Grundlagenforschung zu Craniosacraler Therapie

Systematische Übersichtsarbeiten (Reviews):

1. Systematischer Review über die Physiologie der Cranialen Osteopathie

Zitation	Ferguson A: A review of the physiology of cranial osteopathy. J Osteopath Med 2003, 6(2): 74-84.
Abstract	The models generally used to explain the practice of cranial osteopathy have not been supported by reliable research. This paper reviews and explores the relevant physiology and finds much to advance knowledge in this field. Arterial vasomotor waves have a frequency similar to reports of cranial rhythmic impulses; these are controlled by the sympathetic nervous system. Thermoregulation can reverse venous flow through emissary veins of the skull. Cerebrospinal fluid is circulated by arterial pulsations and is partially drained via the cribiform plate into nasal and cervical lymphatics. A model for the practice of cranial osteopathy based on well-researched physiology is proposed, and some clinical implications outlined. Some reasons for poor interobserver agreement in palpatory studies are discussed. This paper should provide a basis for informed research in this subject in the future.

2. Systematischer Review über Craniosacrale Therapie

Zitation	Green C, Martin CW, Bassett K, Kazanjian A: A systematic review of craniosacral therapy: biological plausibility, assessment reliability and clinical effectiveness. Complementary Therapies in Medicine, 1999, 7(4), 201-207.
Zitation	Green C, Martin CW, Bassett K, Kazanjian A: A Systematic Review and Critical Appraisal of the Scientific Evidence on Craniosacral Therapy. Vancouver: British Columbia Office of Health Technology Assessment, 1999.
Zusammenfassung	Methodik: Um die biologische Plausibilität, diagnostische Reliabilität und klinische Wirksamkeit der CST zu beurteilen, wurde eine systematische Literaturrecherche in internationalen medizinischen Datenbanken (Medline, Embase, Healthsstar, Mantis, Amed, Scisearch, Biosis) bis einschließlich Februar 1999 durchgeführt. Ergebnisse: Zu den biologischen Grundlagen der CST wurden folgende wissenschaftliche gesicherte Nachweise gefunden: Studien belegen die Bewegung bzw. rhythmische Pulsation des zerebrospinalen Liquors unabhängig vom Herz- oder Atemrhythmus. Die Existenz des craniosacralen Rhythmus konnte durch Enzephalographie, Myelographie und MRT sichtbar gemacht werden. In Studien konnte jedoch nicht gezeigt werden, dass die diagnostische Palpation des craniosacralen Rhythmus zwischen mehreren Therapeuten übereinstimmend möglich ist. Darüber hinaus bestätigen einige wenige Studien die Theorie, dass die Schädelknochen bis ins Erwachsenenalter hinein beweglich bleiben. Jedoch gibt es keine Studien, die zeigen, dass die Manipulation der Schädelknochen durch manuelle Techniken möglich ist. Zudem fanden die Autoren nur sehr begrenzte Evidenz, dass Blockaden der Schädelknochen oder Restriktionen im craniosacralen Flüssigkeitssystem kausal mit Gesundheitsbeeinträchtigungen zusammenhängen. Zur Effektivitätsbeurteilung konnten nur 7 Beobachtungsstudien mit schlechter methodischer Qualität herangezogen werden, was das geringste Evidenzlevel darstellt. In einer Studie (Greenman et al., 1995) wurden 3 Fälle mit Nebenwirkungen der CST berichtet. Bewertung: Der Review erfüllt alle Qualitätskriterien für systematische Übersichtsarbeiten. Er bildet den Forschungsstand bis 1999 ab.

Weitere Studien:

1. Die Verbindung zwischen Dura Mater und Muskulatur: Evidenz für eine myodurale Brücke

Zitation	Kahkeshani K, Ward PJ: Connection between the spinal dura mater and suboccipital musculature: evidence for the myodural bridge and a route for its dissection - a review. Clinical anatomy (New York, NY) 2012, 25(4): 415-422.
Abstract	A connective tissue link between the spinal dura mater and the rectus capitis posterior minor muscle was first described in 1995 and has since been readily demonstrated via dissection, magnetic resonance imaging, and plastinated cross-sections of the upper cervical region (Hack et al. [1995] Spine 20:2484-2486). This structure, the so-called "myodural bridge," has yet to be included in any of the American anatomy textbooks or dissection guides commonly used in medical education. This direct anatomic link between the musculoskeletal system and the dura mater has important ramifications for the treatment of chronic cervicogenic headache. This article summarizes the anatomic and clinical research literature related to this structure and provides a simple approach to dissect the myodural bridge and its attachment to the posterior atlanto-occipital membrane/spinal dura mater complex and summarizes the case for its possible inclusion in medical anatomy curricula.

2. Schwindel: Ein craniosacrales Model

Zitation	Christine DC: Temporal bone misalignment and motion asymmetry as a cause of vertigo: the craniosacral model. Alternative therapies in health and medicine 2009, 15(6): 38-42.
Abstract	Objective: To describe dysfunction of the craniosacral system, particularly temporal bone motion asymmetry, as a cause of vertigo and to suggest a new perspective on research, diagnosis, and treatment. Data Sources: A database search was conducted using Medline, Cinhal; Health Sources: Nursing/Academic Edition; and the Internet. Keywords: vertigo diagnosis and treatment, craniosacral therapy, temporal bones, cranial bone mobility, Upledger, and temporomandibular disorders. Study Selection: Articles that most clearly described a relationship between cranial bone misalignment and vertigo were selected for review. Conclusion: Clinical experience suggests that craniosacral therapy is a powerful evaluative and treatment modality for vertigo patients who have not found relief from medical treatments. A narrative review of the literature describes and supports a theoretical link between dysfunction of the craniosacral system and vertigo. Dysfunction of the craniosacral system may include osseous, dural membrane, and fascial restrictions leading to asymmetric temporal bone movement and hence vertigo. Clinical trials are necessary not only to verify that craniosacral therapy is an effective treatment but also to determine the full range of symptoms and medical diagnoses for which craniosacral therapy is beneficial.

3. Der Prozess des faszialen Unwinding

Zitation	Minasny B: Understanding the process of fascial unwinding. International journal of therapeutic massage & bodywork 2009, 2(3): 10-17.
Abstract	Background: Fascial or myofascial unwinding is a process in which a client undergoes a spontaneous reaction in response to the therapist's touch. It can be induced by using specific techniques that encourage a client's body to move into areas of ease. Unwinding is a popular technique in massage therapy, but its mechanism is not well understood. In the absence of a scientific explanation or hypothesis of the mechanism of action, it can be

	interpreted as "mystical." Purpose: This paper proposes a model that builds on the neurobiologic, ideomotor action, and consciousness theories to explain the process and mechanism of fascial unwinding. Hypothetical Model: During fascial unwinding, the therapist stimulates mechanoreceptors in the fascia by applying gentle touch and stretching. Touch and stretching induce relaxation and activate the parasympathetic nervous system. They also activate the central nervous system, which is involved in the modulation of muscle tone as well as movement. As a result, the central nervous system is aroused and thereby responds by encouraging muscles to find an easier, or more relaxed, position and by introducing the ideomotor action. Although the ideomotor action is generated via normal voluntary motor control systems, it is altered and experienced as an involuntary response. Conclusions: Fascial unwinding occurs when a physically induced suggestion by a therapist prompts ideomotor action that the client experiences as involuntary. This action is guided by the central nervous system, which produces continuous action until a state of ease is reached. Consequently, fascial unwinding can be thought of as a neurobiologic process employing the self-regulation dynamic system theory.

4. Ein Model des Primären Respiratorischen Rhythmus

Zitation	Lee RP: The Living Matrix: a Model for the Primary Respiratory Mechanism. EXPLORE: The Journal of Science and Healing 2008, 4(6): 374-378.
Abstract	Presented here is a physiological model for the primary respiratory mechanism, palpable fluctuations in the tissues to which practitioners of cranial manipulation, visceral manipulation, and lymphatic drainage attribute healing effects. According to this model, the primary respiratory mechanism initiates metabolism and assures nutrients and waste products an efficient transit through the extracellular space. The extracellular matrix is an open, unstable system prone to changes of ionic concentration and macromolecular organization. The cells imbedded in the extracellular matrix are functionally coupled with it through integrins, receptors within the cell membrane. Integrins convey mechanotransduction: activation of intracellular enzyme systems and DNA through changes in extracellular electromechanical information. Utilizing the primary respiratory mechanism, clinicians effect improvements in varied conditions, some of which are reviewed.

5. Die Aufzeichnung des Craniosacralen Rhythmus

Zitation	Nelson KE, Sergueef N, Glonek T: Recording the rate of the cranial rhythmic impulse. The Journal of the American Osteopathic Association 2006, 106(6): 337-341.
Abstract	The rate of the cranial rhythmic impulse can be obtained by both palpation and instrumentation. However, the literature has reported higher rates obtained by instrumentation compared with palpation. The cranial rhythmic impulse has been demonstrated to be synchronous with the Traube-Hering oscillation, measured in blood flow velocity. The current study demonstrates that physicians tend to palpate the cranial rhythmic impulse and Traube-Hering oscillation in a 1:2 ratio. This finding provides an explanation for the difference between palpated and instrumentally recorded rates for the cranial rhythmic impulse.

6. Craniale Manipulation (CV-4 Technik) verändert die Aktivität des sympathischen Nervensystems

Zitation	Cutler MJ, Holland BS, Stupski BA, Gamber RG, Smith ML: Cranial manipulation can alter sleep latency and sympathetic nerve activity in humans: a pilot study. Journal of Alternative and Complementary Medicine 2005, 11(1):103-108.
Abstract	Objective: To determine if cranial manipulation is associated with altered sleep latency. Furthermore, we investigated the effects of cranial manipulation on muscle sympathetic nerve activity (MSNA) as a potential mechanism for altered sleep latency. Design: Randomized block design with repeated measures. Setting: The Integrative Physiology and Manipulative Medicine Departments, University of North Texas Health Science Center, Fort Worth, TX. Subjects: Twenty (20) healthy volunteers (12 male, 8 female; age range, 22-35 years) participated in this investigation. Interventions: Subjects were exposed to 3 randomly ordered treatments: compression of the fourth ventricle (CV4), CV4 sham (simple touch), and control (no treatment). Outcome Measures: Sleep latency was assessed during each of the treatments in 11 subjects, using the standard Multiple Sleep Latency Test protocol. Conversely, directly recorded efferent MSNA was measured during each of the treatments in the remaining 9 subjects, using standard microneurographic technique. Results: Sleep latency during the CV4 trial was decreased when compared to both the CV4 sham or control trials ($p < 0.05$). MSNA during the CV4-induced temporary halt of the cranial rhythmic impulse (stillpoint) was decreased when compared to prestillpoint MSNA ($p < 0.01$). During the CV4 sham and control trials MSNA was not different between CV4 time-matched measurements ($p > 0.05$). Moreover, the change in MSNA prestillpoint to stillpoint during the CV4 trial was different compared to the CV4 sham and control trials ($p < 0.05$). However, this change in MSNA was similar between the CV4 sham and control trials ($p > 0.80$). Conclusions: The current study is the first to demonstrate that cranial manipulation, specifically the CV4 technique, can alter sleep latency and directly measured MSNA in healthy humans. These findings provide important insight into the possible physiologic effects of cranial manipulation. However, the mechanisms behind these changes remain unclear.

7. Radiographische Evidenz für die Beweglichkeit der Kopfknochen

Zitation	Oleski SL, Smith GH, Crow WT: Radiographic evidence of cranial bone mobility. Cranio: the journal of craniomandibular practice 2002, 20(1): 34-38.
Abstract	The purpose of this retrospective chart review was to determine if external manipulation of the cranium alters selected parameters of the cranial vault and base that can be visualized and measured on x-ray. Twelve adult patient charts were randomly selected to include patients who had received cranial vault manipulation treatment with a pre- and post-treatment x-ray taken with the head in a fixed positioning device. The degree of change in angle between various specified cranial landmarks as visualized on x-ray was measured. The mean angle of change measured at the atlas was 2.58 degrees, at the mastoid was 1.66 degrees, at the malar line was 1.25 degrees, at the sphenoid was 2.42 degrees, and at the temporal line was 1.75 degrees. 91.6% of patients exhibited differences in measurement at 3 or more sites. This study concludes that cranial bone mobility can be documented and measured on x-ray.

8. Entrainment und der Craniosacrale Rhythmus

Zitation	McPartland JM, Mein EA: Entrainment and the cranial rhythmic impulse. Alternative therapies in health and medicine 1997, 3(1): 40-45.
Abstract	Entrainment is the integration or harmonization of oscillators. All organisms pulsate with myriad electrical and mechanical rhythms. Many of these rhythms emanate from synchronized pulsating cells (eg, pacemaker cells, cortical neurons). The cranial rhythmic impulse is an oscillation recognized by many bodywork practitioners, but the functional origin of this impulse remains uncertain. We propose that the cranial rhythmic impulse is the palpable perception of entrainment, a harmonic frequency that incorporates the rhythms of multiple biological oscillators. It is derived primarily from signals between the sympathetic and parasympathetic nervous systems. Entrainment also arises between organisms. The harmonizing of coupled oscillators into a single, dominant frequency is called frequency-selective entrainment. We propose that this phenomenon is the modus operandi of practitioners who use the cranial rhythmic impulse in craniosacral treatment. Dominant entrainment is enhanced by "centering," a technique practiced by many healers, for example, practitioners of Chinese, Tibetan, and Ayurvedic medicine. We explore the connections between centering, the cranial rhythmic impulse, and craniosacral treatment.

9. Untersuchungsergebnisse und Iatrogenese der Craniosacralen Therapie bei Patienten mit Schädel-Hirn-Trauma

Zitation	Greenman PE, McPartland JM: Cranial findings and iatrogenesis from craniosacral manipulation in patients with traumatic brain syndrome. The Journal of the American Osteopathic Association 1995, 95(3):182-188;191-192.
Abstract	Craniosacral findings were recorded for all patients with traumatic brain injury entering an outpatient rehabilitation program between 1978 and 1992. The average cranial rhythmic impulse was low in all 55 patients (average, 7.2 c/min). At least one cranial strain pattern was exhibited by 95%, and 87% had one or more bony motion restrictions. Sacral findings were similar to those in patients with low back pain. Although craniosacral manipulation has been found empirically useful in patients with traumatic brain injury, three cases of iatrogenesis occurred. The incidence rate is low (5%), but the practitioner must be prepared to deal with the possibility of adverse reactions.