# Assessing the Impact of Positional Changes and Movements in Spinal Cord Stimulation Patients

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## INTRODUCTION

The electrical field distribution patterns of spinal cord stimulation are affected by patient movement and positional changes due to increases and decreases in the layer of CSF between the electrode and the spinal cord (Barolat, 1998). These physiological changes during movement can alter patient perception of their stimulation, which can cause painful or ineffective stimulation (North et al., 1991). Therefore, the impact of positional changes and movement on stimulation perception was analyzed from an international registry.

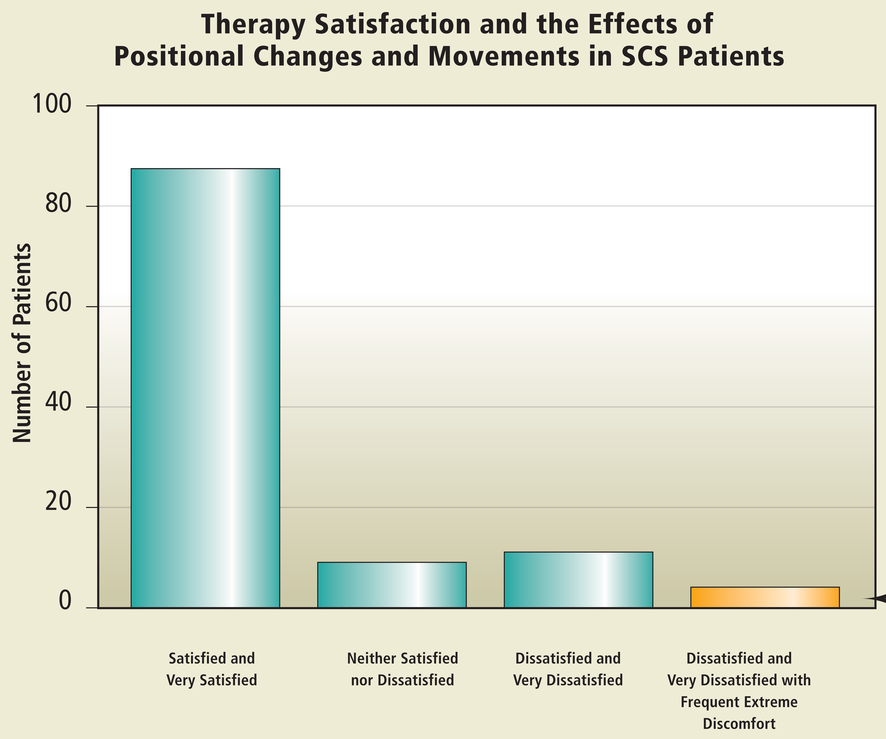
## METHODS

- One hundred eleven patients who were enrolled in a prospective, multicenter, international registry were asked to rate their satisfaction with their therapy and the effect of stimulation changes during specific positional changes and movements in the time since their last visit.
- Questionnaires were completed at 6 months post-implant.
- Patients rated their satisfaction with their SCS therapy as "Very Satisfied", "Satisfied", "Neither Satisfied nor Dissatisfied", "Dissatisfied", or "Very Dissatisfied."
- Patients rated the effect of their stimulation changes during positional changes and movements as "No Discomfort", "Minor Discomfort" or "Extreme Discomfort". If the patient felt discomfort, they were given a choice of "Seldom" or "Frequent".

## REFERENCES

- Barolat G. Epidural Spinal Cord Stimulation: Anatomical and Electrical Properties of the Intraspinal Structures Relevant to Spinal Cord Stimulation and Clinical Correlations. Neuromodulation. 1998; 1(2):63-71.
- North R, Ewend MG, Lawton MT and Piantadosi S. Spinal cord stimulation for chronic, intractable pain: superiority of "multi-channel" devices. Pain.1991; 44:119-130.

## RESULTS




| Patient: | A | B | C | D |
|---|---|---|---|---|
| Gender | Female | Female | Male | Female |
| Age | 50 | 64 | 47 | 56 |
| Years in pain | 4 | 14 | 10 | 8 |
| Cause of pain | Just woke up with severe arm pain | Accident | Carried too much weight | Work accident |
| Diagnosis | FBSS | Radiculopathy | Chronic Pain Syndrome | FBSS |
| Insurance Type | Private | Medicare | Private | Workers' Compensation |
| Spinal level of lead | C2 | T8-T9 | Bottom of T9 | T9-T11 |
| Type of lead | Surgical | Percutaneous | Surgical | Percutaneous |
| Hours of stimulation per day | 19-24 | 0 | <3 | 0 |
| Reported percentage of pain relief | 50 | 0 | 10 | 0 |
| Quality of life (Overall) | Deteriorated | Deteriorated | Neither improved nor deteriorated | Neither improved nor deteriorated |
| Post SCS work status | — | Disabled | Returned to work | Disabled |

Figure 1. The majority of patients report to be satisfied with spinal cord stimulation therapy. Of the 111 patients, only 4 reported to be dissatisfied or very dissatisfied with SCS therapy and to have extreme positional discomfort. Patient details are summarized in the table for these 4 patients.

## SUMMARY AND CONCLUSIONS

- In 107 of 111 patients evaluated, changes in stimulation due to movement did not have an impact on their satisfaction with SCS.
- In the 4 patients that reported dissatisfaction with SCS and "Frequent Extreme Discomfort", changes in stimulation due to movement appears to be only one of several factors that contributed to their outcome.

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