

# The Craniosacral Rhythmic Impulse

by Don Cohen, D.C.

**A**s chiropractors we treat the nervous system. We believe that healing is inherent and that our job is to remove interference to nervous function. But what is the function of the nervous system? Can there be interference with nervous function besides at the intervertebral foramen? What is innate intelligence and what is it doing? How did the subluxation manifest in the first place, and why when we remove it does it return? These are some of the questions that arise. Chiropractic philosophy offers some potent insights into nature, and in other ways presents limitations that sometimes would keep us locked in the speculative framework of late-19th-century thought.

The craniosacral system is the structural aspect of the central nervous system. It represents a "big picture" view that allows us to consider the behavioral aspects of the CNS organ and its manifestations throughout the body. While the idea is derived from our cousin osteopathy, it is a sound physiologic concept and deserves consideration. It includes all of the structural components of the spinal subluxation complex and helps to shed some light on the nature of that phenomenon.

The word chiropractic means "hands-on." Traditionally we have applied our hands to the spine because it represents a bridge between the brain and the body. But there are other conduits between the two as well. The craniosacral system offers us the opportunity to work directly with the cranial nerves, including the spine's quiet counterpart the vagus, as they exit the foramina of the skull. In this way we can also more directly interact with the special senses. It offers a pre-foraminal approach to the spinal cord and nerve roots. And most importantly, it allows us directly to perceive and influence the structural configuration of the brain itself in its relationship to the body architecture, and gives us hands-on access to the interface between body, mind, and emotion. For those of us who subscribe to the unity of structure and function, this represents a significant opportunity.

Actually, the craniosacral system has been recognized in chiropractic for generations and is the basis of DeJarnette's SOT. We will consider here some physiologic aspects of the nervous system and will offer a simple,

direct and non-dogmatic introduction to the palpation of neurologic motion.

## The fluid model

The craniosacral rhythm is a brain-generated fluid pulse that emanates from the central fluid core structure (ventricles) outward. "From the inside out, from the top down." Upledger theorizes that the origin of the rhythm is the intermittent proliferation of CSF by the cells of the choroid plexus, and has identified proprioceptive neurons from the sagittal suture to the ventricles which may control this function by feedback mechanism. As the choroid plexus function fluctuates, the CSF hydrostatic pressure also fluctuates, at a normal rate of 6-10 times per minute. This pressure gradient wave drives the circulation of CSF rhythmically through the brain tissue from the ventricles outward to the subarachnoid space. Thus the choroid plexus is the "heart" of the brain.

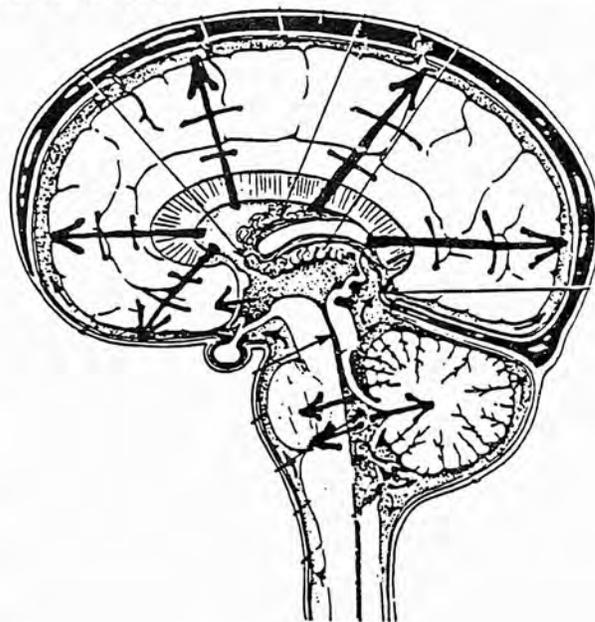
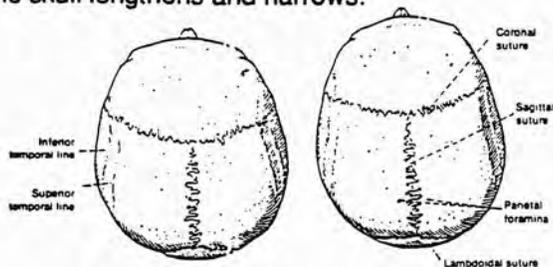


Figure 1. One-way CSF flow through the brain matter

ROM, keeping in mind that the sutures are occupied by cartilage. The motion is felt as an impulse rather than a gross movement. In cranial flexion (choroid systole) the skull widens and shortens. In cranial extension (diastole) the skull lengthens and narrows.



**Figure 3.** Cranial flexion and extension (exaggerated)

## The sutures: joints

The inevitable fusion of the adult skull has long been accepted anatomical dogma. The cranosacral model refutes this concept as its basic premise, and instead presents a concept of the sutures as joints which retain integrity of motion throughout normal life. Like all joints, the undulating interdigitations of the cranial sutures are designed to facilitate certain motion and to restrict other motion, thus fulfilling dual functions of providing both stability and motility. Sutures are unique to the skull and are classified as fibrous joints.

## Sphenobasilar mechanism

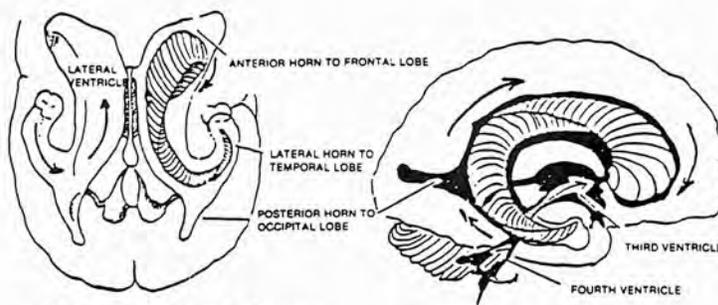
The junction of the sphenoid and the basilar portion of the occiput, just anterior to the foramen magnum, is the functional fulcrum of osseous cranial motion. The joint, a synchondrosis, acts as a subtle gear-hinge, with the sphenoid flexing anteriorward and the occiput flexing posterior.

The cranial base is closely associated with the spinal column because it evolves embryologically with the column from cartilage derived from the notocord. This has been traditionally interpreted to signify that the sphenobasilar hinge is the primary motivation of the CRI while the cranial vault, derived from embryologic membrane, simply accommodates the motion. The "pressurestat" model of fluid wave generation by the choroid plexus attributes the primary motivation of the CRI to non-osseous origins.

## Temporals

The design of the temporal bones provided the original inspiration for Sutherland's concept of cranial bone motion. The temporal sutures are "beveled like the gills of a fish" and the bones swivel around a rotatory horizontal axis in a spiraling fashion that in flexion flares the anterior aspects laterally, like gills, and approximates the mastoids. The motion of the temporals reflects the "rams horn"

configuration of the lateral ventricles.



**Figure 4.** Ram's horns

## Sacral flexion and extension:

The sacral base rocks posterior (and the sacral apex anterior) with cranosacral flexion and anterior (sacral apex posterior) with extension.

## Whole body:

Craniosacral flexion urges each half of the body to subtly rotate laterally. Each limb also rotates laterally with the flexion phase, along the longitudinal axis, and internally with cranosacral extension. These changes can be palpated but usually not observed visually, but on occasion there will be visual clues, for example in the case of a pigeon-toed child. If the hands are also turned in, the child may be fixed in cranosacral extension.

A more detailed account of osseous cranosacral motion can be found in the texts by Upledger and Magoun.

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Don Cohen, D.C., is a 1981 graduate of Palmer College of Chiropractic-West. He has studied Craniosacral Therapy with Dr. John Upledger since 1985 and is the author of The Physiology and Treatment of the Craniosacral System: The Functional Physician, Volume I, to be published in 1989. He is a member of the Adjunct Faculty, PCCW, maintains a private practice with his wife, Karen Bilgrai Cohen, D.C. in Santa Cruz, CA., and is the owner and publisher of Extension Press. Comments are welcome. What is the Big Idea? Your reply c/o Extension Press, 2110 Ocean St., Santa Cruz CA 95060.

*This is the first of three articles by the author concerning the cranosacral system in chiropractic. "The Nature of Palpation" will appear in the April issue and "Palpation of Craniosacral Motion" in the May issue of The American Chiropractor.*

Table 2: Conscious sensory routes

|                                | Tracts                                    |
|--------------------------------|---|
| <b>spinothalamic</b>           | <b>dorsal column-lemniscal</b>            |
| exteroception                  | conscious proprioception                  |
| objective touch (stereognosis) | subjective touch (and fine gradation)     |
| pain (nociception)             | body position at rest                     |
| thermal                        | kinesthetic sense                         |
| viscerosomatic                 | vibratory (pattern of pressure and touch) |
| poor spatial definition        | spatially specific (homunculus)           |
| slow (1-15 mps)                | fast (30-75 mps)                          |

The active palpating hand utilizes motor activity (movement and pressure) and sensory activity (tactile and mechanical perception) to discriminate between its activity and that of the subject, as perceived at the boundary between palpator and subject. It is a probe, its nature is to "delve into" tissue and discover information. Objective tactile discrimination is exteroceptive and occurs at the dermal and epidermal level (body surface) with the activation of tactile skin receptors.

**The vibratory sense**

The vibratory sense perceives organization in biphasic touch activity (rhythm). The rhythm can be binary (digital) or wave-form (analog) and may be easily organized or may seem random. Vibratory sensation ascends with the proprioceptive tracts.

**The blended hand**

The passive palpating hand "blends" with the subject, thereby bypassing the tactile receptors. Use the proprioceptive mechanism of the wrists, forearms, elbows, and arms as your main sensory instrument. From this vantage the hand proprioceptors are also readily available, especially in the interossei and opponens muscles. When learning to palpate proprioceptively, it will probably be useful to avoid focusing on the hands at first.

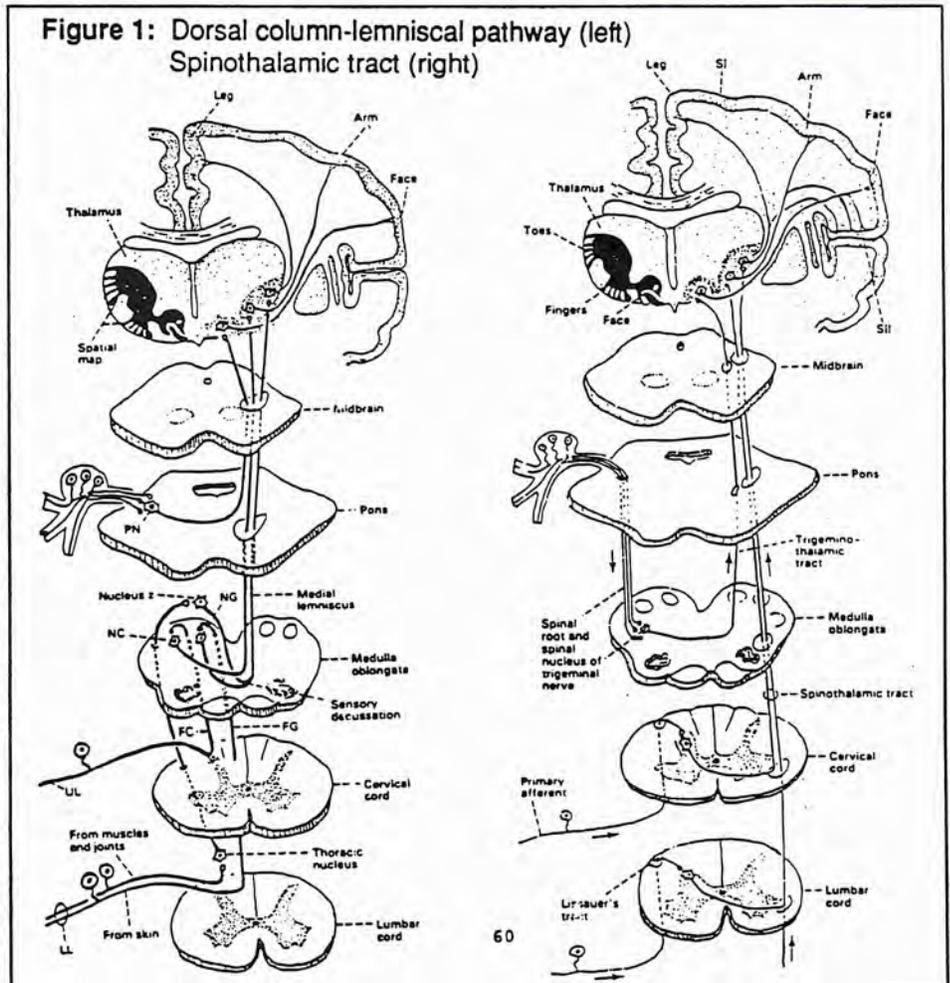
It is the proprioceptive tracts that allow us to know our own body position in the dark. Most of us regard it as a sensitive and absolutely reliable system. The blended hand is by its quiet nature fully sensory, and as it is also fluid it rides with the wave pattern of that with which it is blended. In proprioceptive palpa-

tion, discriminate between one part of yourself (distal forearm/wrist) and another (proximal forearm/elbow) as a means of understanding the milieu of your subject. The dorsal columns provide us with "an instantaneous body image at the level of the somatic sensory cortex" (Fitzgerald). The development of this conscious and inherent imaging phenomenon, in conjunction with the blended hand, allows us to perceive our patient in a subjective physiologic state. The human nervous system is as complex and sensitive a sensory device as has ever been ever devised "by God or Man." There are myriad implications to the old adage "Know yourself" in this practice.

**Subjectivity in palpation**

Palpation is a subjective skill. Its advantage is that it is harmonious with the concept of the nervous system as a communicating system that can be communicated with. The willfulness of the human CNS is well-documented. As the experience of life, conscious and autonomic, is largely subjective it seems appropriate that this appreciation be developed. Passive palpation is listening and requires presence. Perhaps the less one says about what he palpates, the better we can trust that person's palpatory efficacy. The idea is not to give the patient advice, but to listen as the patient expresses herself, something she does inherently every moment of her life. In chiropractic we call this innate intelligence.

Figure 1: Dorsal column-lemniscal pathway (left) Spinothalamic tract (right)



# Palpation of Craniosacral Motion

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**I**n palpating for craniosacral motion, observe the characteristics of the waveform and also the body's tendency to transmit or resist the impulse. Be curious as to the number of agendas that the organism is attending and the nature of these concerns. This represents a kind of overview in which we ascertain the extent to which the organism is functioning as a whole as represented by the impulse of the cranial rhythm and the ease with which the tissues accommodate it. A "local agenda" will offer resistance to both fluid wave transmission (rhythmic pressure gradient) and membrane gliding.

Picture a bubbling mountain spring cascading contently and delightfully along. It fills up every nook and cranny in its course, always finding the path of least resistance to overcome every obstacle. In contrast, imagine a dammed-up and lazy river that winds through an industrial city in midsummer. Barely moving, its waters murky and thick, dusted with floating sediment and debris, and subject to stagnation and bacterial infestation, it presents a contrasting dynamic as it meanders along.

## Placing your hands

When approaching the craniosacral system, place your hands on the body as quietly as possible, "as a bird alights on a twig, and then grabs hold" (Sutherland). Begin with your hands on rather than in the tissue, touching the interface between the surface of the skin and the atmosphere, between "self" and "not self." Imagine a water spider resting on the surface tension of the water. Be still and receptive. Keep your eyes open. Relax your arms and shoulders, focus on your proprioceptive circuit and listen. If you begin your therapeutic interaction with your patient in this way, you will have the wisdom of his body to assist your own. After a short time the proprioceptive tract will extend itself across your sensorimotor cortex and connect with the motor tion. This is the long loop.

## The listening stations

The listening stations are the various places on the  
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body where it is natural to place the hands and listen to the inherent motion. The use of the word "listen" in this context implies passivity in your activity. "Float" your hands at the surface and feel for fluid wave patterns, pressure, and membrane tension. Suspend your elbows from your wrists and feel the motion in them. Don't judge or doubt your ability. If you think you feel it, assume that you do feel it. Learn to feel confidence without doubt and without arrogance.

Traditional listening stations are:

1. The soles of the feet
2. The dorsum of the feet
3. The calves
4. The thighs
5. The ilia
6. The abdomen
7. The thoracic outlet
8. The thoracic inlet
9. The arms and hands
10. The neck
11. The base of the skull
12. The calvarium

The concept of listening stations is not a dogmatic one. It is appropriate to listen anywhere, but use the stations as an opportunity to listen throughout the body so that you can note relative variations from one station to the next.

## Palpation of rhythms

The various rhythms of the body can be palpated at any station. Learn to recognize the nature of each and to feel it anywhere. Then practice selective focus and "wipe the slate clean" as you shift your attention back and forth from one rhythm to the next. The rhythms most readily palpable are the arterial, breathing, and CRI. The descriptions below are approximations of normal motions, and are offered as guidelines. If you feel something different, trust your perception.

1. **Vascular:** The cardiovascular arterial pulse is characterized as a beat (perceived as motility without

pathway amplifies your own subjective joint proprioception. Each phase of cranial flexion or extension normally takes about three seconds. When you have registered the rhythm, feel it without judgement for a few minutes. Then begin to note the amplitude and symmetry of the impulse. Practice switching back and forth between the three rhythms at will, wiping your sentient (perceptive) field clean between your perceptions.

Now return to poise without losing the rhythm. From your palpatory vantage, imagine the poise of the entire body architecture as it relates to your tactile impression. This exercise strengthens your intuition.

#### **Practice: cranial rhythm on a subject**

Sit at the head of the table. Your subject is supine. Cradle your subject's head comfortably in your hands, with the ears between the third and fourth fingers (vault hold). Palpate the cranial rhythm for a minute, your blended hands doing what the head is doing. Suspend your elbows and feel the rhythm in them. Notice that you can feel a slight motion in your own arms and in your pectorals. Now "ride" with the rhythm. Get ahead of it by anticipating it just slightly as it flexes and extends, as though the hands welcome and encourage the motion. Now confront the fulcrum; anticipating the maximum motion, resist the last bit of motion not by pushing but becoming "immovable as stone." Confront the edge of each phase and let it push up against the "stone" of your hand. Then let it up, and

"welcome" it again, riding for several cycles. Now you are ready to practice the palpation of rhythms at the various listening stations of the body. This is the preliminary skill required for working with the craniosacral system.

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