Joint manipulation goes right to the core of Chiropractic. Specifically, cervical spine manipulation was the procedure performed that began Chiropractic as a profession. This test section will discuss how the neurological system is activated as a result of joint manipulation and help further explain the powerful results seen by Chiropractors during clinical practice on a daily basis. This section will deal primarily with the local effects of manipulation that occur simply at the spinal cord level. Supraspinal effects of joint manipulation will be discussed in another test section.

With adequate stimulation of nociceptors by either mechanical irritation (such as trauma or injury) or by chemical irritation (lactic acid, prostaglandin E2, leukotriene B4, glycosaminoglycans, histamine, 5 hydroxytryptamine and bradykinin), C and Delta Type A fibers carry nociceptive information into the central nervous system. These fibers have their cell body in the dorsal root ganglion and then synapse in the basal spinal nucleus, Lamina V. Through much interneuronal activity, this may result in pain, reflexogenic muscle spasm and sympathetic vasoconstriction at the spinal cord level. This information is then transmitted by a second order neuron in the spinothalamic and spinoreticular pathways to the thalamus (the anterolateral system). The third order neuron then relays information to the parietal cortex for the localization of pain, to the limbic system for the emotional experience of pain, to the temporal lobe for the memory of pain and to the Hypothalamus which can result in the autonomic concomitants of pain.

Chiropractors can affect these neurological pathways with the use of joint manipulation as well as adjunctive therapies. Joint manipulation, via stimulation of Type I and II mechanoreceptors and information carried in 1a and 1b fibers, can greatly affect the nociceptive system. Manipulation can cause both presynaptic and postsynaptic inhibition of the anterolateral system in Lamina 2 resulting in decreased pain, as well as causing an indirect inhibition of the anterolateral system by producing activation of the endorphin producing hypothalamus as well as the periaqueductal gray and nucleus raphe magnus. Relaxation of tight muscles can result from manipulation via gamma motor neurons and via 1b inhibitory interneurons. Manipulation also results in reflex inhibition of the preganglionic sympathetic neurons and improvement of coordination through pathways to the cerebellum.

COMMENTS: Chiropractic Physicians are one of the three primary health care providers along with Medical Doctors and Osteopathic Physicians. Chiropractors often act as primary portals into the health care system and deal with a wide variety of presenting symptomatology including pain, loss of function, and autonomic symptomatology. This
section reviews the neurological effects of manipulation through the actual neurological pathways that exist. The understanding of these pathways will allow the Chiropractor to explain the effects of manipulation to other health care professionals as well as being able to help patients understand basic but important reasons by which manipulation reduces their pain and autonomic concomitants.

Chiropractors have often treated patients with low back pain that also identified that they were experiencing nausea, digestive dysfunction and/or difficulty in urination, that, following manipulative therapy for which the low back pain is improved also find that these concomitant symptoms are alleviated. During the examination of a new patient with a neuromusculoskeletal condition, increased sweating, increases or decreases in blood pressure and/or alterations in pulse are identified and improve after manipulation. It offers nothing but excitement to review the pathways that account for such improvements in not only the patients' condition, but also their concomitant symptoms.

Manipulation results in a complex neurological interaction that has wide reaching effects. One must develop an understanding of these pathways by first reviewing cellular physiology, action potentials, synapses, receptors, and spinal cord anatomy.

REFERENCES:


Seaman, David, DC, MS, DABCN. Chiropractic and Pain Control. DRS Systems. Asheville, North Carolina. 1993


NOTE: This is only one section of the Neurology 101 course. If you enjoyed this material, please visit www.ChiroCredit.com and take the entire one-hour program. Registration for the website is free and courses run between $20-$24 per credit hour.

With state-of-the-art technology, ChiroCredit offers online continuing education credits and ways to participate in other distance learning opportunities. Save time and money! No longer will you miss hours from your practice and family. You can obtain continuing education credits in the comfort of your own home or office at hours convenient to you while saving on travel and hotel expenses as well.

To learn more, visit us @ www.ChiroCredit.com