



The Sensitive Nervous System - A review by Nicholas Lucas

Butler D, Noigroup Publications, Adelaide Australia, 430 pages, over 300 illustrations.

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From its beginnings, osteopathy never embraced a single system (eg arthrodiol) approach to treatment, or health care. Reading through both the early (1800's) and modern osteopathic texts, one finds consistent references to the health and function of the skeletal, arthrodiol, muscular, fascial, lymphatic, vascular and nervous systems; each of which is a component of the current definition of somatic dysfunction.

The role of the nervous system from an anatomical and physiological point of view has always been important to the osteopathic understanding of health and disease. Anatomically, great importance has been given to knowledge of nerve pathways and sites of compression, or obstruction to movement. Physiologically, the early osteopaths considered that nerves had both electric and nutritive functions, and that the health of the nervous system was paramount to the health of the innervated tissues and the individual as a whole. Early this century, researchers focused on neurally mediated pathological changes in the target tissues of nerves involved in some sort of movement or vascular dysfunction. Later, Korr and others developed the idea of a facilitated segment of the spinal cord and hypothesised a reflexive model of spinal dysfunction related to abnormal afferent input and abnormal motor and sympathetic output. Korr also went on to develop experimental models which tested the trophic function - and dysfunction - of nerves (1960's).

Since that time there has been little experimental research within the osteopathic profession to further these ideas. Consequently, many of our techniques are still based on a rationale derived from early osteopathic ideas and research. A decade has passed since van Buskirk's article, 'Nociceptive reflexes and the somatic dysfunction: a model' (Journal of the American osteopathic Association, 1990; 90(9): 792-809) and there is a need for a millennial update in our concepts of somatic dysfunction and the role of the nervous system in the aetiology and management of disease. *The Sensitive Nervous System*, authored by David Butler, does this more than adequately.

Chapter 1 is a very brief introduction to the history of manual medicine concepts. Titled 'Painting on a bigger canvas' it sets the flavour of the book as 'non-denominational' and acknowledges the contributions made by many professions and individuals to the field.

Chapter 2 provides a general summary of current neurophysiological concepts. The chapter ends with a very useful collection of nervous system metaphors and analogies, which can be used to help our patients (and us) grasp the complex nature of the nervous system and its relationship to pain and dysfunction.

Chapter 3 looks at peripheral pain mechanisms. An argument is developed to promote a clinical approach based on a deeper understanding of tissue injury and healing in parallel with an understanding of the underlying pain mechanisms that may be involved. Management is then based on both of these factors, and not on either alone.

Chapter 4 provides a thoughtful outline of the current understanding of central pain mechanisms, with a discussion of how they become dysregulated and sensitised (similar to Korr's facilitation) at the dorsal horn, brain stem and cortex. Butler also discusses and updates the basic characteristics of the autonomic nervous system and immune system; their interrelation with pain and emotional distress and their participation in the wellbeing - or not so - of patients.

Chapter 5 is where the book really starts to get interesting. How does the molecular biology of a facilitated segment relate to the results of a straight leg raise test? How does the assessment of gross range of motion affect the cortex? This chapter links molecular biology with gross anatomy and movement.

Chapter 6 is titled 'Clinicians and their decisions' and discusses the numerous issues that underlie our decision-making processes, while highlighting ways to improve this process by using current knowledge. This chapter also provides a useful discussion of evidence-based practice and goes some way to dispelling the myths surrounding this subject. It helps the reader understand that evidence-based practice is not all about randomized controlled trials.

Chapter 7 is a bridging chapter between the early basic science chapters and the clinical decision making chapters that follow. It sets the scene for the physical examination of the nervous system, within your existing physical examination framework.

Chapter 8 orientates the reader to the palpation of the peripheral nervous system. It provides information on the feel of peripheral nerves, how to locate them, and their responses to palpation. The text and diagrams then describe the palpation and assessment of the accessory, trigeminal, ulnar, radial, median, sciatic, tibial, peroneal, sural, femoral, and saphenous nerves. Other nerves are also mentioned.

Chapter 9 is titled 'Manual assessment of nerve conduction' and describes the typical neurological assessment, such as muscle stretch reflexes and sensation testing. Rather than solely describing techniques of assessment, Butler also discusses the reliability and validity of the techniques, providing data from recent research. He also discusses the common mistakes made when performing neurological assessments and how to avoid them; and alternative methods of assessment when standard test responses are equivocal. I personally found this chapter to be very useful and it made an immediate impact on my examination skills in the clinic.

Chapters 10-12 detail the neurodynamic tests. Chapter 10 introduces their use in clinic; chapter 11 provides instruction on neurodynamic tests for the spine and lower limb, and Chapter 12 on those for the upper limb. In what is a pleasure to read, the description of each test is accompanied by a summary of the basic and clinical science which supports its application - quite a novel experience in manual medicine texts.

Chapter 13, written by James Matheson, asks the question 'Is neurodynamics worthy of scientific merit?' Matheson discusses the reliability and validity of the concepts presented in the book, and places them within the current theoretical framework of evidence-based medicine (EBM). Future directions for research are also discussed. The chapter is written in the language of EBM and is a fine example of clinicians asking themselves, 'what do we know?' and 'how do we know it?' I would like to see a similar chapter on osteopathic approaches to health care.

Finally, **Chapters 14 and 15** discuss management strategies and clinical aspects of neurodynamics. The integration of neurodynamics into clinical practice is not based on formulas, and so none are given. As Butler indicates, to give recipes for treatment would be to make the chapters on clinical reasoning pointless.

Written with a refreshing absence of 'turf' protection, the sensitive nervous system is aimed at the whole group of clinicians who use manual techniques. For osteopaths, the information will add to and refine the construct validity of our many approaches. It provides modern, rational support for an approach to the whole person and the broad concept of somatic dysfunction.

To his credit, Butler poses many of his opinions as questions rather than statements. You get the distinct impression that he is humbled by the sheer complexity of it all, and he refrains from making authoritative, unsubstantiated claims. The information presented is comprehensively referenced with literature published up to and including the year 2000.

Those of you who are history buffs may be disappointed with the inaccuracy of early osteopathic history - placing chiropractic as an earlier development than osteopathy in the first chapter. However, don't let this very minor detail bias you from taking in the valuable information and cogent arguments provided in the book. With statements such as 'ion channels can be considered the molecular targets of manual therapy' the book often reads like a dramatic novel that keeps you on the edge of your seat. It will therefore be enjoyed as a book that provides an exciting summary of contemporary neurophysiology and cell biology while also providing a comprehensive framework for advanced clinical reasoning and the application of theoretical concepts in clinical practice.

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