NASET's Severe Disabilities Series

Comprehensive Overview of Speech and Language Impairments

Introduction

Speech and language disorders refer to problems in communication and related areas such as oral motor function. These delays and disorders range from simple sound substitutions to the inability to understand or use language or use the oral-motor mechanism for functional speech and feeding. Some causes of speech and language disorders include hearing loss, neurological disorders, brain injury, mental retardation, drug abuse, physical impairments such as cleft lip or palate, and vocal abuse or misuse. Frequently, however, the cause is unknown. SLI is also called developmental language disorder, language delay, or developmental dysphasia. It is one of the most common childhood learning disabilities, affecting approximately 7 to 8 percent of children in kindergarten. The impact of SLI persists into adulthood.

Incidence

More than one million of the students served in the public schools' special education programs in the 2000-2001 school year were categorized as having a speech or language impairment. This estimate does not include children who have speech/language problems secondary to other conditions such as deafness. Language disorders may be related to other disabilities such as mental retardation, autism, or cerebral palsy. It is estimated that communication disorders (including speech, language, and hearing disorders) affect one of every 10 people in the United States.

Characteristics

A child's communication is considered delayed when the child is noticeably behind his or her peers in the acquisition of speech and/or language skills. Sometimes a child will have greater receptive (understanding) than expressive (speaking) language skills, but this is not always the case.

Speech disorders refer to difficulties producing speech sounds or problems with voice quality. They might be characterized by an interruption in the flow or rhythm of speech, such as stuttering, which is called dysfluency. Speech disorders may be problems with the way sounds are formed, called articulation or phonological disorders, or they may be difficulties with the

pitch, volume or quality of the voice. There may be a combination of several problems. People with speech disorders have trouble using some speech sounds, which can also be a symptom of a delay. They may say "see" when they mean "ski" or they may have trouble using other sounds like "l" or "r." Listeners may have trouble understanding what someone with a speech disorder is trying to say. People with voice disorders may have trouble with the way their voices sound.

A language disorder is an impairment in the ability to understand and/or use words in context, both verbally and nonverbally. Some characteristics of language disorders include improper use of words and their meanings, inability to express ideas, inappropriate grammatical patterns, reduced vocabulary and inability to follow directions. One or a combination of these characteristics may occur in children who are affected by language learning disabilities or developmental language delay. Children may hear or see a word but not be able to understand its meaning. They may have trouble getting others to understand what they are trying to communicate.

Educational Implications

Because all communication disorders carry the potential to isolate individuals from their social and educational surroundings, it is essential to find appropriate timely intervention. While many speech and language patterns can be called "baby talk" and are part of a young child's normal development, they can become problems if they are not outgrown as expected. In this way an initial delay in speech and language or an initial speech pattern can become a disorder which can cause difficulties in learning. Because of the way the brain develops, it is easier to learn language and communication skills before the age of 5. When children have muscular disorders, hearing problems or developmental delays, their acquisition of speech, language and related skills is often affected

Speech-language pathologists assist children who have communication disorders in various ways. They provide individual therapy for the child; consult with the child's teacher about the most effective ways to facilitate the child's communication in the class setting; and work closely with the family to develop goals and techniques for effective therapy in class and at home. The speech-language pathologist may assist vocational teachers and counselors in establishing communication goals related to the work experiences of students and suggest strategies that are effective for the important transition from school to employment and adult life.

Technology can help children whose physical conditions make communication difficult. The use of electronic communication systems allow nonspeaking people and people with severe physical disabilities to engage in the give and take of shared thought.

Vocabulary and concept growth continues during the years children are in school. Reading and writing are taught and, as students get older, the understanding and use of language becomes more complex. Communication skills are at the heart of the education experience. Speech and/or language therapy may continue throughout a student's school years either in the form of direct therapy or on a consultant basis.

Specific Types of Communication Disorders

Aphasia

What is Aphasia?

Aphasia is a language disorder that results from damage to portions of the brain that are responsible for language. For most people, these are parts of the left side (hemisphere) of the brain. Aphasia usually occurs suddenly, often as the result of a stroke or head injury, but it may also develop slowly, as in the case of a brain tumor. The disorder impairs both the expression and understanding of language as well as reading and writing. Aphasia may co-occur with speech disorders such as dysarthria or apraxia of speech, which also result from brain damage.

What causes aphasia?

Aphasia is caused by damage to one or more of the language areas of the brain. Many times, the cause of the brain injury is a stroke. A stroke occurs when, for some reason, blood is unable to reach a part of the brain. Brain cells die when they do not receive their normal supply of blood, which carries oxygen and important nutrients. Other causes of brain injury are severe blows to the head, brain tumors, brain infections, and other conditions of the brain.

How is aphasia diagnosed?

Aphasia is usually first recognized by the physician who treats the individual for his or her brain injury. Frequently this is a neurologist. The physician typically performs tests that require the individual to follow commands, answer questions, name objects, and converse. If the physician suspects aphasia, the individual is often referred to a speech-language pathologist, who performs a comprehensive examination of the person's ability to understand, speak, read, and write.

Apraxia

What Is Apraxia of Speech?

Apraxia of speech, also known as verbal apraxia or dyspraxia, is a speech disorder in which a person has trouble saying what he or she wants to say correctly and consistently. It is not due to weakness or paralysis of the speech muscles (the muscles of the face, tongue, and lips). The severity of apraxia of speech can range from mild to severe.

What Are the Types and Causes of Apraxia?

There are two main types of speech apraxia: acquired apraxia of speech and developmental apraxia of speech. Acquired apraxia of speech can affect a person at any age, although it most typically occurs in adults. It is caused by damage to the parts of the brain that are involved in speaking, and involves the loss or impairment of existing speech abilities. The disorder may

result from a stroke, head injury, tumor, or other illness affecting the brain. Acquired apraxia of speech may occur together with muscle weakness affecting speech production (dysarthria) or language difficulties caused by damage to the nervous system (aphasia).

Developmental apraxia of speech (DAS) occurs in children and is present from birth. It appears to affect more boys than girls. This speech disorder goes by several other names, including developmental verbal apraxia, developmental verbal dyspraxia, articulatory apraxia, and childhood apraxia of speech. DAS is different from what is known as a developmental delay of speech, in which a child follows the "typical" path of speech development but does so more slowly than normal.

The cause or causes of DAS are not yet known. Some scientists believe that DAS is a disorder related to a child's overall language development. Others believe it is a neurological disorder that affects the brain's ability to send the proper signals to move the muscles involved in speech. However, brain imaging and other studies have not found evidence of specific brain lesions or differences in brain structure in children with DAS. Children with DAS often have family members who have a history of communication disorders or learning disabilities. This observation and recent research findings suggest that genetic factors may play a role in the disorder.

What Are the Symptoms?

People with either form of apraxia of speech may have a number of different speech characteristics, or symptoms. One of the most notable symptoms is difficulty putting sounds and syllables together in the correct order to form words. Longer or more complex words are usually harder to say than shorter or simpler words. People with apraxia of speech also tend to make inconsistent mistakes when speaking. For example, they may say a difficult word correctly but then have trouble repeating it, or they may be able to say a particular sound one day and have trouble with the same sound the next day. People with apraxia of speech often appear to be groping for the right sound or word, and may try saying a word several times before they say it correctly. Another common characteristic of apraxia of speech is the incorrect use of "prosody" -- that is, the varying rhythms, stresses, and inflections of speech that are used to help express meaning.

Children with developmental apraxia of speech generally can understand language much better than they are able to use language to express themselves. Some children with the disorder may also have other problems. These can include other speech problems, such as dysarthria; language problems such as poor vocabulary, incorrect grammar, and difficulty in clearly organizing spoken information; problems with reading, writing, spelling, or math; coordination or "motor-skill" problems; and chewing and swallowing difficulties.

The severity of both acquired and developmental apraxia of speech varies from person to person. Apraxia can be so mild that a person has trouble with very few speech sounds or only has occasional problems pronouncing words with many syllables. In the most severe cases, a person may not be able to communicate effectively with speech, and may need the help of alternative or additional communication methods.

How Is It Diagnosed?

Professionals known as speech-language pathologists play a key role in diagnosing and treating apraxia of speech. There is no single factor or test that can be used to diagnose apraxia. In addition, speech-language experts do not agree about which specific symptoms are part of developmental apraxia. The person making the diagnosis generally looks for the presence of some, or many, of a group of symptoms, including those described above. Ruling out other contributing factors, such as muscle weakness or language-comprehension problems, can also help with the diagnosis.

To diagnose developmental apraxia of speech, parents and professionals may need to observe a child's speech over a period of time. In formal testing for both acquired and developmental apraxia, the speech-language pathologist may ask the person to perform speech tasks such as repeating a particular word several times or repeating a list of words of increasing length (for example, love, loving, lovingly). For acquired apraxia of speech, a speech-language pathologist may also examine a person's ability to converse, read, write, and perform non-speech movements. Brain-imaging tests such as magnetic resonance imaging (MRI) may also be used to help distinguish acquired apraxia of speech from other communication disorders in people who have experienced brain damage.

How Is It Treated?

In some cases, people with acquired apraxia of speech recover some or all of their speech abilities on their own. This is called spontaneous recovery. Children with developmental apraxia of speech will not outgrow the problem on their own. Speech-language therapy is often helpful for these children and for people with acquired apraxia who do not spontaneously recover all of their speech abilities.

Speech-language pathologists use different approaches to treat apraxia of speech, and no single approach has been proven to be the most effective. Therapy is tailored to the individual and is designed to treat other speech or language problems that may occur together with apraxia. Each person responds differently to therapy, and some people will make more progress than others. People with apraxia of speech usually need frequent and intensive one-on-one therapy. Support and encouragement from family members and friends are also important.

In severe cases, people with acquired or developmental apraxia of speech may need to use other ways to express themselves. These might include formal or informal sign language, a language notebook with pictures or written words that the person can show to other people, or an electronic communication device such as a portable computer that writes and produces speech.

Auditory Processing Disorder (APD)

What is auditory processing?

Auditory processing is a term used to describe what happens when your brain recognizes and interprets the sounds around you. Humans hear when energy that we recognize as sound travels through the ear and is changed into electrical information that can be interpreted by the brain. The "disorder" part of auditory processing disorder means that something is adversely affecting the processing or interpretation of the information.

Children with APD often do not recognize subtle differences between sounds in words, even though the sounds themselves are loud and clear. For example, the request "Tell me how a chair and a couch are alike" may sound to a child with APD like "Tell me how a couch and a chair are alike." It can even be understood by the child as "Tell me how a cow and a hair are alike." These kinds of problems are more likely to occur when a person with APD is in a noisy environment or when he or she is listening to complex information.

APD goes by many other names. Sometimes it is referred to as central auditory processing disorder (CAPD). Other common names are auditory perception problem, auditory comprehension deficit, central auditory dysfunction, central deafness, and so-called "word deafness."

What causes auditory processing difficulty?

We are not sure. Human communication relies on taking in complicated perceptual information from the outside world through the senses, such as hearing, and interpreting that information in a meaningful way. Human communication also requires certain mental abilities, such as attention and memory. Scientists still do not understand exactly how all of these processes work and interact or how they malfunction in cases of communication disorders. Even though your child seems to "hear normally," he or she may have difficulty using those sounds for speech and language.

The cause of APD is often unknown. In children, auditory processing difficulty may be associated with conditions such as dyslexia, attention deficit disorder, autism, autism spectrum disorder, specific language impairment, pervasive developmental disorder, or developmental delay. Sometimes this term has been misapplied to children who have no hearing or language disorder but have challenges in learning.

What are the symptoms of possible auditory processing difficulty?

Children with auditory processing difficulty typically have normal hearing and intelligence. However, they have also been observed to

- Have trouble paying attention to and remembering information presented orally

- Have problems carrying out multistep directions
- Have poor listening skills
- Need more time to process information
- Have low academic performance
- Have behavior problems
- Have language difficulty (e.g., they confuse syllable sequences and have problems developing vocabulary and understanding language)
- Have difficulty with reading, comprehension, spelling, and vocabulary

How is suspected auditory processing difficulty diagnosed in children?

You, a teacher, or a day care provider may be the first person to notice symptoms of auditory processing difficulty in your child. So talking to your child's teacher about school or preschool performance is a good idea. Many health professionals can also diagnose APD in your child. There may need to be ongoing observation with the professionals involved.

Much of what will be done by these professionals will be to rule out other problems. A pediatrician or a family doctor can help rule out possible diseases that can cause some of these same symptoms. He or she will also measure growth and development. If there is a disease or disorder related to hearing, you may be referred to an otolaryngologist--a physician who specializes in diseases and disorders of the head and neck.

To determine whether the child has a hearing function problem, an audiologic evaluation is necessary. An audiologist will give tests that can determine the softest sounds and words a person can hear and other tests to see how well people can recognize sounds in words and sentences. For example, for one task, the audiologist might have the child listen to different numbers or words in the right and the left ear at the same time. Another common audiologic task involves giving the child two sentences, one louder than the other, at the same time. The audiologist is trying to identify the processing problem.

A speech-language pathologist can find out how well a person understands and uses language. A mental health professional can give you information about cognitive and behavioral challenges that may contribute to problems in some cases, or he or she may have suggestions that will be helpful. Because the audiologist can help with the functional problems of hearing and processing, and the speech-language pathologist is focused on language, they may work as a team with the child.

Developmental Dyspraxia

What is Developmental Dyspraxia?

Developmental dyspraxia is a disorder characterized by an impairment in the ability to plan and carry out sensory and motor tasks. Generally, individuals with the disorder appear "out of sync" with their environment. Symptoms vary and may include poor balance and coordination, clumsiness, vision problems, perception difficulties, emotional and behavioral problems, difficulty with reading, writing, and speaking, poor social skills, poor posture, and poor short-term memory. Although individuals with the disorder may be of average or above average intelligence, they may behave immaturely.

Is there any treatment?

Treatment is symptomatic and supportive and may include occupational and speech therapy, and "cueing" or other forms of communication such as using pictures and hand gestures. Many children with the disorder require special education.

What is the prognosis?

Developmental dyspraxia is a lifelong disorder. Many individuals are able to compensate for their disabilities through occupational and speech therapy.

Landau-Kleffner Syndrome

What is Landau-Kleffner syndrome?

Landau-Kleffner syndrome (LKS) is a childhood disorder. A major feature of LKS is the gradual or sudden loss of the ability to understand and use spoken language. All children with LKS have abnormal electrical brain waves that can be documented by an electroencephalogram (EEG), a recording of the electric activity of the brain. Approximately 80 percent of the children with LKS have one or more epileptic seizures that usually occur at night. Behavioral disorders such as hyperactivity, aggressiveness and depression can also accompany this disorder. LKS may also be called infantile acquired aphasia, acquired epileptic aphasia or aphasia with convulsive disorder. This syndrome was first described in 1957 by Dr. William M. Landau and Dr. Frank R. Kleffner, who identified six children with the disorder.

What are the signs of Landau-Kleffner syndrome?

LKS occurs most frequently in normally developing children who are between 3 and 7 years of age. For no apparent reason, these children begin having trouble understanding what is said to them. Doctors often refer to this problem as auditory agnosiaor "word deafness." The auditory agnosia may occur slowly or very quickly. Parents often think that the child is developing a hearing problem or has become suddenly deaf. Hearing tests, however, show normal hearing. Children may also appear to be autistic or developmentally delayed.

The inability to understand language eventually affects the child's spoken language which may progress to a complete loss of the ability to speak (mutism). Children who have learned to read and write before the onset of auditory agnosia can often continue communicating through written language. Some children develop a type of gestural communication or sign-like language. The communication problems may lead to behavioral or psychological problems. Intelligence usually appears to be unaffected.

The loss of language may be preceded by an epileptic seizure that usually occurs at night. At some time, 80 percent of children with LKS have one or more seizures. The seizures usually stop by the time the child becomes a teenager. All LKS children have abnormal electrical brain activity on both the right and left sides of their brains.

Laryngeal Papillomatosis

What is Laryngeal Papillomatosis?

Laryngeal papillomatosis is a disease consisting of tumors that grow inside the larynx (voice box), vocal cords, or the air passages leading from the nose into the lungs (respiratory tract). It is a rare disease caused by the human papilloma virus (HPV). Although scientists are uncertain how people are infected with HPV, they have identified more than 60 types of HPVs. Tumors caused by HPVs, called papillomas, are often associated with two specific types of the virus (HPV 6 and HPV 11). They may vary in size and grow very quickly. Eventually, these tumors may block the airway passage and cause difficulty breathing.

Laryngeal papillomatosis affects infants and small children as well as adults. Between 60 and 80 percent of cases occur in children, usually before the age of three. Because the tumors grow quickly, young children with the disease may find it difficult to breathe when sleeping, or they may experience difficulty swallowing. Adults with laryngeal papillomatosis may experience hoarseness, chronic coughing, or breathing problems.

How is laryngeal papillomatosis disagnosed?

There are several tests to diagnose laryngeal papillomatosis. Two routine tests are indirect and direct laryngoscopy. An indirect laryngoscopy is done in an office by a speech-language pathologist or by a doctor. To examine the larynx for tumors, the doctor places a small mirror in the back of the throat and angles the mirror down towards the larynx. A direct laryngoscopy is performed in the operating room under general anesthesia.

This procedure is usually used with children or adults during lengthy examinations to minimize discomfort. It involves looking directly at the larynx. Direct laryngoscopy allows the doctor to view the vocal folds and other parts of the larynx under high magnification and samples of unusual tissue lesions that may be in the larynx or other parts of the throat.

Spasmodic dysphonia

What is Spasmodic Dysphonia?

Spasmodic dysphonia (or laryngeal dystonia) is a voice disorder caused by involuntary movements of one or more muscles of the larynx or voice box. Individuals who have spasmodic dysphonia may have occasional difficulty saying a word or two or they may experience sufficient difficulty to interfere with communication. Spasmodic dysphonia causes the voice to break or to have a tight, strained or strangled quality. There are three different types of spasmodic dysphonia.

What are the types of Spasmodic Dysphonia?

The three types of spasmodic dysphonia are adductor spasmodic dysphonia, abductor spasmodic dysphonia and mixed spasmodic dysphonia.

What are the features of spasmodic dysphonia?

In adductor spasmodic dysphonia, sudden involuntary muscle movements or spasms cause the vocal folds (or vocal cords) to slam together and stiffen. These spasms make it difficult for the vocal folds to vibrate and produce voice. Words are often cut off or difficult to start because of the muscle spasms. Therefore, speech may be choppy and sound similar to stuttering. The voice of an individual with adductor spasmodic dysphonia is commonly described as strained or strangled and full of effort. Surprisingly, the spasms are usually absent while whispering, laughing, singing, speaking at a high pitch or speaking while breathing in. Stress, however, often makes the muscle spasms more severe.

In abductor spasmodic dysphonia, sudden involuntary muscle movements or spasms cause the vocal folds to open. The vocal folds can not vibrate when they are open. The open position of the vocal folds also allows air to escape from the lungs during speech. As a result, the voices of these individuals often sound weak, quiet and breathy or whispery. As with adductor spasmodic dysphonia, the spasms are often absent during activities such as laughing or singing.

Mixed spasmodic dysphonia involves muscles that open the vocal folds as well as muscles that close the vocal folds and therefore has features of both adductor and abductor spasmodic dysphonia.

(For other types of Communication Disorders and further information on this topic, , use NASET's table of hundreds of links to Speech and Language Impairments. This table will be found when you close out of this window.)

Resources

Brice, A. (2001). Children with communication disorders (ERIC Digest #E617). Arlington, VA: ERIC Clearinghouse on Disabilities and Gifted Education. (Available online at: http://ericec.org/digests/e617.html)

Charkins, H. (1996). Children with facial differences: A parents' guide. Bethesda, MD: Woodbine House. (Telephone: 800.843.7323. Web: www.woodbinehouse.com)

Cleft Palate Foundation. (1997). For parents of newborn babies with cleft lip/cleft palate. Chapel Hill, NC: Author. (Telephone: 800.242.5338. Also available online at: www.cleftline.org)

Gruman-Trinker, C. (2001). Your cleft-affected child: The complete book of information, resources and hope. Alameda, CA: Hunter House. (Web: www.hunterhouse.com)

Hamaguchi, P. M. (2001). Childhood speech, language, & listening problems: What every parent should know (2nd ed.). New York: John Wiley & Sons, Inc. (Telephone: 800.225.5945. Web: www.wiley.com)

Organizations

Alliance for Technology Access
2175 E. Francisco Boulevard, Suite L
San Rafael, CA 94901
800.455.7970; 415.455.4575
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American Speech-Language-Hearing Association (ASHA)
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Web: www.asha.org

Childhood Apraxia of Speech Association of North America (CASANA)
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