

SPEECH AND LANGUAGE

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Communication is the process by which people exchange information. There are many ways that communication can occur, but the primary methods are verbal and written. Verbal communication involves the use of speech and language skills, and it is augmented by facial expressions and gestures.

Speech is the process of creating sounds and combining them to form words that are understood by a listener. It requires the integration of cognitive and neurological abilities along with the musculoskeletal skills that support respiration, phonation, and articulation. Language is the process by which thoughts, feelings and emotions are generated using a recognizable verbal or written system. When the intended message is verbal, the brain and peripheral nerves must activate muscles in the chest, throat and mouth to produce the required sounds (neuromuscular execution). This process is dependent upon the selection and organization of “neurologic programs” that activate speech muscles at appropriate times, durations and intensities (motor speech programming).

The actual production of speech is a complex process that involves the coordinated function of many structures in the chest, throat and mouth.

- The muscles of the chest wall (the rib cage, diaphragm and abdomen) regulate breathing to provide a stream of exhaled air. The regulation of exhaled air affects the loudness of speech, number of words spoken on a single breath and duration of pauses between breaths.
- The exhaled air is then passed through the voice box (larynx) and causes the vocal folds to vibrate to produce voice (phonation). Muscles in the larynx adjust the length and tension of the vocal folds to regulate the pitch and loudness of the voice. Muscles in the throat (pharynx) alter the quality of the voice (resonance).
- The jaw, lips, tongue and palate change the shape of the mouth to produce sounds of speech (articulation).

Evaluation

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also have other problems affecting communication. They may have difficulty understanding the meaning of words (receptive language), or expressing their needs or ideas (expressive language). Delayed language is the term used to describe the development of language skills at ages older than expected. Caregivers or educators may request speech and language evaluations when children are having difficulty communicating because of any of these problems.

The speech and language evaluation examines all facets of a person's ability to communicate functionally for his or her current daily needs and requirements. Whenever possible, standardized testing is performed to determine current levels of language function. In addition, since difficulties with sound production (dysarthria) are often a noticeable problem with A-T, the individual's sound production, voice skills and respiratory support for speech are analyzed. Oral motor function is also assessed with a focus on how those skills affect eating and drinking.

General Speech and Language Findings

Speech and language abilities vary among patients with A-T, and vary over time for individual patients. Each individual will have areas of relative strengths and weaknesses. It is difficult to compare children's abilities simply because they share the diagnosis of A-T. The young child with A-T may or may not have delayed language. Although expressive language, specifically difficulty with sound production, is often the most apparent problem for the child with A-T, receptive language may also be affected.

The need for increased time to process information and respond appropriately is a common characteristic of many patients with A-T. Often the patient does not give any verbal or nonverbal (e.g., using facial expressions) indication that he or she is thinking, but given time, is often able to respond appropriately. Obviously, this apparent hesitation could be interpreted as a lack of knowledge and thus affect the A-T patient's ability to interact with others and to perform successfully in school.

Some people with A-T have subtle difficulties with word retrieval and word recall. This means that the person is not able to think of a word that he or she wants to say. Oftentimes the A-T patient may respond, "I knew what I wanted to say but couldn't think of the word, so I didn't say anything at all." When given cues such as a description of the word (semantic cues) or the beginning sound of the word (phonemic cues), the person may be able to think of the word.

A-T patients also may have problems with thought organization and processing. For example, a person may have difficulty developing sentences with a specific word. In school, this problem becomes increasingly apparent as the tasks become complicated. Patients with A-T may be better able to communicate when they are not constrained by specific language tasks.

The most obvious communicative area of difficulty for the person with A-T is slurred speech, or dysarthria. It often is the first sign of speech and language involvement. This difficulty with speech production may be present in the very young child with A-T or develop with age. Incoordination of the muscles of speech causes difficulty with the oral musculature and affects the clarity with which speech sounds can be produced. Decreased muscle tone throughout the face and lips as well as decreased tongue strength may contribute to diminished clarity of speech. Muscle incoordination and weakness may decrease the rate of speech and cause drooling.

Usually those familiar with the person who has A-T are able to understand his or her speech although repetitions are sometimes necessary. It may become difficult or impossible for strangers to understand what has been said. The person with A-T who develops poor respiratory control (difficulty taking breaths in or out) for speech may speak in a soft voice or have problems with intonation and pitch inflection. As the person gets older or the symptoms worsen with age, it may become increasingly tiring for the patient with A-T to speak. As a result, the person may speak less and may avoid communicative situations, affecting the person's ability to interact with others.

General Recommendations

Speech and language services are often recommended to help the person learn communication skills that incorporate areas of strength and compensate for areas of difficulty. For example, an area of strength for many persons with A-T is the ability to listen to information presented auditorily. This auditory strength can be used to offset other areas of language weakness. Generally, the earlier compensatory strategies can be taught and implemented, the easier time the person has using them. In addition, those individuals around the A-T patient at school, home and socially, must become attuned to the special needs of the A-T patient. In all cases, it is essential to keep suggestions and techniques functional, practical and simple.

Patients with A-T need extra time to respond to verbal or written requests. Some patients are aware of this need. Others are not and need family members and educators to set up situations in which there is sufficient time to process information. When patients are aware of their needs, they can develop systems to indicate that they need more time or help. It may be helpful to use a gesture such as lifting a hand to signal that more time is needed.

When following directions, it may be helpful for the person to learn to listen for key words and to "chunk" (group) important words that are essential to completing the task. The person may find it easier to follow directions by listening for key words, chunking them, and then inaudibly repeating the words while the command is being followed and after it is completed. Consultation with a therapist is important to clarify what should be done only during therapy sessions, in the classroom and at home.

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To address word retrieval and word recall difficulties, the person needs continued exposure to a variety of activities involving vocabulary. Schools or educators may address this need in therapy sessions. In that setting, when it is obvious that the person is having difficulty finding a word, the therapist can provide a description of the word (semantic cue) or the beginning sound of the word (phonemic cue) to assist in recall. Family members should consult with therapists to determine how to reinforce these strategies at home.

The deterioration of oral motor and respiratory skills may affect articulation and phonation in A-T. Your therapist may recommend oral motor exercises to address the mobility and strength of muscles in the mouth, and breathing exercises that may support breathing for voice production. Some of these exercises may be helpful. However, the long-term benefit of these exercises in A-T is unknown. Consequently, we suggest using only those exercises that appear to be helpful while preventing frustration or fatigue.

Speech is sometimes hard to understand, especially as the person fatigues. During those times, it is important to understand that talking requires energy. When the person is tired, do not expect full sentences, but encourage the use of the key words needed to convey the message. For example, it is easier to say, "Drink milk" than "I'd like a drink of milk, please." When a complete sentence is not understood, the listener can confirm the portion of the sentence that was understood and ask only for the information in the remaining part of the sentence. Alternatively, if the person is too tired even to use key words, one can pose simple yes/no questions to which the person can nod or shake his or her head in response.

In rare cases, augmentative communication devices can be used to assist a person in communicating. These devices work by having a patient touch a word or picture display which in turn activates the production of a sound. Unfortunately, the problems with eye movements and ataxia may make using an augmentative communication device almost as frustrating as trying to talk. However, even with dysarthria, speech usually does not decline to the point where it is impossible and almost all A-T patients are able to communicate verbally throughout their lifetimes.

Another problem associated with A-T is drooling. The child may have decreased sensation in the oral area and may not be aware that the chin is wet. It may be helpful to slurp the saliva into the mouth, and as a first step, to instruct the child to do so. Once the technique is learned, it may be helpful to create a nonverbal cue (touching your cheek to signal the child). It also may be helpful for the A-T patient to wear a terry cloth sports band on the wrist to wipe the mouth, or a kerchief around the neck to protect the shirt.

The primary purposes of communication are to allow people to express their needs and interact with others. With some modifications, patients with A-T will be able to communicate effectively throughout life.