Resource Guide to Oral Motor Skill Difficulties in Children with Down Syndrome

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Why does my child have difficulty with feeding, drinking and speech?

Infants, toddlers, and children with Down syndrome have anatomical (structural) and physiological (functional) differences in the mouth and throat areas that make it more difficult for them to make precise movements. This affects feeding (breast as well as bottle), cup drinking, chewing and swallowing solid foods, and speech. Some anatomical differences that are seen include a small and narrow upper jaw, and a high palatal arch. Physiological differences that are seen include low muscle tone, and weak oral facial muscles. A combination of anatomical and physiological difficulties result in open mouth posture and tongue protrusion. Many children with Down syndrome have hypersensitive (tactile defensive) or hyposensitive reactions to touch around the mouth. Learning to speak requires sensory feedback from the oral area, so difficulty with sensory feedback affects learning to speak. Postural stability and support and respiratory support also affect oral motor skills.

What do I need to know about oral motor skills?

Oral motor skills refers to the movement of muscles of the face (e.g. lips and jaw) and oral area (e.g. tongue and soft palate), especially the movements related to speech. Although parents and clinicians frequently observe difficulty with oral motor skills in children with Down syndrome, there is little information on incidence in the research literature. The results of a parent survey study indicated that 61% of 1620 parents of children with Down syndrome had been told that their child had oral motor skill difficulty. Parents also reported that their children had difficulty with low muscle tone in the face affecting feeding and speaking in infancy, but that the low muscle tone improved with age.

Oral motor skills include:

- Muscle tone
- Muscle strength
- Range of motion (distance)
- Speed
- Coordination
- Dissociation (ability to move structures such as tongue and lips independent of one another)

When can therapy for oral motor skills begin? How can I get help for my child?

Speech uses the same muscles that are used for sucking, swallowing, feeding, eating and drinking so therapy can begin early, in infancy. Feeding therapy will help strengthen the muscles that will later be used for speaking. As part of early intervention programs (birth-two), you may work with a feeding therapist or a speech-language pathologist. As your child begins to vocalize, making vowels and consonants as s/he plays with sounds, you can help by repeating those sounds and engaging your child in sound play. The oral motor skills team, at different ages and stages in your child's development may include your pediatrician, dentist, orthodontist, prosthodontist, speech-language pathologist, occupational therapist, physical therapist, feeding therapist, and sensory integration specialist.

Assessment of oral facial structures and function

On the oral facial examination, also known as an oral peripheral examination, the SLP wants to examine the structure and muscle movements in the oral facial area including the strength, accuracy, range of motion and coordination. This may be done using an informal checklist or a formal test such as the *Verbal Motor Production Assessment for Children* VMPAC (Hayden & Square, 1999). Many treatment manuals provide pre and post tests for specific oral motor skills, e.g. *Oral Motor Activities for Young Children* (Mackie, 1996a, 1996b). Structures that will be observed include:

A. Lips
B. Tongue
C. Teeth/Occlusion
D. Hard Palate
E. Soft Palate
F. Upper Jaw (maxilla)
G. Lower Jaw (mandible)
H. Oropharynx
I. Nasopharynx
J. Tonsils/Adenoids
K. Larynx

The SLP will ask your child to imitate or spontaneously make movements such as puckering for a kiss, smiling and make movements with sounds such as /oo/ and /ee/. Some of the oral motor skills the SLP will observe include:

A. Lip Posture (at rest)/Movement
B. Tongue Posture/Movement
C. Palatal Movement
D. Intra-Oral Air Pressure (puff out cheeks)
E. Velopharyngeal Closure
F. Jaw Movement/Stability
G. Trunk Stability
H. Voice
I. Breath Control/Support
J. Other
    1. Involuntary Movements
    2. Drooling
    3. Tooth grinding (Bruxism)

The SLP is looking for any differences in structure such as a high narrow palatal arch or a large tongue and how structures relate to each other, for example an average sized tongue in relation to a smaller than average upper and lower jaw will appear large and will interfere with the ability to move the tongue freely. This is known as relative macroglossia. She will evaluate your child's speech mechanism at rest, e.g. are the lips open or closed. She will observe the strength and range of motion of the muscles that are used for speaking, or to support speech (breath control or trunk stability). She is also interested in the smoothness, accuracy and control of oral movements. She will note any involuntary movements (tics), or drooling. She will be interested in your reports of any breathing difficulties, sleep apnea, tooth grinding, or other habits that involve the oral area.

Oral motor difficulties affect the strength and precision of muscle movement, resulting in speech that sounds thickened or imprecise. When oral motor function is affected, the problem is consistent across all of the activities that would involve those specific muscle movements, so if lip muscles are affected, eating and keeping the lips closed would be affected, as well as speech.

What kinds of treatment programs are available for oral motor skills?

Treatment for oral motor skills can focus on helping infants, toddlers, and young children develop oral motor skills, or on helping older children and adolescents in areas where they have difficulty. If your child is not yet speaking, therapy might focus on imitation of non-speech movements such as popping the lips or blowing bubbles. There is some controversy over whether non-speech practice should be used in therapy. Current best practice is to use activities such as blowing bubbles or blowing horns and whistles:

- To help children develop awareness of the mouth and the speech articulators
- To help children learn movements that are needed for speech sounds, e.g. rounding the lips and closing the lips
- To serve as warm-up exercises at the beginning of therapy sessions once your child is working on speech activities

Non-speech tasks should be phased out as the focus of therapy as soon as the child is able to make speech sounds. Oral motor treatment may involve non-speech movements, movements with sounds, movements with speech, speech exercises, jaw stabilization work including bite blocks and exercises, whistles, horns, straws and blowing exercises, feeding therapy, and myofunctional therapy (tongue thrust therapy). Work with the SLP to develop a home practice program based on the exercises being used in therapy sessions. Exercise programs are used with play activities to strengthen the muscles. Family participation and regular practice are essential to the treatment program. The SLP will design an individualized program to meet your child's needs. For example, there are many varieties of whistles and horns that you can use for practice. What you are focusing on is the size of the mouthpiece of the whistle (larger mouthpieces are easier to blow than smaller mouthpieces) and the ease or difficulty to make sounds using the whistle. The SLP will choose appropriate materials for your child. Sarah Rosenfeld-Johnson has sets of whistles, horns and straws that are arranged in a hierarchy of difficulty, and many other oral motor practice materials in the Talk Tools catalog. (www.talktoolstm.com).

Therapy approaches that may be used include:

- Massage
- Vibration
- Icing
- Blowing bubbles
- Playing horns
- Mirror work
- Games to practice oral movements
- Video oral exercise tapes/DVDs
- Books of oral motor play activities

For older children and adolescents, orofacial myology (tongue thrust treatment) may be a focus in therapy.

There is a need for further research to describe the oral motor difficulties that children with Down syndrome experience. There is also a need for research to compare various treatment approaches for oral motor difficulties and their outcomes.

Want to know more?

Websites:

www.talktoolstm.com (Sara Rosenfeld-Johnson)

www.asha.org

www.disabilitysolutions.org (download Vol. 5, which has articles on speech intelligibility)

Videos:

Kumin, L. *What Did You Say? A Guide to Speech Intelligibility in People with Down Syndrome* (DVD) (2006). Bethesda, MD: Woodbine House.

Schermerhorn, W. (2005). *DS: The First Eighteen Months*. Bethesda, MD: Woodbine House (DVD).

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Books and Articles:

Caruso, A.J. and Strand, E. A. (1999). Motor speech disorders in children: Definitions, background, and a theoretical framework. In A. J. Caruso and E. A. Strand (Eds.), *Clinical Management of Motor Speech Disorders in Children*. (pp. 1-28). New York: Thieme.

Desai, S.S. (1997). Down syndrome: A review of the literature. *Oral Surgery Oral Medicine Oral Pathology*, 84, 279-285.

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Rosin, P. and Swift, E. (1999). Communication intervention: Improving the speech intelligibility of children with Down syndrome. In J. Miller, M. Leddy and L. A. Leavitt. *Improving the communication of people with Down Syndrome*. Baltimore, MD: Paul H. Brookes.

Therapy Materials:

Mackie, E. (1996). *Oral-motor activities for young children*. Moline, IL: LinguiSystems.

Mackie, E. (1996). *Oral-motor activities for school-aged children*. Moline, IL:LinguiSystems.

Marshalla, P. (2001). *Oral-motor techniques in articulation & phonological therapy*. Greenville, SC: Super Duper Inc.

Oetter, P., Richter, E.W. and Frick, S.M. (1995) M.O.R.E.: *Integrating the mouth with sensory and postural functions, second edition*. Hugo, MN:PDP Press.

Rosenfeld-Johnson, S. (1999). *Oral-motor exercises for speech clarity*. Tucson, AZ: Innovative Therapists International.

Rosenfeld-Johnson, S. bubble blowing hierarchy, straw hierarchy, horn hierarchy

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