

Craniosacral mechanisms

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Proponents of a mode of treatment involving manipulation of the cranium and the sacrum maintain that physiologically beneficial changes are induced by this method. Although there has been somewhat limited quantitative information available in regard to what is accomplished by the craniosacral techniques, the subjective response of patients to this type of therapy is generally favorable. The method has been useful in obtaining relief from pain such as headache. A good summary of clinical application is provided in Magoun's text.¹

A series of histologic and physiologic studies on the squirrel monkey, *Saimiri sciureus*, have shown that the cranial bones can move as a result of respiration, cardiac activity, and alterations in cerebrospinal fluid pressure.^{2,3}

The structure of the cranial bone suture is important in that it provides a means by which the cranial bones are held together while allowing some degree of movement. The sutural connective tissue has the appearance of a bed of areolar tissue consisting of bundles of collagenous (Sharpey's fibers), reticular, and elastic connective tissue. The Sharpey's fibers, along with the other two types of connective tissue, penetrate the approximated edges of the bone. The connective tissue also extends inward to the dura and outward through the periosteum to the inner layer of the scalp. Accordingly, movement of the scalp and/or the cranial bones would be reflected in the dura and vasculature.

When force is applied to the sacrum of the squirrel monkey, there is an increase in the cerebrospinal fluid pressure as recorded in the ventricle. This pressure change could result in stimulation of the nerve fibers in the choroid plexus and the tela choroidea.

According to Crosby and associates,⁴ the cerebral ventricles are innervated by both myelinated and nonmyelinated fibers; some of these arise from cervical sympathetic ganglia as well as from the glossopharyngeal and vagus nerves. The choroid plexus is also innervated by these sympathetic fibers. It is of particular interest that some of the sympathetic fibers end in relation to the blood vessels. Others appear to arise in relation to the epithelial cells and the connective tissue of the tela choroidea. The function of this innervation is not known, but it may be related to autonomic sympathetic vasomotor activity and sympathetic pain reception.

The cranial suture area is highly vascularized. This vascular system probably is under the control of autonomic

sympathetic vasomotor fibers on the arteriole side. On the venous side, pain sensation may be transmitted by sympathetic fibers.

These findings suggest that some of the therapeutic action of craniosacral manipulation may be due to changes in the vasomotor tone of the arterioles and the modulation of pain sensation arising from the venous portion of the cerebral vasculature.

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Supported by AOA Research Grant #75-91, "Cranial Motion and Intracranial Fluid Dynamics," through the AOA Bureau of Research (National Osteopathic Foundation).