

## WHY PATIENTS USE OR REJECT A PERONEAL MUSCLE STIMULATOR?

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### ABSTRACT

Technical and clinical functional testing of peroneal muscle stimulators have been in progress at the Unit for Applied Orthotics, Department of Rehabilitation Medicine, Jönköping, Sweden, since 1973.

The results of fitting commercially available stimulators with regard to other aspects have been previously reported. The goal of this follow-up study is to understand why many patients use a peroneal muscle stimulator, while others reject them.

A questionnaire, specifically designed and tested for this purpose, was used as the measuring device. The questionnaire included 23 questions concerning the application, training, acceptance, technical quality, and medical as well as social aspects. A total of 125 patients fitted with peroneal muscle stimulators in the country between 1973-1983 were included in the study.

The results give an answer as to why the use of stimulators differs between patients. Emphasis was placed on the medical, technical and social aspects which influence the patients' behavior with regard to wearing the peroneal stimulator.

KEY WORDS: FES, Electrical Stimulation.

### INTRODUCTION

Many patients with a mal function of their gait and with central nerve lesions can use peroneal muscle stimulators.

Technical and clinical functional testing of peroneal muscle stimulators have been in progress at the Unit for Applied Orthotics, Department of Rehabilitation Medicine, Jonkoping, Sweden since 1973.

The testing was performed according to test instructions for clinical function testing and technical type tests (2,3). The clinical function testing followed a special routine where the medical record of the patient notes specific data regarding the

peroneal muscle stimulator: Diagnosis, loss of function, sensitivity, social and psychological factors, vocation, various kinds of technical aids, application routine, training method and improvement of function.

The results of fitting commercially available stimulators with regard to these aspects have been previously reported (1,4,5, 6,7,8,9,10,11,13).

The goal of this follow-up study is to understand why many patients use a peroneal muscle stimulator, while others reject them.

## METHOD

A questionnaire, specifically designed and tested for this purpose was used as measuring device. The questionnaire included 23 questions concerning the application, training, acceptance, technical quality and medical as well as social aspects. A total of 125 patients fitted with peroneal muscle stimulators in the country between 1973 - 1983 were included in the study. During this period 16 patients died (5 didn't want to participate, 3 were lost and 3 had problems to communicate). Finally 99 patients were involved in this follow-up study.

	No. of patients	Diagnoses
	43	MS (Multiple Sclerosis)
	34	CVS (Cerebral palsy)
	22	Others (ALS, Arnold Chiari Syndrom, St post trauma)
Total	99	

Mainly 5 types of peroneal muscle stimulators were used by patients:

FEPA 10	From Yugoslavia
FEPA 12	
MIKROFES	
LIC	From Sweden
CEFAR	

In a previous research project we found no significant difference, from the patient's point of view, between the different stimulators (6).

RESULTS

Some of the questions and answers are introduced below.

**Question 1: What was your attitude towards the stimulator?**

Answer:

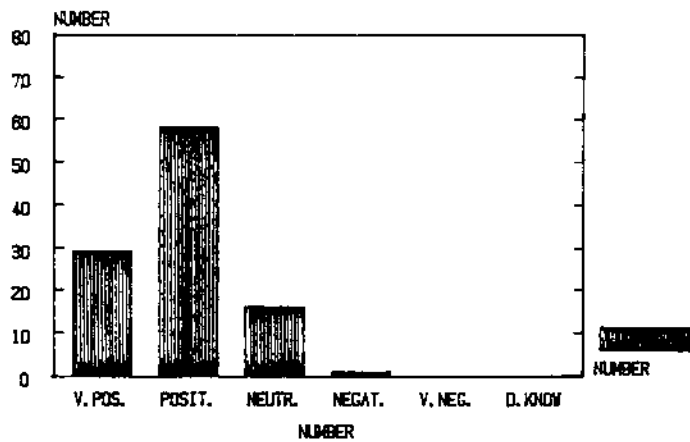


Fig. 1. Attitude towards the stimulator

Most of the patients were positive to use a peroneal muscle stimulator.

**Question 2: How often do you use the stimulator?**

Answer:

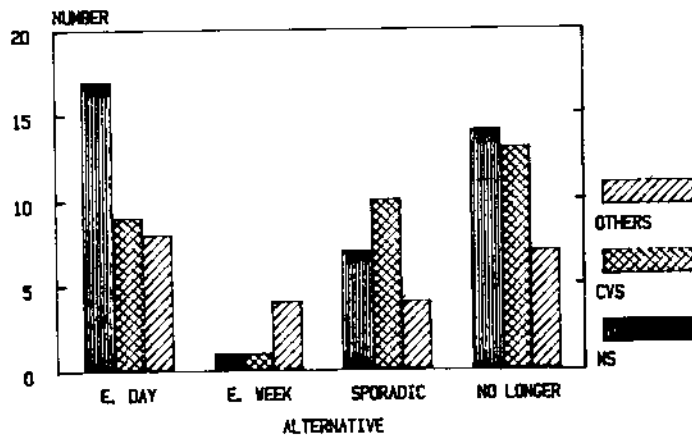


Fig. 2. Frequency of using

4 patients did not answer this question.

**Question 3: Was the stimulator to any help for you in your job, at home and at leisure time?**

Answer:

Alternative	Number
Yes, very important	46
Neutral	9
No, not important	22
Don't know	13
Total	90

Many patients said that they got an increase in selfconfidence, safety and balance while walking with a stimulator.

**Question 4: Could you walk longer distances outdoors using the stimulator?**

Answer	Number
Yes	58
No	12
Don't know	22
Total	92

Most of the patients had benefit from the stimulator. Almost everyone had an improved dorsiflexion and pronation of the foot during the gait. They could walk longer distance and longer time with the stimulator. The reduction of spasticity with the treatment of Functional Electrical Stimulation (FES) has been reported many times earlier (14,15,16).

**Question 5: Was it difficult to find the spot of stimulation?**

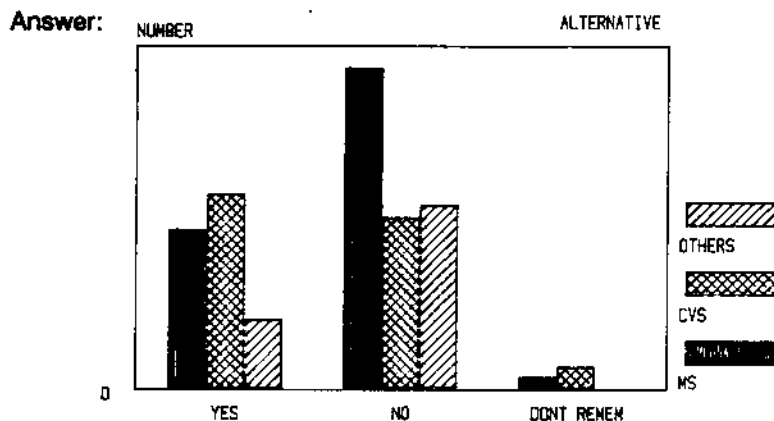


Fig. 3. Problems with stimulation spot

**Question 6: Did you get enough and adequate help from the applicator?**

Answer:

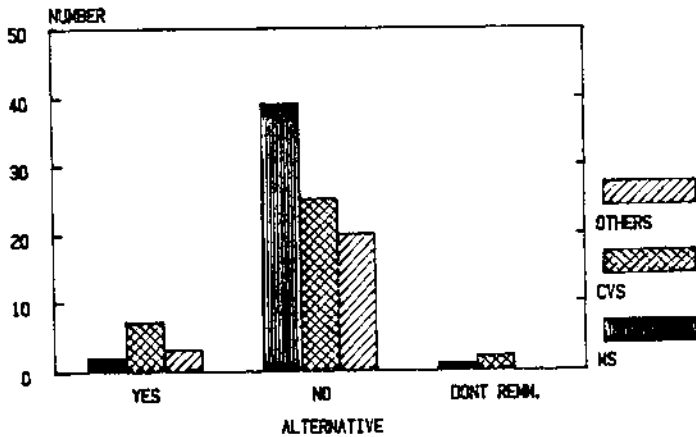


Fig. 4. Help from the applicator

When supplying a patient with relatively complicated technical aids, it is absolutely necessary to give him an adequate training.

**Question 7: Was the practice period too short?**

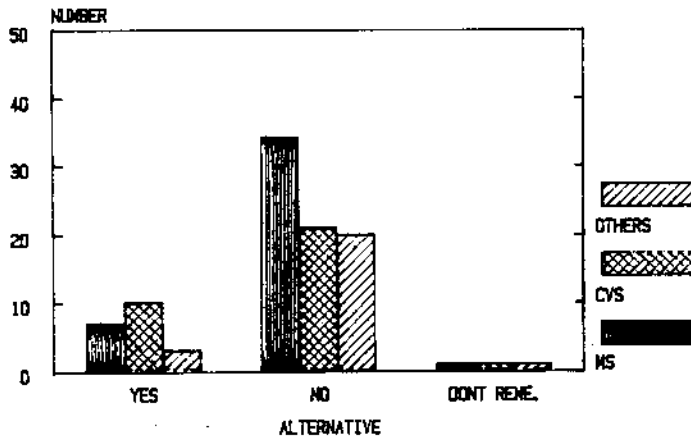


Fig. 5. Too short time for practice

To get a good result of the fitting the patient should have at least five days intensive training as an inward patient (6).

**Question 8: Did you have problems with skin irritation (from the electrodes)?**

Answer:

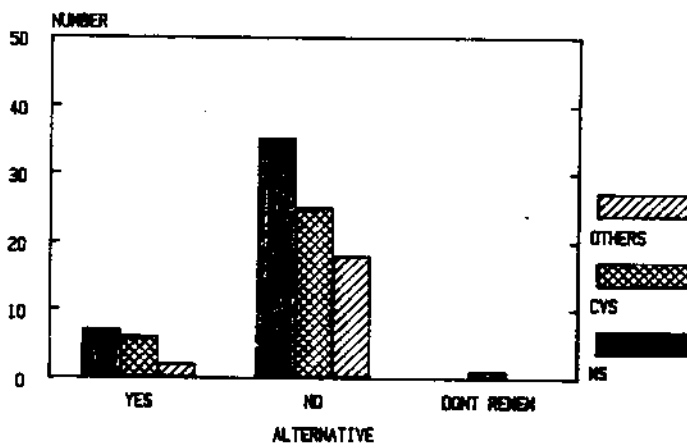


Fig. 6. Problems with skin reaction

15 patients had problems with skin reaction. Some of these patients cannot use surface electrodes. In these cases it is possible to use a stimulator with implant electrodes. In our county we have used implant electrodes on 12 patients (11).

**Question 9: Did you have problems applying the stimulator at home?**

Answer:

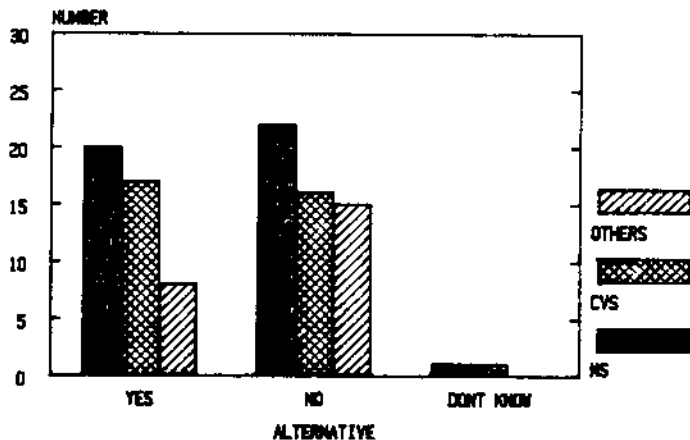


Fig. 7. Application problems at home

There were many patients who had application problems at home. To simplify the daily application for the patient he should be tattooed on the stimulation spot.

**Question 10: Did you find it troublesome to carry about the stimulator?**

Answer:

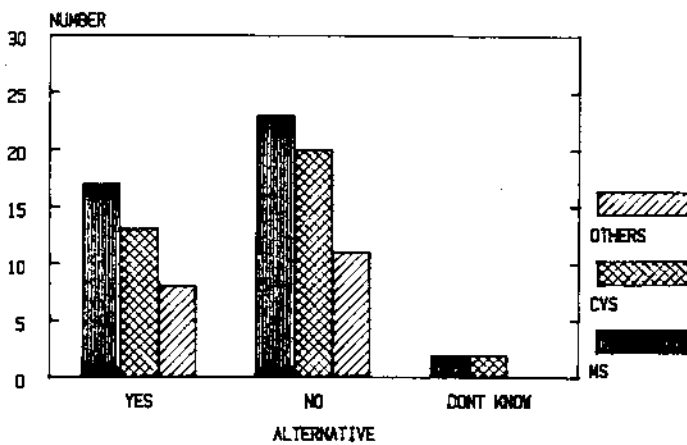


Fig 8. Carry about the stimulator

2 patients did not answer. Some of the CVS-patients have lost function on the paretic hand. Many patients have reduced "body image" and fine hand-motory.

**Question 11: Did you have any technical trouble with the stimulator?**

Answer:

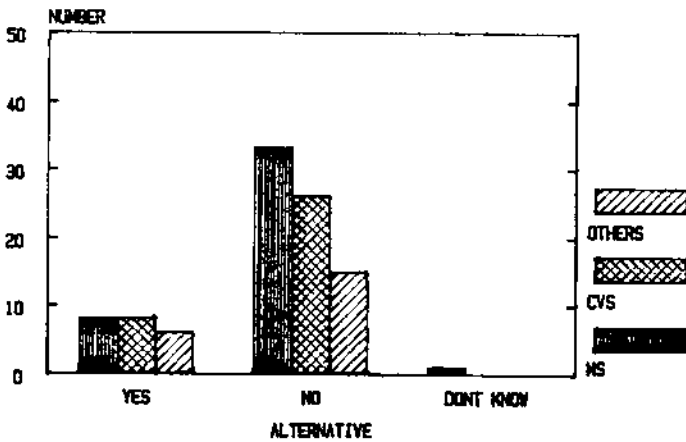


Fig. 9. Stimulators defect

2 patients did not answer.

**Question 12: Do you think the effect of your disease has changed during the last 10 years?**

Answer	Number
Yes	51
No	44
Total	95

25 patients became worse and were forced to stop using the stimulator. Most of them were MS-patients.

16 patients became better and did not use the stimulator any longer. Most of them were CVS-patients.

**Question 13: How was the follow-up carried out?**

Alternative	Number
Next appointment	30
Reseized	19
Telephone interview	21
None	24
Total	94

The patient needs to be checked several times after application (6).

## CONCLUSION

Some aspects to increase the understanding of the problems involved using a peroneal muscle stimulator:

- *For how long a period a patient uses the stimulator depends on his disease. Many patients with CVS became better and did no longer need help from the stimulator. On the other hand many MS- patients became worse and were forced to stop using the stimulator.*
- *A good application of the stimulator is necessary. The stimulator must be adapted to the patient's individual needs and possibilities. To simplify the daily application for the patient, the stimulation spot should be tattooed.*
- *Each application needs a follow-up. The patient needs to be checked several times after he has been discharged and be helped with his problems.*



- *In the training the patient must learn how to put on and take off the stimulator, how to use it in different situations and how to use the trouble shooting table. All these preferable independently of other persons.*

According to the questionnaire the patient who was fitted with a peroneal muscle stimulator wanted:

- *Good information about the stimulator*
- *Adequate application and training*
- *To be helped with his problems as soon as possible*

This is common for all technical aids for handicapped but especially for this aid since it is quite technically complicated and therefore one needs to support the patient individually.

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