This *Handbook for Somatosensory Rehabilitation* is dedicated to all patients whose pain is unspoken of, places itself at the crossroads of medicine, fundamental research and rehabilitation. It is intended for physicians, neuroscientists, therapists in all disciplines as well as the patients they care for.

This work presents clinical tools developed starting from the 19th century until today. Four of these tools make it possible to establish a Diagnostic Testing of Axonal Lesions, which in turn reveal undetectable lesions in the cutaneous axons of the whole body. These various clinical tools enable the decrease of the Perception Pressure Threshold and simulaneously the relieving of neuropathic pain syndrome or complex regional pain syndrome.

In 2004, Claude Spicher founded the Somatosensory Rehabilitation Centre in Clinique de Fribourg (member of the Genolier Swiss Medical Network). He is a scientific collaborator for the Unit of Physiology (Prof. EM Rouiller) at the University of Fribourg as well as the editor of the e-News for somatosensory Rehabilitation.

He holds a license in Occupational Therapy from the Institute for Social and Pedagogic Studies in Lausanne. He is a certified Hand Therapist of the Swiss Society for Hand Therapy. He has participated in many events in Switzerland, France and Belgium and has published articles in several internationally renowned publications.

Claude Spicher has written a scholarly, enlightening book that is visually fun to read, and yet a challenge to the intellect. This handbook was carefully written with love, as it represents the culmination of more than two decades of his clinical work. His handbook is full of practical techniques to help patients with peripheral nerve problems. Therapists in all disciplines will learn from studying this material.

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Handbook for Somatosensory Rehabilitation

Handbook for Somatosensory Rehabilitation

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FOREWORD

By

A. Lee Dellon, MD
for
Handbook for somatosensory rehabilitation

By

Claude Spicher

The lives of Claude Spicher and me have become interwoven. And yet we have never met. Ideas and research are the material of which the fabric is woven, and the process of weaving is the process of writing. The finished product for me was my first book Evaluation of Sensibility in the Hand and Re-Education of Sensation, published in 1981, and my last book, Somatosensory Testing and Rehabilitation, published in 1997. The finished product for Clause Spicher is what you now hold in your hands, the Handbook for Somatosensory Rehabilitation. It is as if our writings were a word puzzle in which the individual words have been shifted to create something similar yet different. Claude Spicher has written a scholarly, enlightening book that is visually fun to read, and yet a challenge to the intellect. This handbook was carefully written with love, as it represents the culmination of more than two decades of his clinical work. His handbook is full of practical techniques to help patients with peripheral nerve problems using classic approaches and his own synthesis of these to create novel approaches as well. Therapists in all disciplines will learn from studying this material. One day it will be my honor to meet him in person, and have our actual lives, instead of our virtual lives, intertwined.

A Lee Dellon, MD
Baltimore, Maryland, 4/29/05

La méthode de rééducation sensitive de la douleur
by Claude Spicher & Isabelle Quintal

Foreword

This new edition of Claude Spicher's excellent *"Handbook for Somatosensory Rehabilitation"* covers every important aspect of the field. It describes recent advances in diagnosing the various clinical states and the procedures to combat them. It will stimulate all health professionals who are dedicated to the management of pain and associated problems.

The field of pain has recently undergone a major revolution. Historically, pain has been understood as an unidimensional sensation produced by injury or disease. We now possess a much broader concept that comprises the emotional, cognitive and somatosensory dimensions of pain experience, as well as an impressive array of new approaches to pain management. Chronic pain especially, is now a major challenge to all health sciences and professions.

An important component of the gate control theory which I proposed with Patrick Wall is that somatosensory stimuli of various kinds—electrical pulses, massage, vibration, cold, heat—can "close the gate" to those nerve impulse patterns that generate pain. The theory also recognizes that pain is a multidimensional experience determined by psychological as well as physical factors, which broadens the scope of pain therapies. Patients with chronic pain need every bit of the armamentarium to battle the pain. John Bonica, a brilliant anaesthesiologist, played a huge role in these developments. He contended that chronic pain is not a "symptom" but a syndrome in its own right, and requires therapists from a wide range of disciplines.

The recognition that pain is the result of multiple determinants gave rise to a variety of psychological approaches such as relaxation and cognitive therapies and also provided an explanation for the effectiveness of transcutaneous electrical nerve stimulation (TENS) and physical therapy procedures that bring substantial pain relief to large numbers of people.

The pain revolution has taken us from a direct-line pain pathway to an open biological system that comprises multiple sensory inputs, memories of past experiences, personal and social expectations, genetic contributions, gender, aging, and stress patterns involving the endocrine, autonomic and immune systems. Pain is now universally recognized as a major challenge for all health sciences and professions. Every aspect of life, from birth to dying, has characteristic pain problems. Genetics, until recently, was rarely considered relevant to the understanding of pain, but sophisticated epidemiological and laboratory studies have established genetic predispositions related to pain as an essential component of the field. The study of pain, therefore, has broadened and now incorporates research in epidemiology and medical genetics as well as sociological and cultural studies.

This *"Handbook for Somatosensory Rehabilitation"* encompasses chronic as well as acute forms of pain. It highlights a mission for all of us: to provide relief from all forms of chronic pain. We must also encourage patients to communicate about their pain, which stimulated me to develop the McGill Pain Questionnaire. If we pursue these goals together, as members of the full range of health professions, we can hope to meet the goal we all strive for: to help our fellow human beings who suffer pain.

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Conclusion

In the introduction to the chapter covering the diagnostic testing of axonal lesions [136] – which deserves to become a test for axonal lesions, since it has the qualities of a test – two questions were put forward:

1. How are disorders of the cutaneous sense detected?
2. Or, more precisely, how are sites of axonal lesions localized?

In addition, the search procedure for a site of axonal lesions was proposed as a systematics one. The last question which arises and one frequently asked to me is, "Why?" "Why try desperately to look for these cutaneous sense disorders in such an insistent, not to say obsessional, manner?":

- Because these disorders are present in a small majority of traumatized patients (~60%).
- Because these electrical discharges slow down mobilization.
- Because hyposensibility is a source of functional incapacity of the hand, Moberg was the first to demonstrate the correlation between sense disorders (static 2-point discrimination test) and hand dysfunctions.
- Because, and above all for this reason, somatosensory rehabilitation is a prevention against DISABLING complications, in the sense of the term relative to social security. Year after year, I see patients who return to therapy with constant painful disorders which limit, even prevent, any professional activity, after having stopped somatosensory rehabilitation prematurely, either because the therapist has not been convincing enough, or because they did not believe in the importance of this preventative work. The greater the lapse of time between axonal lesions and the start of somatosensory rehabilitation, the more the prognostic of recuperation is reserved. The greater the lapse of time between the axonal lesions and the start of somatosensory rehabilitation, the less are the chances of a cure, and this for life… this is what will be discovered in the second part of this handbook, which covers the painful consequences of cutaneous sense disorders.

[136] See chapter *Testing of the Cutaneous Sense*

However, to conclude this first part on cutaneous sense disorders, I would quickly like to return to the 3rd point in the chapter on Senses, the Touch. For myself, touch is a primary need, just like eating, the need to be loved and the need to be between heaven and earth by prayer. Thus, recovering contact with the damaged limb is vital to overall neurorehabilitation. Perhaps this was better said by the sociologist David Le Breton:

"To think the body is a way to think the world and the social link: a disorder introduced into the body's configuration is a disorder introduced into the coherence of the world".

Le Breton, D. (1999). L'adieu au corps (Farewell to the body). Paris: Métailié.

PART 2

DEFINITIONS, TESTING, REHABILITATION & PREVENTION
OF PAINFUL COMPLICATIONS OF CUTANEOUS SENSE DISORDERS
IN CASE OF PERIPHERAL NEUROLOGICAL LESIONS

Introduction

Somatosensory rehabilitation is part of the somaesthetic system, frequently also called the tactilo-kinaesthetic (T-K) system. Theoretically, somaesthesia can be broken down into two sub-systems:

- The muscular, or deep sense
- The cutaneous, or superficial sense

These two sub-systems are closely linked.
Somatosensory rehabilitation of the cutaneous sense comprises three treatment phases:

1	2	3
Rehabilitation of Hyposensitivity, or, more precisely, of the hypoaesthetic territory.	**Desensitization**, by mechanical vibrations at the point that constitutes the site of axonal lesions.	**Vibrotactile Counter-Stimulation**, in the presence of a possible allodynic territory.

The distinction between these three phases is primordial as is the **sequence** of carrying out these three treatment phases each one justified by itself.
Example: Desensitization of the site of axonal lesions cannot be undertaken in the presence of an allodynic territory [1]. It is first necessary to eradicate the allodynic territory during a number of sessions. Only then can rehabilitation of the hypoaesthetic territory followed by desensitization of the site of axonal lesions be effected.

In the first part of this handbook, readers learnt how to effect somatosensory rehabilitation of hyposensitivity in simple pathologies. In this second part, this knowledge will

[1] See chapter: *Mechanical Allodynia*

be extended to cover **painful pathologies**, **e.g. complex regional pain syndrome (CRPS)**, **the new terminology for reflex sympathetic dystrophy** [2].

In addition, two other major phases of somatosensory rehabilitation will be treated:

- Vibrotactile counter stimulation **of the allodynic territory**, if present.
- Desensitization of the point that constitutes the site of axonal lesions (neuroma) by means of mechanical vibrations.

If the cornerstone of the first part of this handbook on basic disorders is the vibrotactile sense, with the Semmes-Weinstein pressure aesthesiometers as preferred instruments, then the cornerstone of this second part on painful complications is the **phenomenon of pain**, with the **McGill Pain Questionnaire** as its preferred instrument.

[2] See chapter: *Complex Regional Pain Syndrome*