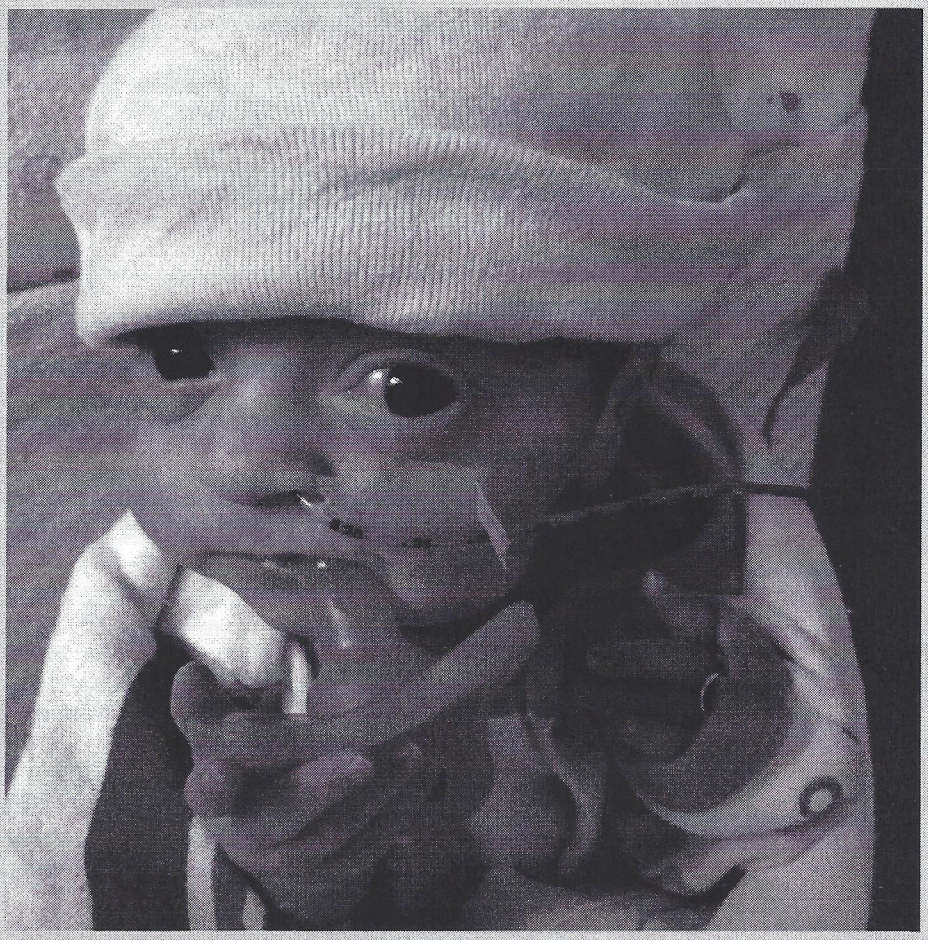
NEONATAL NETWORK®

THE JOURNAL OF NEONATAL NURSING



Intracranial Hemorrhage

White Matter Injury

Osteopenia of Prematurity

Special Issue on Neuro-Critical Care

Academy of Neonatal Nursing™

SPRINGER PUBLISHING COMPANY

Feeding in the NICU: A Perspective from a Craniosacral Therapist

Karyn Quraishy, MSPT, CST-D

Disclosure

The author has no relevant financial interest or affiliations with any commercial interests related to the subjects discussed within this article.
No commercial support or sponsorship was provided for this educational activity.

ABSTRACT

Completing full feedings is a requirement for discharge for babies in the NICU. Interaction between the nerves and the muscles of the jaw, tongue, and the soft palate is required for functional sucking and swallowing. Jaw misalignment, compressed nerves, and misshapen heads can interfere with these interactions and create feeding difficulties. Craniosacral therapy (CST) is a noninvasive manual therapy that is perfect for the fragile population in the NICU. CST can be used as a treatment modality to release fascial restrictions that are affecting the structures involved in feeding, thereby improving feeding outcomes.

Keywords: feeding; NICU; craniosacral therapy; misshapen heads; plagiocephaly; vagus nerve; hypoglossal nerve; hyoid

For most babies to be discharged from the NICU, they must be able to regulate their body temperature, take full feedings, and gain weight for 48 hours.[1] Often, discharge is delayed because of the inability of the infant to complete the desired volume of feeding. In other words, the sooner a baby can take full feedings, the sooner a baby will go home.

Present education on feeding tends to revolve around proper positioning; nipple flow rate; and suck, swallow, breathe (SSB) coordination. Although these are all important components of feeding, by using craniosacral therapy (CST), one can take an active look at the structural components involved as well.

In 2011, Browne and Ross stated "for an infant to eat effectively they must sense and react to a variety of tactile, kinesthetic and proprioceptive, olfactory, auditory, and visual inputs at the same time they have to coordinate sucking, swallowing, and breathing."[2] Functional sucking and swallowing requires interaction between the nerves and the muscles of the jaw, tongue, and the soft palate. Jaw misalignment, compressed nerves, and misshapen heads impede these interactions and can create feeding difficulties. All of these components of feeding can be addressed with CST.[3,4] In this article, we will take a brief look at feeding from the perspective of a craniosacral therapist.

CST is a light touch (approximately 5 g of pressure), manual therapy that can be applied anywhere on the body. It is named for the craniosacral system, which is composed of the membranes and fluid that surround and protect the brain and spinal cord. The system extends from the bones of the skull, face, and mouth, which make up the cranium, down to the sacrum, or tailbone area.[4]

The membranes that surround the brain and spinal cord are composed of fascia. Fascia is the connective tissue that binds, connects, surrounds, and envelopes the entire body.[5,6] It both holds us together and allows for movement. Every structure in the body—including the bones, muscles, nerves, and organs involved in feeding—has its own fascial sheath surrounding it. All of these sheaths are continuous with each other, so we can travel throughout the entire body and never leave the fascial system.[5]

Fascia is made up of many components. In CST, we primarily address two of these: elastin and collagen. Elastin gives the fascia its stretchability. It deforms easily under

Accepted for publication August 2015.

http://dx.doi.org/10.1891/0730-0832.35.2.105

most types of force, and, when the force stretching it is removed, it reverts back to the (shortened) form it had before. Collagen gives fascia its strength. It does not stretch easily, only responding to gentle forces over time. Once stretched, however, it makes a permanent change by conforming to its new (longer) form.[5] The gentle pressure used in CST is ideal for remodeling fascial structure.[4]

Different body functions require different proportions of elastin and collagen in the fascia. Some parts of us are meant to stretch easily, like many of the structures used for feeding, and others are meant to provide more structural support. Fascia can change its makeup from overuse, misuse, trauma, disuse, and disease. When fascia is stressed, no matter the cause, more collagen fibers are laid down, and in turn the fascia hardens and thickens, providing less freedom of movement. The entire body remolds to compensate around these changes, impairing the normal physiologic motion of the body. In CST, this is called a fascial restriction. The body can still move, but it is forced to work around the restriction.

Premature infants have the potential to experience fascial restrictions during positioning and general care and with feeding. According to Steven Barlow, ororhythmic pattern development for suck may be disrupted in an infant who is subjected to abnormal tactile stimulation of the sensitive perioral and intraoral tissues during periods of intubation and cannulation. He further states that trussing the face and nostrils with tubes and tape also restrict the range and type of oral movements.[7] With CST, using a light touch, we mobilize restricted areas to improve feeding outcomes.

Because fascia is a continuous system that is present throughout the body, we can, for example, use a light touch on the sacrum to address the jaw. This approach releases fascial tightness that might be interfering with feeding. We would start at the pubococcygeus, which stretches from the coccyx to the pubic bone, and from there travel along the rectus abdominis to the sternal region or breastbone. The sternohyoideus stretches from the sternum to the hyoid, and via the geniohyoideus, we connect to the underside of the jaw. You can see from this example how tension from the pelvic floor can affect the jaw, and vice versa.[8] CST addresses tension patterns both at the site of dysfunction and at distant, but related, structures. CST can also help with feedings when the hyoid bone has shifted out of its normal alignment. The hyoid is a free-floating bone that sits between the clavicle and the mandible. In the newborn, it sits anterior to C1, and, as we age, it moves downward, so that, by the time we are adults, it sits anterior to C3. The hyoid functions by assisting in the production of sound, assisting with swallowing, and allowing for a wider range of movements for the tongue, pharynx, and larynx. There are more than 10 muscles that attach to the hyoid, and most of these play a role in sucking and swallowing. For a baby to have controlled movement of his tongue, the hyoid must be stable and located in the middle of the neck region. An asymmetrical jaw line could pull the hyoid to one side, creating a muscle imbalance that would affect the tongue's mobility and its ability to shape to the nipple during feeding. CST can be employed to release fascial restrictions in the anterior cervical region, allowing the hyoid to relocate to a neutral position and thus improve feeding skills.

Compression of the vagus, glossopharyngeal, or hypoglossal nerve can affect feeding as well. These nerves innervate most of the muscles that are attached to the hyoid and others that function in suck and swallow.[9,10] CST can be used to address fascial restrictions along the nerve route, releasing any compressed regions, thereby improving the suck/swallow coordination required for feeding. Because the accessory and hypoglossal cranial nerves trigger the motor activity of swallowing, the relationship between the occiput and temporal bones, and therefore the shape of the jugular foramina, is assessed and addressed with CST.[3,9]

Head shape can also influence feeding in several ways. Scaphocephaly, or bilateral flat temporal bones, can occur when a preterm baby is positioned with the head to the side for an extended amount of time. At 30 weeks, the parietal bones are ten times weaker than in a term baby.[11] When the lateral diameter of the head decreases, the anterior/posterior length increases. This in turn changes the center of gravity, balance, and righting of the head on the neck. This can cause the baby to have a hard time holding his head upright, creating a predisposition for cervical extension. Cervical extension brings the jaw and tongue posterior, and, if the tongue is elevated and bunched in the back of the mouth, it cannot shape around the nipple. Sucking requires the tongue to shape around the nipple and then to strip the nipple to draw the fluid forward and out. If the baby cannot facilitate a good suck, he will have trouble with a coordinated swallow. By using CST, we can release the underlying fascial restrictions that can occur with scaphocephaly, allowing the cranial bones to realign correctly, and thereby preventing cervical extension and improving feeding skills.

Plagiocephaly, or abnormal-shaped head, can be the result of gestational or positional deformities. When a head is maintained in a fixed position (against the uterus or the mattress), it can change shape. If a child is born with a flat spot on his head, he may tend to gravitate to that spot when sleeping because of a lack of control of the neck muscles. This will cause the head to become even flatter. One side of the head can be flat posteriorly and push the front of the head forward.[2,12,13] When the head is misshapen, the fascia covering the brain, pia mater, and the fascia attached to the skull, dura mater, may become imbalanced and tight. The dura mater separates from the bones of the cranium to form the falx cerebri, which separates the brain into right and left halves, and the tentorium cerebelli, which separates the cerebrum from the cerebellum. Several cranial nerves pass through these fascial structures, and, if the head is misshapen, these nerves may become compressed.[3] CST can be used to release tension in the underlying fascia, thereby allowing mobility of the nerves. Now, when we look at poor feeders, we need to ask ourselves: Is the head misshapen? Is the jaw line symmetrical? Are there

fascial restrictions in any of the anterior cervical muscles? Are there fascial restrictions throughout the body, pulling on the structures used in feeding? All of these can be addressed with techniques used in CST. The NICU is the perfect environment for the light touch of CST because the therapy is noninvasive, and the baby can be treated in any position while remaining in the Isolette.

It has been the experience of the author, who has worked in the NICU for more than nine years and as a craniosacral therapist for more than 12 years, that craniosacral therapy can be used not only as a treatment modality to improve feeding outcomes but has also been shown to be successful in hastening cranial remolding, improving self-organization, improving sleep, and facilitating quicker recovery from invasive procedures.

For more information on craniosacral therapy, or to sponsor a one-day course on CST in the NICU, please contact the Upledger Institute or Karyn Quraishy, MSPT, CST at karynq@neblett.org.

REFERENCES

1. American Academy of Pediatrics Committee on Fetus and Newborn. Hospital discharge of the high-risk neonate. *Pediatrics.* 2008;122: 1119-1126.
2. Browne J, Ross E. Eating as a neurodevelopmental process for high-risk newborns. *Clin Perinatol.* 2011;38:731-743.
3. Sergueef N. *Cranial Osteopathy for Infants, Children and Adolescents.* Philadelphia, PA: Churchill Livingstone; 2007.
4. Upledger JE, Vredevoogd JD. *Craniosacral Therapy.* Chicago, IL: Eastland Press; 1983.
5. Paoletti S. *The Fasciae.* Seattle, WA: Eastland Press; 2006.
6. Schultz LR, Feitis R. *The Endless Web.* Berkeley, CA: North Atlantic Books; 1996.
7. Barlow SM. Oral and respiratory control for preterm feeding. *Curr Opin Otolaryngol Head Neck Surg.* 2009;17:179-186.
8. Franklin EN. *Pelvic Power.* Hightstown, NJ: Elysian; 2003.
9. Barral JP, Croibier A. *Manual Therapy for the Cranial Nerves.* Edinburgh, Scotland: Churchill Livingstone; 2009.
10. Porges SW. *The Polyvagal Theory.* New York, NY: Norton; 2011.
11. Kriewall TJ. Structural, mechanical, and material properties of fetal cranial bone. *Am J Obstet Gynecol.* 1982;143:707-714.
12. Fish D, Lima D. An overview of positional plagiocephaly and cranial remolding orthoses. *J Prosthet Orthot.* 2003;15(2):37-47.
13. Miller RI, Clarren SK. Long-term developmental outcomes in patients with deformational plagiocephaly. *Pediatrics.* 2000;105(2):E26.

About the Author

Karyn Quraishy, MSPT, CST-D, has been a pediatric physical therapist for more than 20 years and has spent the last nine years working in a Level III NICU. She is NDT certified in pediatrics, a certified infant massage instructor, and a certified craniosacral therapist, and she recently received the Neonatal Touch and Massage Certification. Karyn has also earned the Developmental Care Specialist Designation from the National Association of Neonatal Nurses. She is the owner of The Body Network in San Diego, California, where she practices CST for infants and children.

For further information, please contact:
Karyn Quraishy, MSPT, CST-D
P.O. Box 2646
Rancho Santa Fe, CA 92067
E-mail: KarynQ@Neblett.org