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CranioSacral Therapy and Scientific Research, Part I

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I cannot count the number of times I have been told by well-meaning friends and harsh critics that CranioSacral Therapy (CST) should be investigated using scientific methods. Many people say CST would be a real boon to health care - if only there were more scientific proof. In a recent article (www.massagetoday.com/archives/2003/03/07.html), I explained why I believe CST can never be adequately evaluated within the confines of the laboratory. In addition, many people don't realize that research has indeed been done. For you skeptics, I offer the following overview:

In the mid-1970s, I was approached by Michigan State University (MSU) to uncover the scientific basis for a premise put forth by William Sutherland, DO, in the 1930s: that the joints and sutures of the cranium do not fully ossify, as was once believed. From 1975 through 1983, I was a professor in the department of biomechanics at MSU's College of Osteopathic Medicine, where I led a team of anatomists, physiologists, biophysicists and bioengineers to test and document the influence of the craniosacral system on the body. Together we conducted research - much of it published - that formed the basis for the modality I went on to develop and name CranioSacral Therapy.

I first worked with neurophysiologist and histologist Ernest Retzlaff, PhD, to prove that under normal conditions, cranial sutures do not calcify before death. We studied numerous bone and suture samples taken from neurosurgery patients between the ages of seven and 57 years. Not only did these samples show living sutures completely free of calcification, but they were chock full of collagen and elastic fibers; arteries; arterioles; capillaries; venules; veins; nerves; and neuroreceptors.

After in-depth examinations, we demonstrated definitive potential for movement between the cranial sutures. Yet these results appeared to contradict anatomy-lab samples taken from cadavers whose skull sutures were calcified. These seemingly conflicting findings suggested that the calcification of skull sutures seen in preserved cadavers was due to postmortem changes and reactions

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to chemical embalming agents. Our findings supported those published in Anatomica Humanica by Italian professor Guiseppi Sperino, who noted that cranial sutures fuse before death only under pathological circumstances.

Once we saw the potential for motion in living sutures, our next step was to demonstrate that the motion we had hypothesized actually existed in the living skull. With the assistance of biophysicist Richard Ropell, PhD, we began using head (band) strain gauges on living subjects. These gauges demonstrated rhythmical expansion-contraction movements of the cranial circumferences at eight to 12 cycles per minute; however, there were other variables that could discredit these measurements as solid evidence of sutural movement, so we had measure the movements of one skull bone in relation to another. While we could not use humans for studies like this, we were able to use live monkeys from the university's pharmacology department.

In pain-free experiments, we anesthetized the monkeys and did minor surgery to cement an antenna directly to each parietal bone, about two centimeters lateral to the sagittal suture, and two centimeters posterior to the coronal sutures. We then wired these two 10-inch antennae so that we could broadcast a radio signal between them. In the recorded wavelengths, we discovered as the parietal bones moved independently of each other, the distances between antenna times changed. These changes demonstrated interparietal movement of about 12 cycles per minute. At one point, I placed a fingertip on the monkey's coccyx. With minimal pressure, I was able to stop the parietal bone motion.

Now we had evidence of a system that could move parietal bones rhythmically - and be stopped by pressure on the coccyx. This and a multitude of other factors caused me to deduce that the coccygeal pressure influenced the parietal motion via the hydraulic force of cerebrospinal fluid (CSF) moving through the dural membrane and myofascial system related to the spinal column and the cranium.

My first inkling that such a hydraulic system existed came some years earlier during a neck surgery I assisted. The lead surgeon had removed the spinous processes and part of the laminae of the middle cervical vertebrae (C4 and C5) in order to expose the meningeal dura mater and keep it intact. At that time, I witnessed a rhythmical rise and fall of CSF pressure at about eight cycles per minute. It became clear that a fluid pressure deep to the dura mater was causing its continual movement. This fluid had to be cerebrospinal, and its volume had to be increasing and decreasing cyclically. Why hadn't this phenomenon been noticed in surgeries before? The answer is surprisingly simple: In most cases, the dura mater was incised. (Fortunately, that's not always the case.) I recently received a letter from Professor Charles Probst, a prominent Swiss neurosurgeon. He reported seeing,

"... without any doubt, rhythmical spinal cord movements with a four to 10 cycle-per-minute rhythm. This rhythm is corresponding to that of cerebrospinal fluid, visible very well with the subarachnoid space being opened. All these movements have quite another frequency than those of the pulse-beat [heart] and respiration! This is all, I can tell you, based on our own experiences in about 20,000 neurosurgical operations (11,000 cranial, 9,000 spinal)."

In the case of lumbar-puncture procedures, when the needle enters the CSF compartment, the fluid enters the manometer via the needle and an elbow apparatus. When the fluid rises to its peak pressure, a valve is opened to take a specimen. It was generally assumed that the CSF specimen that was removed accounted for the reduction of pressure in the manometer. Any cyclic drop in fluid pressure was thus overlooked.

Editor's note: Look for the conclusion of this article and its relevant references in the November issue.

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