

A Review of Craniosacral Therapy SCIENCE, FADS, AND APPLIED BEHAVIOR ANALYSIS

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When seeking therapy for any particular ailment or condition, most people insist on a treatment that will improve the particular concern for which they need help. Examples of conditions or issues in need of effective treatment include Autism Spectrum Disorder (ASD), learning disabilities, attention deficit hyperactive disorder (ADHD), post-traumatic syndrome disorder (PTSD), orthopedic problems, traumatic brain injury (TBI), spinal cord injuries, and color blindness. It may come as a surprise to learn that proponents of one therapeutic approach, craniosacral therapy (CST; Upledger Institute, 2011), claim it improves all of the diverse problems above.

According to the founder John Upledger, CST (sometimes called cranial manipulative therapy, craniopathy, or neural organizational technique), involves the physical manipulation of the craniosacral system of the body, consisting of the cranium, spinal cord, and the cerebral spinal fluid (Zane, 2005). Learning, behavioral, and emotional problems can be thought of as caused by disruptions, interruptions, or blockage of the flow of the cerebral spinal fluid, and the CST's goal is to remove such disruptions and blockages and thus eliminate the observed problems. By physically pressing on different parts of the skull and spine, craniosacral (CS) therapists claim the therapy can change the flow of the spinal fluid.

Upledger has published numerous articles in the journal *Massage Today* (e.g., Upledger, 2003a, 2003b, 2003c), advocating for the use of CST with a wide variety of problems, including difficult pregnancies and deliveries, anemia, scoliosis, migraines, PTSD, ADHD, chronic pain, seizures, earaches, osteoporosis, obesity, brain injury, cholesterol, AIDS, and milk intolerance. CST is also promoted as a therapy to treat Autism Spectrum Disorders (ASD). Green, Pituch, Itchon, Choi, O'Reilly, and Sigafos (2006) conducted an Internet survey of parents of children with autism, asking them to list the therapies that they previously or currently used with their children. CST was listed 40th out of 108 therapies reported (8.4% of 552 respondents reported previous or current use). Similarly, Wong and Smith (2006) asked parents of children diagnosed with ASD to report on their use of complementary and alternative medical therapies previously or currently used. These authors reported 50% of the parents using "chiropractic" or massage strategies. Further, the Autism Research Institute (2011) includes CST in its list of therapies to treat the disorder, and a description of CST can be found in Siri and Lyon (2010), *Cutting-Edge Therapies for Autism*.

The CST technique involves physical manipulation of the patient. Gentle pushing and massaging of the skull, spine, and other parts of the body supposedly produce changes in the inflammation and inflexibility. CS therapists use "release" and "pumping" manipulation to produce motion in that particular body area. Such physical manipulations purport to direct blood flow and eventually more movement in that particular area. Upledger (2003c) described how the CS therapist must "blend" (not defined) with the patient, and utilized the patient's "inner wisdom" or the patient's "inner physician" to dictate the therapy actually used on that patient.

CST is based upon at least six assumptions that can be examined. One is the belief that the human brain pulsates unrelated to breathing or heart rate, at about 10-14 cycles per minute. Two, a person can feel such pulsations with one's fingertips in particular locations on the body. Three, the craniosacral system (cranium, joints, sutures, and spine) can move and be moved by touching and massaging. Four, restrictions of the natural movements of the cranial system restrict or prevent the flow of cerebral spinal fluid. Wanveer (2007) hypothesized that persons with ASD have increased inflammatory levels, neuroglial activation, and "proinflammatory cytokines" in their cerebral spinal fluid. This causes a "loss of flexibility" and possibly inflammation of the membrane surrounding the brain. These negative findings can result in hampering the functioning of the brain, straining it when performing its body-regulation duties of the hypothalamus and autonomic nervous system. Wanveer stated that "ASD is partially caused by a loss of flexibility and probable inflammation of the membrane layers surrounding the brain." (p. 1), which produces the "inner chaos" represented by "biomechanical and biochemical turmoil." Five, these presumed

difficulties result in numerous problems, such as learning disabilities, autistic symptomology (e.g., behavioral problems, poor social relationships, communication difficulties and poor abstract thought), and other physical, social, and intellectual abnormalities. Six, with the pressure of about 5 grams, or the weight of a nickel, therapists can remove restrictions and generate movement of the cranial system that results in improved functioning and the curing of disease.

As a proponent of evidenced-based practice I have examined the evidence that CST can fulfill the claims made by Upledger and others. The first claim – that the brain pulsates unrelated to breathing or heart rate – is not supported by other professionals (e.g., Barrett, 2011; Ferre, Chevalier, Lumineau, & Barbin, 1990). Brain pulsation seems completely related to breathing and they are not independent. In addition, Upledger's claim that the craniosacral system can move, be manipulated by touch, and detected by therapists is not supported. One of the most exhaustive reviews of CST was conducted by Green, Martin, Bassett, and Kazanjian (1999) examining the published literature on different aspects of CST, primarily the hypothesis that the cranial system is amenable to physical manipulation. The authors reviewed 9 studies focusing on the question of whether or not cranial movement is possible. The overall conclusion was that such movement is possible, but only in younger ages; adult cranial systems are essentially fused and stationary. The authors reviewed another 34 studies concerning whether such movement is detectable. Green, et al. concluded that movement of the cranium and the remaining parts of the system in children are not observable by a therapist and can be detected only by medical instrumentation designed to detect minute changes, such as Magnetic Resonance Imaging (MRI) and not by therapist's hands. In another study devoted to the question of cranial movement, Moran and Gibbons (2001) examined the existing interrater reliability of clinicians using CST and detecting cranial rate palpation. Two registered osteopaths worked with eleven subjects and manipulated the head and sacrum. There was very poor reliability across the two therapists, with Moran and Gibbons concluding that if natural palpations were occurring, they are essentially unmeasurable. Relatedly, Hartman and Norton (2002) conducted a review of all published reports on the clinical use of CST, analyzing the diagnostic reliability of the therapists and researchers. They examined five studies conducted by different researchers, all assessing the issue of movement of the cranial system. These five studies found opposite results of Upledger on this particular question, leading Hartman and Norton to conclude that this basic tenet of CST is invalid. Further evidence against this tenet of CST was found by Downey, Barbaon, Kapur-Wadhwa, Scoite, Siegel, and Mooney (2006), who were unable to find any such movement in controlled experiments with rabbits.

With regards to the claim by proponents of CST that restriction in the movement of the cranial system prevents the flow of cerebral spinal fluid, there is simply no evidence that these phenomena exist at all (Green, et al., 1994).

A final issue relates to whether or not CST has been shown to be causally related to improvements in targeted dependent measures focusing in the remediation of problems or deficiencies. There is a serious lack of empirical evidence for a causal relationship between CST and improvements in target problems. First, Upledger (2003a) claimed that CST can never be validly tested in a scientific way, with standard controls over internal and external validity, under what he calls "laboratory conditions." His assertions about the CS therapist "blending" with the patient, using the patient's "inner wisdom" and "inner physician" to shape the therapeutic regime for that particular client suggests that the therapy technique will vary per patient and thus a controlled study of the CST methodology is unattainable. In fact, Upledger wrote, "It seems to me that the only studies that can be done to validate the efficacy of (CST) are clinical outcome studies that do not dictate the protocol." In his opinion, "...it's the outcome that counts, whether you understand the process or not."

Despite such claims from the founder of CST, Wanveer (2007) mounted a defense of the effectiveness of CST by claiming that this therapeutic approach has been shown to "...help the autistic individual find greater ease, both within themselves and in the world around them, by decreasing structural stress and strain on their central nervous system." (p. 1).

These conclusions are not supported by others. Green, et al. reviewed 12 studies that tested the effectiveness of CST on improving a number of targeted deficiencies and problem symptomology. Green et al. found significant problems in measurement reliability and the use weak designs (i.e., case studies) that lack adequate controls for threats to internal and external validity. Hartman and Norton (2002) found no well-controlled scientific studies (i.e., randomization of participants, double-blind and placebo controls) actually performed on CST.

There are no existing research studies of adequate scientific control that provide evidence that CST delivers on any of its promised benefit. In fact, Hartman and Norton (2002) were so critical of the state of the research that they advocated for removing references to CST from courses of study at colleges of osteopathic medicine, and questions about CST be removed from the licensing examination for the osteopathic field. In addition, the National Council Against Health Fraud (1998) formally declared its opposition to CST, noting that it was more of a belief system than a science.

When consumers seek treatments for ailments and conditions, they are looking for solutions that work. For most professions, the gold standard of effectiveness is evidence based on studies conforming to the scientific method of research and investigation. The scientific process demands adherence to certain methodological requirements, such as the use of research designs that control for threats of internal and external validity, demonstration of reliability of measurement, operational definition of key terms, and replication of results. CST falls short of all these common requirements of quality evidence.

Consumers rely on the professionals to provide them with judgments about what therapies are reasonable ones to consider. As Jarvis (2001) acknowledged, "By granting us a license to practice, the public trusts us to apply knowledge to treatment of their...problems. This implies that we must critically examine new ideas, decide if there is rational evidence for them, reject the bunk and apply the knowledge that sifts through." (p. 1). CST conceptual underpinnings have been shown to be flawed and are not substantiated by medical science. Its effectiveness in improving problems to which it has been applied has not been proven scientifically. There seems little to be gained from application of this therapy. Consumers would be advised to consider other proven effective alternatives to the use of CST for treating autism.

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