	99	99	89	95	99	96	98	93	95	97	94	97	92	96
Did you feel involved in decisions about your care and treatment, as much as you wanted?	<b>90</b>	95	95	93	82	88	96	90	93	83	88	90	90	91	92	92
Were you satisfied with the treatment of pain and discomfort during your hospital stay?	<b>90</b>	96	95	90	86	89	88	92	94	89	92	91	86	86	97	93
Did you get enough information and guidance when you were discharged?	<b>82</b>	91	89	95	80	83	77	85	87	77	87	74	69	81	77	79
How do you value the care/treatment you received overall?	<b>83</b>	94	90	86	72	78	79	79	84	77	89	81	79	77	83	86

	TOTAL	RSÖ	St. Göran	Sahl- grenska	Skövde	Spine Center Göteborg	Sportsmed Carlanderska	Stockholm Spine Center	Sträng- näs	Sunderby Hospital	Sunds- vall	SÖS	Umeå	Visby	Väster- vik	Väster- ås	Öster- sund
<i>Number of respondents</i>	<b>1697</b>	50	45	58	54	80	74	38	81	45	45	62	57	18	16	41	48
Has the wound healed without any problems?	<b>94%</b>	94%	93%	95%	96%	90%	95%	91%	94%	100%	93%	89%	95%	67%	100%	88%	85%
Have you been treated with antibiotics for infection in the wound?	<b>6%</b>	10%	15%	5%	4%	14%	5%	8%	1%	3%	7%	14%	7%	22%	0%	7%	9%
Have you had to seek medical care for any other complication after your surgery?	<b>16%</b>	6%	19%	14%	18%	17%	16%	24%	13%	20%	16%	16%	21%	28%	33%	24%	26%
<b>PUK</b>																	
Did you feel that the doctors were respectful and considerate toward you?	<b>96</b>	97	96	98	94	98	99	95	100	96	91	94	94	94	100	92	95
Did you feel involved in decisions about your care and treatment, as much as you wanted?	<b>90</b>	90	86	85	90	95	97	92	97	87	88	84	94	86	97	83	87
Were you satisfied with the treatment of pain and discomfort during your hospital stay?	<b>90</b>	88	85	87	85	97	95	90	98	87	94	83	93	92	88	80	85
Did you get enough information and guidance when you were discharged?	<b>82</b>	89	81	74	83	90	95	80	95	71	63	75	82	64	88	68	82
How do you value the care/treatment you received overall?	<b>83</b>	80	83	77	80	92	92	85	96	76	77	78	81	79	88	72	81

The results are reported under Patient-Perceived Quality. Relevant responses to each question that are positive in nature are assigned a value between 1 and 0.25, where 1 represents the most positive response option. The proportion of respondents for each relevant option is then multiplied by the value of the option.

The calculation method for patient-perceived quality results in a figure between 0 and 1. For simplification, the results are reported in whole numbers in the range 0-100, where the highest numbers possible are desirable.

Some questions are not appropriate for reporting under Patient-Perceived Quality; for example, questions about antibiotic prescribing are therefore only reported as rates.

**Table 3 Selection: total selection or max 25 patients per quarter**

**Selection: total selection or max 25 patients per quarter**

	All	Aleris Ängelholm	Art Clinic Jönköping	Blekinge Hospital	Eskilstuna	Falun	Gävle	Halmstad	Hässleholm	Jönköping	Kalmar	Karlstad	Karolinska	Kungälv	Linköping	Motala Proxima	Proxima Sthlm Nacka
Sent	2244	90	63	48	77	94	49	98	57	81	77	35	96	14	100	25	100
<i>Returned</i>	<i>1697</i>	<i>72</i>	<i>51</i>	<i>39</i>	<i>52</i>	<i>69</i>	<i>35</i>	<i>77</i>	<i>44</i>	<i>61</i>	<i>65</i>	<i>30</i>	<i>70</i>	<i>10</i>	<i>80</i>	<i>19</i>	<i>73</i>
Response rate	76.1%	80%	81%	83%	67.5%	75%	72.9 %	79.4%	78.6%	76.3%	84.4%	85.7%	74.5%	71.4%	80%	76%	73%
Attrition	13			1		2	1	1	1	1			2				
Did not want to participate	14			2		1				1					3		
Throughput*)	4840	224	40	112	32	136	48	128	80	80	56	64	80	24	272	40	304

	All	RSÖ	<i>St. Göran</i>	Sahlgrenska	Skövde	Stockholm Spine Center Spine Center Göteborg	Stockholm Spine Center Stockholm Spine Center	Sportsmed Carlanderska	Strängnäs	Sunderby Hospital	Sundsvall	SÖS	Umeå	Visby	Västervik	Västerås	Östersund
Sent	2244	72	69	76	68	100	100	55	100	62	57	94	77	21	17	57	67
<i>Returned</i>	<i>1697</i>	<i>50</i>	<i>45</i>	<i>58</i>	<i>54</i>	<i>80</i>	<i>74</i>	<i>38</i>	<i>81</i>	<i>45</i>	<i>45</i>	<i>62</i>	<i>57</i>	<i>18</i>	<i>16</i>	<i>41</i>	<i>48</i>
Response rate	76.1%	71.4%	66.2%	76.30%	80.6%	80%	74%	69.10%	81%	72.6%	78.9%	66%	74%	85,%	94.1%	71.9%	71.6%
Attrition	13	2	1		1												
Did not want to participate	14	1						1	1		1	2					1
Throughput*)	4840	112	136	200	88	392	784	48	456	80	72	120	144		32	104	88

\*) Based on monthly flow \* 8 months

Note: Units with fewer than 14 responses are not included.

### **Appendix 3. Indikator**

#### **ANALYSIS**

**SWESPINE:  
POSTOPERATIVE FOLLOW-UP  
AUTUMN 2013- SPRING 2014**

## Summary

*This report summarizes the results from follow-up of the patient questionnaire given to patients who underwent spine surgery during the autumn of 2013 and spring of 2014. The survey was conducted using a postal questionnaire to patients randomly selected from lists of patients reported to the Swedish Spine Register. A total of 1709 responses were gathered, representing a response rate of 76.2%.*

## Introduction

### Implementation

*The survey was conducted by Institutet för Kvalitetsindikatorer AB (Indikator), which also authored the report.*

*The survey was conducted using postal questionnaires with the option to complete the questionnaire online. Up to two reminders were sent to those respondents who had not yet completed the questionnaire. The results were published in Indikator's login-driven online tool, where each clinic can access its own results and compare them with all participating units in Sweden.*

### Scope

*The survey includes 40 units in Sweden that have conducted back surgery and reported patients to the Swedish Spine Register during the period August 2013 - May 2014. Based on lists, a maximum of 100 patients per participating unit were randomly selected with respect to flow so that an equal numbers of patients for each month had the opportunity to participate. The questionnaire was sent to 2256 patients. A total of 1709 responses were received, including 96 questionnaires completed online. This represents a response rate of 76.2%.*

Table 1 description of respondents

		Proportion	Number
Age	under 45	15%	235
	45-64.	33%	557
	65-75.	32%	606
	over 75	22%	311
Gender	Male	45%	764
	Female	55%	933
Native language	Swedish	89%	1516
	Other	10%	173

*Note: not all respondents answered.*

### About the statistics

*The analysis covers all questions in the questionnaire, a selection of which is shown in diagrams. All differences between patient groups mentioned in the text are statistically significant. The analysis is based on all received responses and illuminates all patient responses.*

*An in-depth analysis of the background questions—gender, age, education, native language and self-perceived state of health—was presented in a previous analysis, which was delivered to Swespine on September 5, 2014.*

## Results

### *Follow-up Surgical wound*

Few indicate problems with surgical wound

*Nine of ten patients (93%) state that the surgical wound has healed without problems. The proportion of patients who had antibiotics prescribed took them for eight or more days (50%).*

*Incoming open responses indicating which antibiotics were prescribed and what complications the patients describe could be processed for quality. The results cannot be presented online.*

*The majority of patients (81%) gave their consent to release their records for further study.*

### **Overall impression**

Waiting time

*The experience regarding waiting time varies greatly among care providers, though half of the patients (49%) state that the time is acceptable.*

Table 2 Time from first contact with medical facility until first visit

<b>Response</b>	<b>Number</b>	<b>Proportion</b>	<b>WEIGHT</b>
Up to one week	156	9%	1
More than one week up to one month	414	24%	1
More than one month up to three months	653	38%	0
More than three months	353	21%	0
Not completed	121	7%	

Total number of responses:	1697
Number of weighted responses:	1576
Patient-perceived quality	<b>36</b>

Table 3 Perception about waiting time

<b>Response</b>	<b>Number</b>	<b>Proportion</b>	<b>WEIGHT</b>
Acceptable	829	49%	1
Somewhat too long	372	22%	0.5
Much too long	352	21%	0
Not completed	144	8%	

Total number of responses:	1697
Number of weighted responses:	1553
Patient-perceived quality	<b>65</b>

Treatment and participation

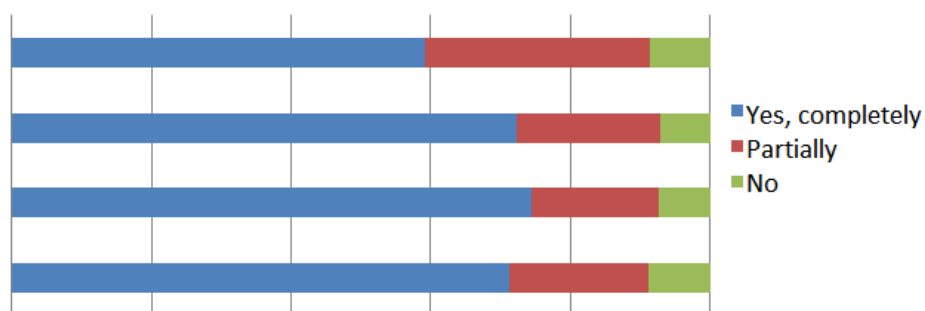
*Nine out of ten patients are very satisfied with how they were treated by both doctors (91%) and other staff (92%). Most people felt they were able to participate in their own care and treatment (81%).*



### Pain and discomfort

*Eight out of ten patients are completely satisfied with the treatment of pain and discomfort during their hospital stay (83%) and 15% were partially satisfied. Most felt that they received enough pain medication when they went home (82%).*

*70% of patients feel they received enough information and guidance at discharge.*



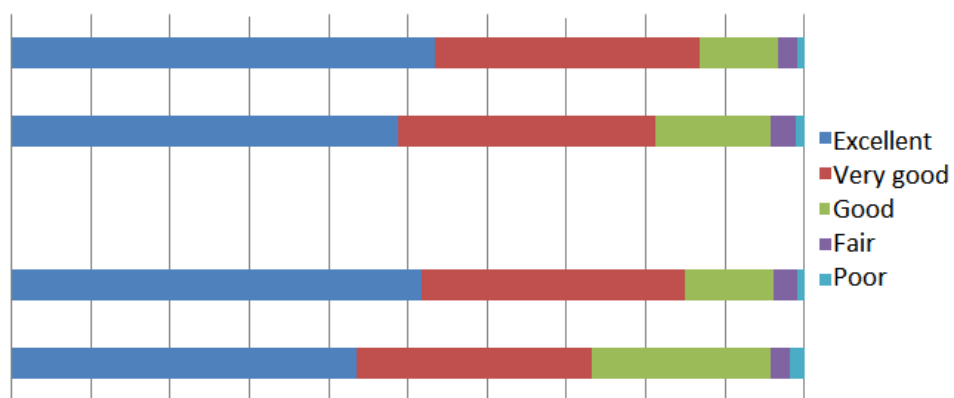
*Patients with the worst self-perceived health experience that they do not get enough information and guidance (16% of patients with poor self-perceived health). Older patients have the most positive perception of the information and guidance received.*

### Phone call the day after surgery

*The majority of patients (65%) did not receive a phone call the day after surgery. Of those who received a call, 96% of patients perceived this as good and not as something negative. The percentage of women who did not respond to the question was high (62%).*

### Care associated with back surgery as a whole

*The survey shows that patients are generally satisfied with the care received during back surgery. Half of the patients rate their care as completely excellent (50%) and nine of ten rate it as good or better (94%). Patients whose native language is not Swedish are more cautious in their assessment, as are women compared with men.*



## X. Completeness of Swespine registration – an analysis with the assistance of the National Board of Health and Welfare

During the spring of 2014 we have performed an analysis of the completeness of Swespine, with the assistance of the National Board of Welfare using their Patient Register (PAR). It covers the period from 2001 to 2012. The analysis is based on personal numbers and the search in the registers is based on a combination of codes for diagnosis and procedure aiming to cover all spinal procedures in our country.

Results are reported by year for the whole nation and by hospital/clinic. The tables show that neither PAR, nor Swespine display a full completeness of registration of all spinal procedures in the country.

In this context completeness means the number of spinal procedures performed in Swespine (numerator) compared to the estimated number of spinal procedures performed in Sweden (denominator). The estimate is based on the sum of patients in both registers. Procedures occurring in both or either register count as a single procedure.

From 2002, when the rate of completeness was 48%, it has gradually increased to 73% and has remained there since 2008. The rate of completeness calculated in this way is lower than the approximation we have performed earlier based on sampling from a minority of departments (See 2012 Report).

The difference of rate of completeness is presently being investigated by the steering group of Swespine. Back pain has many causes (several ICD codes) and there are several surgical options (surgical codes). One reason of uncertainty in the calculations could be limitations in the combination of ICD and surgical codes. This is under investigation. During the autumn a new analysis of the rate of completeness will be performed with the assistance of the National Board of Welfare, using partly different criteria.

Year 2012	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
<b>Whole nation</b>	6825	72.8	8438	90	942	10	2555	27.2	5883	62.7	9380
<b>01 Stockholm</b>	1650	73	2223	98.3	38	1.7	611	27	1612	71.3	2261
Karolinska universitetssjukhuset Hudding	.	.	55	100	.	.	55	100	.	.	55
Karolinska universitetssjukhuset Solna	91	67.4	126	93.3	9	6.7	44	32.6	82	60.7	135
Löwenströmska sjukhuset	840	72.2	1163	100	.	.	323	27.8	840	72.2	1163
Nacka sjukhus	390	85.3	457	100	.	.	67	14.7	390	85.3	457
S:t Görans sjukhus	165	87.8	166	88.3	22	11.7	23	12.2	143	76.1	188
Sophiahemmet	.	.	62	100	.	.	62	100	.	.	62
Södersjukhuset	164	81.6	194	96.5	7	3.5	37	18.4	157	78.1	201
<b>03 Uppsala</b>	212	64.8	307	93.9	20	6.1	115	35.2	192	58.7	327
Akademiska sjukhuset	212	64.8	307	93.9	20	6.1	115	35.2	192	58.7	327
<b>04 Södermanland</b>	759	89.8	806	95.4	39	4.6	86	10.2	720	85.2	845
Löts Rehabiliteringscentrum	1	3.3	30	100	.	.	29	96.7	1	3.3	30
Mälarsjukhuset	91	84.3	106	98.1	2	1.9	17	15.7	89	82.4	108
Ryggkirurgiska kliniken i Strängnäs	667	94.3	670	94.8	37	5.2	40	5.7	630	89.1	707
<b>05 Östergötland</b>	398	69.5	509	88.8	64	11.2	175	30.5	334	58.3	573
Motala lasarett	46	68.7	67	100	.	.	21	31.3	46	68.7	67
Universitetssjukhuset i Linköping	352	69.6	442	87.4	64	12.6	154	30.4	288	56.9	506
<b>06 Jönköping</b>	98	54.1	175	96.7	6	3.3	83	45.9	92	50.8	181
Arts Clinic Jönköping	4	7.8	48	94.1	3	5.9	47	92.2	1	2	51
Höglandssjukhuset Eksjö och Nässjö	3	25	12	100	.	.	9	75	3	25	12

Year 2012	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
Länssjukhuset Ryhov	91	77.1	115	97.5	3	2.5	27	22.9	88	74.6	118
07 Kronoberg	20	29.9	66	98.5	1	1.5	47	70.1	19	28.4	67
Centrallasarettet i Växjö	20	44.4	44	97.8	1	2.2	25	55.6	19	42.2	45
Ljungby lasarett	.	.	22	100	.	.	22	100	.	.	22
08 Kalmar	75	54.3	131	94.9	7	5.1	63	45.7	68	49.3	138
Länssjukhuset i Kalmar	75	81.5	85	92.4	7	7.6	17	18.5	68	73.9	92
Västerviks sjukhus	.	.	46	100	.	.	46	100	.	.	46
09 Gotland	.	.	46	100	.	.	46	100	.	.	46
Visby lasarett	.	.	46	100	.	.	46	100	.	.	46
10 Blekinge	149	87.1	146	85.4	25	14.6	22	12.9	124	72.5	171
Blekingesjukhuset	149	87.1	146	85.4	25	14.6	22	12.9	124	72.5	171
12 Skåne	438	75.9	555	96.2	22	3.8	139	24.1	416	72.1	577
Hässleholms sjukhus	102	84.3	121	100	.	.	19	15.7	102	84.3	121
Trelleborgs lasarett	.	.	23	100	.	.	23	100	.	.	23
Universitetssjukhuset i Lund	135	77.6	166	95.4	8	4.6	39	22.4	127	73	174
Universitetssjukhuset i Malmö	201	77.6	245	94.6	14	5.4	58	22.4	187	72.2	259
13 Halland	315	57.7	537	98.4	9	1.6	231	42.3	306	56	546
Hallands sjukhus Halmstad	161	79.7	193	95.5	9	4.5	41	20.3	152	75.2	202
Spenshults reumatikersjukhus	154	44.8	344	100	.	.	190	55.2	154	44.8	344
14 Västra Götaland	959	63.1	1455	95.8	64	4.2	560	36.9	895	58.9	1519
Kungälv's sjukhus	34	91.9	36	97.3	1	2.7	3	8.1	33	89.2	37
NU-sjukvården	19	17.1	110	99.1	1	0.9	92	82.9	18	16.2	111
Sahlgrenska universitetssjukhuset	239	57.6	400	96.4	15	3.6	176	42.4	224	54	415
Skaraborgs sjukhus	114	88.4	126	97.7	3	2.3	15	11.6	111	86	129
Spine Center Göteborg	537	67.9	747	94.4	44	5.6	254	32.1	493	62.3	791
Södra Älvsborgs sjukhus	16	44.4	36	100	.	.	20	55.6	16	44.4	36
17 Värmland	55	61.1	86	95.6	4	4.4	35	38.9	51	56.7	90
Karlstads sjukhus	55	61.1	86	95.6	4	4.4	35	38.9	51	56.7	90
18 Örebro	174	89.2	187	95.9	8	4.1	21	10.8	166	85.1	195
Karlskoga lasarett	25	83.3	30	100	.	.	5	16.7	25	83.3	30
Universitetssjukhuset Örebro	149	90.3	157	95.2	8	4.8	16	9.7	141	85.5	165
19 Västmanland	151	68.9	217	99.1	2	0.9	68	31.1	149	68	219
Västerås lasarett	151	68.9	217	99.1	2	0.9	68	31.1	149	68	219
20 Dalarna	180	81.4	209	94.6	12	5.4	41	18.6	168	76	221
Falu lasarett	180	81.4	209	94.6	12	5.4	41	18.6	168	76	221
21 Gävleborg	105	68.2	151	98.1	3	1.9	49	31.8	102	66.2	154
Aleris specialistvård Bollnäs	13	72.2	17	94.4	1	5.6	5	27.8	12	66.7	18
Gävle sjukhus	59	72	82	100	.	.	23	28	59	72	82
Hudiksvalls sjukhus	33	61.1	52	96.3	2	3.7	21	38.9	31	57.4	54
22 Västernorrland	111	94.9	109	93.2	8	6.8	6	5.1	103	88	117
Sundsvalls sjukhus	111	94.9	109	93.2	8	6.8	6	5.1	103	88	117
23 Jämtland	110	75.9	126	86.9	19	13.1	35	24.1	91	62.8	145
Östersunds sjukhus	110	75.9	126	86.9	19	13.1	35	24.1	91	62.8	145
24 Västerbotten	190	76.9	228	92.3	19	7.7	57	23.1	171	69.2	247
Norrlands Universitetssjukhus	190	76.9	228	92.3	19	7.7	57	23.1	171	69.2	247
25 Norrbotten	110	62.9	169	96.6	6	3.4	65	37.1	104	59.4	175
Gällivare lasarett	.	.	33	100	.	.	33	100	.	.	33
Sunderbyns sjukhus	110	77.5	136	95.8	6	4.2	32	22.5	104	73.2	142
UNKNOWN	566	100	.	.	566	100	.	.	.	.	566
	566	100	.	.	566	100	.	.	.	.	566

**Match between the Swedish Spine Register and the National Patient Register, 2001-2012 surgery date and personal identification number. A 7-day difference between the date of surgery entered in the quality register and the Patient Register's date of admission and discharge was permitted.**

**The selection from the National Patient Register was made in accordance with Swespine's outcome groups**

**Today's date is: May 26, 2014**

Year 2011	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	N:o
<b>Whole nation</b>	6467	73.2	7026	79.5	1812	20.5	2371	26.8	4655	52.7	8838
<b>01 Stockholm</b>	1316	69.6	1865	98.6	26	1.4	575	30.4	1290	68.2	1891
Dalens sjukhus	.	.	1	100	.	.	1	100	.	.	1
Karolinska universitetssjukhuset Hudding	.	.	44	100	.	.	44	100	.	.	44
Karolinska universitetssjukhuset Solna	144	79.1	177	97.3	5	2.7	38	20.9	139	76.4	182
Löwenströmska sjukhuset	480	63.6	755	100	.	.	275	36.4	480	63.6	755
Nacka sjukhus	385	83	464	100	.	.	79	17	385	83	464
S:t Görans sjukhus	166	88.8	171	91.4	16	8.6	21	11.2	150	80.2	187
Sophiahemmet	.	.	53	100	.	.	53	100	.	.	53
Södersjukhuset	141	68.8	200	97.6	5	2.4	64	31.2	136	66.3	205
<b>03 Uppsala</b>	201	68.8	277	94.9	15	5.1	91	31.2	186	63.7	292
Akademiska sjukhuset	201	68.8	277	94.9	15	5.1	91	31.2	186	63.7	292
<b>04 Södermanland</b>	806	93.9	534	62.2	324	37.8	52	6.1	482	56.2	858
Löts Rehabiliteringscentrum	1	3	33	100	.	.	32	97	1	3	33
Mälarsjukhuset	87	81.3	103	96.3	4	3.7	20	18.7	83	77.6	107
Ryggkirurgiska kliniken i Strängnäs	718	100	398	55.4	320	44.6	.	.	398	55.4	718
<b>05 Östergötland</b>	359	71.7	467	93.2	34	6.8	142	28.3	325	64.9	501
Motala lasarett	77	82.8	93	100	.	.	16	17.2	77	82.8	93
Universitetssjukhuset i Linköping	282	69.1	374	91.7	34	8.3	126	30.9	248	60.8	408
<b>06 Jönköping</b>	89	67.4	121	91.7	11	8.3	43	32.6	78	59.1	132
Arts Clinic Jönköping	9	90	1	10	9	90	1	10	.	.	10
Högländssjukhuset Eksjö och Nässjö	.	.	18	100	.	.	18	100	.	.	18
Länssjukhuset Ryhov	80	76.9	102	98.1	2	1.9	24	23.1	78	75	104
<b>07 Kronoberg</b>	39	62.9	62	100	.	.	23	37.1	39	62.9	62
Centrallasarettet i Växjö	39	86.7	45	100	.	.	6	13.3	39	86.7	45
Ljungby lasarett	.	.	17	100	.	.	17	100	.	.	17
<b>08 Kalmar</b>	93	63.7	138	94.5	8	5.5	53	36.3	85	58.2	146
Länssjukhuset i Kalmar	88	75.2	109	93.2	8	6.8	29	24.8	80	68.4	117
Västerviks sjukhus	5	17.2	29	100	.	.	24	82.8	5	17.2	29
<b>09 Gotland</b>	.	.	41	100	.	.	41	100	.	.	41
Visby lasarett	.	.	41	100	.	.	41	100	.	.	41
<b>10 Blekinge</b>	121	85.8	117	83	24	17	20	14.2	97	68.8	141
Blekingesjukhuset	121	85.8	117	83	24	17	20	14.2	97	68.8	141
<b>12 Skåne</b>	475	76.9	566	91.6	52	8.4	143	23.1	423	68.4	618
Hässleholms sjukhus	10	58.8	17	100	.	.	7	41.2	10	58.8	17
Trelleborgs lasarett	.	.	5	100	.	.	5	100	.	.	5
Universitetssjukhuset i Lund	196	77.2	245	96.5	9	3.5	58	22.8	187	73.6	254
Universitetssjukhuset i Malmö	172	87.3	190	96.4	7	3.6	25	12.7	165	83.8	197
Ängelholms sjukhus	97	66.9	109	75.2	36	24.8	48	33.1	61	42.1	145
<b>13 Halland</b>	197	86.8	218	96	9	4	30	13.2	188	82.8	227
Hallands sjukhus Halmstad	197	86.8	218	96	9	4	30	13.2	188	82.8	227
<b>14 Västra Götaland</b>	981	57.4	1175	68.7	535	31.3	729	42.6	446	26.1	1710
Kungälv's sjukhus	38	92.7	37	90.2	4	9.8	3	7.3	34	82.9	41

**Match between the Swedish Spine Register and the National Patient Register, 2001-2012 surgery date and personal identification number. A 7-day difference between the date of surgery entered in the quality register and the Patient Register's date of admission and discharge was permitted.**

**The selection from the National Patient Register was made in accordance with Swespine's outcome groups**

**Today's date is: May 26, 2014**

Year 2011	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
NU-sjukvården	69	58	117	98.3	2	1.7	50	42	67	56.3	119
Sahlgrenska universitetssjukhuset	226	65.9	333	97.1	10	2.9	117	34.1	216	63	343
Skaraborgs sjukhus	112	86.2	125	96.2	5	3.8	18	13.8	107	82.3	130
Spine Center Göteborg	522	49.9	533	50.9	514	49.1	525	50.1	8	0.8	1047
Södra Älvsborgs sjukhus	14	46.7	30	100	.	.	16	53.3	14	46.7	30
17 Värmland	62	71.3	78	89.7	9	10.3	25	28.7	53	60.9	87
Karlstads sjukhus	62	71.3	78	89.7	9	10.3	25	28.7	53	60.9	87
18 Örebro	149	88.2	162	95.9	7	4.1	20	11.8	142	84	169
Karlskoga lasarett	16	80	19	95	1	5	4	20	15	75	20
Universitetssjukhuset Örebro	133	89.3	143	96	6	4	16	10.7	127	85.2	149
19 Västmanland	119	50	232	97.5	6	2.5	119	50	113	47.5	238
Köpings lasarett	.	.	2	100	.	.	2	100	.	.	2
Västerås lasarett	119	50.4	230	97.5	6	2.5	117	49.6	113	47.9	236
20 Dalarna	172	90.1	179	93.7	12	6.3	19	9.9	160	83.8	191
Falu lasarett	172	90.5	178	93.7	12	6.3	18	9.5	160	84.2	190
Mora lasarett	.	.	1	100	.	.	1	100	.	.	1
21 Gävleborg	87	60.8	139	97.2	4	2.8	56	39.2	83	58	143
Gävle sjukhus	50	62.5	78	97.5	2	2.5	30	37.5	48	60	80
Hudiksvalls sjukhus	37	58.7	61	96.8	2	3.2	26	41.3	35	55.6	63
22 Västernorrland	98	73.1	126	94	8	6	36	26.9	90	67.2	134
Sundsvalls sjukhus	98	73.1	126	94	8	6	36	26.9	90	67.2	134
23 Jämtland	84	74.3	99	87.6	14	12.4	29	25.7	70	61.9	113
Östersunds sjukhus	84	74.3	99	87.6	14	12.4	29	25.7	70	61.9	113
24 Västerbotten	230	74.7	295	95.8	13	4.2	78	25.3	217	70.5	308
Norrlands Universitetssjukhus	230	74.7	295	95.8	13	4.2	78	25.3	217	70.5	308
25 Norrbotten	94	66.7	135	95.7	6	4.3	47	33.3	88	62.4	141
Gällivare lasarett	.	.	18	100	.	.	18	100	.	.	18
Sunderbyns sjukhus	94	76.4	117	95.1	6	4.9	29	23.6	88	71.5	123
UNKNOWN	695	100	.	.	695	100	.	.	.	.	695
	695	100	.	.	695	100	.	.	.	.	695

**Match between the Swedish Spine Register and the National Patient Register, 2001-2012 surgery date and personal identification number. A 7-day difference between the date of surgery entered in the quality register and the Patient Register's date of admission and discharge was permitted.**

**The selection from the National Patient Register was made in accordance with Swespine's outcome groups**

**Today's date is: May 26, 2014**

Year 2010	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
<b>Hela Whole nation</b>	6188	73.6	7906	94.1	500	5.9	2218	26.4	5688	67.7	8406
<b>01 Stockholm</b>	1532	72.7	2085	98.9	23	1.1	576	27.3	1509	71.6	2108
Karolinska universitetssjukhuset Hudding	.	.	54	100	.	.	54	100	.	.	54
Karolinska universitetssjukhuset Solna	156	67	224	96.1	9	3.9	77	33	147	63.1	233
Löwenströmska sjukhuset	731	71.3	1025	100	.	.	294	28.7	731	71.3	1025
Nacka sjukhus	371	88.8	418	100	.	.	47	11.2	371	88.8	418
S:t Görans sjukhus	139	83.2	153	91.6	14	8.4	28	16.8	125	74.9	167
Södersjukhuset	135	64	211	100	.	.	76	36	135	64	211
<b>03 Uppsala</b>	280	74.7	349	93.1	26	6.9	95	25.3	254	67.7	375
Akademiska sjukhuset	280	74.7	349	93.1	26	6.9	95	25.3	254	67.7	375
<b>04 Södermanland</b>	792	91.9	821	95.2	41	4.8	70	8.1	751	87.1	862
Löts Rehabiliteringscentrum	1	5.9	17	100	.	.	16	94.1	1	5.9	17
Mälarsjukhuset	108	89.3	119	98.3	2	1.7	13	10.7	106	87.6	121
Nyköpings lasarett	.	.	1	100	.	.	1	100	.	.	1
Ryggkirurgiska kliniken i Strängnäs	683	94.5	684	94.6	39	5.4	40	5.5	644	89.1	723
<b>05 Östergötland</b>	281	81.4	338	98	7	2	64	18.6	274	79.4	345
Motala lasarett	28	73.7	38	100	.	.	10	26.3	28	73.7	38
Universitetssjukhuset i Linköping	253	83	298	97.7	7	2.3	52	17	246	80.7	305
Vrinnevisjukhuset	.	.	2	100	.	.	2	100	.	.	2
<b>06 Jönköping</b>	100	81.3	122	99.2	1	0.8	23	18.7	99	80.5	123
Högländssjukhuset Eksjö och Nässjö	12	85.7	13	92.9	1	7.1	2	14.3	11	78.6	14
Länssjukhuset Ryhov	88	80.7	109	100	.	.	21	19.3	88	80.7	109
<b>07 Kronoberg</b>	38	70.4	54	100	.	.	16	29.6	38	70.4	54
Centrallasarettet i Växjö	38	95	40	100	.	.	2	5	38	95	40
Ljungby lasarett	.	.	14	100	.	.	14	100	.	.	14
<b>08 Kalmar</b>	124	73.4	159	94.1	10	5.9	45	26.6	114	67.5	169
Länssjukhuset i Kalmar	106	71.6	138	93.2	10	6.8	42	28.4	96	64.9	148
Västerviks sjukhus	18	85.7	21	100	.	.	3	14.3	18	85.7	21
<b>09 Gotland</b>	.	.	54	100	.	.	54	100	.	.	54
Visby lasarett	.	.	54	100	.	.	54	100	.	.	54
<b>10 Blekinge</b>	109	86.5	110	87.3	16	12.7	17	13.5	93	73.8	126
Blekingesjukhuset	109	86.5	110	87.3	16	12.7	17	13.5	93	73.8	126
<b>12 Skåne</b>	656	72.1	877	96.4	33	3.6	254	27.9	623	68.5	910
Trelleborgs lasarett	.	.	2	100	.	.	2	100	.	.	2
Universitetssjukhuset i Lund	148	50.7	288	98.6	4	1.4	144	49.3	144	49.3	292
Universitetssjukhuset i Malmö	155	80.7	188	97.9	4	2.1	37	19.3	151	78.6	192
Ängelholms sjukhus	353	83.3	399	94.1	25	5.9	71	16.7	328	77.4	424
<b>13 Halland</b>	140	81.4	169	98.3	3	1.7	32	18.6	137	79.7	172
Hallands sjukhus Halmstad	95	82.6	113	98.3	2	1.7	20	17.4	93	80.9	115
Hallands sjukhus Varberg	45	78.9	56	98.2	1	1.8	12	21.1	44	77.2	57
<b>14 Västra Götaland</b>	911	65.1	1338	95.6	62	4.4	489	34.9	849	60.6	1400
Kungälv's sjukhus	42	82.4	50	98	1	2	9	17.6	41	80.4	51
NU-sjukvården	68	67.3	101	100	.	.	33	32.7	68	67.3	101

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**Today's date is: May 26, 2014**

Year 2010	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
Sahlgrenska universitetssjukhuset	183	53.4	331	96.5	12	3.5	160	46.6	171	49.9	343
Skaraborgs sjukhus	98	94.2	98	94.2	6	5.8	6	5.8	92	88.5	104
Spine Center Göteborg	484	66.4	688	94.4	41	5.6	245	33.6	443	60.8	729
Södra Älvsborgs sjukhus	36	50	70	97.2	2	2.8	36	50	34	47.2	72
17 Värmland	55	71.4	71	92.2	6	7.8	22	28.6	49	63.6	77
Karlstads sjukhus	55	71.4	71	92.2	6	7.8	22	28.6	49	63.6	77
18 Örebro	168	86.2	186	95.4	9	4.6	27	13.8	159	81.5	195
Karlskoga lasarett	23	92	25	100	.	.	2	8	23	92	25
Universitetssjukhuset Örebro	145	85.3	161	94.7	9	5.3	25	14.7	136	80	170
19 Västmanland	139	51.7	260	96.7	9	3.3	130	48.3	130	48.3	269
Västerås lasarett	139	51.7	260	96.7	9	3.3	130	48.3	130	48.3	269
20 Dalarna	193	87.7	205	93.2	15	6.8	27	12.3	178	80.9	220
Falu lasarett	193	87.7	205	93.2	15	6.8	27	12.3	178	80.9	220
21 Gävleborg	95	70.9	131	97.8	3	2.2	39	29.1	92	68.7	134
Gävle sjukhus	48	68.6	70	100	.	.	22	31.4	48	68.6	70
Hudiksvalls sjukhus	47	73.4	61	95.3	3	4.7	17	26.6	44	68.8	64
22 Västernorrland	69	74.2	92	98.9	1	1.1	24	25.8	68	73.1	93
Sundsvalls sjukhus	69	74.2	92	98.9	1	1.1	24	25.8	68	73.1	93
23 Jämtland	66	71.7	74	80.4	18	19.6	26	28.3	48	52.2	92
Östersunds sjukhus	66	71.7	74	80.4	18	19.6	26	28.3	48	52.2	92
24 Västerbotten	237	74.5	304	95.6	14	4.4	81	25.5	223	70.1	318
Norrlands Universitetssjukhus	237	74.5	304	95.6	14	4.4	81	25.5	223	70.1	318
25 Norrbotten	.	.	107	100	.	.	107	100	.	.	107
Gällivare lasarett	.	.	15	100	.	.	15	100	.	.	15
Sunderbyns sjukhus	.	.	92	100	.	.	92	100	.	.	92
UNKNOWN	203	100	.	.	203	100	.	.	.	.	203
	203	100	.	.	203	100	.	.	.	.	203



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Year 2009	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	N:o
<b>Hela Whole nation</b>	5818	73.8	7160	90.8	727	9.2	2069	26.2	5091	64.5	7887
<b>01 Stockholm</b>	1303	65.7	1966	99.1	18	0.9	681	34.3	1285	64.8	1984
Danderyds sjukhus	.	.	1	100	.	.	1	100	.	.	1
Karolinska universitetssjukhuset Hudding	.	.	62	100	.	.	62	100	.	.	62
Karolinska universitetssjukhuset Solna	159	70.4	213	94.2	13	5.8	67	29.6	146	64.6	226
Löwenströmska sjukhuset	707	69.2	1021	100	.	.	314	30.8	707	69.2	1021
Nacka sjukhus	238	80.7	295	100	.	.	57	19.3	238	80.7	295
S:t Görans sjukhus	115	78.2	142	96.6	5	3.4	32	21.8	110	74.8	147
Sophiahemmet	.	.	64	100	.	.	64	100	.	.	64
Södersjukhuset	84	50	168	100	.	.	84	50	84	50	168
<b>03 Uppsala</b>	291	72.2	358	88.8	45	11.2	112	27.8	246	61	403
Akademiska sjukhuset	291	72.2	358	88.8	45	11.2	112	27.8	246	61	403
<b>04 Södermanland</b>	764	92.3	678	81.9	150	18.1	64	7.7	614	74.2	828
Löts Rehabiliteringscentrum	.	.	21	100	.	.	21	100	.	.	21
Mälarsjukhuset	108	98.2	4	3.6	106	96.4	2	1.8	2	1.8	110
Ryggkirurgiska kliniken i Strängnäs	656	94.1	653	93.7	44	6.3	41	5.9	612	87.8	697
<b>05 Östergötland</b>	277	83.9	325	98.5	5	1.5	53	16.1	272	82.4	330
Universitetssjukhuset i Linköping	277	83.9	325	98.5	5	1.5	53	16.1	272	82.4	330
<b>06 Jönköping</b>	135	82.3	159	97	5	3	29	17.7	130	79.3	164
Högländssjukhuset Eksjö och Nässjö	15	93.8	16	100	.	.	1	6.3	15	93.8	16
Länssjukhuset Ryhov	120	81.1	143	96.6	5	3.4	28	18.9	115	77.7	148
<b>07 Kronoberg</b>	40	88.9	44	97.8	1	2.2	5	11.1	39	86.7	45
Centrallasarettet i Växjö	40	90.9	43	97.7	1	2.3	4	9.1	39	88.6	44
Ljungby lasarett	.	.	1	100	.	.	1	100	.	.	1
<b>08 Kalmar</b>	101	87.1	109	94	7	6	15	12.9	94	81	116
Länssjukhuset i Kalmar	75	85.2	82	93.2	6	6.8	13	14.8	69	78.4	88
Västerviks sjukhus	26	92.9	27	96.4	1	3.6	2	7.1	25	89.3	28
<b>09 Gotland</b>	.	.	56	100	.	.	56	100	.	.	56
Visby lasarett	.	.	56	100	.	.	56	100	.	.	56
<b>10 Blekinge</b>	128	87.7	132	90.4	14	9.6	18	12.3	114	78.1	146
Blekingesjukhuset	128	87.7	132	90.4	14	9.6	18	12.3	114	78.1	146
<b>12 Skåne</b>	566	70.3	757	94	48	6	239	29.7	518	64.3	805
Helsingborgs lasarett	.	.	1	100	.	.	1	100	.	.	1
Trelleborgs lasarett	.	.	3	100	.	.	3	100	.	.	3
Universitetssjukhuset i Lund	150	55.4	261	96.3	10	3.7	121	44.6	140	51.7	271
Universitetssjukhuset i Malmö	132	79.5	157	94.6	9	5.4	34	20.5	123	74.1	166
Ängelholms sjukhus	284	78	335	92	29	8	80	22	255	70.1	364
<b>13 Halland</b>	102	69.4	138	93.9	9	6.1	45	30.6	93	63.3	147
Capio Movement	.	.	1	100	.	.	1	100	.	.	1
Hallands sjukhus Halmstad	81	73	103	92.8	8	7.2	30	27	73	65.8	111
Hallands sjukhus Varberg	21	60	34	97.1	1	2.9	14	40	20	57.1	35
<b>14 Västra Götaland</b>	893	71.4	1193	95.4	58	4.6	358	28.6	835	66.7	1251
Kungälv's sjukhus	26	68.4	37	97.4	1	2.6	12	31.6	25	65.8	38

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Year 2009	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total
	N:o	%	N:o	%	N:o		N:o	%	N:o	%	N:o
NU-sjukvården	63	78.8	79	98.8	1	1.3	17	21.3	62	77.5	80
Sahlgrenska universitetssjukhuset	170	48.4	332	94.6	19	5.4	181	51.6	151	43	351
Skaraborgs sjukhus	106	92.2	112	97.4	3	2.6	9	7.8	103	89.6	115
Spine Center Göteborg	473	84.5	527	94.1	33	5.9	87	15.5	440	78.6	560
Södra Älvsborgs sjukhus	55	51.4	106	99.1	1	0.9	52	48.6	54	50.5	107
17 Värmland	59	86.8	59	86.8	9	13.2	9	13.2	50	73.5	68
Karlstads sjukhus	59	86.8	59	86.8	9	13.2	9	13.2	50	73.5	68
18 Örebro	147	83.5	169	96	7	4	29	16.5	140	79.5	176
Karlskoga lasarett	13	92.9	14	100	.	.	1	7.1	13	92.9	14
Universitetssjukhuset Örebro	134	82.7	155	95.7	7	4.3	28	17.3	127	78.4	162
19 Västmanland	130	62.5	201	96.6	7	3.4	78	37.5	123	59.1	208
Köpings lasarett	.	.	9	100	.	.	9	100	.	.	9
Västerås lasarett	130	65.3	192	96.5	7	3.5	69	34.7	123	61.8	199
20 Dalarna	174	88.8	177	90.3	19	9.7	22	11.2	155	79.1	196
Falu lasarett	174	88.8	177	90.3	19	9.7	22	11.2	155	79.1	196
21 Gävleborg	99	89.2	105	94.6	6	5.4	12	10.8	93	83.8	111
Bollnäs sjukhus	10	90.9	10	90.9	1	9.1	1	9.1	9	81.8	11
Gävle sjukhus	51	94.4	52	96.3	2	3.7	3	5.6	49	90.7	54
Hudiksvalls sjukhus	38	82.6	43	93.5	3	6.5	8	17.4	35	76.1	46
22 Västernorrland	57	47.1	118	97.5	3	2.5	64	52.9	54	44.6	121
Sundsvalls sjukhus	57	62	89	96.7	3	3.3	35	38	54	58.7	92
Örnsköldsviks sjukhus	.	.	29	100	.	.	29	100	.	.	29
23 Jämtland	84	74.3	96	85	17	15	29	25.7	67	59.3	113
Östersunds sjukhus	84	74.3	96	85	17	15	29	25.7	67	59.3	113
24 Västerbotten	195	75.3	233	90	26	10	64	24.7	169	65.3	259
Norrlands Universitetssjukhus	195	75.3	233	90	26	10	64	24.7	169	65.3	259
25 Norrbotten	.	.	87	100	.	.	87	100	.	.	87
Gällivare lasarett	.	.	18	100	.	.	18	100	.	.	18
Sunderbyns sjukhus	.	.	69	100	.	.	69	100	.	.	69
UNKNOWN	273	100	.	.	273	100	.	.	.	.	273
	273	100	.	.	273	100	.	.	.	.	273

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Year 2008	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	N:o
<b>Hela Whole nation</b>	5169	73.5	6081	86.5	949	13.5	1861	26.5	4220	60	7030
<b>01 Stockholm</b>	1307	70.8	1812	98.1	35	1.9	540	29.2	1272	68.9	1847
Karolinska universitetssjukhuset Hudding	.	.	50	100	.	.	50	100	.	.	50
Karolinska universitetssjukhuset Solna	156	75.7	197	95.6	9	4.4	50	24.3	147	71.4	206
Löwenströmska sjukhuset	139	45	309	100	.	.	170	55	139	45	309
Nacka sjukhus	166	82.2	202	100	.	.	36	17.8	166	82.2	202
S:t Görans sjukhus	178	85.6	186	89.4	22	10.6	30	14.4	156	75	208
Södersjukhuset	61	38.9	153	97.5	4	2.5	96	61.1	57	36.3	157
Vidarkliniken	607	84.9	715	100	.	.	108	15.1	607	84.9	715
<b>03 Uppsala</b>	237	81.4	278	95.5	13	4.5	54	18.6	224	77	291
Akademiska sjukhuset	237	81.4	278	95.5	13	4.5	54	18.6	224	77	291
<b>04 Södermanland</b>	699	91.1	714	93.1	53	6.9	68	8.9	646	84.2	767
Löts Rehabiliteringscentrum	1	3.7	27	100	.	.	26	96.3	1	3.7	27
Mälarsjukhuset	94	85.5	104	94.5	6	5.5	16	14.5	88	80	110
Ryggkirurgiska kliniken i Strängnäs	604	95.9	583	92.5	47	7.5	26	4.1	557	88.4	630
<b>05 Östergötland</b>	305	83.6	354	97	11	3	60	16.4	294	80.5	365
Universitetssjukhuset i Linköping	305	83.6	354	97	11	3	60	16.4	294	80.5	365
<b>06 Jönköping</b>	124	75.6	154	93.9	10	6.1	40	24.4	114	69.5	164
Högländssjukhuset Eksjö och Nässjö	17	85	17	85	3	15	3	15	14	70	20
Länssjukhuset Ryhov	107	74.3	137	95.1	7	4.9	37	25.7	100	69.4	144
<b>07 Kronoberg</b>	.	.	45	100	.	.	45	100	.	.	45
Centrallasarettet i Växjö	.	.	45	100	.	.	45	100	.	.	45
<b>08 Kalmar</b>	94	76.4	122	99.2	1	0.8	29	23.6	93	75.6	123
Länssjukhuset i Kalmar	72	76.6	93	98.9	1	1.1	22	23.4	71	75.5	94
Västerviks sjukhus	22	75.9	29	100	.	.	7	24.1	22	75.9	29
<b>09 Gotland</b>	.	.	47	100	.	.	47	100	.	.	47
Visby lasarett	.	.	47	100	.	.	47	100	.	.	47
<b>10 Blekinge</b>	78	71.6	99	90.8	10	9.2	31	28.4	68	62.4	109
Blekingesjukhuset	78	71.6	99	90.8	10	9.2	31	28.4	68	62.4	109
<b>12 Skåne</b>	400	64.8	585	94.8	32	5.2	217	35.2	368	59.6	617
Helsingborgs lasarett	.	.	2	100	.	.	2	100	.	.	2
Trelleborgs lasarett	.	.	3	100	.	.	3	100	.	.	3
Universitetssjukhuset i Lund	88	45.6	190	98.4	3	1.6	105	54.4	85	44	193
Universitetssjukhuset i Malmö	116	83.5	132	95	7	5	23	16.5	109	78.4	139
Ängelholms sjukhus	196	70	258	92.1	22	7.9	84	30	174	62.1	280
<b>13 Halland</b>	92	71.9	125	97.7	3	2.3	36	28.1	89	69.5	128
Hallands sjukhus Halmstad	72	83.7	83	96.5	3	3.5	14	16.3	69	80.2	86
Hallands sjukhus Varberg	20	51.3	39	100	.	.	19	48.7	20	51.3	39
Spenshults reumatikersjukhus	.	.	3	100	.	.	3	100	.	.	3
<b>14 Västra Götaland</b>	850	72.5	658	56.1	515	43.9	323	27.5	335	28.6	1173
Kungälv's sjukhus	55	90.2	61	100	.	.	6	9.8	55	90.2	61
NU-sjukvården	69	66.3	96	92.3	8	7.7	35	33.7	61	58.7	104
Sahlgrenska universitetssjukhuset	116	39.1	278	93.6	19	6.4	181	60.9	97	32.7	297

**Match between the Swedish Spine Register and the National Patient Register, 2001-2012 surgery date and personal identification number. A 7-day difference between the date of surgery entered in the quality register and the Patient Register's date of admission and discharge was permitted.**

**The selection from the National Patient Register was made in accordance with Swespine's outcome groups**

**Today's date is: May 26, 2014**

Year 2008	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	N:o
Skaraborgs sjukhus	75	58.1	111	86	18	14	54	41.9	57	44.2	129
Spine Center Göteborg	475	100	8	1.7	467	98.3	.	.	8	1.7	475
Södra Älvsborgs sjukhus	60	56.1	104	97.2	3	2.8	47	43.9	57	53.3	107
17 Värmland	13	59.1	19	86.4	3	13.6	9	40.9	10	45.5	22
Karlstads sjukhus	13	59.1	19	86.4	3	13.6	9	40.9	10	45.5	22
18 Örebro	115	81.6	134	95	7	5	26	18.4	108	76.6	141
Karlskoga lasarett	11	78.6	14	100	.	.	3	21.4	11	78.6	14
Universitetssjukhuset Örebro	104	81.9	120	94.5	7	5.5	23	18.1	97	76.4	127
19 Västmanland	99	64.3	143	92.9	11	7.1	55	35.7	88	57.1	154
Köpings lasarett	.	.	5	100	.	.	5	100	.	.	5
Västerås lasarett	99	66.4	138	92.6	11	7.4	50	33.6	88	59.1	149
20 Dalarna	169	90.4	168	89.8	19	10.2	18	9.6	150	80.2	187
Falu lasarett	169	90.4	168	89.8	19	10.2	18	9.6	150	80.2	187
21 Gävleborg	83	77.6	105	98.1	2	1.9	24	22.4	81	75.7	107
Bollnäs sjukhus	22	81.5	25	92.6	2	7.4	5	18.5	20	74.1	27
Gävle sjukhus	22	73.3	30	100	.	.	8	26.7	22	73.3	30
Hudiksvalls sjukhus	39	78	50	100	.	.	11	22	39	78	50
22 Västernorrland	59	53.6	104	94.5	6	5.5	51	46.4	53	48.2	110
Sundsvalls sjukhus	59	65.6	84	93.3	6	6.7	31	34.4	53	58.9	90
Örnsköldsviks sjukhus	.	.	20	100	.	.	20	100	.	.	20
23 Jämtland	59	74.7	70	88.6	9	11.4	20	25.3	50	63.3	79
Östersunds sjukhus	59	74.7	70	88.6	9	11.4	20	25.3	50	63.3	79
24 Västerbotten	197	77.9	233	92.1	20	7.9	56	22.1	177	70	253
Norrlands Universitetssjukhus	197	77.9	233	92.1	20	7.9	56	22.1	177	70	253
25 Norrbotten	.	.	112	100	.	.	112	100	.	.	112
Gällivare lasarett	.	.	17	100	.	.	17	100	.	.	17
Sunderbyns sjukhus	.	.	95	100	.	.	95	100	.	.	95
UNKNOWN	189	100	.	.	189	100	.	.	.	.	189
	189	100	.	.	189	100	.	.	.	.	189

**Match between the Swedish Spine Register and the National Patient Register, 2001-2012 surgery date and personal identification number. A 7-day difference between the date of surgery entered in the quality register and the Patient Register's date of admission and discharge was permitted.**

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**Today's date is: May 26, 2014**

Year 2007	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
<b>Hela Whole nation</b>	4440	70.5	5051	80.3	1243	19.7	1854	29.5	3197	50.8	6294
<b>01 Stockholm</b>	910	69	1253	95.1	65	4.9	408	31	845	64.1	1318
Danderyds sjukhus	12	35.3	32	94.1	2	5.9	22	64.7	10	29.4	34
Karolinska universitetssjukhuset Hudding	.	.	130	100	.	.	130	100	.	.	130
Karolinska universitetssjukhuset Solna	106	69.7	132	86.8	20	13.2	46	30.3	86	56.6	152
Löwenströmska sjukhuset	317	85	373	100	.	.	56	15	317	85	373
Nacka sjukhus	175	78.1	224	100	.	.	49	21.9	175	78.1	224
S:t Görans sjukhus	223	86.8	223	86.8	34	13.2	34	13.2	189	73.5	257
Södersjukhuset	77	52	139	93.9	9	6.1	71	48	68	45.9	148
<b>03 Uppsala</b>	149	68.7	210	96.8	7	3.2	68	31.3	142	65.4	217
Akademiska sjukhuset	149	68.7	210	96.8	7	3.2	68	31.3	142	65.4	217
<b>04 Södermanland</b>	581	96	277	45.8	328	54.2	24	4	253	41.8	605
Löts Rehabiliteringscentrum	.	.	18	100	.	.	18	100	.	.	18
Mälarsjukhuset	64	91.4	61	87.1	9	12.9	6	8.6	55	78.6	70
Ryggkirurgiska kliniken i Strängnäs	517	100	198	38.3	319	61.7	.	.	198	38.3	517
<b>05 Östergötland</b>	132	46.5	275	96.8	9	3.2	152	53.5	123	43.3	284
Universitetssjukhuset i Linköping	132	46.5	275	96.8	9	3.2	152	53.5	123	43.3	284
<b>06 Jönköping</b>	129	75.9	161	94.7	9	5.3	41	24.1	120	70.6	170
Högländssjukhuset Eksjö och Nässjö	10	76.9	11	84.6	2	15.4	3	23.1	8	61.5	13
Länssjukhuset Ryhov	119	75.8	150	95.5	7	4.5	38	24.2	112	71.3	157
<b>07 Kronoberg</b>	.	.	52	100	.	.	52	100	.	.	52
Centrallasarettet i Växjö	.	.	51	100	.	.	51	100	.	.	51
Ljungby lasarett	.	.	1	100	.	.	1	100	.	.	1
<b>08 Kalmar</b>	101	76.5	126	95.5	6	4.5	31	23.5	95	72	132
Länssjukhuset i Kalmar	70	74.5	91	96.8	3	3.2	24	25.5	67	71.3	94
Oskarshamns sjukhus	2	100	2	100	.	.	.	.	2	100	2
Västerviks sjukhus	29	80.6	33	91.7	3	8.3	7	19.4	26	72.2	36
<b>09 Gotland</b>	.	.	52	100	.	.	52	100	.	.	52
Visby lasarett	.	.	52	100	.	.	52	100	.	.	52
<b>10 Blekinge</b>	73	76	87	90.6	9	9.4	23	24	64	66.7	96
Blekingesjukhuset	73	76	87	90.6	9	9.4	23	24	64	66.7	96
<b>12 Skåne</b>	455	68.5	630	94.9	34	5.1	209	31.5	421	63.4	664
Trelleborgs lasarett	.	.	8	100	.	.	8	100	.	.	8
Universitetssjukhuset i Lund	97	45.5	201	94.4	12	5.6	116	54.5	85	39.9	213
Universitetssjukhuset i Malmö	133	91.7	142	97.9	3	2.1	12	8.3	130	89.7	145
Ängelholms sjukhus	225	75.5	279	93.6	19	6.4	73	24.5	206	69.1	298
<b>13 Halland</b>	122	77.7	152	96.8	5	3.2	35	22.3	117	74.5	157
Hallands sjukhus Halmstad	57	93.4	58	95.1	3	4.9	4	6.6	54	88.5	61
Hallands sjukhus Varberg	65	85.5	74	97.4	2	2.6	11	14.5	63	82.9	76
Spenshults reumatikersjukhus	.	.	20	100	.	.	20	100	.	.	20
<b>14 Västra Götaland</b>	418	51.1	611	74.7	207	25.3	400	48.9	211	25.8	818
Kungälv's sjukhus	45	80.4	55	98.2	1	1.8	11	19.6	44	78.6	56
NU-sjukvården	74	70.5	91	86.7	14	13.3	31	29.5	60	57.1	105

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Year 2007	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
Sahlgrenska universitetssjukhuset	95	41.3	219	95.2	11	4.8	135	58.7	84	36.5	230
Skaraborgs sjukhus	7	5.1	137	99.3	1	0.7	131	94.9	6	4.3	138
Spine Center Göteborg	179	100	.	.	179	100	.	.	.	.	179
Södra Älvsborgs sjukhus	18	16.4	109	99.1	1	0.9	92	83.6	17	15.5	110
17 Värmland	33	63.5	44	84.6	8	15.4	19	36.5	25	48.1	52
Karlstads sjukhus	33	63.5	44	84.6	8	15.4	19	36.5	25	48.1	52
18 Örebro	115	79.9	136	94.4	8	5.6	29	20.1	107	74.3	144
Karlskoga lasarett	13	100	12	92.3	1	7.7	.	.	12	92.3	13
Universitetssjukhuset Örebro	102	77.9	124	94.7	7	5.3	29	22.1	95	72.5	131
19 Västmanland	127	70.6	168	93.3	12	6.7	53	29.4	115	63.9	180
Köpings lasarett	.	.	10	100	.	.	10	100	.	.	10
Västerås lasarett	127	74.7	158	92.9	12	7.1	43	25.3	115	67.6	170
20 Dalarna	169	88.9	167	87.9	23	12.1	21	11.1	146	76.8	190
Falu lasarett	169	88.9	167	87.9	23	12.1	21	11.1	146	76.8	190
21 Gävleborg	118	87.4	132	97.8	3	2.2	17	12.6	115	85.2	135
Bollnäs sjukhus	26	86.7	28	93.3	2	6.7	4	13.3	24	80	30
Gävle sjukhus	45	88.2	50	98	1	2	6	11.8	44	86.3	51
Hudiksvalls sjukhus	47	87	54	100	.	.	7	13	47	87	54
22 Västernorrland	86	75.4	110	96.5	4	3.5	28	24.6	82	71.9	114
Sundsvalls sjukhus	86	75.4	110	96.5	4	3.5	28	24.6	82	71.9	114
23 Jämtland	52	68.4	74	97.4	2	2.6	24	31.6	50	65.8	76
Östersunds sjukhus	52	68.4	74	97.4	2	2.6	24	31.6	50	65.8	76
24 Västerbotten	179	70.2	242	94.9	13	5.1	76	29.8	166	65.1	255
Norrlands Universitetssjukhus	179	70.2	242	94.9	13	5.1	76	29.8	166	65.1	255
25 Norrbotten	.	.	92	100	.	.	92	100	.	.	92
Gällivare lasarett	.	.	25	100	.	.	25	100	.	.	25
Sunderbyns sjukhus	.	.	67	100	.	.	67	100	.	.	67
UNKNOWN	491	100	.	.	491	100	.	.	.	.	491
	491	100	.	.	491	100	.	.	.	.	491

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Year 2006	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
<b>Hela Whole nation</b>	4060	68.5	4940	83.4	986	16.6	1866	31.5	3074	51.9	5926
<b>01 Stockholm</b>	921	67.4	1343	98.3	23	1.7	445	32.6	898	65.7	1366
Danderyds sjukhus	80	64	121	96.8	4	3.2	45	36	76	60.8	125
Karolinska universitetssjukhuset Hudding	.	.	156	100	.	.	156	100	.	.	156
Karolinska universitetssjukhuset Solna	54	50.5	106	99.1	1	0.9	53	49.5	53	49.5	107
Löwenströmska sjukhuset	311	84.3	369	100	.	.	58	15.7	311	84.3	369
Nacka sjukhus	215	82.4	261	100	.	.	46	17.6	215	82.4	261
S:t Görans sjukhus	177	83.9	196	92.9	15	7.1	34	16.1	162	76.8	211
Södersjukhuset	84	61.3	134	97.8	3	2.2	53	38.7	81	59.1	137
<b>03 Uppsala</b>	115	55	197	94.3	12	5.7	94	45	103	49.3	209
Akademiska sjukhuset	115	55	197	94.3	12	5.7	94	45	103	49.3	209
<b>04 Södermanland</b>	552	93.7	277	47	312	53	37	6.3	240	40.7	589
Löts Rehabiliteringscentrum	.	.	18	100	.	.	18	100	.	.	18
Mälarsjukhuset	68	78.2	84	96.6	3	3.4	19	21.8	65	74.7	87
Ryggkirurgiska kliniken i Strängnäs	484	100	175	36.2	309	63.8	.	.	175	36.2	484
<b>05 Östergötland</b>	197	68.2	272	94.1	17	5.9	92	31.8	180	62.3	289
Universitetssjukhuset i Linköping	197	68.2	272	94.1	17	5.9	92	31.8	180	62.3	289
<b>06 Jönköping</b>	148	70.8	203	97.1	6	2.9	61	29.2	142	67.9	209
Högländssjukhuset Eksjö och Nässjö	7	58.3	11	91.7	1	8.3	5	41.7	6	50	12
Länssjukhuset Ryhov	141	71.6	192	97.5	5	2.5	56	28.4	136	69	197
<b>07 Kronoberg</b>	.	.	35	100	.	.	35	100	.	.	35
Centrallasarettet i Växjö	.	.	34	100	.	.	34	100	.	.	34
Ljungby lasarett	.	.	1	100	.	.	1	100	.	.	1
<b>08 Kalmar</b>	131	81.4	147	91.3	14	8.7	30	18.6	117	72.7	161
Länssjukhuset i Kalmar	82	78.8	95	91.3	9	8.7	22	21.2	73	70.2	104
Oskarshamns sjukhus	15	83.3	15	83.3	3	16.7	3	16.7	12	66.7	18
Västerviks sjukhus	34	87.2	37	94.9	2	5.1	5	12.8	32	82.1	39
<b>09 Gotland</b>	.	.	21	100	.	.	21	100	.	.	21
Visby lasarett	.	.	21	100	.	.	21	100	.	.	21
<b>10 Blekinge</b>	42	45.2	89	95.7	4	4.3	51	54.8	38	40.9	93
Blekingesjukhuset	42	45.2	89	95.7	4	4.3	51	54.8	38	40.9	93
<b>12 Skåne</b>	384	63.9	569	94.7	32	5.3	217	36.1	352	58.6	601
Helsingborgs lasarett	5	71.4	6	85.7	1	14.3	2	28.6	4	57.1	7
Trelleborgs lasarett	.	.	5	100	.	.	5	100	.	.	5
Universitetssjukhuset i Lund	104	47.3	208	94.5	12	5.5	116	52.7	92	41.8	220
Universitetssjukhuset i Malmö	120	85.1	140	99.3	1	0.7	21	14.9	119	84.4	141
Ängelholms sjukhus	155	68	210	92.1	18	7.9	73	32	137	60.1	228
<b>13 Halland</b>	127	86.4	141	95.9	6	4.1	20	13.6	121	82.3	147
Hallands sjukhus Halmstad	66	91.7	69	95.8	3	4.2	6	8.3	63	87.5	72
Hallands sjukhus Varberg	61	81.3	72	96	3	4	14	18.7	58	77.3	75
<b>14 Västra Götaland</b>	315	47.4	602	90.7	62	9.3	349	52.6	253	38.1	664
Carlanderska	21	100	2	9.5	19	90.5	.	.	2	9.5	21
Kungälv's sjukhus	1	1.8	56	100	.	.	55	98.2	1	1.8	56

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Year 2006	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
NU-sjukvården	63	64.9	79	81.4	18	18.6	34	35.1	45	46.4	97
Sahlgrenska universitetssjukhuset	161	66.5	225	93	17	7	81	33.5	144	59.5	242
Skaraborgs sjukhus	7	5.4	128	99.2	1	0.8	122	94.6	6	4.7	129
Spine Center Göteborg	3	100	3	100	.	.	.	.	3	100	3
Södra Älvsborgs sjukhus	59	50.9	109	94	7	6	57	49.1	52	44.8	116
17 Värmland	72	86.7	69	83.1	14	16.9	11	13.3	58	69.9	83
Karlstads sjukhus	72	86.7	69	83.1	14	16.9	11	13.3	58	69.9	83
18 Örebro	107	84.9	119	94.4	7	5.6	19	15.1	100	79.4	126
Karlskoga lasarett	9	75	12	100	.	.	3	25	9	75	12
Universitetssjukhuset Örebro	98	86	107	93.9	7	6.1	16	14	91	79.8	114
19 Västmanland	83	67.5	119	96.7	4	3.3	40	32.5	79	64.2	123
Västerås lasarett	83	67.5	119	96.7	4	3.3	40	32.5	79	64.2	123
20 Dalarna	120	75.5	141	88.7	18	11.3	39	24.5	102	64.2	159
Falu lasarett	120	75.5	141	88.7	18	11.3	39	24.5	102	64.2	159
21 Gävleborg	77	62.6	121	98.4	2	1.6	46	37.4	75	61	123
Bollnäs sjukhus	.	.	17	100	.	.	17	100	.	.	17
Gävle sjukhus	36	70.6	49	96.1	2	3.9	15	29.4	34	66.7	51
Hudiksvalls sjukhus	41	74.5	55	100	.	.	14	25.5	41	74.5	55
22 Västernorrland	85	66.4	126	98.4	2	1.6	43	33.6	83	64.8	128
Sundsvalls sjukhus	85	66.4	126	98.4	2	1.6	43	33.6	83	64.8	128
23 Jämtland	74	88.1	83	98.8	1	1.2	10	11.9	73	86.9	84
Östersunds sjukhus	74	88.1	83	98.8	1	1.2	10	11.9	73	86.9	84
24 Västerbotten	63	33.3	186	98.4	3	1.6	126	66.7	60	31.7	189
Norrlands Universitetssjukhus	63	33.3	186	98.4	3	1.6	126	66.7	60	31.7	189
25 Norrbotten	.	.	80	100	.	.	80	100	.	.	80
Gällivare lasarett	.	.	12	100	.	.	12	100	.	.	12
Sunderbyns sjukhus	.	.	68	100	.	.	68	100	.	.	68
UNKNOWN	447	100	.	.	447	100	.	.	.	.	447
	447	100	.	.	447	100	.	.	.	.	447



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**Today's date is: May 26, 2014**

Year 2005	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	N:o
<b>Hela Whole nation</b>	3488	63.6	4883	89	604	11	1999	36.4	2884	52.6	5487
<b>01 Stockholm</b>	724	64.2	1100	97.5	28	2.5	404	35.8	696	61.7	1128
Danderyds sjukhus	75	58.6	121	94.5	7	5.5	53	41.4	68	53.1	128
Karolinska universitetssjukhuset Hudding	.	.	138	100	.	.	138	100	.	.	138
Karolinska universitetssjukhuset Solna	44	41.9	98	93.3	7	6.7	61	58.1	37	35.2	105
Löwenströmska sjukhuset	283	83.2	340	100	.	.	57	16.8	283	83.2	340
Nacka sjukhus	141	81.5	173	100	.	.	32	18.5	141	81.5	173
S:t Görans sjukhus	98	72.6	125	92.6	10	7.4	37	27.4	88	65.2	135
Sophiahemmet	.	.	1	100	.	.	1	100	.	.	1
Södersjukhuset	83	76.9	104	96.3	4	3.7	25	23.1	79	73.1	108
<b>03 Uppsala</b>	141	64.4	211	96.3	8	3.7	78	35.6	133	60.7	219
Akademiska sjukhuset	141	64.4	211	96.3	8	3.7	78	35.6	133	60.7	219
<b>04 Södermanland</b>	525	89.6	527	89.9	59	10.1	61	10.4	466	79.5	586
Löts Rehabiliteringscentrum	.	.	12	100	.	.	12	100	.	.	12
Mälarsjukhuset	59	86.8	66	97.1	2	2.9	9	13.2	57	83.8	68
Ryggkirurgiska kliniken i Strängnäs	466	92.1	449	88.7	57	11.3	40	7.9	409	80.8	506
<b>05 Östergötland</b>	60	29.9	192	95.5	9	4.5	141	70.1	51	25.4	201
Universitetssjukhuset i Linköping	60	29.9	192	95.5	9	4.5	141	70.1	51	25.4	201
<b>06 Jönköping</b>	140	62.8	217	97.3	6	2.7	83	37.2	134	60.1	223
Högländssjukhuset Eksjö och Nässjö	20	83.3	24	100	.	.	4	16.7	20	83.3	24
Länssjukhuset Ryhov	120	60.3	193	97	6	3	79	39.7	114	57.3	199
<b>07 Kronoberg</b>	.	.	48	100	.	.	48	100	.	.	48
Centrallasarettet i Växjö	.	.	44	100	.	.	44	100	.	.	44
Ljungby lasarett	.	.	4	100	.	.	4	100	.	.	4
<b>08 Kalmar</b>	105	76.6	125	91.2	12	8.8	32	23.4	93	67.9	137
Länssjukhuset i Kalmar	85	81.7	94	90.4	10	9.6	19	18.3	75	72.1	104
Oskarshamns sjukhus	5	45.5	10	90.9	1	9.1	6	54.5	4	36.4	11
Västerviks sjukhus	15	68.2	21	95.5	1	4.5	7	31.8	14	63.6	22
<b>09 Gotland</b>	.	.	25	100	.	.	25	100	.	.	25
Visby lasarett	.	.	25	100	.	.	25	100	.	.	25
<b>10 Blekinge</b>	64	65.3	90	91.8	8	8.2	34	34.7	56	57.1	98
Blekingesjukhuset	64	65.3	90	91.8	8	8.2	34	34.7	56	57.1	98
<b>12 Skåne</b>	337	58.4	547	94.8	30	5.2	240	41.6	307	53.2	577
Helsingborgs lasarett	5	71.4	6	85.7	1	14.3	2	28.6	4	57.1	7
Hässleholms sjukhus	.	.	8	100	.	.	8	100	.	.	8
Simrishamns sjukhus	35	64.8	48	88.9	6	11.1	19	35.2	29	53.7	54
Trelleborgs lasarett	.	.	4	100	.	.	4	100	.	.	4
Universitetssjukhuset i Lund	99	44	219	97.3	6	2.7	126	56	93	41.3	225
Universitetssjukhuset i Malmö	88	80	104	94.5	6	5.5	22	20	82	74.5	110
Ystads lasarett	.	.	6	100	.	.	6	100	.	.	6
Ängelholms sjukhus	110	67.5	152	93.3	11	6.7	53	32.5	99	60.7	163
<b>13 Halland</b>	116	73	155	97.5	4	2.5	43	27	112	70.4	159
Hallands sjukhus Halmstad	67	88.2	74	97.4	2	2.6	9	11.8	65	85.5	76

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	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	N:o
Hallands sjukhus Varberg	49	59	81	97.6	2	2.4	34	41	47	56.6	83
14 Västra Götaland	415	53.5	716	92.4	59	7.6	360	46.5	356	45.9	775
Carlanderska	7	100	.	.	7	100	.	.	.	.	7
Kungälv's sjukhus	.	.	30	100	.	.	30	100	.	.	30
NU-sjukvården	63	71.6	71	80.7	17	19.3	25	28.4	46	52.3	88
Sahlgrenska universitetssjukhuset	211	58.1	347	95.6	16	4.4	152	41.9	195	53.7	363
Skaraborgs sjukhus	67	40.9	158	96.3	6	3.7	97	59.1	61	37.2	164
Spine Center Göteborg	3	100	1	33.3	2	66.7	.	.	1	33.3	3
Södra Älvsborgs sjukhus	64	53.3	109	90.8	11	9.2	56	46.7	53	44.2	120
17 Värmland	54	73	52	70.3	22	29.7	20	27	32	43.2	74
Karlstads sjukhus	54	73	52	70.3	22	29.7	20	27	32	43.2	74
18 Örebro	106	77.9	124	91.2	12	8.8	30	22.1	94	69.1	136
Karlskoga lasarett	10	90.9	10	90.9	1	9.1	1	9.1	9	81.8	11
Universitetssjukhuset Örebro	96	76.8	114	91.2	11	8.8	29	23.2	85	68	125
19 Västmanland	57	50	104	91.2	10	8.8	57	50	47	41.2	114
Västerås lasarett	57	50	104	91.2	10	8.8	57	50	47	41.2	114
20 Dalarna	102	67.5	129	85.4	22	14.6	49	32.5	80	53	151
Falu lasarett	102	67.5	129	85.4	22	14.6	49	32.5	80	53	151
21 Gävleborg	44	55	79	98.8	1	1.3	36	45	43	53.8	80
Bollnäs sjukhus	.	.	4	100	.	.	4	100	.	.	4
Gävle sjukhus	21	58.3	35	97.2	1	2.8	15	41.7	20	55.6	36
Hudiksvalls sjukhus	23	57.5	40	100	.	.	17	42.5	23	57.5	40
22 Västernorrland	57	52.3	105	96.3	4	3.7	52	47.7	53	48.6	109
Sollefteå sjukhus	.	.	16	100	.	.	16	100	.	.	16
Sundsvalls sjukhus	57	61.3	89	95.7	4	4.3	36	38.7	53	57	93
23 Jämtland	71	83.5	84	98.8	1	1.2	14	16.5	70	82.4	85
Östersunds sjukhus	71	83.5	84	98.8	1	1.2	14	16.5	70	82.4	85
24 Västerbotten	68	34.7	189	96.4	7	3.6	128	65.3	61	31.1	196
Norrlands Universitetssjukhus	68	34.7	189	96.4	7	3.6	128	65.3	61	31.1	196
25 Norrbotten	.	.	64	100	.	.	64	100	.	.	64
Gällivare lasarett	.	.	17	100	.	.	17	100	.	.	17
Sunderbyns sjukhus	.	.	47	100	.	.	47	100	.	.	47
UNKNOWN	302	100	.	.	302	100	.	.	.	.	302
	302	100	.	.	302	100	.	.	.	.	302

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	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
<b>Hela Whole nation</b>	2772	57	3973	81.7	892	18.3	2093	43	1880	38.6	4865
<b>01 Stockholm</b>	490	49.9	955	97.3	26	2.7	491	50.1	464	47.3	981
Danderyds sjukhus	81	58.7	134	97.1	4	2.9	57	41.3	77	55.8	138
Karolinska universitetssjukhuset Hudding	.	.	161	100	.	.	161	100	.	.	161
Karolinska universitetssjukhuset Solna	46	42.6	100	92.6	8	7.4	62	57.4	38	35.2	108
Löwenströmska sjukhuset	191	72.6	263	100	.	.	72	27.4	191	72.6	263
Nacka sjukhus	.	.	14	100	.	.	14	100	.	.	14
S:t Görans sjukhus	72	58.5	115	93.5	8	6.5	51	41.5	64	52	123
Sabbatsbergs närsjukhus	4	7.1	56	100	.	.	52	92.9	4	7.1	56
Sophiahemmet	.	.	2	100	.	.	2	100	.	.	2
Södersjukhuset	96	82.8	110	94.8	6	5.2	20	17.2	90	77.6	116
<b>03 Uppsala</b>	112	47.9	217	92.7	17	7.3	122	52.1	95	40.6	234
Akademiska sjukhuset	112	47.9	217	92.7	17	7.3	122	52.1	95	40.6	234
<b>04 Södermanland</b>	453	94.6	77	16.1	402	83.9	26	5.4	51	10.6	479
Mälarsjukhuset	53	67.1	77	97.5	2	2.5	26	32.9	51	64.6	79
Ryggkirurgiska kliniken i Strängnäs	400	100	.	.	400	100	.	.	.	.	400
<b>05 Östergötland</b>	12	6.9	175	100	.	.	163	93.1	12	6.9	175
Motala lasarett	4	100	4	100	.	.	.	.	4	100	4
Universitetssjukhuset i Linköping	.	.	163	100	.	.	163	100	.	.	163
Vrinnevisjukhuset	8	100	8	100	.	.	.	.	8	100	8
<b>06 Jönköping</b>	124	57.9	209	97.7	5	2.3	90	42.1	119	55.6	214
Högländssjukhuset Eksjö och Nässjö	32	78	41	100	.	.	9	22	32	78	41
Länssjukhuset Ryhov	92	53.2	168	97.1	5	2.9	81	46.8	87	50.3	173
<b>07 Kronoberg</b>	.	.	37	100	.	.	37	100	.	.	37
Centrallasarettet i Växjö	.	.	34	100	.	.	34	100	.	.	34
Ljungby lasarett	.	.	3	100	.	.	3	100	.	.	3
<b>08 Kalmar</b>	104	70.3	145	98	3	2	44	29.7	101	68.2	148
Länssjukhuset i Kalmar	74	74.7	96	97	3	3	25	25.3	71	71.7	99
Oskarshamns sjukhus	17	85	20	100	.	.	3	15	17	85	20
Västerviks sjukhus	13	44.8	29	100	.	.	16	55.2	13	44.8	29
<b>09 Gotland</b>	.	.	21	100	.	.	21	100	.	.	21
Visby lasarett	.	.	21	100	.	.	21	100	.	.	21
<b>10 Blekinge</b>	50	68.5	68	93.2	5	6.8	23	31.5	45	61.6	73
Blekingesjukhuset	50	68.5	68	93.2	5	6.8	23	31.5	45	61.6	73
<b>12 Skåne</b>	319	54.1	552	93.6	38	6.4	271	45.9	281	47.6	590
Helsingborgs lasarett	25	69.4	35	97.2	1	2.8	11	30.6	24	66.7	36
Hässleholms sjukhus	.	.	50	100	.	.	50	100	.	.	50
Simrishamns sjukhus	52	77.6	48	71.6	19	28.4	15	22.4	33	49.3	67
Universitetssjukhuset i Lund	131	52.6	232	93.2	17	6.8	118	47.4	114	45.8	249
Universitetssjukhuset i Malmö	90	76.3	118	100	.	.	28	23.7	90	76.3	118
Ystads lasarett	.	.	34	100	.	.	34	100	.	.	34
Ängelholms sjukhus	21	58.3	35	97.2	1	2.8	15	41.7	20	55.6	36
<b>13 Halland</b>	96	72.2	130	97.7	3	2.3	37	27.8	93	69.9	133

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	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
Hallands sjukhus Halmstad	58	73.4	78	98.7	1	1.3	21	26.6	57	72.2	79
Hallands sjukhus Varberg	38	70.4	52	96.3	2	3.7	16	29.6	36	66.7	54
<b>14 Västra Götaland</b>	<b>253</b>	<b>41.5</b>	<b>563</b>	<b>92.4</b>	<b>46</b>	<b>7.6</b>	<b>356</b>	<b>58.5</b>	<b>207</b>	<b>34</b>	<b>609</b>
Kungälv's sjukhus	.	.	32	100	.	.	32	100	.	.	32
NU-sjukvården	55	59.8	67	72.8	25	27.2	37	40.2	30	32.6	92
Sahlgrenska universitetssjukhuset	125	38.3	315	96.6	11	3.4	201	61.7	114	35	326
Skaraborgs sjukhus	25	45.5	53	96.4	2	3.6	30	54.5	23	41.8	55
Södra Älvsborgs sjukhus	48	46.2	96	92.3	8	7.7	56	53.8	40	38.5	104
<b>17 Värmland</b>	<b>44</b>	<b>55.7</b>	<b>66</b>	<b>83.5</b>	<b>13</b>	<b>16.5</b>	<b>35</b>	<b>44.3</b>	<b>31</b>	<b>39.2</b>	<b>79</b>
Karlstads sjukhus	44	55.7	66	83.5	13	16.5	35	44.3	31	39.2	79
<b>18 Örebro</b>	<b>94</b>	<b>81.7</b>	<b>109</b>	<b>94.8</b>	<b>6</b>	<b>5.2</b>	<b>21</b>	<b>18.3</b>	<b>88</b>	<b>76.5</b>	<b>115</b>
Karlskoga lasarett	14	82.4	17	100	.	.	3	17.6	14	82.4	17
Universitetssjukhuset Örebro	80	81.6	92	93.9	6	6.1	18	18.4	74	75.5	98
<b>19 Västmanland</b>	<b>51</b>	<b>44</b>	<b>107</b>	<b>92.2</b>	<b>9</b>	<b>7.8</b>	<b>65</b>	<b>56</b>	<b>42</b>	<b>36.2</b>	<b>116</b>
Västerås lasarett	51	44	107	92.2	9	7.8	65	56	42	36.2	116
<b>20 Dalarna</b>	<b>78</b>	<b>59.5</b>	<b>118</b>	<b>90.1</b>	<b>13</b>	<b>9.9</b>	<b>53</b>	<b>40.5</b>	<b>65</b>	<b>49.6</b>	<b>131</b>
Falu lasarett	78	59.5	118	90.1	13	9.9	53	40.5	65	49.6	131
<b>21 Gävleborg</b>	<b>28</b>	<b>30.8</b>	<b>85</b>	<b>93.4</b>	<b>6</b>	<b>6.6</b>	<b>63</b>	<b>69.2</b>	<b>22</b>	<b>24.2</b>	<b>91</b>
Bollnäs sjukhus	.	.	14	100	.	.	14	100	.	.	14
Gävle sjukhus	28	62.2	39	86.7	6	13.3	17	37.8	22	48.9	45
Hudiksvalls sjukhus	.	.	32	100	.	.	32	100	.	.	32
<b>22 Västernorrland</b>	<b>59</b>	<b>53.2</b>	<b>101</b>	<b>91</b>	<b>10</b>	<b>9</b>	<b>52</b>	<b>46.8</b>	<b>49</b>	<b>44.1</b>	<b>111</b>
Sollefteå sjukhus	.	.	14	100	.	.	14	100	.	.	14
Sundsvalls sjukhus	59	60.8	87	89.7	10	10.3	38	39.2	49	50.5	97
<b>23 Jämtland</b>	<b>52</b>	<b>89.7</b>	<b>56</b>	<b>96.6</b>	<b>2</b>	<b>3.4</b>	<b>6</b>	<b>10.3</b>	<b>50</b>	<b>86.2</b>	<b>58</b>
Östersunds sjukhus	52	89.7	56	96.6	2	3.4	6	10.3	50	86.2	58
<b>24 Västerbotten</b>	<b>68</b>	<b>51.5</b>	<b>129</b>	<b>97.7</b>	<b>3</b>	<b>2.3</b>	<b>64</b>	<b>48.5</b>	<b>65</b>	<b>49.2</b>	<b>132</b>
Norrlands Universitetssjukhus	68	51.5	129	97.7	3	2.3	64	48.5	65	49.2	132
<b>25 Norrbotten</b>	<b>.</b>	<b>.</b>	<b>53</b>	<b>100</b>	<b>.</b>	<b>.</b>	<b>53</b>	<b>100</b>	<b>.</b>	<b>.</b>	<b>53</b>
Gällivare lasarett	.	.	4	100	.	.	4	100	.	.	4
Sunderbyns sjukhus	.	.	49	100	.	.	49	100	.	.	49
<b>UNKNOWN</b>	<b>285</b>	<b>100</b>	<b>.</b>	<b>.</b>	<b>285</b>	<b>100</b>	<b>.</b>	<b>.</b>	<b>.</b>	<b>.</b>	<b>285</b>
	285	100	.	.	285	100	.	.	.	.	285

**Match between the Swedish Spine Register and the National Patient Register, 2001-2012 surgery date and personal identification number. A 7-day difference between the date of surgery entered in the quality register and the Patient Register's date of admission and discharge was permitted.**

**The selection from the National Patient Register was made in accordance with Swespine's outcome groups**

**Today's date is: May 26, 2014**

Year 2003	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
<b>Hela Whole nation</b>	2402	56.7	3567	84.3	666	15.7	1831	43.3	1736	41	4233
<b>01 Stockholm</b>	361	46.5	763	98.2	14	1.8	416	53.5	347	44.7	777
Danderyds sjukhus	45	52.3	80	93	6	7	41	47.7	39	45.3	86
Karolinska universitetssjukhuset Hudding	.	.	158	100	.	.	158	100	.	.	158
Karolinska universitetssjukhuset Solna	33	29.2	112	99.1	1	0.9	80	70.8	32	28.3	113
Löwenströmska sjukhuset	162	70.1	231	100	.	.	69	29.9	162	70.1	231
S:t Görans sjukhus	48	64	73	97.3	2	2.7	27	36	46	61.3	75
Sabbatsbergs närsjukhus	.	.	4	100	.	.	4	100	.	.	4
Sophiahemmet	.	.	15	100	.	.	15	100	.	.	15
Södersjukhuset	73	76.8	90	94.7	5	5.3	22	23.2	68	71.6	95
<b>03 Uppsala</b>	79	45.9	166	96.5	6	3.5	93	54.1	73	42.4	172
Akademiska sjukhuset	79	45.9	166	96.5	6	3.5	93	54.1	73	42.4	172
<b>04 Södermanland</b>	247	92.5	72	27	195	73	20	7.5	52	19.5	267
Mälarsjukhuset	55	73.3	72	96	3	4	20	26.7	52	69.3	75
Ryggkirurgiska kliniken i Strängnäs	192	100	.	.	192	100	.	.	.	.	192
<b>05 Östergötland</b>	78	40	189	96.9	6	3.1	117	60	72	36.9	195
Motala lasarett	31	72.1	38	88.4	5	11.6	12	27.9	26	60.5	43
Universitetssjukhuset i Linköping	.	.	80	100	.	.	80	100	.	.	80
Vrinnevisjukhuset	47	65.3	71	98.6	1	1.4	25	34.7	46	63.9	72
<b>06 Jönköping</b>	85	50.6	162	96.4	6	3.6	83	49.4	79	47	168
Högländssjukhuset Eksjö och Nässjö	5	55.6	7	77.8	2	22.2	4	44.4	3	33.3	9
Länssjukhuset Ryhov	80	51.3	152	97.4	4	2.6	76	48.7	76	48.7	156
Värnamo sjukhus	.	.	3	100	.	.	3	100	.	.	3
<b>07 Kronoberg</b>	.	.	23	100	.	.	23	100	.	.	23
Centrallasarettet i Växjö	.	.	22	100	.	.	22	100	.	.	22
Ljungby lasarett	.	.	1	100	.	.	1	100	.	.	1
<b>08 Kalmar</b>	79	68.7	104	90.4	11	9.6	36	31.3	68	59.1	115
Länssjukhuset i Kalmar	57	76	65	86.7	10	13.3	18	24	47	62.7	75
Oskarshamns sjukhus	10	58.8	17	100	.	.	7	41.2	10	58.8	17
Västerviks sjukhus	12	52.2	22	95.7	1	4.3	11	47.8	11	47.8	23
<b>09 Gotland</b>	.	.	20	100	.	.	20	100	.	.	20
Visby lasarett	.	.	20	100	.	.	20	100	.	.	20
<b>10 Blekinge</b>	70	67.3	100	96.2	4	3.8	34	32.7	66	63.5	104
Blekingesjukhuset	70	67.3	100	96.2	4	3.8	34	32.7	66	63.5	104
<b>12 Skåne</b>	381	63.8	535	89.6	62	10.4	216	36.2	319	53.4	597
Helsingborgs lasarett	40	76.9	48	92.3	4	7.7	12	23.1	36	69.2	52
Hässleholms sjukhus	.	.	57	100	.	.	57	100	.	.	57
Simrishamns sjukhus	97	85.8	86	76.1	27	23.9	16	14.2	70	61.9	113
Universitetssjukhuset i Lund	141	66.5	185	87.3	27	12.7	71	33.5	114	53.8	212
Universitetssjukhuset i Malmö	80	87.9	87	95.6	4	4.4	11	12.1	76	83.5	91
Ystads lasarett	.	.	34	100	.	.	34	100	.	.	34
Ängelholms sjukhus	23	60.5	38	100	.	.	15	39.5	23	60.5	38
<b>13 Halland</b>	98	79	121	97.6	3	2.4	26	21	95	76.6	124
Hallands sjukhus Halmstad	55	71.4	76	98.7	1	1.3	22	28.6	54	70.1	77
Hallands sjukhus Varberg	43	91.5	45	95.7	2	4.3	4	8.5	41	87.2	47
<b>14 Västra Götaland</b>	308	50	562	91.2	54	8.8	308	50	254	41.2	616

**Match between the Swedish Spine Register and the National Patient Register, 2001-2012 surgery date and personal identification number. A 7-day difference between the date of surgery entered in the quality register and the Patient Register's date of admission and discharge was permitted.**

**The selection from the National Patient Register was made in accordance with Swespine's outcome groups**

**Today's date is: May 26, 2014**

Year 2003	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	N:o
Kungälv's sjukhus	.	.	28	100	.	.	28	100	.	.	28
NU-sjukvården	91	75.2	92	76	29	24	30	24.8	62	51.2	121
Sahlgrenska universitetssjukhuset	144	43.9	311	94.8	17	5.2	184	56.1	127	38.7	328
Skaraborgs sjukhus	28	56	47	94	3	6	22	44	25	50	50
Södra Älvsborgs sjukhus	45	50.6	84	94.4	5	5.6	44	49.4	40	44.9	89
17 Värmland	49	79	49	79	13	21	13	21	36	58.1	62
Karlstads sjukhus	49	79	49	79	13	21	13	21	36	58.1	62
18 Örebro	91	77.1	98	83.1	20	16.9	27	22.9	71	60.2	118
Karlskoga lasarett	3	27.3	10	90.9	1	9.1	8	72.7	2	18.2	11
Universitetssjukhuset Örebro	88	82.2	88	82.2	19	17.8	19	17.8	69	64.5	107
19 Västmanland	1	1.3	78	98.7	1	1.3	78	98.7	.	.	79
Västerås lasarett	1	1.3	78	98.7	1	1.3	78	98.7	.	.	79
20 Dalarna	77	48.7	145	91.8	13	8.2	81	51.3	64	40.5	158
Falu lasarett	77	48.7	145	91.8	13	8.2	81	51.3	64	40.5	158
21 Gävleborg	17	19.1	88	98.9	1	1.1	72	80.9	16	18	89
61015	.	.	42	100	.	.	42	100	.	.	42
Gävle sjukhus	17	36.2	46	97.9	1	2.1	30	63.8	16	34	47
22 Västernorrland	41	50.6	75	92.6	6	7.4	40	49.4	35	43.2	81
Sollefteå sjukhus	.	.	3	100	.	.	3	100	.	.	3
Sundsvalls sjukhus	41	52.6	72	92.3	6	7.7	37	47.4	35	44.9	78
23 Jämtland	54	78.3	66	95.7	3	4.3	15	21.7	51	73.9	69
Östersunds sjukhus	54	78.3	66	95.7	3	4.3	15	21.7	51	73.9	69
24 Västerbotten	39	46.4	83	98.8	1	1.2	45	53.6	38	45.2	84
Norrlands Universitetssjukhus	39	46.4	83	98.8	1	1.2	45	53.6	38	45.2	84
25 Norrbotten	.	.	68	100	.	.	68	100	.	.	68
Gällivare lasarett	.	.	2	100	.	.	2	100	.	.	2
Kalix lasarett	.	.	1	100	.	.	1	100	.	.	1
Sunderbyns sjukhus	.	.	65	100	.	.	65	100	.	.	65
UNKNOWN	247	100	.	.	247	100	.	.	.	.	247
	247	100	.	.	247	100	.	.	.	.	247

Year 2002	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
Hela Whole nation	1883	47.7	3539	89.7	405	10.3	2061	52.3	1478	37.5	3944
<b>01 Stockholm</b>	380	43.1	870	98.6	12	1.4	502	56.9	368	41.7	882
Danderyds sjukhus	37	50.7	73	100	.	.	36	49.3	37	50.7	73
Karolinska universitetssjukhuset Hudding	.	.	168	100	.	.	168	100	.	.	168
Karolinska universitetssjukhuset Solna	57	47.9	113	95	6	5	62	52.1	51	42.9	119
Löwenströmska sjukhuset	215	69.6	309	100	.	.	94	30.4	215	69.6	309
S:t Görans sjukhus	.	.	50	100	.	.	50	100	.	.	50
Sabbatsbergs närsjukhus	.	.	61	100	.	.	61	100	.	.	61
Sophiahemmet	.	.	21	100	.	.	21	100	.	.	21
Södersjukhuset	71	87.7	75	92.6	6	7.4	10	12.3	65	80.2	81
<b>03 Uppsala</b>	90	55.2	156	95.7	7	4.3	73	44.8	83	50.9	163
Akademiska sjukhuset	90	55.2	156	95.7	7	4.3	73	44.8	83	50.9	163
<b>04 Södermanland</b>	208	93.7	75	33.8	147	66.2	14	6.3	61	27.5	222
Mälarsjukhuset	62	81.6	75	98.7	1	1.3	14	18.4	61	80.3	76
Ryggkirurgiska kliniken i Strängnäs	146	100	.	.	146	100	.	.	.	.	146
<b>05 Östergötland</b>	78	46.4	162	96.4	6	3.6	90	53.6	72	42.9	168
Motala lasarett	22	52.4	39	92.9	3	7.1	20	47.6	19	45.2	42
Universitetssjukhuset i Linköping	1	2	49	100	.	.	48	98	1	2	49
Vrinnevisjukhuset	55	71.4	74	96.1	3	3.9	22	28.6	52	67.5	77
<b>06 Jönköping</b>	93	54.7	160	94.1	10	5.9	77	45.3	83	48.8	170
Högländssjukhuset Eksjö och Nässjö	12	60	16	80	4	20	8	40	8	40	20
Länssjukhuset Ryhov	81	57	136	95.8	6	4.2	61	43	75	52.8	142
Värnamo sjukhus	.	.	8	100	.	.	8	100	.	.	8
<b>07 Kronoberg</b>	.	.	18	100	.	.	18	100	.	.	18
Centrallasarettet i Växjö	.	.	11	100	.	.	11	100	.	.	11
Ljungby lasarett	.	.	7	100	.	.	7	100	.	.	7
<b>08 Kalmar</b>	104	78.2	124	93.2	9	6.8	29	21.8	95	71.4	133
Länssjukhuset i Kalmar	84	87.5	89	92.7	7	7.3	12	12.5	77	80.2	96
Oskarshamns sjukhus	9	69.2	13	100	.	.	4	30.8	9	69.2	13
Västerviks sjukhus	11	45.8	22	91.7	2	8.3	13	54.2	9	37.5	24
<b>09 Gotland</b>	.	.	28	100	.	.	28	100	.	.	28
Visby lasarett	.	.	28	100	.	.	28	100	.	.	28
<b>10 Blekinge</b>	16	20	77	96.3	3	3.8	64	80	13	16.3	80
Blekingesjukhuset	16	20	77	96.3	3	3.8	64	80	13	16.3	80
<b>12 Skåne</b>	223	42.4	487	92.6	39	7.4	303	57.6	184	35	526
Helsingborgs lasarett	29	78.4	35	94.6	2	5.4	8	21.6	27	73	37
Hässleholms sjukhus	.	.	56	100	.	.	56	100	.	.	56
Simrishamns sjukhus	.	.	45	100	.	.	45	100	.	.	45
Universitetssjukhuset i Lund	97	46.6	180	86.5	28	13.5	111	53.4	69	33.2	208
Universitetssjukhuset i Malmö	73	82	81	91	8	9	16	18	65	73	89
Ystads lasarett	.	.	44	100	.	.	44	100	.	.	44
Ängelholms sjukhus	24	51.1	46	97.9	1	2.1	23	48.9	23	48.9	47
<b>13 Halland</b>	53	35.1	146	96.7	5	3.3	98	64.9	48	31.8	151
Hallands sjukhus Halmstad	52	63.4	78	95.1	4	4.9	30	36.6	48	58.5	82
Hallands sjukhus Varberg	1	1.4	68	98.6	1	1.4	68	98.6	.	.	69
<b>14 Västra Götaland</b>	283	51.6	510	93.1	38	6.9	265	48.4	245	44.7	548
Kungälv's sjukhus	.	.	14	100	.	.	14	100	.	.	14
NU-sjukvården	51	54.8	73	78.5	20	21.5	42	45.2	31	33.3	93
Sahlgrenska universitetssjukhuset	147	51	275	95.5	13	4.5	141	49	134	46.5	288
Skaraborgs sjukhus	46	68.7	66	98.5	1	1.5	21	31.3	45	67.2	67
Södra Älvsborgs sjukhus	39	45.3	82	95.3	4	4.7	47	54.7	35	40.7	86
<b>17 Värmland</b>	43	66.2	55	84.6	10	15.4	22	33.8	33	50.8	65
Karlstads sjukhus	43	66.2	55	84.6	10	15.4	22	33.8	33	50.8	65
<b>18 Örebro</b>	85	76.6	99	89.2	12	10.8	26	23.4	73	65.8	111
Karlskoga lasarett	4	66.7	6	100	.	.	2	33.3	4	66.7	6
Universitetssjukhuset Örebro	81	77.1	93	88.6	12	11.4	24	22.9	69	65.7	105
<b>19 Västmanland</b>	.	.	91	100	.	.	91	100	.	.	91
Västerås lasarett	.	.	91	100	.	.	91	100	.	.	91
<b>20 Dalarna</b>	33	23.4	132	93.6	9	6.4	108	76.6	24	17	141

Year 2002	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
Falu lasarett	33	24.1	128	93.4	9	6.6	104	75.9	24	17.5	137
Mora lasarett	.	.	4	100	.	.	4	100	.	.	4
21 Gävleborg	22	19.3	114	100	.	.	92	80.7	22	19.3	114
61015	.	.	68	100	.	.	68	100	.	.	68
Gävle sjukhus	22	47.8	46	100	.	.	24	52.2	22	47.8	46
22 Västernorrland	45	69.2	57	87.7	8	12.3	20	30.8	37	56.9	65
Sollefteå sjukhus	.	.	4	100	.	.	4	100	.	.	4
Sundsvalls sjukhus	45	73.8	53	86.9	8	13.1	16	26.2	37	60.7	61
23 Jämtland	41	70.7	54	93.1	4	6.9	17	29.3	37	63.8	58
Östersunds sjukhus	41	70.7	54	93.1	4	6.9	17	29.3	37	63.8	58
24 Västerbotten	.	.	73	100	.	.	73	100	.	.	73
Norrlands Universitetssjukhus	.	.	73	100	.	.	73	100	.	.	73
25 Norrbotten	.	.	51	100	.	.	51	100	.	.	51
Gällivare lasarett	.	.	4	100	.	.	4	100	.	.	4
Sunderbyns sjukhus	.	.	47	100	.	.	47	100	.	.	47
UNKNOWN	86	100	.	.	86	100	.	.	.	.	86
	86	100	.	.	86	100	.	.	.	.	86



Year 2001	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
Hela Whole nation	1877	51.3	3070	83.8	592	16.2	1785	48.7	1285	35.1	3662
<b>01 Stockholm</b>	<b>237</b>	<b>36.2</b>	<b>635</b>	<b>97.1</b>	<b>19</b>	<b>2.9</b>	<b>417</b>	<b>63.8</b>	<b>218</b>	<b>33.3</b>	<b>654</b>
Danderyds sjukhus	16	34	45	95.7	2	4.3	31	66	14	29.8	47
Karolinska universitetssjukhuset Hudding	.	.	103	100	.	.	103	100	.	.	103
Karolinska universitetssjukhuset Solna	97	63.4	139	90.8	14	9.2	56	36.6	83	54.2	153
Löwenströmska sjukhuset	50	70.4	71	100	.	.	21	29.6	50	70.4	71
S:t Görans sjukhus	8	10	80	100	.	.	72	90	8	10	80
Sabbatsbergs närsjukhus	.	.	102	100	.	.	102	100	.	.	102
Sophiahemmet	.	.	17	100	.	.	17	100	.	.	17
Södersjukhuset	66	81.5	78	96.3	3	3.7	15	18.5	63	77.8	81
<b>03 Uppsala</b>	<b>121</b>	<b>62.7</b>	<b>159</b>	<b>82.4</b>	<b>34</b>	<b>17.6</b>	<b>72</b>	<b>37.3</b>	<b>87</b>	<b>45.1</b>	<b>193</b>
Akademiska sjukhuset	100	58.1	159	92.4	13	7.6	72	41.9	87	50.6	172
Elisabethkliniken	21	100	.	.	21	100	.	.	.	.	21
<b>04 Södermanland</b>	<b>191</b>	<b>93.6</b>	<b>78</b>	<b>38.2</b>	<b>126</b>	<b>61.8</b>	<b>13</b>	<b>6.4</b>	<b>65</b>	<b>31.9</b>	<b>204</b>
Mälarsjukhuset	70	84.3	78	94	5	6	13	15.7	65	78.3	83
Ryggkirurgiska kliniken i Strängnäs	121	100	.	.	121	100	.	.	.	.	121
<b>05 Östergötland</b>	<b>23</b>	<b>16.4</b>	<b>138</b>	<b>98.6</b>	<b>2</b>	<b>1.4</b>	<b>117</b>	<b>83.6</b>	<b>21</b>	<b>15</b>	<b>140</b>
Motala lasarett	23	85.2	25	92.6	2	7.4	4	14.8	21	77.8	27
Universitetssjukhuset i Linköping	.	.	47	100	.	.	47	100	.	.	47
Vrinnevisjukhuset	.	.	66	100	.	.	66	100	.	.	66
<b>06 Jönköping</b>	<b>105</b>	<b>66</b>	<b>141</b>	<b>88.7</b>	<b>18</b>	<b>11.3</b>	<b>54</b>	<b>34</b>	<b>87</b>	<b>54.7</b>	<b>159</b>
Högländssjukhuset Eksjö och Nässjö	29	63	35	76.1	11	23.9	17	37	18	39.1	46
Länssjukhuset Ryhov	76	69.1	103	93.6	7	6.4	34	30.9	69	62.7	110
Värnamo sjukhus	.	.	3	100	.	.	3	100	.	.	3
<b>07 Kronoberg</b>	<b>.</b>	<b>.</b>	<b>15</b>	<b>100</b>	<b>.</b>	<b>.</b>	<b>15</b>	<b>100</b>	<b>.</b>	<b>.</b>	<b>15</b>
Centrallasarettet i Växjö	.	.	8	100	.	.	8	100	.	.	8
Ljungby lasarett	.	.	7	100	.	.	7	100	.	.	7
<b>08 Kalmar</b>	<b>31</b>	<b>28.4</b>	<b>107</b>	<b>98.2</b>	<b>2</b>	<b>1.8</b>	<b>78</b>	<b>71.6</b>	<b>29</b>	<b>26.6</b>	<b>109</b>
Länssjukhuset i Kalmar	3	4.3	69	100	.	.	66	95.7	3	4.3	69
Oskarshamns sjukhus	15	83.3	16	88.9	2	11.1	3	16.7	13	72.2	18
Västerviks sjukhus	13	59.1	22	100	.	.	9	40.9	13	59.1	22
<b>09 Gotland</b>	<b>.</b>	<b>.</b>	<b>28</b>	<b>100</b>	<b>.</b>	<b>.</b>	<b>28</b>	<b>100</b>	<b>.</b>	<b>.</b>	<b>28</b>
Visby lasarett	.	.	28	100	.	.	28	100	.	.	28
<b>10 Blekinge</b>	<b>9</b>	<b>12.7</b>	<b>68</b>	<b>95.8</b>	<b>3</b>	<b>4.2</b>	<b>62</b>	<b>87.3</b>	<b>6</b>	<b>8.5</b>	<b>71</b>
Blekingesjukhuset	9	12.7	68	95.8	3	4.2	62	87.3	6	8.5	71
<b>12 Skåne</b>	<b>245</b>	<b>49.8</b>	<b>447</b>	<b>90.9</b>	<b>45</b>	<b>9.1</b>	<b>247</b>	<b>50.2</b>	<b>200</b>	<b>40.7</b>	<b>492</b>
Helsingborgs lasarett	50	80.6	58	93.5	4	6.5	12	19.4	46	74.2	62
Hässleholms sjukhus	.	.	65	100	.	.	65	100	.	.	65
Simrishamns sjukhus	.	.	2	100	.	.	2	100	.	.	2
Universitetssjukhuset i Lund	107	58.5	160	87.4	23	12.6	76	41.5	84	45.9	183
Universitetssjukhuset i Malmö	82	69.5	100	84.7	18	15.3	36	30.5	64	54.2	118
Ystads lasarett	.	.	35	100	.	.	35	100	.	.	35
Ängelholms sjukhus	6	22.2	27	100	.	.	21	77.8	6	22.2	27
<b>13 Halland</b>	<b>65</b>	<b>52.4</b>	<b>110</b>	<b>88.7</b>	<b>14</b>	<b>11.3</b>	<b>59</b>	<b>47.6</b>	<b>51</b>	<b>41.1</b>	<b>124</b>
Hallands sjukhus Halmstad	65	85.5	62	81.6	14	18.4	11	14.5	51	67.1	76
Hallands sjukhus Varberg	.	.	48	100	.	.	48	100	.	.	48
<b>14 Västra Götaland</b>	<b>307</b>	<b>57.2</b>	<b>488</b>	<b>90.9</b>	<b>49</b>	<b>9.1</b>	<b>230</b>	<b>42.8</b>	<b>258</b>	<b>48</b>	<b>537</b>
Kungälv's sjukhus	.	.	13	100	.	.	13	100	.	.	13

Year 2001	SWESPINE		PAR		Only SWESPINE		Only PAR		Matching		Total N:o
	N:o	%	N:o	%	N:o	%	N:o	%	N:o	%	
NU-sjukvården	59	69.4	73	85.9	12	14.1	26	30.6	47	55.3	85
Sahlgrenska universitetssjukhuset	127	49.2	243	94.2	15	5.8	131	50.8	112	43.4	258
Skaraborgs sjukhus	82	80.4	86	84.3	16	15.7	20	19.6	66	64.7	102
Spine Center Göteborg	1	100	1	100	.	.	.	.	1	100	1
Södra Älvsborgs sjukhus	38	48.7	72	92.3	6	7.7	40	51.3	32	41	78
17 Värmland	37	72.5	46	90.2	5	9.8	14	27.5	32	62.7	51
Karlstads sjukhus	37	72.5	46	90.2	5	9.8	14	27.5	32	62.7	51
18 Örebro	81	80.2	92	91.1	9	8.9	20	19.8	72	71.3	101
Karlskoga lasarett	8	80	9	90	1	10	2	20	7	70	10
Universitetssjukhuset Örebro	73	80.2	83	91.2	8	8.8	18	19.8	65	71.4	91
19 Västmanland	.	.	2	100	.	.	2	100	.	.	2
Västerås lasarett	.	.	2	100	.	.	2	100	.	.	2
20 Dalarna	67	53.6	116	92.8	9	7.2	58	46.4	58	46.4	125
Falu lasarett	67	57.8	107	92.2	9	7.8	49	42.2	58	50	116
Mora lasarett	.	.	9	100	.	.	9	100	.	.	9
21 Gävleborg	18	18.9	95	100	.	.	77	81.1	18	18.9	95
61015	.	.	55	100	.	.	55	100	.	.	55
Gävle sjukhus	18	45	40	100	.	.	22	55	18	45	40
22 Västernorrland	57	53.8	100	94.3	6	5.7	49	46.2	51	48.1	106
Sollefteå sjukhus	.	.	4	100	.	.	4	100	.	.	4
Sundsvalls sjukhus	57	55.9	96	94.1	6	5.9	45	44.1	51	50	102
23 Jämtland	35	72.9	45	93.8	3	6.3	13	27.1	32	66.7	48
Östersunds sjukhus	35	72.9	45	93.8	3	6.3	13	27.1	32	66.7	48
24 Västerbotten	.	.	95	100	.	.	95	100	.	.	95
Norrlands Universitetssjukhus	.	.	95	100	.	.	95	100	.	.	95
25 Norrbotten	.	.	65	100	.	.	65	100	.	.	65
Gällivare lasarett	.	.	6	100	.	.	6	100	.	.	6
Sunderbyns sjukhus	.	.	59	100	.	.	59	100	.	.	59
UNKNOWN	248	100	.	.	248	100	.	.	.	.	248
	248	100	.	.	248	100	.	.	.	.	248

## XI. The Register Center - monitoring of results in Swespine

In September 2012, following intensive preparations, the Register Center (RC), a central register collection unit, started operating. The RC offers all surgical departments assistance with follow-up, and the service is currently used by half of Sweden's surgery departments (21 of 40). The result is less work for individual departments, as well as optimal monitoring frequency and quality of entered data.

The Register Center currently has six contact secretaries (equivalent to almost 4 Full Time Employees - FTEs) who enter patient data. The work is led by a Register Coordinator (CB). The Swespine application has a Notification function that informs the RC Secretary when it is time for follow-up checks after 1, 2, 5 and 10 years, and can send out questionnaires to the patient. To cover the Sweden's needs for clinical follow-up, we estimate that 7-8 FTEs (secretaries) are needed.

By engaging the RC, we can conclude that the registration rate and follow-up does not decrease (important), but rather just the opposite, table 35. Continued focus on the RC will be prioritized with a view toward both increasing the registration rate, and eliminating concerns that the data might not be efficiently registered.

Table 35 Follow-up rate, affiliated with Register Centre compared with those who are not affiliated with the Register Center

	Op. year 2012		Op. 2011.		Op. 2008.
	Follow-up 1	Follow-up 1*	Follow-up 2	Follow-up 2*	Follow-up 5 years
<b>RC</b>	74.2	77.6	67.6	74.8	60.3
<b>Other clinics</b>	60	62.4	58.3	63.6	41

\*/

\*= consideration has been taken to those who interrupted their first index procedure and thus are not relevant for follow-up

## **XII. Improvement projects – examples of ongoing projects based on Swespine**

### **1. Malmö**

#### **Length of stay after surgery for a lumbar disc herniation at Skåne University Hospital, Malmö**

**Background** A comparison of information within Sweden with regard to hospital stay after surgery based on Swespine data and presented in the annual publication “Open Comparisons” by “Swedish Association of Local Authorities and Regions (SALAR)”, showed that the average length of stay after surgery for lumbar disc herniation in Malmö in 2011 and 2012 was 4 days, compared with 2 days nationwide. While a case-mix with more seriously ill patients can be expected at a university hospital, it does not explain the large difference.

**Action.** Structural changes in the treatment of this patient category have included: Information to the patient that the planned length of stay is no more than 2 days. Information to physical therapists and ward staff about this planning and motivation for early mobilization. Daily “Pulse meetings” on the ward to implement this change.

**Results.** Reduced length of stay for this patient category, currently an average of 2.5 days, and with a declining trend without the need for readmissions. Savings for the healthcare system: an estimated 100 bed days on an annual basis as a result of this quality improvement initiative. We see this as an important step also in minimizing the risk of hospitalization-associated infections, which have been reported to increase with the number of hospital days.

Malmö Sept 29, 2014 Acke Ohlin, MD, associate professor. Björn Strömquist, MD, professor

### **2. Jönköping**

#### **“Fast track” for patients with lumbar disc herniation in Jönköping County**

**Background** At our annual review of the results of the Swedish Spine Register, we noted considerable variation in how long patients have had symptoms prior to surgery at the different hospitals and clinics in Sweden. The patients in our region have had symptoms on average for a longer period than patients at departments that have the shortest duration without our patients reporting better outcome. Swespine data also suggest that final patient reported outcome benefits if patients have surgery after a shorter period of time. Please see the 2010 Swespine Report; [http://www.4s.nu/pdf/Ryggregisterrapport\\_2010.pdf](http://www.4s.nu/pdf/Ryggregisterrapport_2010.pdf).

**Aim** Decreased waiting time for selected patients before surgery and Improved patient-reported outcomes following disc herniation surgery in Jönköping County.

**Method** We are implementing a “fast track” called “Herniated Disc Direct” so that patients with clear lumbar disc herniation, and with no signs of improvement within the expected natural course, can have surgery within three months from the onset of symptoms. This has been indicated to provide better patient-reported 1-year outcome – See Swespine Annual Report 2010 ([http://www.4s.nu/pdf/Report\\_2010\\_Swespine\\_englishversion.pdf](http://www.4s.nu/pdf/Report_2010_Swespine_englishversion.pdf)). These selected patients will quickly be scheduled for an MRI and quickly assessed by a spine surgeon and have surgery scheduled. This

protocol is being introduced into the healthcare guidelines for Jönköping County (the “FACTS” document) with start scheduled for late 2014 or early 2015.

**We will evaluate the change** by following up on data in the Swedish Spine Register in the years to come and evaluating whether pain duration has become shorter than before implementation and whether the final outcome has changed with respect to pain and functional performance.

Håkan Löfgren, MD, PhD

### **3. Stockholm Spine Center**

#### **Patient Selection, Surgery and Rehabilitation at Stockholm Spine Center**

**Background** Based on Swespine, the Stockholm County Council is collaborating on a unique project with the Swedish Society of Spinal Surgeons and the company IVBAR (health economists): Value-based reimbursement (VBR), which is applied for patients operated at three private clinics, Stockholm Spine Clinic as well as at Nacka and the Spinal Surgery Clinic in Strängnäs. For details, please see the Table of Contents, Point XIII

**Aim** To create the best conditions to choose the right candidates for surgery, as well as to optimize treatment and rehabilitation to provide each patient with the opportunity to achieve an optimal result.

**Method** Within the framework of the “Back surgery Care Choice program” used at Stockholm County Council, which will be evaluated/partially reimbursed using VBR, an extensive initiative was carried out at the Stockholm Spine Center to provide patients with optimal care and treatment. **This has been initiated through a project based on Swespine. Follow-up/assessment is also based on Swespine.**

#### ***To reduce the number of infections.***

The ventilation was remodeled in the summer of 2014, but since the CFU values have not been good in all operating rooms, further improvements are planned by introducing laminar flow in three additional rooms next summer (1 already has this). The hygiene rules have been tightened up and compliance is monitored to reduce the risk of hospital-acquired infections. We have also started a randomized clinical trial (RCT) in which we evaluate the use of a new prophylactic antibiotic treatment for patients with herniated discs.

#### ***To reduce the number of reoperations.***

We have purchased modern navigation equipment, an “O arm”, to reduce the risk of misplaced screws.

**Rehabilitation unit.** We have built a new rehabilitation unit with a gym to take care of the exercise needs of our surgical patients. Our own physical therapists can have both preoperative groups and provide postoperative exercise. Previously, patients were sent out somewhat randomly for postop exercise and no one knows how much and what type of exercises have been provided. We hope this will lead to better resource utilization and better end results.

The single most important factor for improving the end result is to choose the right candidates for surgery. Normally the back surgeon takes this decision alone. We have now built up a rehab ward (the department is included from Oct. 1 in the care option for pain rehabilitation in SCC) with rehab doctor, psychologist and physical therapist. The purpose is to be able to address dubious cases and sort out those patients who are unsuitable for surgery. The rehab unit can both make assessments and rehab attempts both before and after surgery.

**Assessment** Improvement takes time; it will probably take a few years to see the effect of the above changes. But everything is being done because of Swespine!

Tycho Tullberg, CEO Stockholm Spine Center

#### **4. Care/Treatment of back patients at the orthopedics department in Sundsvall**

**Background** Swespine mainly uses validated patient-reported outcome measures (PROMs) to follow up the outcome of spine surgery, but there are also other important aspects of being a patient with back disease, i.e. measures that capture patients' experience of care, PREM (patient-reported experience measures), where back surgery is only one of many other parts of treatment.

**Aim** In order to evaluate this, and so that we at the spine society (4s) should be able to evaluate whether certain PREM parameters need to be incorporated in Swespine, the company "Indikator" was commissioned by 4s, to carry out a PREM-based evaluation of patient-experienced care at Sweden's spine surgery clinics during the autumn of 2013 and spring of 2014. The results are presented in the 2014 report. The semi-annual report shows that the orthopedic department in Sundsvall reports comparably poor results with respect to patient-perceived waiting time, as well as the overall experience compared with Sweden at large.

#### **Method**

2.1 We will continue to build on the PREM assessment carried out by "Indikator" (see point IX in the Report) to improve patient-perceived quality (care/treatment) at the Orthopedics Department in Sundsvall. The aim of the project is to change the structure of outpatient clinic operations. Most patients who come for a new patient visit will now first meet a physical therapist who will carry out a standardized survey. Each week, the patient's medical history, physical and radiological examination will be discussed at a patient conference attended by doctors, physical therapists and secretaries. The patient and referring physician will be informed about the results by letter or phone. An appointment to see the doctor will be set up for those patients considered to be appropriate for surgery. The team also includes a social worker, who will be consulted in appropriate cases.

Performance measures will include the PREM evaluation, as well as waiting times from the referral assessment to the first visit to the clinic (physical therapist or doctor) and number of visits before deciding on surgical treatment.

2.2 Crucial for this application, and specifically for Swespine, is that we intend to investigate whether a possible change in PREM parameters correlates with a change in PROM-reported results. This

information is important to determine whether we need to supplement the register with PREM parameters, as requested by SALAR and the National Board of Health and Welfare.

2.3 We will use 1-year results (PROM) following surgery for disc herniation and spinal stenosis to compare the old and new foster care/treatment protocols. The parameters in Swespine that will be used as outcome variables in this project are EQ-5D, ODI, VAS “global assessment” (leg pain) and patient satisfaction.

**Assessment** The results will be presented in the 2015 report.  
Sundsvall Sept. 7, 2014 Björn Knutsson, MD, spine surgeon, Sundsvall

## **5. Registercentrum Sydost (Register Center Southeast, RCSO)**

### **PROM – can preoperative decisions be based on patient-reported outcomes after one year: a collaboration between the Swespine Steering Committee and RCSO**

**Background** Swespine is based on PROM, and we want to investigate whether there are certain indications already at baseline that can identify patients who will become better or worse following spinal surgery.

**Method** Collaboration between the Steering Committee and “Registercentrum Sydost” (RCSO) has been underway since 2012. The plan is to publish a report in 2015 (Evalill Nilsson, investigator initially at RCSO and Lotta Fornander, statistician) that addresses the following issues:

1. Can SWESPINE’s PROM data identify subgroups which, following surgical intervention, have persistent symptoms, in order to better tailor the intervention to the individual, including preoperative preparations and follow-up work/rehabilitation?
2. Can SWESPINE’s PROM data identify subgroups that do not experience any benefit from surgical intervention, and conversely subgroups that particularly benefit from such interventions; in other words, help with “patient selection”?
3. Based on the above analyses, is it possible to identify the PROM that are optimal for SWESPINE’s purposes?

Peter Fritzell, MD, PhD, Swespine registrar and Swespine Steering Committee  
Evalill Nilsson, investigator RCSO

## **6. Spine Center Göteborg**

### **Surgery-related outcomes and complications at Spine Center Göteborg**

**Background** Improved patient safety requires that the most critical situations in a care episode are addressed and reviewed. Within the surgical specialties, general anesthesia and surgery are the situations in which the most serious complications can occur. To carry out a useful review, monitoring should take place on an individual basis; i.e., results and complications should be reported and reviewed by each surgeon individually.

**Aim** To reduce the frequency of complications and reoperations, and to improve the outcome of surgical treatment of spinal disorders.

**Method** For the past year our clinic has held semiannual quality conferences during which the physicians jointly review outcomes, complications, and reoperations for each individual surgeon. The review is based on Swespine data.

**Assessment/Results** As mentioned above, quality conferences are a new project, so we cannot yet assess the impact of all aspects.

Olle Hägg, MD, PhD, Spine Center Göteborg



### **XIII. Value-based reimbursement for patients treated with spinal surgery, based on Swespine data: a collaboration involving SWESPINE – SCC – IVBAR**

Within the framework of a unique project, “Value-based reimbursement” (VBR), a collaborative project since 2011 involving Stockholm County Council – Swespine /Swedish Society of Spinal Surgeons (4S) – and the company IVBAR (health economists), we have used patient-reported one-year results after back surgery (PROM) to design a reimbursement model based on statistically expected results for each individual patient. This initiative is based on reported outcomes from many thousands of patients which can therefore be viewed as “guidelines” with respect to the expected results. If a clinic surpasses the 1-year patient-reported expected results, as measured by the “Global Assessment” (validated improvement measure regarding pain and dichotomized: pain free - much better vs. somewhat better-unchanged-worse), reimbursement will be increased (at most 10% of base reimbursement, the “value portion”, which is paid regardless of the “value portion”), and conversely, if the results fall short of the expected results, the clinic will be required to pay a refund. The model has been used since Oct. 1, 2013 at three facilities associated with Stockholm City Council (SCC): Stockholm Spine Center, Nacka, and the Spinal Surgery Department in Strängnäs. The first practical application will begin on Oct. 1, 2014. Results will be presented in a running fashion, and in the Annual Swespine report 2015

A number of Swedish county councils have also shown interest in the model, which is thus based on a “case mix” analysis of surgical patients, which can help provide a fair picture of the results at various clinics, which in turn allows more accurate comparisons.

This work has led to the start-up of the “Sveus project” (<http://www.sveus.se/>), which is currently jointly run by Stockholm county (SLL), different counties, and IVBAR. Seven counties are currently involved (each with a different diagnosis area) in developing a model similar to the one for which spine surgery served as a pilot. Regular meetings are held with SLL and IVBAR which Peter Fritzell and Olle Hägg attend as representatives of the Steering Committee and the Swedish Society of Spinal Surgeons (4s: <http://www.4s.nu/>).

## XIV. ICHOM - LBP international collaboration involving 25 countries

For the past two years, Swespine, represented by registrar Peter Fritzell (PF) as well as Olle Hägg and Björn Strömqvist from the Steering Committee, has been involved in a large-scale international project aimed at reaching agreement on the relevant variables that must be gathered before/during/after work-up/treatment of patients with back problems – both surgically and non-surgically. The collaboration is taking place at the initiative of ICHOM (<http://www.ichom.org/>), a non-profit organization consisting of Harvard Business School (Michael Porter) - Karolinska Institutet (Martin Ingvar) and the Boston Consulting Group (Stefan Larsson).

Registrar PF has served as working group leader in the Low back pain group (<http://www.ichom.org/project/low-back-pain/>) during phase 1, the design of the “core data set” (2013), which has now ended. About 20 countries have now agreed on the data/outcomes/follow-up times we will jointly use. The aim is to simplify comparisons, thereby accelerating the pace at which we assimilate new knowledge that can benefit the patient. The method is based on collaboration on reported register-based results from all over the world.

We are currently in Phase 2; Implementation.

Phase 3 will be addressing the Change process.

Swespine has played and continues to play a key role in this work.

Within the frame of the ICHOM collaboration, Swespine has taken the initiative to a four-nation study (4NIG) with participation from Sweden-Norway-Denmark-Netherlands:

The following international research projects are based on Swespine and national spine surgery registries from Norway and Denmark. The Netherlands is participating to compare register results with outcomes report in RCTs. The first meeting was held in Amsterdam on March 27, 2014 and several teleconferences were held during the year. The project plan has been written and the Ethics Application process is underway. The plan was approved by Board of the Swedish Society of Spinal Surgeons (4s)

The following projects are agreed upon, and Peter Fritzell/registry manager of Swespine, is the coordinator of the international projects presented below:

1. Lumbar disc herniation. QoL and Function 1 year after surgery - a comparison of 3 countries: Sweden-Denmark-Norway. **Sweden responsible**. Paul Gerdhem is intended to be coordinator
2. Central lumbar spinal stenosis. QoL and Function 1 year after surgery – a comparison of 3 countries: Sweden-Denmark-Norway. **Norway responsible**. Greger Lönne (Norway) is the coordinator
3. Chronic low back pain (DDD). QoL and Function 1 year after surgery for CLBP – a comparison of 3 countries: Sweden-Denmark-Norway. **Denmark responsible**. Martin Gehrchen is the coordinator

4. Results after surgery for LDH – a comparison of national registers and clinical studies. **Holland responsible.** Wilco Jacobs and Miranda von Hooff (Netherlands) are coordinators

Peter Fritzell, MD, PhD, registrar Swespine and Steering Committee

## **XV. DDD improvement project – Longitudinal analysis of outcome over time**

### **Problem definition and methodology**

This year's analysis section is dedicated to the diagnosis of DDD. Spine surgeons use this concept, which is not entirely unambiguous, to define the subgroup of individuals with chronic lumbar pain who meet the following criteria: movement/load-induced back pain, limited to one or a few segments verifiable by clinical examination and findings on MRI (magnetic resonance imaging) consistent with the clinical examination.

Compared with spinal stenosis and disc herniation, which have long been established and reasonably well-defined diagnoses, DDD is a relatively new diagnosis, which still lacks robust diagnostic precision. Consequently, the period during which we have maintained a quality register for spine surgery for this condition has also been a learning period. Both diagnostic and surgical techniques have evolved during, especially the last 20 years. Discussions today have focused on the selection of individuals suitable for surgical treatment of DDD. Such considerations have been, and are, based on the fundamental recognition that the individual should have maximum benefit from our treatment.

In addition to the purely clinical diagnosis, a number of personal and circumstance-related conditions are also present that are of importance for surgical outcome. Such conditions include age, education, comorbidity, previous spine surgery, duration of pain, and level of activity prior to surgery. In last year's analysis section we showed how these variables affect outcome when we carried out case-mix adjustment of the outcome in conjunction with 1-year follow-up

[http://www.4s.nu/pdf/%C3%85rsrapport\\_2012\\_isbn.pdf](http://www.4s.nu/pdf/%C3%85rsrapport_2012_isbn.pdf) page 29ff).

During the existence of the register as a national database accessible to all spine surgeons, individual surgeons have been able to follow their own treatment results as well as the results achieved by other surgeons, and consider changes in the composition of the relevant patient group. All spine surgeons have had the opportunity to evaluate their own results and compare them with national averages, allowing them to learn and change their practices; in short, we have had good conditions for benchmarking.

Two circumstances make it interesting to study how spine surgery has benefited from the register in the effort to improve surgical outcomes for DDD.

One is that fusion surgery outcome for DDD in the 1990s, when this type of surgery became more common, were not particularly impressive, even though we could show that surgery was better than physical therapy. The proportion of patients, who then felt that they were pain-free or much better was only 29%, while 24% had unchanged pain and 14% had more pain at follow-up, according to the Swedish Spine Study carried out at the time. (*Fritzell P, Hägg O, Wessberg P, Nordwall A; Swedish Lumbar Spine Study Group. Spine 2001;26(23):2521-32*).

The question is whether we have been able to improve the outcome over the years with the help of the register.

The other circumstance is that voices have been raised suggesting that too many patients with chronic lumbar pain are having surgery, and that there has been an “indication shift” in which the selection of individuals suitable for surgery for DDD has become less strict. If so, the results can be expected to worsen over time. The question is whether the register data suggest that there has been a shift in indications?

The purpose of this analysis is to evaluate whether outcomes have changed over time, and if so, in which direction.

### **Basis of calculation and analytical method**

The registry began nationwide in 1998. We have chosen to study the period from 2000 to 2012, because the first years had relatively poor national coverage. Table 36 shows the basis for the calculations. Figure 75 shows the number of registered operations for DDD.

Table 36. Basis of calculation beginning in 2000.

All registered surgeries for DDD	5330
Primary surgery	4298
With follow-up data	3032
Back pain reason for surgery	2975

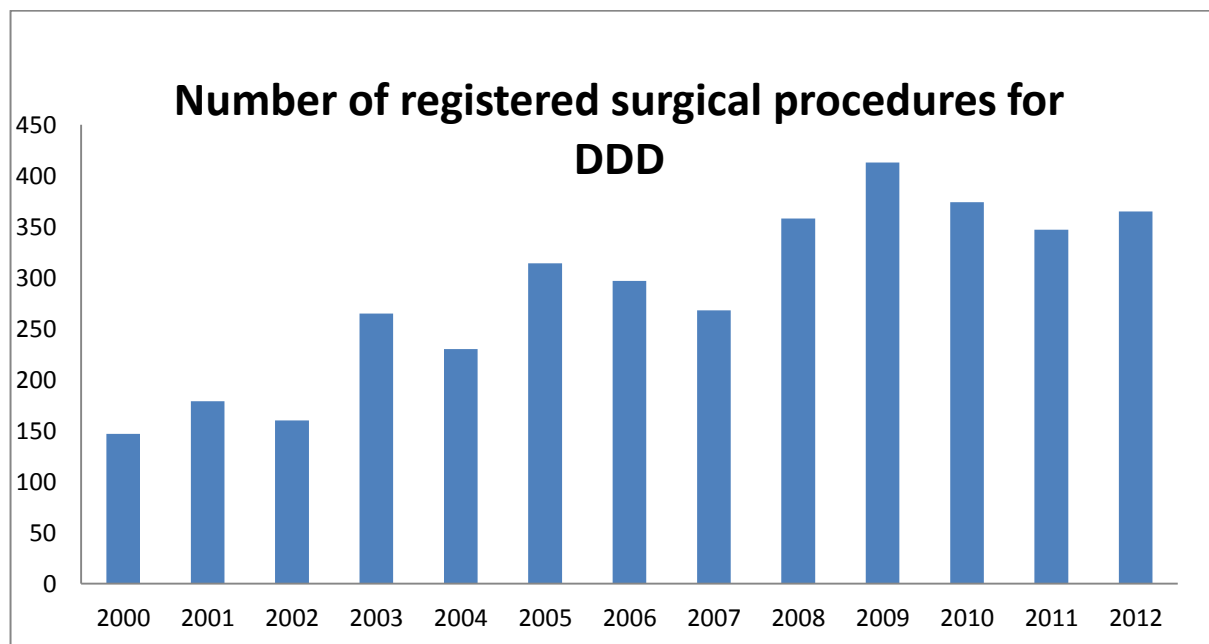


Fig. 75. Number of registered surgical procedures for DDD.

Inclusion criterion is primary surgery for DDD in individuals who have not undergone any previous back surgery. The register includes individuals who underwent arthrodesis after having previously undergone

surgery for conditions such as spinal stenosis. When evaluating these individuals the outcome is clouded by possible residual symptoms from the stenosis. We have therefore excluded these patients.

We use the Global Assessment at 1-year follow-up as the primary outcome measure, using a simple question about how the operation affected the back pain. This is an appropriate summary outcome measure, since pain is the main reason for surgery for DDD. It includes and simply summarizes aspects of change in back pain, which can also be identified with multi-item questionnaires, such as the Oswestry Disability Index (ODI), Visual Analog Scale (VAS) and the EQ-5D (*Hägg O, Fritzell P, Odén A, Nordwall A; Swedish Lumbar Spine Study Group. Spine 2002;27(11):1213-22*).

The question is formulated as follows:

How is your back pain today compared with before the operation?

0 = No back pain before the operation

1 = Completely gone

2 = Much better

3 = Somewhat better

4 = Unchanged

5 = Worse

Patients who state that their back pain is “completely gone” or “much better” have experienced clear and unambiguous improvement. Patients who describe their condition as “somewhat improved” are a more dubious group. We have therefore limited true surgical success to the group that states that the back pain is “completely gone” or “much better.” We refer to this group in the text below “Pain-free/much better.”

We use patient satisfaction as a secondary outcome measure, also using a simple question that summarizes the individual’s attitude to the effect of the operation. It probably also includes expectation and its significance for the outcome.

It is formulated as follows:

What is your attitude to the outcome of your back surgery?

1 = I am satisfied

2 = I am unsure

3 = I am dissatisfied

We have only used response 1 (“I am satisfied”) as a positive outcome.

A number of different surgical methods have been used over the years. We have combined the different fusion methods into one group, and the different disc prostheses in the other group. In the statistical analysis, we used frequency analysis with bootstrapping and linear regression to study changes by year.

The material is so small by year that an annual analysis of the significance of potential predictive factors for outcome is not feasible. We have therefore divided the period into two sections: the first covers the period 2000-2005, the second 2006-2012. Multivariate logistic regression analysis was applied over the

entire period with Global Assessment as a dependent variable in the analysis of potential predictive factors. Differences in the size or incidence of variables were then compared between the two periods.

### Results

Follow-up rates were poor during the first few years, but later were consistently at an acceptable level. (Table 37).

Table 37 Follow-up rate

2000	73	
2001	56	
2002	59	
2003	71	
2004	74	
2005	73	
2006	78	
2007	81	
2008	82	
2009	77	
2010	74	
2011	75	
2012	73	

Compared with the Swedish Spine Study, which conducted the final 2-year follow-ups in 1998, with 29% pain-free/much better after fusion, the outcome in 2000 had already clearly improved (58%). We also see a slow continuous, significant, improvement in outcome until 2012 (Figs 76 and 77). The outcome measured using satisfaction shows a similar trend (Fig. 78).

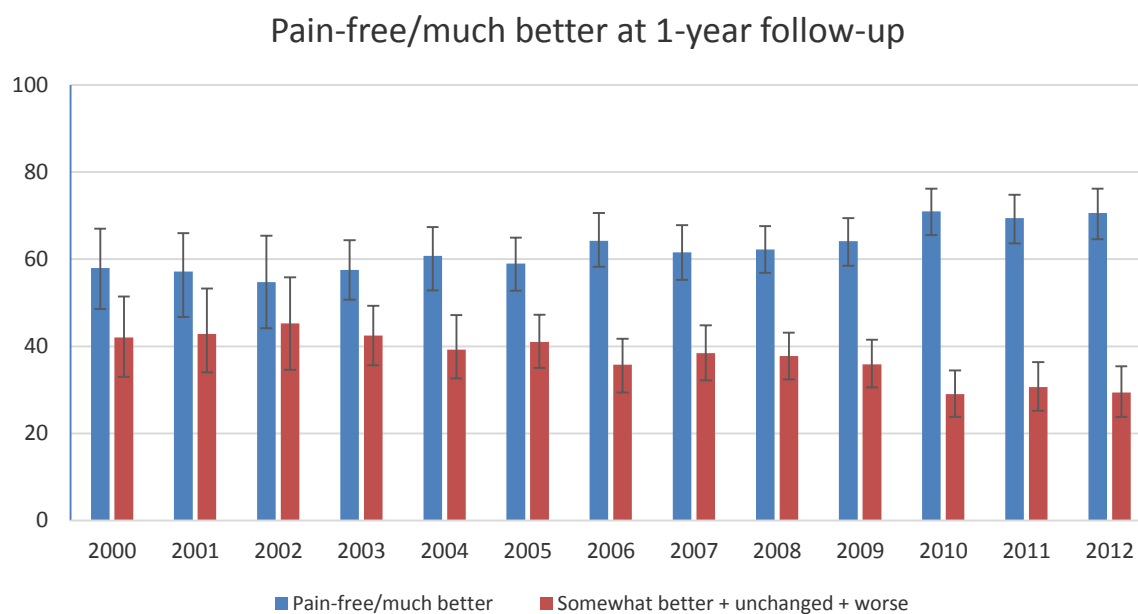


Fig 76. Perceived pain at 1-year follow-up (%).

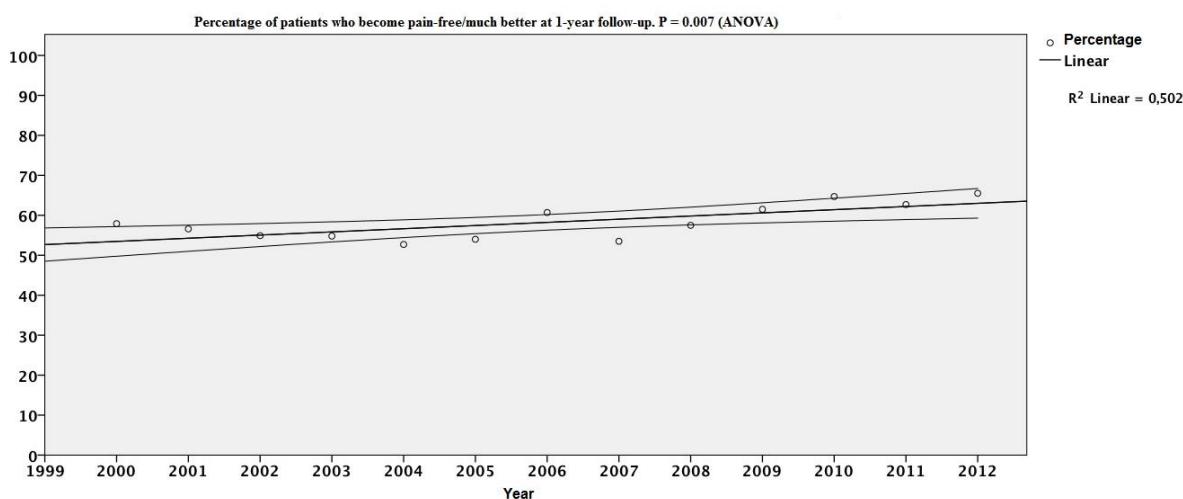


Fig. 77. Percentage of patients who become pain-free/much better at 1-year follow-up.  $P = 0.007$  (ANOVA)





Fig. 78. Attitude toward surgical outcome.

The outcome distribution of all responses in the Global Assessment for 2012 compared with the Swedish Spine Study (Table 39) shows a clear improvement in the outcome.

Table 39. Global assessment for 2012 compared with the Swedish Spine Study.

Global Assessment (%)	Swespine 2012	Swedish Spine Study
Completely gone	17.2	28.8
Much better	50.1	
Somewhat better	19	33.8
Unchanged	6.2	23.6
Worse	7.4	13.8

In the multivariate analysis of predictors, we found that male gender, smoking, sick leave before surgery and lower quality of life as measured by the EQ-5D were significantly associated with poorer outcome. Short duration of pain preoperatively and total disc replacement surgery were significantly associated with a better outcome (Table 40). Age was not significantly associated with either better or worse outcomes.

Table 40 Multivariate logistic regression using potentially predictive variables Odds ratio (OR) and 95% confidence interval (CI 95%). Pain-free/much better = 0. Somewhat better/unchanged/worse = 1.

Variable	OR	CI95%
Female	0.71	0.59 - 0.86
Smoker	1.35	1.04 - 1.76
Duration of pain	1.4	1.18 - 1.67
Pain intensity	1.002	0.997 - 1.007
Sick leave	1.18	1.10 - 1.26
Age	0.99	0.98 - 1.003
EQ-5D	1.022	1.013 - 1.03
Disc replacement	0.78	0.62 - 0.98

When comparing the periods we find significantly fewer smokers, fewer patients on sick leave preoperatively, higher preoperative quality of life and more disc replacement procedures for the period 2006-2012. There was no significant difference in age, distribution by gender or duration of pain during these periods (Table 41).

Table 41 Frequency or size of predictive variables in the periods 2000-2005 and 2006-2012.

	2000 - 2005		2006 - 2012		
Variable	%	mean(sd)	%	mean(sd)	P
Female	55		53.2		ns
Smoker	19		12.8		<0.0001
Duration of pain <1 year	7.9		8.8		ns
Sick leave	87.9		71.1		<0.0001
Disc replacement	12.9		26.7		<0.0001
EQ-5D		0.30 (0.32)		0.34 (0.32)	0.003

### Interpretation

The aspiration to achieve continuous improvement that characterizes Swedish spine surgery, thanks to the benchmarking made possible by the spine register, has resulted in continuous improvement in outcomes for individuals who undergo surgery for DDD. In the 1990s, prior to the existence of the national spine register, our true success rate with DDD surgeries was 29% as described in a large randomized controlled study. In the national register today, 67% of patients report that they are pain-free or much better and 73 % were satisfied with the outcome of the surgery.

The open comparison of Sweden's spine clinics and orthopedic departments regarding patient-reported outcomes after surgery, which has been openly reported on the Swedish Society of Spinal Surgeons website since 2007 ([www.4s.nu](http://www.4s.nu)), clearly shows the results that each department achieves, year by year.

The available variables that were evaluated suggest that we have learned how to better select those individuals who can be offered the greatest benefit from our surgery. The typical DDD patient today is largely a working non-smoker with a higher quality of life than previously. However, preoperative back pain is of unchanged intensity and duration of pain is not significantly shorter. This suggests that there has been no shift in indications, which is also contradicted by the continuous improvement in outcome.

Technical developments with the addition of a new surgical method (total disc replacement) also appear to have contributed to a better outcome. This is very interesting, and will be monitored in the register's 5-year and 10-year follow-ups to evaluate the long-term consistency of the method. Technological developments have also led to a less traumatizing fusion technique. The significance of such developments for improvement cannot, however, be evaluated using register data.

Undoubtedly there are other variables that are not included in the spine register, which could be significant for both outcomes and improvement.

## **Summary**

In summary, we can conclude that the "DDD improvement project" using the national spine register seems to have been successful, in that surgical outcome has improved. However, we cannot be satisfied, in a situation in which 6% still do not improve and 7% even have more back pain after surgery. The improvement project needs to continue.

## XVI. Surgery for Central Spinal Stenosis (CSS) with and without spondylolisthesis

Register studies<sup>1,3</sup> have reported that arthrodesis in connection with decompression of the spinal canal in the presence of a clinically relevant spinal stenosis, is generally speaking not justified, regardless of whether or not concomitant spondylolisthesis is present. This has now been verified in a large randomized studie<sup>2</sup>. This is a new and potentially very important finding, which may have substantial consequences since the combined, more extensive surgical procedure, is very common, especially internationally. Moreover, spinal stenosis is one of the most common surgical diagnoses in Sweden; about 50% of all back surgery procedures/year, including all diagnoses.

One consequence of this new insight can be seen in the ongoing Swedish trend to reduce the number of fusions during stenosis procedures; see Fig. 79, which shows a reduction of decompression plus fusion of more than 10% since 2010. Moreover, avoiding arthrodesis will potentially reduce the risk of complications and postoperative morbidity, which not only benefits the patient, but also saves healthcare resources. This trend will be monitored and reported for the upcoming year.

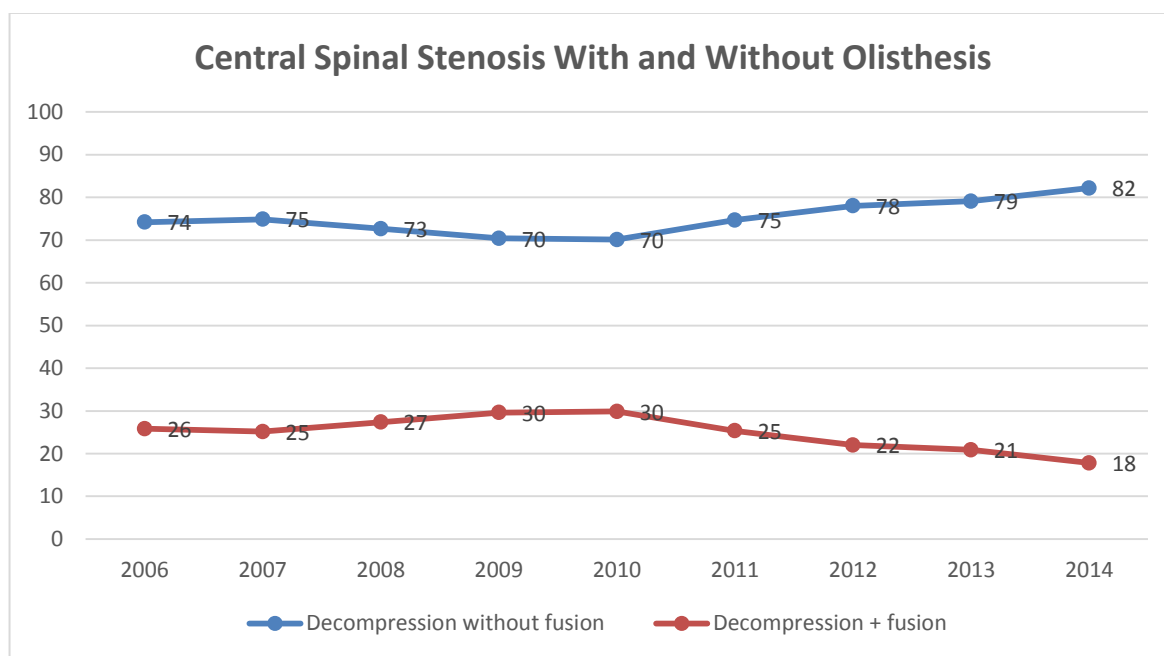


Fig 79. Central spinal stenosis – Surgical trends in Sweden

Discussion of the results after decompression for spinal stenosis intensified in Sweden around 2010. The results in Swespine suggest that the addition of fusion does not give better results in general, regardless of whether there is a slippage (olisthesis) or not. Since 2010, we see a decrease of additional fusion by over 10%

<sup>1</sup>Försth P, Michaëlsson K, Sandén B. Does fusion improve the outcome after decompressive surgery for lumbar spinal stenosis?: A two-year follow-up study involving 5390 patients. Bone Joint J 2013;95-B(7):960-5.

<sup>2</sup>Försth P, Carlsson T, Michaëlsson K, Sanden B. No benefit from fusion in decompressive surgery for lumbar spinal stenosis. 2 year-results from the Swedish spinal stenosis study, a multicenter RCT of 229 patients. Oral presentation Eurospine 2014

<sup>3</sup>Sigmundsson FG, Jönsson B, Strömqvist B Spine 2014;39(3):E199-210. Preoperative pain pattern predicts surgical outcome more than type of surgery in patients with central spinal stenosis without concomitant spondylolisthesis: a register study of 9051 patients.

## XVII. Number of registered operations and follow-up rate in Swespine

The number of patients entered in the surgery register for degenerative lumbar disorders has steadily increased in recent years, as illustrated in Figure 80.

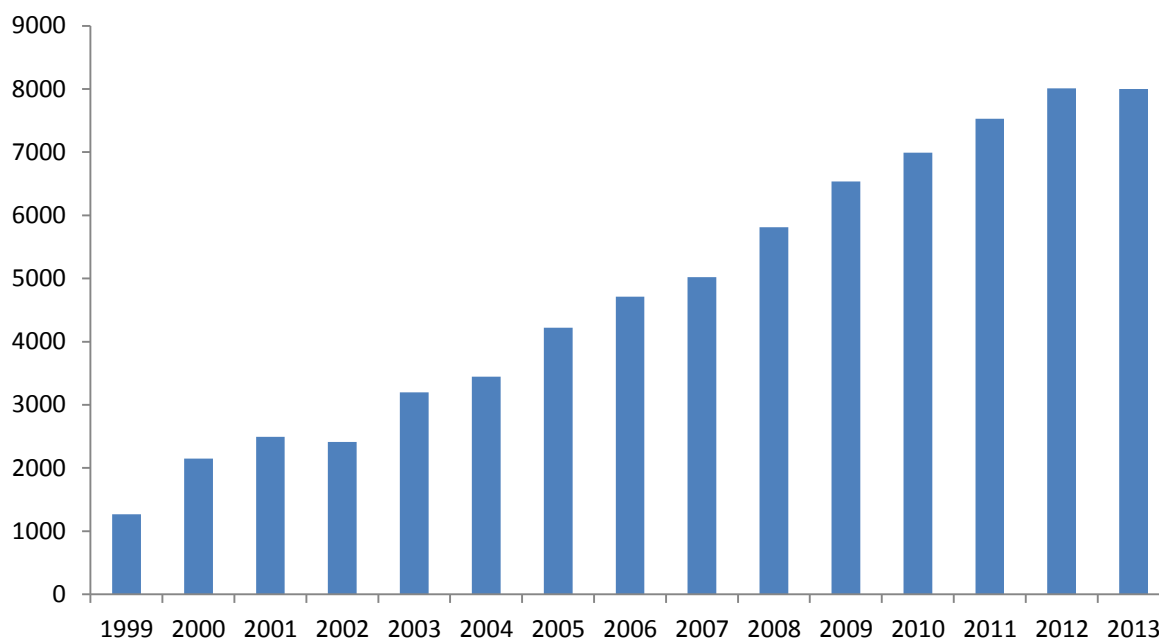


Fig. 80. Number of patients entered in the register for degenerative disorders of the lumbar spine 1999-2013.

Figure 81 below shows the follow-up rate at 1 and 2 years for patients operated in 2011.

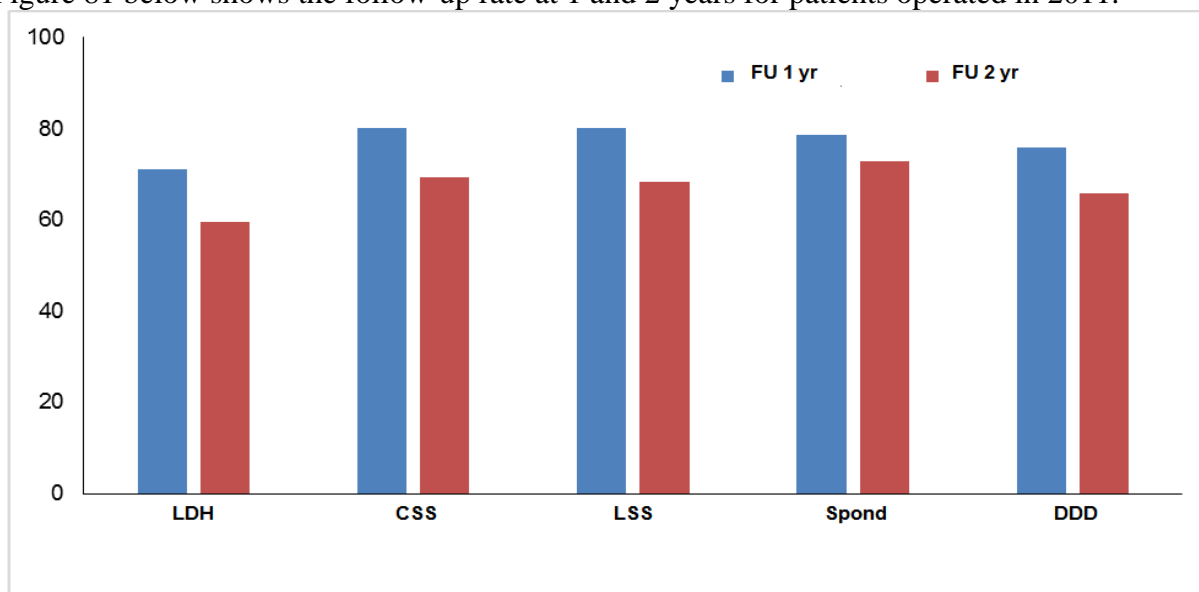


Fig. 81. Current follow-up rate.

## **XVIII. Conclusion**

In addition to the annual report for 2011 to 2013, the 2014 spine register report also includes material gathered for an analysis of surgical outcomes for segmental pain over the past 15 years. In addition, we have included a PREM analysis (patient reported experience measures) of patient satisfaction with care related to the surgical procedure. Ongoing work includes focus group analyses with representatives of spine surgery patients from County Hospitals, University Hospitals and Private Clinics, continued work on Value Based Reimbursement (VBR) in spinal surgery, as well as international collaboration within the framework of ICHOM with a “core data set” for lumbar spine surgery that was agreed in 2013 and for which Swespine serves as the basis for the protocol for baseline data, surgery data, and patient follow-up. The project is now in its Implementation phase and a four-nation study is planned to begin in 2015, in which we will examine whether any differences can be found among patients with herniated discs and spinal stenosis of the lumbar spine in the three Nordic countries—Sweden, Norway and Denmark—in terms of inputs and outcomes after 1 year.

Over 50% of Sweden’s surgical clinics now engage the services of the Register Center, which both relieves the burden on these departments and optimizes data quality. Gathering this impressive amount of register data requires a major effort by both the Register Center Secretary and all other department secretaries and doctors in Sweden, and we want to express our great appreciation for their work, which gives us a spine register in Sweden that is unique worldwide.

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