

There is a visual impression that each of us holds in our mind when we think of a child or adult with Down syndrome. As a Speech Pathologist in private practice for twenty-five years and as a continuing education instructor for speech and language pathology classes on Oral-Motor Therapy, I have learned that this impression is a powerful teaching aid. When I teach, I ask the participants to tell me what they consider to be the characteristics of a Down syndrome child, or any low-tone child from an oral-motor point of view; without fail, I get the same responses. Their portrayals have become so predictable I have come to refer to them as the "Myths of Down syndrome". This is what these professionals see: a high narrow palatal vault, (Myth #1), tongue protrusion (#2), mild to moderate conductive hearing loss (#3), chronic upper respiratory infections (#4), mouth breathing (#5), habitual open mouth posture (#6), and finally, the impression that the child's tongue is too big for its mouth (#7).

These seven structural/functional disorders have been plausibly associated with Down syndrome, so why label them myths? Because the children my associates and I have worked with over the past fifteen years no longer exhibit these characteristics. The therapeutic community has inadvertently allowed these myths to flourish because we didn't recognize that they could be prevented. These abnormalities emerge in most children by the time they enter early-intervention programs. What has been missing in our treatment that has allowed them to develop? How do we pursue prevention?

A quick review of some oral motor development basics. Children are born with two cranial soft spots. One on the top of the skull at midline and the other under the skull at the midline. Soft spots facilitate the birth process, allowing plates in the skull to overlap, easing the infant's downward progress. After birth, the plates return to original position, eventually joining between 12 and 18 months of age. When the plates meet at the top of the skull, they take the shape of the brain's contour, giving us a round-headed shape. In the Down's population, this closing of plates may not occur until 24 months of age.

The identical closing of plates occurs under the brain in the plates of the hard palate. Just as the brain lends shape to the top of the head, the

tongue shapes the palate. During the closing of the palate, if the tongue is not resting habitually inside the mouth, there is nothing to inhibit plate movement toward midline. The result: myth #1, a high, narrow palatal vault.

Can this be prevented? Let's return to the infant at birth. What is not commonly known is that even children with severe low tone at birth, including Down syndrome, are nose breathers. They maintain their tongues in their mouth and upon examination their tongues are not abnormally large. Orally, these children look pretty much like any other infant with the exception that they have a weak suckle. This critical observation draws us to the connection between feeding muscles and muscles of speech.

In quick order, a cascade of events unfolds for these babies with weak suckle. Many mothers tell me they genuinely wanted to breast feed their newborn but were unable because the child had a weak suckle and/or the mother did not produce sufficient milk. Absent a medical problem, the difficulty is often that the child's suckle was not strong enough to stimulate the mammary glands into producing adequate milk flow.

In this scenario mothers are traditionally encouraged by physicians to use a bottle. Bottle feeding is fine, when done therapeutically, but mothers should be given meaningful choices. Further, when bottle feeding is suggested for these infants, the hole in the nipple is often cross-cut or enlarged to make it easier for the infant to suckle. The child is held in the mother's bent elbow and the bottle is held on a diagonal, nipple down. Visualize this - the milk flows easily into the infant's mouth, but what stops the flow, allowing the child to swallow? Tongue protrusion; myth #2. Excessive tongue protrusion is a learned behavior that creates a physical manifestation.

Keep visualizing this infant with low tone/muscle strength. There is a sphincter muscle at the base of the Eustachian tube whose function is to allow air to enter the middle ear. If weak muscle tone reduces the effectiveness of this sphincter muscle, then in the described feeding position, milk is able to enter the middle ear. The result: chronic otitis media; a primary causative factor in conductive hearing loss; myth #3

Fluid build-up in the middle ear, and the resulting infection, circumfuses throughout mucous membranes of the respiratory system and frequently becomes the originator of chronic upper respiratory infections; myth #4. The nasal cavity becomes blocked, the child transfers from nose breathing to mouth breathing and we have myth #5. The jaw drops to accommodate the mouth breathing, encouraging a chronic open mouth posture; myth #6. Because the tongue is no longer maintained within the closed mouth, the palatal arches have nothing to stop their movement towards midline and we end up with a high, narrow palatal vault, making full circle back to myth #1. The child's tongue remains flaccid in the open mouth posture, at rest. Lack of a properly retracted tongue position is myth #7. This enlarged appearance of the tongue is therefore not genetically coded, but rather the result of a series of care-provider related responses to the very real problem of weak suckle.

Understanding this scenario provides insight into the characteristics seen in these children when speech and language therapists begin to work on correcting their multiple articulation disorders. Addressing the oral muscles/structure from birth offers a more effective, preventative therapy than the wait-and-see approach taken today. These physical features are not predetermined. Our therapeutic goal should be to normalize the oral-motor system through feeding beginning in infancy.

In infancy, nutrition is of primary concern. Our job is to balance nutrition, successful feeding and therapy. Goal one is to change the position in which the child is being fed. Mouths must always be lower than ears to prevent milk flow into Eustachian tubes. The bottle position is altered to introduce the nipple from below the mouth, vertically encouraging a slight chin tuck. In this position the child draws the milk up the nipple predominately with tongue retraction. This position and retractive action prevents milk from flowing freely into the child's mouth. The child no longer needs strong tongue protrusion to enable swallowing. It is also important not to make the hole in the nipple larger.

Can children with weak suckle draw the milk into their mouths in this position? Yes, if you don't use standard glass bottles. Bottles with the disposable liners, in either 4-ounce or 8-ounce sizes, can be filled with either pumped breastmilk or any variety of formula, and the air can be forced out causing a vacuum. This type of bottle can then be fed to the child in an upright position. If the child has trouble drawing the milk up because of weak suckle, you can facilitate the draw by pushing gently on the liner. When I have used this technique with even

the most severely impaired children, it has been successful. After a week or so you will be able to push less as the muscles will begin to get stronger. Facilitation is generally eliminated within 3-6 weeks.

Breastfeeding mothers follow the same principles. Hold the child in a position where its mouth is lower than its ears. Stimulate the mammary glands while the child is suckling to increase milk flow. This also enables the mother's milk to come in stronger. As the child's suckle strength increases, the need for gland stimulation will be eliminated.

A simple change in the position relationship of the child's mouth to the bottle/breast can improve long-term oral-motor skill levels. That one change prevents a series of abnormal compensatory patterns to develop. It is so significant that I have incorporated feeding intervention into the treatment of all my clients with oral-motor issues regardless of age or diagnosis. Even my third-grade "regular" kids who are seeing me for an interdental lisp work on developing muscle strength and tongue retraction through feeding.

If Speech and Language Pathologists accept the premise that normal speech is superimposed on normal oral structures and functions, then the call to provide early therapeutic feeding intervention takes on an importance that we must both acknowledge and affect.