CME

Economic evaluation of spinal cord stimulation for chronic reflex sympathetic dystrophy

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Abstract—*Objective:* To evaluate the economic aspects of treatment of chronic reflex sympathetic dystrophy (RSD) with spinal cord stimulation (SCS), using outcomes and costs of care before and after the start of treatment. *Methods:* Fifty-four patients with chronic RSD were randomized to receive either SCS together with physical therapy (SCS+PT; n = 36) or physical therapy alone (PT; n = 18). Twenty-four SCS+PT patients responded positively to trial stimulation and underwent SCS implantation. During 12 months of follow-up, costs (routine RSD costs, SCS costs, out-of-pocket costs) and effects (pain relief by visual analogue scale, health-related quality of life [HRQL] improvement by EQ-5D) were assessed in both groups. Analyses were carried out up to 1 year and up to the expected time of death. *Results:* SCS was both more effective and less costly than the standard treatment protocol. As a result of high initial costs of SCS, in the first year, the treatment per patient is $4,000 more than control therapy. However, in the lifetime analysis, SCS per patient is $60,000 cheaper than control therapy. In addition, at 12 months, SCS resulted in pain relief (SCS+PT [−2.7] vs PT [0.4] [$p < 0.001$]) and improved HRQL (SCS+PT [0.22] vs PT [0.03] [$p = 0.004$]). *Conclusions:* The authors found SCS to be both more effective and less expensive as compared with the standard treatment protocol for chronic RSD.

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Reflex sympathetic dystrophy (RSD) is a neuropathic pain syndrome that starts after trauma or operation on a limb, and is now conventionally termed complex regional pain syndrome (CRPS) type I; it is believed to be fundamentally similar to causalgia or CRPS type II. We use the more common name—RSD. The incidence of RSD is not precisely known, but has been estimated to be 1 case in every 2,000 accidents.[1] RSD is a clinical diagnosis that probably subsumes a variety of mechanisms; a subgroup of patients with RSD have sympathetically maintained pain. Although in most patients symptoms will subside after some years, a smaller percentage—again, the incidence is unknown—will develop severe chronic disability. Chronic RSD is a tremendous problem for both patients and physicians. The syndrome has an unknown pathophysiology, and results in functional disability and severe pain in affected arms or legs. Conventional treatments—consisting of a long list of analgesic medication, physical therapy (PT), sympathetic blocks, psychological therapy, and transcutaneous electrical nerve stimulation—are recommended by expert panels,[2] and are being used despite a lack of evidence of effectiveness from randomized controlled trials. The treatments are largely ineffective.[3,4] Spinal cord stimulation (SCS), on the other hand, has been shown to relieve pain, but not to improve function in patients with chronic RSD.[5] The costs of this treatment are considered prohibitive. Nevertheless, no economic evaluation, in which the increment in health benefits resulting from SCS is related to the increment in cost, has been reported.

Alongside a randomized controlled trial on the effectiveness of SCS in chronic RSD, we performed an economic evaluation. We adopted the societal perspective—i.e., measuring all the costs and benefits of providing SCS, regardless of who pays or who benefits. In addition, we projected the long-term benefits and costs for the entire life of the patients in the cohorts. The comparisons were made from inclusion to 1 year following implantation of a SCS system, and up to the predicted date of death.

We sought to determine whether treatment of patients with chronic RSD with SCS in addition to conventional treatments is preferable to the existing treatment with conventional procedures alone from the viewpoint of 1) the budget of the Sickness Funds (i.e., the Dutch health insurance council, comparable with the National Health Council in the United Kingdom) and 2) society.

Additional material related to this article can be found on the *Neurology* Web site. Go to www.neurology.org and scroll down the Table of Contents for the October 22 issue to find the title link for this article.

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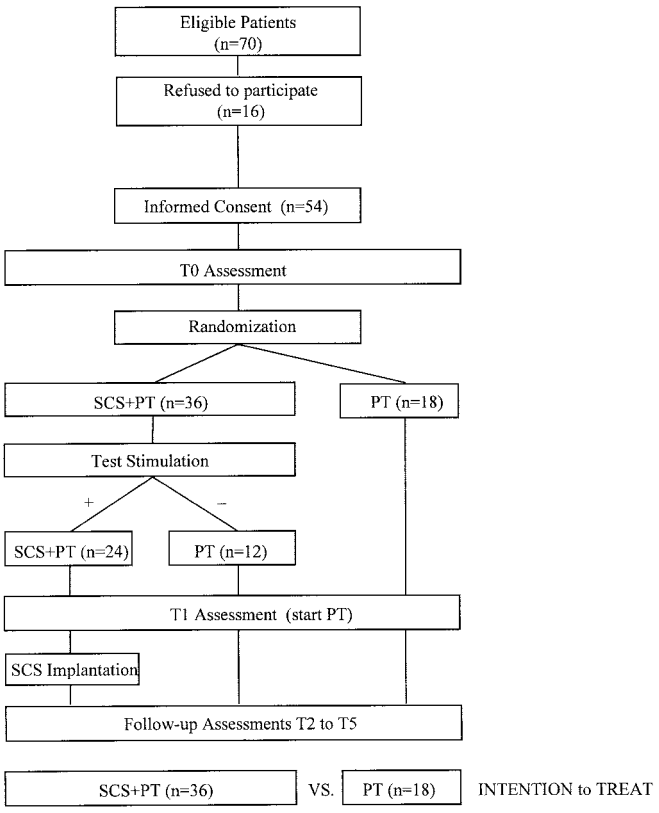

Figure 1. Flow chart illustrates the study protocol and indicates the groups compared in the intention-to-treat analysis. SCS-PT = spinal cord stimulation + physical therapy.

Methods. Our analysis used data from a randomized controlled trial.[5] For details on study characteristics, surgical procedures, and study outcomes, we make reference to the report of the clinical trial. In brief, 54 patients with chronic RSD of one extremity, referred to our department during the period March 1997 to July 1998, were included in the study. The study sample size was based on a power analysis.[5] In 33 cases, the arm was the affected limb, whereas in 21 cases it was the leg. Patients were assigned by randomization to a group with SCS and a standardized PT program (SCS+PT group) or to a group with the standardized PT program alone (PT group). The randomization was stratified according to the location of RSD (hand or foot). All patients assigned to SCS+PT underwent test stimulation; those not successfully responding did not receive the SCS system. The randomization used a 2:1 ratio in favor of the SCS+PT group, and thus 36 patients were allocated to SCS+PT and 18 were allocated to PT. Of the 36 patients allocated to SCS+PT, 24 responded to test stimulation successfully and underwent implantation of a SCS system (figure 1). The success rate of test stimulation did not differ between hand and foot patients.

Health outcomes. Both pain and health state valuations were assessed on six occasions during the first year. These included baseline (T0), 1 day prior to implantation of the SCS system (T1), and 1 (T2), 3 (T3), 6 (T4), and 12 (T5) months following T1.

Pain. Pain intensity was measured using a 10-cm visual analogue scale (VAS)—0 cm representing no pain, 10 cm the most extreme pain—on which patients rated their pain at three fixed timepoints per day for 4 consecutive days. The average of these samples indicated the mean pain intensity.[6]

Health state. Patients rated their health-related quality of life (HRQL) in relation to mobility, self-care, usual activities, pain/discomfort, and anxiety/depression using the EQ-5D.[7,8] Each of these five attributes has three levels—no problem, some problems, or major problems—thus defining 243 possible health states, to which has been added unconscious and dead for a total of 245 in all. In the societal perspective, patients' health states have to be valued by the general public, because everyone is not only a potential patient but also a taxpayer. Therefore, each patient's EQ-5D ratings were transformed into a utility (i.e., a preference score that the general public would give for the health state as indicated by the patient). The relative valuations of members of the general public of different states of health (i.e., EQ-5D ratings) were derived from Dolan et al.[9] and have been elicited by using the time trade-off.[10]

Costs. Spinal cord stimulation. All costs were calculated in 1998 Dutch guilders, but are expressed in 1998 Euros. One Euro is equal to 2.20371 Dutch guilders. The costs of SCS for year 1 were calculated by estimating each component of resource use. Applying 1998 financial and service data resulted in the determination of a fully allocated unit price for each service (microcosting). The actual cost for each patient was determined by recording the quantity of services used, multiplying the quantity by the unit price of the service, and then calculating the totals for all services. Unit prices not only reflect the direct costs of care (e.g., salaries, wages, and supplies), but also the costs of support departments (e.g., administration and housekeeping) and overhead items (e.g., employee benefits and equipment depreciation).

SCS costs for the predicted lifespan were calculated as follows. Life expectancy of each patient at the start of the study was calculated from age- and sex-specific life expectancies for the Dutch population.[11] In this way we obtained a mean residual life expectancy of 41 years (range 15 to 60 years). Longevity of the pulse-generator was estimated on all hospital visits of patients with an implanted SCS system (n = 24) with the console programmer, using pulse-generator settings (number of hours use per day, amplitude, rate, pulse width) of each patient. The console programmer applied Medtronic (Minneapolis, MN) longevity tables and estimated a mean battery life of 5.8 years (range 0.6 to 9.8 years). For year 1 we used the actual complication costs observed, but for subsequent years we have calculated the average cost of complications. The frequency of each type of complication (e.g., infection, other biologic complication, electrode defect, electrode displacement, pulse-generator defect) was acquired from a systemic literature synthesis of SCS.[12] By linking the cost per complication type in our study to the frequencies of the literature synthesis, a total cost of 1,371 Euro for any complication was obtained. A mean percentage of patients with any complication of 42% has been reported.[12] All patients in that study had an implanted SCS system, whereas in our study only two thirds of patients in the SCS+PT group had an implanted SCS system. Therefore, 28% of patients in the SCS+PT group (2/3 × 42%) could be expected to have any complication each year. By multiply-

ing the total cost for any complication by the percentage of patients with any complication, the complication costs per patient per year were calculated.

Routine RSD costs. Routine RSD costs are the costs of resources that are generally consumed by patients with RSD. The costs are divided into five categories: medical care (e.g., hospital treatments, general practitioner visits, outpatient attendances, bed days); physical therapy; transport (e.g., journeys to and from the hospital by taxi, car, train, or ambulance); medication; and aids (e.g., splints, crutches, special chairs). In the Netherlands, health insurance is a legal requirement for all citizens.[13] As a consequence, health care expenses of the inhabitants of the country are precisely known and registered. We gathered this information for all patients from the authorities concerned, and calculated mean annual routine RSD costs before and after the intervention. Costs of PT were disregarded in the analysis, because these costs were a consequence of the study protocol and were generated equally in both groups.

Out-of-pocket expenses. In order to estimate patient and family resources, patients were required to complete seven cost diaries prospectively during the first half year of the study (one in each month). The diaries provided information on resource use and expenses resulting from illness and treatment.[14] We compared information from Diary one (before intervention) with the mean of Diaries two to seven (after intervention). Because virtually all patients in both groups were unfit for work before and after the intervention, no actual working hours were lost by the patients. The opportunity costs of leisure time were disregarded in the analysis: the costs are low and do not differ between both groups. For out-of-pocket expenses, the exact financial expenditures as reported by the patients were used. Journeys made for health care visits were rated at 0.27 Euro per kilometer, as is normal practice in the Netherlands.[15]

Analyses. Analyses were done up to 1 year after implantation of the SCS system, and up to the predicted death date. Costs included SCS costs and routine RSD costs. Because costs to patients (out-of-pocket expenses) did not differ between the groups, these were omitted in the analysis. Effects included reductions in pain intensity and quality-adjusted life-years (QALY; i.e., a measure of health improvement combining morbidity and mortality into one measure) gained. We undertook two types of analysis: 1) a cost-effectiveness analysis, which investigates the additional cost and the additional net economic cost per reduction in pain intensity; and 2) a cost-utility analysis, which investigates the additional cost and the additional net economic cost per QALY gained.[16]

Treatment with SCS requires the early expenditure of large amounts of money to achieve later gains. Therefore, in the reference case analysis, both costs and health effects were discounted at the end of the year at a rate of 3% per annum to convert the future values to their equivalent present value, as recommended by the US Panel on Cost-Effectiveness in Health and Medicine.[17] In the reference case analysis, life expectancy was set at 40 years, longevity of the pulse-generator at 5 years, and the annual complication rate at 30%.

Sensitivity analyses were performed in order to determine the robustness of the findings in the presence of major changes in key factors. The following factors were varied: the discount rate (0 to 10%); implantation rate (success of test stimulation) (67 to 100%); life expectancy (2 to 50 years); longevity of the pulse-generator (1 to 7 years); complication rate (30 to 50%); and reduction in routine RSD costs (0 to 100%).

Table 1 *Pain intensity and health state valuations at baseline and at 1-year follow-up of patients with chronic reflex sympathetic dystrophy (RSD)*

Pain intensity/health state	Baseline	Follow-up	Δ T0–T5
Pain intensity (VAS)			
SCS+PT, n = 36	7.1 (1.5)	4.4 (2.8)	−2.7 (2.8)
PT, n = 18	6.7 (1.2)	7.1 (2.2)	0.4 (1.8)
p Value			<0.001
Health state (EQ-5D)			
SCS+PT, n = 36	0.21 (0.33)	0.43 (0.32)	0.22 (0.33)
PT, n = 18	0.19 (0.30)	0.22 (0.29)	0.03 (0.13)
p Value			0.004

Mean pain and health state scores (SD) of patients with chronic RSD either treated by spinal cord stimulation plus physical therapy (SCS+PT) or by physical therapy alone (PT). Pain intensity on a 0 (no pain) to 10 (most severe pain) scale, health state on a 0 (death) to 100 (perfect health) scale.

VAS = Visual Analogue Scale; EQ-5D = EuroQol-5 dimensions.

Statistical analysis. The statistical analysis was carried out according to the "intention to treat" principle: all patients, including withdrawals from treatment, remained in the group to which they had been assigned by randomization. For health outcomes, change from T0 to T5 was compared between the SCS+PT and PT groups using independent samples *t*-tests. Costs were not normally distributed and, therefore, change from T0 to T5 was compared between the SCS+PT and PT groups using nonparametric tests. Differences between patients with an affected arm or leg were assessed using independent samples *t*-tests. Linear regression analysis was performed to assess potential influences of age, sex, or location of RSD on effect size. Two-tailed p values < 0.05 indicated significance.

Results. Two patients in the PT group who had had constant scores were lost to follow-up after the 6-month assessment (T4). In order to prevent loss of information, their T4 scores were also used in the T5 analysis.

Health outcomes. As shown in table 1, the mean pain intensity (SD) reduced by 2.7 (2.8) in the SCS+PT group and increased by 0.4 (1.8) in the PT group ($p < 0.001$). The mean HRQL score (SD) improved by 0.22 (0.33) in the SCS+PT group and by 0.03 (0.13) in the PT group ($p = 0.004$). Graphical presentation of the course of HRQL is provided in figure 2. Regression analysis revealed no relationship between effect of treatment and age, sex, or location of RSD. The incremental health improvements by SCS in year 1 were calculated from the area between the curves of SCS+PT and PT, and were found to be 0.18 QALY and −2.7 cm VAS per year. The yearly incremental health improvements by SCS to death were calculated as follows:

Pain change in SCS+PT group (1 year score − baseline score): 4.4 − 7.1 = −2.7

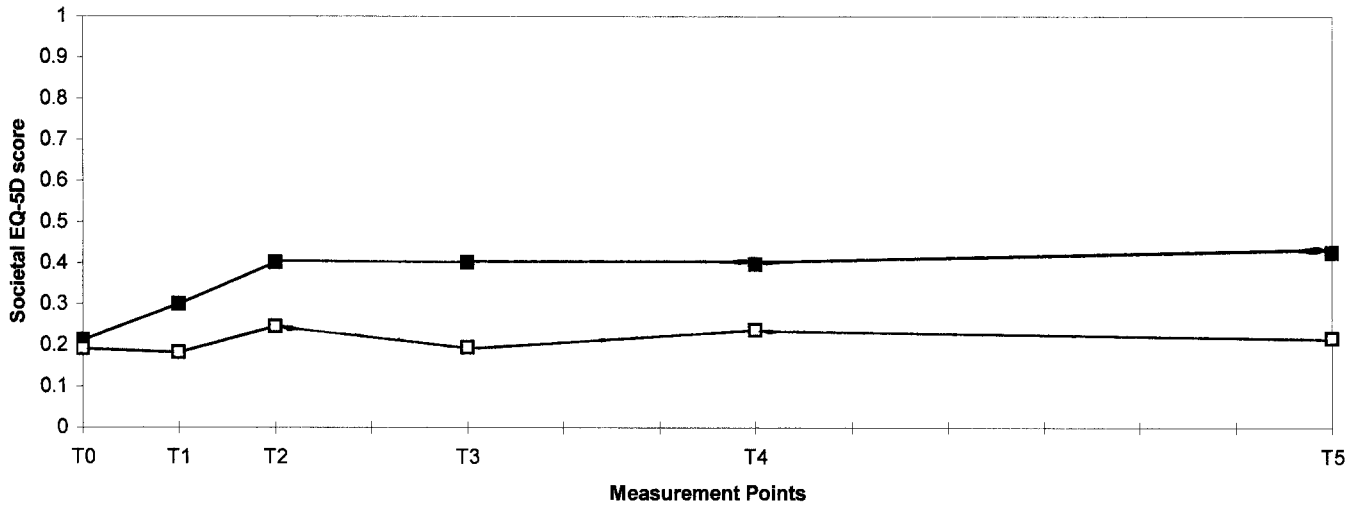

Figure 2. Societal EQ-5D scores of spinal cord stimulation + physical therapy (black) and physical therapy (white). The area between both lines represents the quality-adjusted life years gained by spinal cord stimulation.

Pain change in PT group (1 year score − baseline score): 7.1 − 6.7 = 0.4

Incremental difference: −2.7 − 0.4 = −3.1

EQ5D change in SCS+PT group (1 year score − baseline score): 0.43 − 0.21 = 0.22

EQ5D change in PT group (1 year score − baseline score): 0.22 − 0.19 = 0.03

Incremental difference: 0.22 − 0.03 = 0.19

Complications requiring reinterventions did not occur during test stimulation. Of the 24 patients who received an SCS system, 17 complications in 9 patients during the first year could only be treated by means of an operation (complication percentage of 9/24 equals 38%). These included repositioning of a displaced electrode (eight actions in six patients), revision of a painful pulse-generator pocket or plug wound ("other biologic"; seven actions in six patients), removal and reimplantation of a SCS system after clinical signs of infection (one action), and replacement of a defective lead (one action).

Costs. Spinal cord stimulation. The unit prices of the separate parts of treatment with SCS and the subsequent total costs in this study are presented in table 2. Costs are measured to 1 year and as projected to death. Costs of SCS in the first year consisted mainly of implantation costs (202,986 Euro; 83%). The remaining costs were generated by test stimulation (30,128 Euro; 12%) and complications (11,904 Euro; 5%). Costs as projected to death include replacement every 5 years and an annual complication rate of 30% through the 40-year residual life expectancy.

Routine RSD costs. Mean (SD) annual routine RSD costs at baseline were 5,741 (5,177) Euro and did not show significant differences between patients with an affected arm as opposed to patients with an affected leg, but these groups had a different distribution of costs over categories (see the supplementary figure on the *Neurology* Web site.). The costs of aids ($p < 0.03$) and transport ($p < 0.05$) were higher for patients with an affected leg. Between T0 and T5, change of median (interquartile range [IQR]) routine RSD cost was −751 (−4,335/−125) Euro in the SCS+PT group and 179 (−4,109/1,435) Euro in the PT group ($p = 0.03$). The cost reduction in the SCS+PT group was mainly caused by a diminished requirement for medical care. Expenditure on transport, medication, and aids remained constant. In further calculations (see table 2), mean baseline costs of the complete group (n = 54; 5,741 Euro) and mean costs after SCS of the SCS+PT group (n = 36; 2,999 Euro) were used.

Out-of-pocket expenses. Only one patient refused to complete cost diaries. The median (IQR) baseline out-of-pocket cost of all other patients (n = 53) was 885 Euro (382/1,769) per year. There were no significant differences in out-of-pocket expenses between patients with an affected arm vis-à-vis patients with an affected leg. The change between T0 and T5 in out-of-pocket expenses showed no significant difference between the SCS+PT group and the PT group. Consequently, out-of-pocket expenses were omitted from all further analyses.

Economic evaluation. Table 3 presents incremental costs and effects of SCS for chronic RSD. In this table, future costs (those beyond the first year) and effects (pain intensity and QALY) are presented both undiscounted and discounted at a rate of 3% per annum. In the reference case analysis, as a consequence of the reduction of routine RSD costs by SCS, costs in the PT group permanently exceed costs in the SCS+PT group after 3 years (figure 3).

Sensitivity analyses. Results of the sensitivity analyses are presented in table 4. Incremental costs of SCS remained negative for all variants of discount rate, complication rate, and implantation rate. Extreme values for mean longevity of the pulse-generator (1 year or below) and mean life expectancy (2 years or below) resulted in positive incremental costs. However, if a pulse-generator were to have a mean longevity of only 1 year, the incremental cost per QALY would nevertheless merely be 9,352 Euro (3% discount rate). With regard to the reduction of routine RSD costs, it has been demonstrated that incremental costs of SCS would become positive if the reduction of routine RSD costs were less than 47% of the amount that was measured in our study. However, even if SCS were not to result in any reduction of routine RSD costs, the cost per QALY ratio would only be 6,735 Euro.

Table 2 *Costs to 1 year and to death in the SCS+PT, PT, and implanted SCS groups (undiscounted)*

		SCS+PT, n = 36		PT, n = 18		SCS, n = 24	
Timing and procedures	Costs	Number of actions	Cumulative costs	Number of actions	Cumulative costs	Number of actions	Cumulative costs
To 1 year							
Spinal cord stimulation							
Outpatient visit 1	125	36	4,505			24	3,003
Implant test lead	664	36	23,898			24	15,932
Outpatient visit 2	48	36	1,725			24	1,150
Implant SCS system	8,458	24	202,986			24	202,986
Reposition lead	363	8	2,906			8	2,906
Replacement lead	1,543	1	1,543			1	1,534
Infection (removal + reimplant)	6,245	1	6,245			1	6,245
Other biological	173	7	1,210			7	1,210
Replacement system	6,072	0	0			0	0
Total SCS costs			245,018				234,975
Routine RSD costs							
SCS + PT group	2,999	36	107,973				
PT group	5,741			18	103,331		
SCS group	2,931					24	70,334
Total cost			352,991		103,331		305,309
Mean cost per patient			9,805		5,741		12,721
To Death (projected)							
Spinal cord stimulation			1,842,585		0		1,832,566
First implant		233,090				223,071	
Complications		589,391				589,391	
Replacement system		1,020,104				1,020,104	
Routine RSD costs			4,318,922		4,133,239		2,813,352
Total cost			6,161,507		4,133,239		4,645,918
Mean cost per patient			171,153		229,624		193,580

Values expressed in 1998 Euros. Multiply by 1.04 to calculate equivalent in 1998 US dollars. Replacement system cost is used for pulse generator failure due to longevity.

SCS+PT = spinal cord stimulation plus physical therapy; RSD = reflex sympathetic dystrophy.

Discussion. The current study demonstrates that for patients with chronic RSD, SCS is both more effective and, after 3 years, less costly than the conventional treatment protocol. SCS can therefore be classified as a grade A technology, meaning that there is compelling evidence for adoption and appropriate utilization.[18] Even in the worst-case scenario—a mean battery life of 1 year—the incremental cost per QALY gained would be 9,350 Euro. Technologies that cost less than 13,500 Euro per QALY gained are almost universally accepted as being appropriate ways of using the resources of society and the health care system.[18] Note, however, that these criteria have no official status.

As stated earlier, to our knowledge, a comparable economic evaluation of SCS has not been performed previously. Our study was carried out alongside a randomized controlled trial, resource use and clinical effects were assessed prospectively, and costs were valued via microcosting. The only study that we could find in the literature—cost-effectiveness of SCS for failed back surgery syndrome—based costs and effects almost entirely on assumptions and estimates, and applied a 5-year time horizon.[19] Because SCS is dependent on expensive pulse-generator replacements throughout treatment, a short time horizon is a potential result-improving factor.

Total mean calculated costs in the first year were almost twice as high in the SCS+PT group as compared to those in the PT group (difference between mean costs per patient per year of 4,000 Euro). The high initial expense of SCS was mainly due to the implantation itself, which formed 83% of the expenditure. Because implantation of the complete system

Table 3 *Incremental costs and effects of spinal cord stimulation for chronic reflex sympathetic dystrophy (undiscounted and discounted)*

Period	Costs
To 1 year	
Cost	4,064.68
Pain reduced, cm	2.7
QALY gained	0.18
Cost/QALY gained	22,581.57
To death (projected), undiscounted	
Cost	−58,471.44
Pain reduced, cm	124
QALY gained	7.6
Cost/QALY gained	Dominant
To death (projected), 3% discount rate	
Cost	−17,927.31
Pain reduced, cm	38.02
QALY gained	2.33
Cost/QALY gained	Dominant

Costs expressed in 1998 Euros. Multiply by 1.04 to calculate equivalent in 1998 US dollars.

QALY = quality-adjusted life-year.

is restricted to year 1, expenditures in the SCS+PT group after 1 year will be considerably lower. In fact, costs in the lifetime analysis for the reference case were lower for SCS than for the conventional treatment protocol. Consequently, we have been able to restrict the lifetime analysis to just a presentation of costs. The results of the lifetime analysis were very robust. Whatever figure was chosen, discount rate, implantation rate, and complication rate did not influence the fact that conventional treatment costs outweighed those of SCS. In unrealistic situations—a mean longevity of the pulse-generator of 1 year, or a mean life expectancy for patients of 2 years—SCS did become more expensive than conventional treatment. In addition to reducing costs, however, SCS also results in diminished pain intensity and improved HRQL.[5]

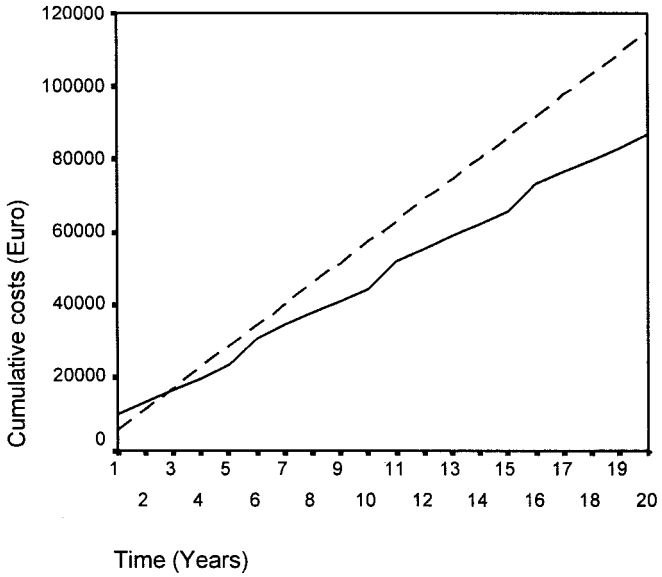

Figure 3. Projected undiscounted cumulative costs in the spinal cord stimulation + physical therapy (SCS+PT) group (continuous line) and the PT group (dashed line). The steeper portions of the SCS+PT line pertain to implantation years based on assumed pulse generator longevity. PT costs go beyond SCS+PT costs after 3 years. Values expressed in 1998 Euros. Multiply by 1.04 to calculate equivalent in 1998 US dollars.

Table 4 *Sensitivity analysis on incremental costs of spinal cord stimulation for chronic reflex sympathetic dystrophy (RSD) (discounted at 3%)*

Alternative	Incremental costs	Delta QALY	Cost/QALY gained
Reference case	−17,927	2.33	Dominant
Discount rate, %			
0	−58,471	7.60	Dominant
10	−1,292	0.17	Dominant
Complication rate, %			
50	−14,648	2.33	Dominant
Longevity, y			
1	21,789	2.33	9,352
2	−3,034	2.33	Dominant
7	−20,410	2.33	Dominant
Life expectancy, y			
2	1,661	0.36	4,615
3	−545	0.52	Dominant
50	−16,805	2.17	Dominant
Implantation rate, %			
100	−10,676	2.33	Dominant
Reduction of routine RSD costs, %			
0	15,693	2.33	6,735
40	2,245	2.33	963
50	−1,117	2.33	Dominant

Costs expressed in 1998 Euros. Multiply by 1.04 to calculate equivalent in 1998 US dollars. In the reference case analysis, costs were discounted at 3%, life expectancy was set at 40 years, pulse-generator longevity at 5 years, the annual complication rate at 30%, the implantation rate at 67%, and the reduction of routine RSD costs at 100% (i.e., the measured value of 2,741 Euro).

We emphasize that our results are solely applicable to the specific category of patients with chronic RSD. A characteristic of this type of patient is their intensive consumption of therapeutic resources due to unsatisfactory long-term relief of chronic pain. After treatment with SCS, demands for medical care made by patients with chronic RSD appear to come down. The sum of costs of SCS treatment, plus the reduced medical costs caused by SCS, result in a

lower total as compared to costs of the conventional treatment. In the reference case analysis, we surmised that the reduced routine RSD costs would persist. Remarkably, incremental costs of SCS only became positive if the reduction of routine RSD costs diminished to less than 47% of the amount that was measured in our study, and even if SCS did not result in any routine RSD cost reduction, the incremental cost per QALY ratio would still be acceptable.

In the reference case analysis, we applied an implantation rate of 67%, a life expectancy of 40 years, a longevity of the pulse-generator of 5 years, and a complication rate of 30%. These assumptions are based on the findings of the clinical study[5] and are in line with figures reported in the literature. In both the pilot study[20] and the clinical study[5] we measured a 67% success rate of test stimulation in RSD. It has been reported that approximately 83% of all screened patients (i.e., not specifically RSD patients) will have a successful test stimulation.[19] RSD is a chronic benign pain syndrome that does not affect life expectancy. Therefore, we could apply unmodified life expectancy tables for the Dutch population. The longevity of the pulse-generator has been found to be 65 months in another trial,[19] comparable to the 5 years we calculated in the current study. The complication rate, and the cost for any complication finally, was (as explained previously) based on a systemic literature synthesis of SCS.[12] If we had used our own figures, the cost of any complication would have been 709 Euro instead of 1,371 Euro. We chose to apply figures from the literature synthesis, because these are least likely to be influenced by chance.

This study did not take into account potential future developments that might influence the results. Once SCS becomes a more common treatment, this will reduce the costs. Technological developments might result in longer battery life, rechargeable batteries, or batteries charged by kinetic energy. Each development will result in reduced costs of treatment. It is hard to find any factors that might result in higher costs, apart from economic changes in inflation or interest rates. For patients with chronic RSD, who are currently often deprived of SCS, the discovery that the only treatment with proven effect on their clinical situation has now been shown to be effectively cheaper in the long run can be considered an enormous step forward.

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