PE-713

CRANIAL PRIMARY RESPIRATION

Cranial Motion

Physiologic motion of the skull, properly referred to as the cranium, is very important in normal health. Many perceive that the primary purpose of the skull is to protect the brain and provide a place for the eyes, ears, and other structures housed in the cranium. This is partly correct but there is much more to understanding the cranium and its association with the nervous system.

The eight bones of the cranium completely encircle the brain, providing protection by that means. The bones are joined by sutures, complex joints that interdigitate or provide sliding between the bones.

Within the cranium there are tension membranes filled with cerebrospinal fluid and anchored to the cranial bones. The outer, very strong cover of the tension membranes is known as the dura mater. The tension membranes provide support to the brain, cushioning it within the cerebrospinal fluid. In health there is dynamic integration of these membranes within the minute movement of the eight bones of the cranium, known as the cranial primary respiratory system. The bony movement can be measured but not seen. Motion — or lack of it — can be felt by individuals trained in how the bones move. This requires skill developed in the art of palpation.

Cutaway view of the cranium and the dural membrane after Leonardo daVinci

The rhythmic movement of the bones and membranes is involuntary and present throughout life. The movement can be altered or enhanced by thoracic inhalation and exhalation.

Failure of proper cranial motion is found by examination. When present it is known as a cranial fault. When cranial motion is not proper there are usually several cranial faults that need correction.

Cause of Dysfunction

There are many reasons why proper motion of the skull can be disturbed. Often it is due to a violent blow to the head as in an auto accident, or it can be more subtle such as rising under an overhead cabinet. Disturbed cranial function in an auto accident may be due to the snapping action of the head and neck without a direct blow to the head.

Some unfortunate people start life with cranial dysfunction because of birth trauma. The skull is very flexible in a newborn and is subjected to compression and distortion during the birthing process. Usually, it expands into normal movement after birth, often enhanced by the pressures of crying. Sometimes the cranium fails to gain proper movement. This may be due to a difficult birth and/or the use of obstetrical instrumentation to help present the baby. Symptoms develop early such as colic, ear infections, or immune problems, or they may not be present until later in life when the cranial bones are fully developed and the flexibility of youth is no longer present.

There is an integral relation between the cranium and the jaw and teeth. When a person chews or clenches the teeth there are strong muscular forces directed to the cranium. When the jaw and teeth are in balance with a normally functioning cranium these forces enhance cranial motion. Loss of teeth or poorly restored teeth may cause an imbalance within the cranium, and the muscular forces distort cranial motion.

These are a few of the more obvious reasons proper cranial motion may not be present. Because the body works as an integrated whole, remote dysfunction can cause cranial faults. For example there is a specific relation between cranial function and the pelvis. The dura mater covering the brain, as discussed previously, extends out of the cranium with the spinal cord where it has a firm connection with the cranium and upper neck vertebrae. The dura mater surrounds the spinal cord and does not have another firm bony connection until it gets to the sacrum, the middle bone of the pelvis. Diaphragmatic inspiration forces

the abdominal organs down into the pelvis, widening the pelvis and flexing the sacrum. Because of the firm upper and lower bony connections of the dura mater (known as the core link), there is a mechanical connection between the pelvis and cranium. Combined they are known as the cranial-sacral primary respiratory system.

Lower back problems may cause distortion of the pelvis that can cause cranial faults because of the connection between the two. Poor posture and disturbed walking (gait) patterns are responsible for strain within the system. Gait problems can result from conditions such as an ankle, knee, or hip injury.

As can easily be seen the cranial primary respiratory function can be disturbed in many ways, but is it important in health?

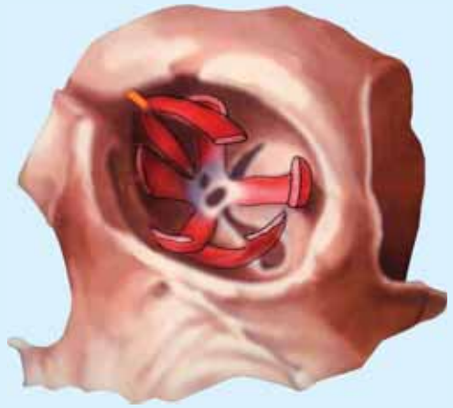
Cerebrospinal Fluid

Cerebrospinal fluid (CSF) is created in four compartments in the brain. It is controlled and distributed to the nervous system by the gentle pulsing action of the cranial-sacral primary respiratory system. As noted previously CSF is important in cushioning the brain. It also provides nutrients to the central nervous system and carries away waste products.

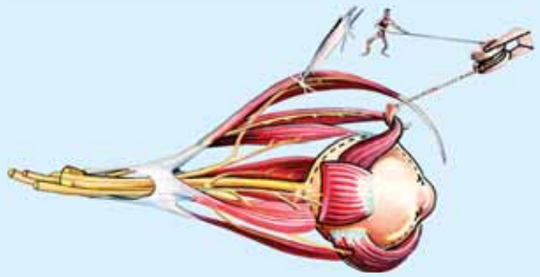
There are twelve pairs of cranial nerves that arise from the base of the brain. In addition to their names they are numbered from I to XII as they arise from the front to back of the brain. For ease of discussion the cranial nerves will be referred to by their numbers here. Some of the nerves remain inside the cranium while others exit the cranium for communication to and from muscles, organs, glands, and other structures in the body. For example the lungs, digestive organs, heart, and some endocrine glands receive cranial nerve supply.

Some cranial nerve function can be disturbed by subtle nerve entrapment due to cranial faults. Here are a few examples of this in-depth subject.

Equilibrium Proprioceptors. Equilibrium has to do with one's balance and when disturbed may cause vertigo or other forms of dizziness; however, equilibrium relates to more than dizziness. Proprioceptors are sensory receptors found in muscles, tendons, joints, and the inner ear. Very important equilibrium proprioceptors are the head-on-neck, visual righting, and labyrinthine reflexes. The head-on-neck reflex information comes from proprioceptors in the ligaments of the upper cervical vertebrae and reports the position of the head with the rest of the body. Eye motion and position provide the visual righting reflexes that orient one's position in space. Cranial nerves III, IV, and VI control the small muscles that position and move the eyes. The labyrinthine reflexes are in the middle ear, and by way of cranial nerve VIII, they report the head position. Organization of these reflexes is paramount to proper function. If there is a fixation of the upper cervical vertebrae or subtle entrapment of the cranial nerves, there is disorganization of equilibrium. The disorganization can cause random function of muscles that results in structural stress and poor function. This is easily recognized in an applied kinesiology examination because the muscles do not perform in an organized manner as expected.



Extraocular eye muscles that move and control eye position.



Cranial nerves III, IV, and VI supplying the extraocular eye muscles

TMJ. Many who have cranial faults have problems with the jaw joint (tempormandibular joint – TMJ). The muscles of mastication that move and control jaw motion are supplied by cranial nerve V. Disorganization of these muscles can contribute to TMJ problems. The resulting distorted pressures present in chewing and biting are often responsible for the perpetuation of the cranial faults because of the integral relation of the jaw and cranium.

Symptoms

As you can see, dysfunction of the cranial-sacral primary respiratory system can cause many health problems. Symptoms may include loss of balance, headache, earache, tinnitus, auditory problems, difficulty swallowing, or sinus problems. Digestive and glandular problems may result from cranial faults. Structural strain resulting in back and neck pain as well as shoulder, arm, hip, and leg pain may be present.

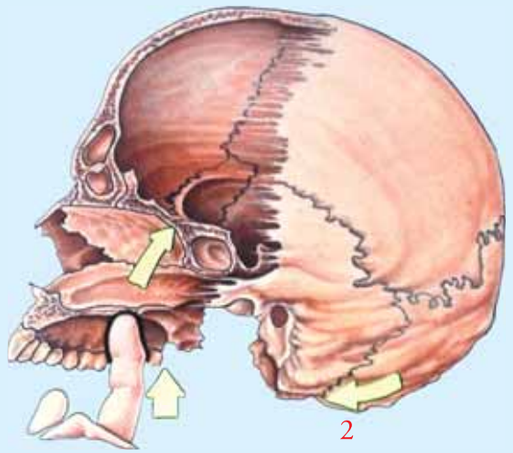
Examination and Correction

There are several techniques in applied kinesiology to first find the dysfunction and then to determine how to correct it. Your doctor may examine muscles and when a weakness is found have you hold a certain phase of respiration to determine its effect on the weak muscle. The doctor may press on certain bones of the cranium to determine if it causes a change in muscle function. The visual righting reflexes are often examined by having you turn your eyes in different directions to determine if the eye position causes a change in muscle function.

Depending on the type of cranial fault being treated, specific contacts are applied to the bone(s) and corrective pressure is applied.

Cranial corrections are usually easily obtained and have a lasting effect. Future examination will determine if the correction is stable. If the faults return it is usually because they have been present for a considerable time. Because of the integration of the cranial-sacral primary respiratory system with the rest of the body, there is probably some remote dysfunction that needs to be corrected. There are techniques for the doctor to examine the integration of the cranium with the rest of the body.

It is important to remember that cranial function can affect almost any place in the body, and remote dysfunction can affect the cranium.



There are many techniques for examining and correcting cranial faults. This illustration shows a double contact to apply mild forces to enhance the cranial motion present on inspiration. The pressure applied at arrow 1 is directed toward the patient's palette, and the force is transmitted to the vomer bone and to the anterior portion of the sphenoid to influence its motion. The pressure at arrow 2 rotates the temporal bone to also transmit motion to the sphenoid bone. The direction of applied pressure is determined by examination prior to application of the corrective pressure.

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