Osteopathic physicians eagerly anticipate research results that would provide an evidence base for the use of osteopathy in the cranial field (OCF), or cranial osteopathy. Why? Proving the efficacy of OCF will help reduce the controversy surrounding its use and fulfill the evidence-based requirement for continuing medical education courses accredited by the American Academy of Family Physicians (AAFP). The AAFP, which originally described craniosacral manipulation as “dangerous”\(^1\) and therefore would not credit continuing medical education courses containing “OCF” in the title, lifted its disapproval of OCF in January 2002. The organization’s disapproval was largely a matter of misunderstanding and lack of knowledge about the research underlying OCF.

Collaboration under way between the AAFP Commission of Continuing Medical Education and the AOA, assisted by the American Academy of Osteopathy (AAO), The Cranial Academy, and the Sutherland Cranial Teaching Foundation, will define terms and establish criteria for CME credit involving OCF.

The osteopathic medical profession has long been challenged to prove the efficacy of osteopathic manipulative treatment (OMT). The AOA Bureau of Research has met the challenge, with further research anticipated from the Osteopathic Research Center, whose main sponsors are the AOA, the American Osteopathic Foundation, and the American Association of Colleges of Osteopathic Medicine. The Center is housed at the University of North Texas Health Science Center at Fort Worth, Texas College of Osteopathic Medicine. The ante has been raised in light of the AAFP’s initiative to emphasize evidence-based medicine in many CME courses. The possibility of having evidence-based medicine on one’s side in the current healthcare climate is a decided advantage, particularly when there are third-party reimbursement issues. With the lifting of the AAFP’s disapproval, research currently under way has added momentum.

**OCF in the spotlight**
The AAO and the AOA worked to ascertain the reasoning behind the AAFP’s declaration of disapproval.\(^2\) Eventually, the AOA, through representation by AOA Trustee Amelia G. Tunanidas, DO, laid the groundwork for testimony by E. John Lentini, DO, a member of the AAFP Commission on CME. This resulted in clarification of the issue and the removal of sanctions against CME presentations with OCF in the title. Apparently, the initial action by the AAFP Commission on Continuing Medical Education was based on lack of knowledge of the research underlying OCF, as well as confusion about the difference between physician-administered OCF and craniosacral manipulation involving nonphysician clinicians.

American Osteopathic Association leaders were also concerned that if one type of OMT was declared “dangerous,” criticism and banning of other OMT modalities would follow. A prime example of a new possible target was high-velocity, low-amplitude thrust manipulation and association with cerebrovascular ischemia.\(^3\)

**Current directions in research in OCF**
Promising research on OCF includes a study that involves measurement of Traube-Hering-Mayer (THM) oscillation.\(^4,5\) Kenneth E. Nelson, DO, and Thomas Glonek, PhD, used a laser-Doppler flowmeter to measure THM oscillation. This oscillation was identified after the invention of the recording...
manometer and was thought to explain systolic-diastolic variation of blood pressure. Oscillation was attributed to intrathoracic pressure fluctuation of pulmonary respiration and was noted by Ludwig Traube in 1865 to persist after the cessation of respiratory motion. Ekbert Hering independently demonstrated Traube’s discovery. Later, Mayer identified an additional, lower-rate oscillation. Nelson and Glonek described the research on these oscillations, which occur between 6 and 10 cpm. “The THM oscillation has been associated with blood pressure, heart rate, cardiac contractility, pulmonary blood flow, cerebral blood flow and movement of cerebrospinal fluid, and peripheral blood flow, including venous volume and body temperature regulation.”

Physiology texts describe THM oscillation as a complex interaction between the sympathetic and parasympathetic components of the autonomic nervous system with renin-angiotensin on the cardiovascular system. Traube-Hering-Mayer oscillation phenomena is an integral aspect of homeostasis. Nelson and Glonek’s research demonstrated a statistically significant relationship between a subject’s laser-Doppler flowmeter measured THM cycle and an examiner’s palpation of the cranial rhythmic impulse (CRI).

Caveat on terminology
Nelson and Glonek’s use of the term cranial rhythmic impulse in their description of the procedure is a matter of convenience. The term should actually be primary respiratory mechanism (PRM), to describe this phenomena by those who use OCF. Cranial rhythmic impulse is just one aspect of the cranial-motion dynamic. Using this term is discouraged as it is an oversimplification that could lead to misusing the concept by those unfamiliar with OCF. The term cranial rhythmic impulse was never intended to have the same empirical characteristic as measure of blood pressure or heart rate. Nelson and Glonek correctly point out that use of the term has communicative value from its traditional use. Until further research can provide a more detailed operational definition, a caveat is appropriate.
Findings and implications of Traube-Hering-Mayer relationship with primary respiratory mechanism

In their subjects, Nelson and Glonek found that the measured frequency of THM oscillation was 6.75 ± 4.50 cpm and that the CRI was 4.54 ± 2.08 cpm. Both figures are consistent with previously determined ranges. The authors wrote that the findings imply that the PRM and the THM oscillations are simultaneous, if not the same phenomenon. Besides establishing a significant relationship of the PRM with other known physiologic phenomena, these findings suggest that measurement of the THM could facilitate development of palpatory skill. That is, feedback on an examinee’s THM rate could be correlated with a medical student or physician learning to palpate the PRM.

Nelson and Glonek were even able to ascribe certain aspects of THM oscillations with the so-called fast tide of between 8 and 12 cpm and the slow tide rate of 0.6 cpm. The phenomenon of a still point, a brief cessation in the rhythm of the PRM, was even associated in 79% of cases with a diminished THM amplitude.

Other research on Traube-Hering-Mayer oscillations

At about the same time as Nelson and Glonek’s initial publication, research published in the British Medical Journal related THM 6-cpm oscillation with enhanced heart-rate variability and baroreflex sensitivity. This study, conducted by Italian and Polish physicians and researchers, compared the effects of reciting the “Ave Maria” in Latin or reciting a yoga mantra on breathing rate, spontaneous oscillations in R-R intervals and on blood pressure and cerebral circulation (measured by transcranial Doppler ultrasonography).

These researchers cited literature linking a respiratory rate of 6 cpm with favorable effects on cardiovascular events such as increases in arterial baroreflex, oxygenation of the blood, and exercise tolerance. In chronic heart failure, a respiratory rate of 6 cpm reduces the exaggerated sensitivity of the respiratory chemoreflex and improves irregular breathing.

The researchers’ discussion of the autonomic nervous system components and physiology affected by the repetition of “Ave Maria” and the yoga mantras was similar to Nelson and Glonek’s discussion of the relationship between THM oscillation and the PRM phenomenon. There appears to be something efficacious in a rhythmic oscillation of around 6 cpm, manifested by the human nervous and vascular systems.

“Ave Maria” and the yoga mantra produced a similar effect, slowing respiration to approximately 6 cpm. They also produced a marked effect on synchronization and increased variability in all cardiovascular rhythms. In that low heart-rate variability and low baroreflex sensitivity related to the THM oscillation are powerful and independent predictors of poor prognosis in heart disease, this research suggested that 6 cpm of breathing and autonomic activity such as THM may have great benefit. The authors concluded that such prayer and mantra practices are beneficial health practices.

Possible effects of OCF on heart-rate variability

An inexpensive study would be to compare the effects of OCF on cardiac R-R interval variability. The appearance of the Nelson and Glonek and European research with THM oscillations as a key ingredient is almost synchronous. The nature of THM physiology and its relation to OCF and heart-rate variability is a compelling research relationship. If the effects of OCF on R-R interval variability control are found beneficial, this would constitute the kind of research that supports OCF. This could in turn lead to definitive, evidence-based research of the type needed to establish OCF as a medical modality worthy of consideration in clinical practice.

References


