Aphasia
A language impairment secondary to a central nervous system insult, lesion or infarct usually in the language dominant left-hemisphere. Types of language syndromes maybe Nonfluent Aphasia [Prefrontal Area], Wernicke’s Fluent Jargon Aphasia [Temporal Angular Gyrus], Global Aphasia, Semantic, Syntactic or Transcortical Aphasias.

Apraxia of Speech
A loss of voluntary speech motor control associated with prefrontal gyrus lesions. Apraxia can be specific to oral-motor control, or generalized to speech-articulation, respiration, or phonation.

Motor Speech Dysarthria
Any paralysis, paresis or incoordination of speech-voice motor control. Symptoms may be classified as Spastic [UMN: CVA, MVA], Hypokinetic [Parkinson Dis.], Hyperkinetic [UMN, Dystonias], Ataxic [UMN, Multiple Seler.] or Flaccid [LMN, Myasthenia Gravis].

Dysphagia

Dysphonia
An organic or psychosomatic impairment of phonation which effects the voice quality, octave range, vocal stamina or vocal power. Vocal Nodules, Polyps, Pappilomata, Paralysis-Paresis, Muscle Tension Dysphonia

Dementia
Any loss of mental faculties which may include memory, reasoning, calculation, or verbal abstraction.

Speech-Voice-Language Technology
Digital technology has exploded in the speech-language pathology profession. Acoustic-Aerodynamic analysis, Speech synthesis & recognition, Videoendoscopy of the Larynx, Nasopharynx, Functional-MRI Speech Imaging, and Digital Language Analysis are common place and available on the internet.
VOWELS

Front
Close i y
Close-mid e θ e θ
Open-mid æ ø æ ø
Open a œ a œ

Central

Back u o u o

Digital Swallowing

Are Nonhuman Species Capable of Language Acquisition?

Cochlear Implant Device

Speaking Software
Speech & Language Pathology

LEADING EDGE REHABILITATION

Beaumont's Speech and Language Pathology program is the most comprehensive in Michigan and one of the largest in the United States. It is one of the first hospital departments in Michigan to achieve full accreditation from the American Speech-Language and Hearing Association.

Beaumont's Speech-Language Pathologists have published numerous books, videos and other resource materials that are used by clinicians throughout the world for stroke and aphasia rehabilitation.

Beaumont clinicians have also pioneered therapy programs used to treat children with speech and language disorders including the ReMax Communication Station Preschool, Michigan's first hospital-based preschool for children having speech or language difficulties.

TREATMENT PROGRAMS

More than 2,000 patients each year are treated at Beaumont for communication problems such as aphasia, voice disorders, stuttering, accent reduction and more.

Helping children learn to communicate effectively so they will become confident adults is the reason Beaumont's Pediatric Speech Program is recognized around the world.

The Lions and Lioness Clubs of Southeastern Michigan provide support for children in need through the Silent Children's Speech Fund.

For new Americans, Beaumont offers an accelerated accent reduction program that many companies offer their employees.

FIND A SPEECH PATHOLOGIST, NOW

Call us at 248.551.2100 and we will help you find a Speech and Language Pathologist who is highly trained in your area of need.

We offer you a staff of more than 40 clinicians who specialize in the full range of speech and language concerns.

Call today for a consultation in one of our clinical programs.
Main Menu

- Return to Speech Pathology Home Page
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- Adult Services home page
- Cane & Able Support Group
- Accent Reduction Programs
- Friends Stroke Club
- Acute Care Services
- Laryngectomee Club
- Alzheimer's and Dementia
- Parkinson's Support Group
- Aphasia Diagnostics
- Spasmodic Dysphoria Support Group
- Center for Voice & Laryngeal Disorders
- Teen Stuttering Support Group
- Care for the Professional Voice
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- Specialized Procedures
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- Orofacial Myology Disorders Clinical Program
- Outpatient Program
- Pediatric Stuttering
- Rehabilitation Unit
- Suggestions for Parents
- Rehabilitation Services
- Pragmatic Enrichment Program
- Spasmodic Dysphoria
- RE/MAX Communication Station
- Role of the Speech & Language Pathologist
- Toddler Language Stimulation Program
- Spasmodic Dysphoria Treatments
- Does your child need help?
- Stroke and Aphasia Rehabilitation
- Aphasia Information
- Stuttering Center
- Apraxia Symptoms
Epidemiology Across Cultures: Total US Population

U.S. Census Data

According to Census 2000, 281.4 million people resided in the United States, and 35.5 million, or about 13 percent, were Latino. The remaining 246.1 million people, or 87 percent, were not Hispanic. Nearly 98 percent of all respondents reported only one race. The largest group reported White alone, accounting for 75 percent of all people living in the United States. The Black or African American alone population represented 12 percent of the total. Just under 1 percent of all respondents indicated only American Indian and Alaska Native. Approximately 4 percent of all respondents indicated only Asian. The smallest race group was the Native Hawaiian and Other Pacific Islander alone population, representing 0.1 percent of the total population. The remainder of the "one race" respondents—5.5 percent of all respondents—indicated only some other race. The two or more races category represents all respondents who reported more than one race. Less than 3 percent of the total population reported more than one race.¹


Health Statistics

Incidence and Prevalence of Diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Incidence Prevalence</th>
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<tbody>
<tr>
<td>AIDS/HIV, number of newly reported cases in 2002²</td>
<td>27,589</td>
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<tr>
<td>Cardiovascular disease³</td>
<td>22.6%</td>
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<tr>
<td>Cleft lip/palate</td>
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<tr>
<td>1 in every 1,000 babies</td>
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<tr>
<td>Cleft Palate</td>
<td></td>
</tr>
<tr>
<td>1 in every 2,000 babies</td>
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</tr>
<tr>
<td>Diabetes (over 20 years of age)⁵</td>
<td>5.5%</td>
</tr>
<tr>
<td>Fetal Alcohol Syndrome⁵</td>
<td>67 per every 1,000 live births</td>
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<tr>
<td>Otitis media for persons under 18 years⁶</td>
<td>2.52 per 1,000</td>
</tr>
<tr>
<td>Stroke</td>
<td>2%</td>
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</tbody>
</table>

Risk Factors

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Prevalence</th>
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<tbody>
<tr>
<td>Hypertension</td>
<td>32.8%</td>
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<tr>
<td>Obesity (BMI 30+)³</td>
<td>30.5%</td>
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<tr>
<td>Prenatal care during 3rd trimester or not at all³</td>
<td>3.7%</td>
</tr>
<tr>
<td>Total Cholesterol 240 mg/dL or higher³</td>
<td>18.3%</td>
</tr>
</tbody>
</table>

Educational Statistics

Percentage distribution of enrollment in public elementary and secondary schools, by race/ethnicity in Fall 2000⁷

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>White</td>
<td>61.2%</td>
</tr>
<tr>
<td>Black</td>
<td>17.2%</td>
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<tr>
<td>Hispanic</td>
<td>16.3%</td>
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<tr>
<td>Asian or Pacific Islander</td>
<td>4.1%</td>
</tr>
<tr>
<td>American Indian/Alaska Native</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

The US Census Bureau indicates that 18.4% of children ages 5-17 speak a language other than English⁸.

Special Education Identification (2000-2001) for total all students served⁹

<table>
<thead>
<tr>
<th>Disability Type</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Specific Learning Disabilities</td>
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<tr>
<td>Speech or Language Impairment</td>
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<tr>
<td>Mental Retardation</td>
<td>10.6</td>
</tr>
<tr>
<td>Emotional Disturbance</td>
<td>8.2</td>
</tr>
<tr>
<td>Multiple Disabilities</td>
<td>2.1</td>
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<tr>
<td>Hearing Impairment</td>
<td>1.2</td>
</tr>
<tr>
<td>Orthopedic Impairment</td>
<td>1.3</td>
</tr>
<tr>
<td>Other Health Impairment</td>
<td>5.1</td>
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<tr>
<td>Visual Impairment</td>
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<tr>
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<tr>
<td>Deaf-Blindness</td>
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<tr>
<td>Traumatic Brain Injury</td>
<td>0.3</td>
</tr>
<tr>
<td>Developmental Delay</td>
<td>0.5</td>
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</table>

Prevalence of Hearing Loss in the United States

- In 1991 approximately 42 million people in the United States were affected by hearing loss and/or some other communication disorder. Of these:
  - 28 million individuals had a hearing loss;
  - 14 million individuals had a voice, speech, or language disorder.¹
- The most common causes of hearing loss are otitis media in children, presbycusis in the elderly, hereditary hearing disorders, and harmful noise levels. Additionally, hearing loss can result from premature birth, neonatal anoxia, otosclerosis, ototoxic drugs, meningitis, head injury, and viral infections.²

In 1992:
- Of individuals who reported having a chronic hearing loss, 73% were 45 years of age or older (Figure 1).³
- Of individuals who reported chronic tinnitus, the smallest percentage was reported by those under 18 years of age (1.0%) and the largest percentage was reported by those 45-64 years of age (37.1%) (Figure 2).³
- Compared to the general population, males are overrepresented in the population reporting hearing loss (57% males versus 43% females).³
- African-Americans are underrepresented in the population reporting hearing loss compared to the general population, with only 7% reporting hearing loss (13% of the general population is comprised of African-Americans).³,⁶
- A slightly larger percentage of those who reported hearing loss live in the South (Figure 3).³
- Between 1971 and 1990-91 there was a 14.8% increase (age-adjusted) in the prevalence of reported hearing loss in the United States.³
Auditory Disease

- Neurofibromatosis 1, previously known as von Recklinghausen's disease, occurs in an estimated one birth in every 4,000.
- Neurofibromatosis 2, also known as bilateral acoustic neuroma or central neurofibromatosis, occurs in one person in 50,000.
- Otitis media: By six years of age, an estimated 90% of all children have experienced otitis media at least once. Annually over 10 million visits to physicians are attributed to otitis media, with an estimated annual cost exceeding one billion dollars.
- Otosclerosis occurs in up to 2% of the U.S. population.

Congenital Hearing Loss

- At least 50% of congenital deafness is genetically based. Many cases of hearing loss with onset in childhood or adulthood have a genetic basis as well.

Deafness

- An estimated two million people are prelingually deaf, that is, they lost their hearing before they acquired language.
- Deafness or severe bilateral hearing loss affects some two million Americans.
- Hearing loss in one third of all deaf children results from acquired damage to the inner ear.

Noise-Induced Hearing Loss

- Some 10 million persons are affected by noise-induced hearing loss and more than 20 million are exposed to hazardous noise levels that could result in hearing loss.
- More than 35% of the 28 million cases of hearing loss in the United States are the result, at least in part, of hazardous noise exposure.

Presbycusis

- An estimated 30% of individuals 65 to 74 years of age, and more than 50% of individuals over 75 years of age are affected by presbycusis.

Sensorineural Hearing Loss

- Approximately 17 million people in the United States have a sensorineural hearing loss.
- Nearly one young child in 1,000 has early-onset sensorineural hearing loss to the extent that it impedes normal language acquisition. Even with special education, one half of these children attain only a fourth-grade level of education by the time they graduate from high school.
- Severe congenital sensorineural hearing loss affects about one child in 1,000.

Tinnitus

- Frequent or constant tinnitus affects at least 15% of the U.S. population; one million of these are compelled to stop or curb social and occupational activities because of the condition.

References


• Amyotrophic lateral sclerosis (ALS) is diagnosed in 14,000 Americans. These patients often develop problems speaking and swallowing.³

**Dysphagia (Swallowing Disorders)**

• More than 15 million Americans have some degree of dysphagia. The incidence of the disorder appears to be rising primarily because of improvements in life-support systems that allow many patients to survive who previously would not.⁷
• Swallowing disorders are seen in more than 65% of all ALS patients, in up to 55% of all traumatic brain injury (TBI) patients, and in 25% to 45% of all stroke patients.⁸
• With regular treatment, 83% of patients with dysphagia recover or significantly improve.⁸

**Fluency Disorders**

• Stuttering usually begins in early childhood. Estimates indicate that more than 2 million Americans⁴, and more than 15 million persons worldwide, stutter.⁹

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**Voice Disorders**

• An estimated 6% to 23% of school-age children have a voice disorder. The most frequent problem is hoarseness resulting from vocal abuse.¹⁰
• Although older adults and patients with acquired neurogenic diseases commonly exhibit voice disorders, no data are available on the incidence of voice disorders in the general adult population.¹⁰
• Spasmodic dysphonia is classified as dystonia—there are an estimated 50,000 to 100,000 cases of idiopathic dystonia in the United States.¹¹

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**Language Disorders**

An estimated 6 to 8 million individuals have some type of language disorder. Because of neurologic, physiologic, and metabolic differences, language disorders affect children and adults differently.¹²

**Language Disorders in Children**

Some language disorders in children are known to result from mental retardation, brain injury, or trism; however, the origin of the disorder in many cases is unknown. The general term used to refer to a language disorder of unknown origin is specific language impairment (SLI).¹²

• In general, language disorders affect about 2% to 3% of preschoolers and about 1% of the school-age population (grades 1-12). Two thirds of language or speech disorders occur in boys.¹³
• Mental retardation is the most prevalent disorder associated with impaired language development. Nearly 50% of children with mild retardation, 90% of children with severe retardation, and 100% of children with profound retardation manifest some type of language disorder.¹³
• Some language disorders are acquired through brain injury. The estimated annual incidence of head trauma in children is as high as 200 in 100,000; the annual incidence of stroke in children is nearly 3 in 100,000.¹⁴
• Autism occurs in roughly 5 births in 10,000, and primarily in boys.⁶
• An estimated 5% of preschool children are specific language impaired.¹⁴

**Language Disorders in Adults**

Language disorders in adults, such as aphasia, may be acquired as the result of stroke, head injury, brain tumor, or other neurological disease. A language deficit may be a symptom of Alzheimer’s disease or other dementias. Language disorders related to inadequate language development in childhood, autism, and deafness may persist into adulthood (prevalence rates are not available for each of these categories).¹²

**Aphasia**

• More than 1 million people in the United States have some degree of aphasia.¹⁵
• Each year, roughly 400,000 Americans have a stroke⁶; of these, approximately 20% develop aphasia.¹⁶
• Dementia affects 10% of the population over 65 years of age, and as many as 50% of those over 85 years of age.⁶ Most people with dementia have a significant language deficit.¹⁴
• Alzheimer’s disease affects some 2.5 to 3 million Americans.⁶
Special Populations
Stroke and Communication Disorders

Stroke is a cerebrovascular injury that occurs when blood flow to the brain is interrupted by a clogged or burst artery. The interruption deprives the brain of blood and oxygen, thereby causing brain cells to die. When brain cells die, function of the body parts they control is impaired or lost, causing paralysis, speech problems, memory and reasoning deficits, coma, and possibly death.

General Demographics

- Three million Americans are currently permanently disabled because of stroke (2).
- It affects more than 550,000 Americans each year with approximately 150,000 dying from stroke-related causes (3).
- Stroke is the number one cause of adult disability, and the third leading cause of death in the United States (1).
- Strokes occur in men more than women, but women die more often as a result of stroke (1).
- Young and middle-aged African-Americans have a stroke incidence rate almost twice as high as Whites, and are almost twice as likely to die from stroke (3).
- Stroke costs the United States $30 billion annually in health care costs and lost productivity. The average cost per patient for the first 90 days is $15,000 (1).

Age

- Approximately two-thirds of all strokes occur in people age 65 and over (1).
- Although stroke is a relatively frequent occurrence in adults, it is much less common in children (4).
- The most common cause of stroke in children is congenital heart disease. Other causes include sickle cell anemia, intracranial infection, brain injury, vascular malformations, occlusive vascular disease, and some genetic diseases (4).

Sequela of Stroke

- Of the 400,000 Americans who survive stroke each year, 10% to 18% will have another stroke within one year, and approximately one-third of survivors will have another stroke within five years (3).
- Physical and functional impairment subsequent to stroke is significantly more severe in African-Americans than in Whites (8).
- Approximately one-third of individuals who have experienced stroke have mild impairments,
Communication Disorders and Stroke

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. The disorder impairs both the expression and understanding of language, as well as reading and writing (5).

- About one million persons in the United States currently have aphasia (5).
- It is estimated that approximately 80,000 individuals acquire aphasia each year (5).
- The majority of acquired aphasia cases are the result of stroke (5).
- Aphasia may co-occur with speech disorders, such as dysarthria or apraxia of speech which also result from brain damage (5).

Dysarthria

Dysarthria refers to a group of speech disorders resulting from weakness, slowness, or incoordination of the speech mechanism due to damage to any of a variety of points in the nervous system.

- Dysarthria may involve disorders to some or all of the basic speech processes: respiration, phonation, resonance, articulation, and prosody (6).
- Dysarthria is a disorder of speech production not language (e.g., use of vocabulary and/or grammar) (6).
- Speech errors that occur in dysarthria are highly consistent from one occasion to the next (7).
- The prevalence of dysarthria following a stroke is not well documented (6).

Apraxia of speech

Apraxia is a term is frequently used by speech-language pathologists to designate an impairment in the voluntary production of articulation and prosody (the rhythm and timing) of speech. It is characterized by highly inconsistent errors (7).

References

http://www.asha.org/professionals/research/facts_stroke.htm


Compiled by Andrea Castrogiovanni
Research Resources and Advocacy ASHA 10801 Rockville Pike, Rockville MD 20852 301-897-5700 email: acastrogiovanni@asha.org

Search | Index | Professionals | Students | Consumers | Home

To email ASHA staff, go to the National Office Email Directory
Email technical questions or comments to webmaster@asha.org
This page was last updated on August 12, 1999
Table 3  Dysarthrias neuropathology and speech-voice symptoms*.

<table>
<thead>
<tr>
<th>Dysarthria</th>
<th>Neuropathology</th>
<th>Prominent Speech-Voice Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flaccid Dysarthria</td>
<td>Lower Motor Neuron (Bulbar Palsy) Hypotonia.</td>
<td>Hypernasal and breathy voice quality with nasal air escape on speech sound production. Weak pressure consonant-vowel syllable repetition.</td>
</tr>
<tr>
<td>Ataxic Dysarthria</td>
<td>Cerebellum (Ataxia) Reduced timing, accuracy.</td>
<td>Dysrhythmic speech timing, random speech sound prolongations. Reduced speech rate.</td>
</tr>
<tr>
<td>Hypokinetic Dysarthria</td>
<td>Extrapyramidal (Parkinson’s) Rigidity, reduced range of motion, bradykinesia.</td>
<td>Reduced voice loudness, absence of voice intonation, fast rushes of speech production, and inappropriate speech silences.</td>
</tr>
<tr>
<td>Hyperkinetic Dysarthria</td>
<td>Extrapyramidal (Dystonia) Myoclonus, dystonia, dyskinesias.</td>
<td>Highly random-intermittent speech or voice strain, imprecision, or sudden speech tics.</td>
</tr>
</tbody>
</table>

Many neurologic dysfunctions present with mixed or combinations of the dysarthrias described above as in ALS, CVI or TBI.

Medical Resident Logopedic Test Matrix

"Neurogenic Communication Disorder"

PMR Conference Seminar—July 12th, 1997
Rick Merson, Ph.D.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Aphasia</th>
<th>Apraxia</th>
<th>Dyslexia</th>
<th>Dysgraphia</th>
<th>Dementia</th>
<th>Dysarthria</th>
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<tbody>
<tr>
<td>Reading</td>
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<td>Voice</td>
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<tr>
<td>Reason Time-Space</td>
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</tbody>
</table>

**Aphasia:** Disorder of linguistic formulation affecting all channels of expression and reception.

**Apraxia:** Disorder of volitional motor movement.

**Dyslexia:** Disorder of visual discrimination and comprehension.

**Dysgraphia:** Disorder of volitional manual-gestural expression.

**Dysarthria:** Disorder of motor control for voice, articulation or resonance.

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**Dementia:** Disorder of higher level cognitive faculties.
Symptoms of Right Hemisphere Communication Disorders

Dysarthria
Swallowing Difficulties
Impaired Judgment & Reasoning
Memory Problems
Naming & Word Loss
Reading Disorders
Left/Right Neglect
Visual Perception Problems
Changes in Behavior & Affect
Rambling/Off Topic Remarks
Lack of Insight
Denial of Problems
Loss of Humor
Loss of Organization
Attention Deficits
Poor Task Initiation

Some or all of these symptoms may be present with damage to the right or nondominant hemisphere. Because the patient appears able to communicate and interact normally, changes can easily be overlooked. They become evident only on further examination or after the patient returns to a less structured environment. Often it is a family member who notices changes as patient denial and lack of insight are classic.

The Speech and Language Pathology Department at Beaumont Hospital has programs to address the specific needs of the patient with right hemisphere damage. Our programs start at the acute stage of illness, continue on the Rehab Unit, and move to outpatient care at the Rehab-ilitation and Health Center in Birmingham. We offer programs at many levels to help an individual reach maximum potential and return to daily activities, work, or learn to adapt and cope with long-term disability and a modified lifestyle. Please call to make a referral or for more information.

Speech & Language Pathology Dept.  
Beaumont Rehabilitation & Health Center  
746 Purdy Street  
Birmingham, MI 48009  
(248) 259-1090  Fax: (248) 259-1396

Symptoms of Left Hemisphere Communication Disorders

Aphasia
Oral/Verbal Apraxia
Limb Apraxia
Dysarthria
Swallowing Difficulties
Jargon Speech
Perseveration
Trouble Following Directions
Naming & Word Loss
Impaired Listening & Understanding
Trouble with Numbers & Math
Reading Comprehension Difficulties
Spelling & Writing Disorders
Visual Perceptual Problems
Emotional Lability

Some or all of these symptoms may be present with damage to the left or dominant hemisphere. Although a speech impairment may be obvious, other symptoms may not be apparent without further evaluation. It is common for individuals with a receptive language component to cover their difficulties with automatic phrases and appropriate social behaviors.

The Speech and Language Pathology Department at Beaumont Hospital has programs to address the specific needs of the patient with left hemisphere damage. Our programs start at the acute stage of illness, continue on the Rehab Unit, and move to outpatient care at the Rehab-ilitation and Health Center in Birmingham. We offer programs at many levels to help an individual reach maximum potential and return to daily activities, work, or learn to adapt and cope with long-term disability and a modified lifestyle. Please call to make a referral or for more information.

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Swallowing Problems in Adults

Swallowing disorders, also called dysphagia (dis FAY juh), can occur at different stages in the swallowing process:

- oral phase--sucking, chewing, and moving food or liquid into the throat
- pharyngeal phase--triggering the swallowing reflex, squeezing food down the throat, and closing off the airway to prevent food or liquid from entering the airway (aspiration) or to prevent choking
- esophageal phase--relaxing and tightening the openings at the top and bottom of the feeding tube in the throat (esophagus) and squeezing food through the esophagus into the stomach

Some causes of feeding and swallowing problems in adults are:

Damage to the nervous system, such as:

- Stroke
- Brain injury
- Spinal cord injury
- Parkinson's disease
- Multiple sclerosis
- Amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease)
- Muscular dystrophy
- Cerebral palsy
- Alzheimer's disease

Problems affecting the head and neck, including:

- Cancer in the mouth, throat, or esophagus
- Injury or surgery involving the head and neck
- Decayed or missing teeth, or poorly fitting dentures

Many other diseases, conditions, or surgical interventions can result in swallowing problems. General signs may include:

- Coughing during or right after eating or drinking
- Wet or gurgly sounding voice during or after eating or drinking
- Extra effort or time needed to chew or swallow
- Food or liquid leaking from the mouth or getting stuck in the mouth
- Recurring pneumonia or chest congestion after eating
- Weight loss or dehydration from not being able to eat enough

As a result, adults may have:
Swallowing Disorders in Children

Swallowing disorders, also called dysphagia (dis FAY juh), can occur at different stages in the swallowing process:

- oral phase—sucking, chewing, and moving food or liquid into the throat
- pharyngeal phase—triggering the swallowing reflex, squeezing food down the throat, and closing off the airway to prevent food or liquid from entering the airway (aspiration) or to prevent choking
- esophageal phase—relaxing and tightening the openings at the top and bottom of the feeding tube in the throat (esophagus) and squeezing food through the esophagus into the stomach

Some causes of feeding and swallowing problems in children are:

- nervous system disorders (cerebral palsy, meningitis, encephalopathy)
- gastrointestinal conditions
- prematurity/low birth weight
- heart disease
- cleft lip or palate
- conditions affecting the airway

Signs and symptoms of feeding and swallowing problems in very young children may include:

- arching or stiffening of the body during feeding
- irritability or lack of alertness during feeding
- failure to accept different textures of food
- prolonged feeding times (more than 30 minutes)

General signs may include:

- excessive drooling or leaking food/liquid from the mouth
- gurgly, hoarse, or breathy voice quality
- coughing or gagging during meals
- recurring pneumonia or respiratory infections
- difficulty coordinating breathing with eating or drinking
- frequent spitting up
- less than normal weight gain or growth

As a result, children may have:

- dehydration or poor nutrition
- risk of aspiration (food or liquid entering the airway)
- pneumonia or repeated upper respiratory infections that can lead to chronic lung disease
- embarrassment or isolation in social situations involving eating
## Outcome Scale: Dysphagia

<table>
<thead>
<tr>
<th>Scale Value</th>
<th>Description of Swallowing Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>PROFOUND</strong>&lt;br&gt;<strong>NPO:</strong> Significant (large amount and/or frequent) aspiration. Inadequate oral/pharyngeal transit to the esophagus. Absent swallow and/or no airway protection. Pt. requires primary enteral feeding support, unable to meet nutrition/hydration needs. May have tracheostomy tube and/or ventilator dependent. Mental/medical status severely limits patient's ability to take food orally. May not be a candidate for a Modified Barium Swallow Radiologic procedure.</td>
</tr>
<tr>
<td>2</td>
<td><strong>SEVERE</strong>&lt;br&gt;<strong>NPO:</strong> Aspiration noted on the MBS procedure (may be inconsistent). Severe dysfunction in oral and/or pharyngeal phase. Pt. continues to require primary enteral feeding. Trial oral-feeding by swallowing therapist only. Patient's diet modified (e.g. liquids, consistency) with safety precautions implemented.</td>
</tr>
<tr>
<td>3</td>
<td><strong>SIGNIFICANT</strong>&lt;br&gt;Aspiration noted on MBS procedure however small amount and infrequent. Penetration noted. Patient continues to show significant risk factors for continued aspiration. Moderate dysfunction in oral and/or pharyngeal phase. Modified diet strategies are necessary (e.g. pureed food, thick liquids possible). Pt. needs full supervision, and may require supplemental enteral feeding. Ongoing re-assessment needed by dysphagia therapist.</td>
</tr>
<tr>
<td>4</td>
<td><strong>MODERATE</strong>&lt;br&gt;Moderate risk of aspiration and moderate dysfunction of oral and/or pharyngeal phase. Occasional penetration may be noted but no frank aspiration during MBS procedure. Requires modified diet (e.g. pureed food, thick liquids possible), with safety strategies and precautions. Pt. continues to require moderate supervision.</td>
</tr>
<tr>
<td>5</td>
<td><strong>MILD</strong>&lt;br&gt;Mild dysfunction in oral and/or pharyngeal phase, and mild aspiration risk. May have modified diet (e.g. casserole consistency food, thickened liquid) possible. Requires safety precautions, strategies and some supervision.</td>
</tr>
<tr>
<td>6</td>
<td><strong>MINIMAL</strong>&lt;br&gt;Slight abnormality in oral and/or pharyngeal phase, no significant risk of aspiration. No specific strategies necessary. Basic safety precautions may be recommended. Few diet modifications are necessary.</td>
</tr>
<tr>
<td>7</td>
<td><strong>NORMAL FUNCTION /INSIGNIFICANT</strong>&lt;br&gt;No dysphagia on the Modified Barium Swallow procedure, regular diet.</td>
</tr>
</tbody>
</table>
How Does Your Child Hear and Talk?

Every child is unique and has an individual rate of development. This chart represents, on average, the age by which most children will accomplish the listed skills. Children typically do not master all items in a category until they reach the upper age in each age range. Just because your child has not accomplished one skill within an age range does not mean the child has a disorder. However, if you have answered no to the majority of items in an age range, seek the advice of an ASHA-certified speech-language pathologist or audiologist. Use Find a Professional, ASHA's online directory of speech-language pathologists and audiologists to locate a practitioner near you.

<table>
<thead>
<tr>
<th>Hearing and Understanding</th>
<th>Talking</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Birth-3 Months</strong></td>
<td><strong>Birth-3 Months</strong></td>
</tr>
<tr>
<td>• Startles to loud sounds.</td>
<td>• Makes pleasure sounds (cooing, gooing).</td>
</tr>
<tr>
<td>• Quiets or smiles when spoken to.</td>
<td>• Cries differently for different needs.</td>
</tr>
<tr>
<td>• Seems to recognize your voice and quiets if crying.</td>
<td>• Smiles when sees you.</td>
</tr>
<tr>
<td>• Increases or decreases sucking behavior in response to sound.</td>
<td></td>
</tr>
<tr>
<td><strong>4-6 Months</strong></td>
<td><strong>4-6 Months</strong></td>
</tr>
<tr>
<td>• Moves eyes in direction of sounds.</td>
<td>• Babbling sounds more speech-like with many different sounds, including <em>p</em>, <em>b</em> and <em>m</em>.</td>
</tr>
<tr>
<td>• Responds to changes in tone of your voice.</td>
<td>• Vocalizes excitement and displeasure.</td>
</tr>
<tr>
<td>• Notices toys that make sounds.</td>
<td>• Makes gurgling sounds when left alone and when playing with you.</td>
</tr>
<tr>
<td>• Pays attention to music.</td>
<td></td>
</tr>
<tr>
<td><strong>7 Months-1 Year</strong></td>
<td><strong>7 Months-1 Year</strong></td>
</tr>
<tr>
<td>• Enjoys games like peek-o-boo and pat-a-cake.</td>
<td>• Babbling has both long and short groups of sounds such as &quot;tata upup bibibibi.&quot;</td>
</tr>
<tr>
<td>• Turns and looks in direction of sounds.</td>
<td></td>
</tr>
<tr>
<td>1-2 Years</td>
<td>1-2 Years</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>- Points to a few body parts when asked.</td>
<td></td>
</tr>
<tr>
<td>- Follows simple commands and understands simple questions (&quot;Roll the ball,&quot; &quot;Kiss the baby,&quot; &quot;Where's your shoe?&quot;).</td>
<td></td>
</tr>
<tr>
<td>- Listens to simple stories, songs, and rhymes.</td>
<td></td>
</tr>
<tr>
<td>- Points to pictures in a book when named.</td>
<td></td>
</tr>
<tr>
<td>- Says more words every month.</td>
<td></td>
</tr>
<tr>
<td>- Uses some 1-2 word questions (&quot;Where kitty?&quot; &quot;Go bye-bye?&quot; &quot;What's that?&quot;).</td>
<td></td>
</tr>
<tr>
<td>- Puts 2 words together (&quot;more cookie,&quot; &quot;no juice,&quot; &quot;mommy book&quot;).</td>
<td></td>
</tr>
<tr>
<td>- Uses many different consonant sounds of the beginning of words.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2-3 Years</th>
<th>2-3 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Understands differences in meaning (&quot;go-stop,&quot; &quot;in-on,&quot; &quot;big-little,&quot; &quot;up-down&quot;).</td>
<td></td>
</tr>
<tr>
<td>- Follows two requests (&quot;Get the book and put it on the table.&quot;).</td>
<td></td>
</tr>
<tr>
<td>- Has a word for almost everything.</td>
<td></td>
</tr>
<tr>
<td>- Uses 2-3-word &quot;sentences&quot; to talk about and ask for things.</td>
<td></td>
</tr>
<tr>
<td>- Speech is understood by familiar listeners most of the time.</td>
<td></td>
</tr>
<tr>
<td>- Often asks for or directs attention to objects by naming them.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3-4 Years</th>
<th>3-4 Years</th>
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</thead>
<tbody>
<tr>
<td>- Hears you when call from another room.</td>
<td></td>
</tr>
<tr>
<td>- Hears television or radio at the same loudness level as other family members.</td>
<td></td>
</tr>
<tr>
<td>- Talks about activities at school or at friends' homes.</td>
<td></td>
</tr>
<tr>
<td>- People outside family usually understand child's speech.</td>
<td></td>
</tr>
<tr>
<td>4-5 Years</td>
<td>4-5 years</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>• Understands simple, &quot;who?&quot;, &quot;what?&quot;, &quot;where?&quot;, &quot;why?&quot; questions.</td>
<td>• Uses a lot of sentences that have 4 or more words.</td>
</tr>
<tr>
<td>• Pays attention to a short story and answers simple questions about it.</td>
<td>• Usually talks easily without repeating syllables or words.</td>
</tr>
<tr>
<td>• Hears and understands most of what is said at home and in school.</td>
<td>• Voice sounds clear like other children's.</td>
</tr>
<tr>
<td></td>
<td>• Uses sentences that give lots of details (e.g. &quot;I like to read my books&quot;).</td>
</tr>
<tr>
<td></td>
<td>• Tells stories that stick to topic.</td>
</tr>
<tr>
<td></td>
<td>• Communicates easily with other children and adults.</td>
</tr>
<tr>
<td></td>
<td>• Says most sounds correctly except a few like l, s, r, v, z, ch, sh, th.</td>
</tr>
<tr>
<td></td>
<td>• Uses the same grammar as the rest of the family.</td>
</tr>
</tbody>
</table>

**Where to Get Help**

If you think your child may have a speech, language, or hearing problem, you can contact an ASHA-certified

- **Audiologist**: Audiologists are hearing care professionals who specialize in prevention, identification, and assessment of hearing and related disorders and provide treatment, rehabilitative services, and assistive devices.

- **Speech-language pathologist**: Speech-language pathologists help people develop their communication abilities as well as treat speech, languages, swallowing, and voice disorders. Their services include prevention, identification, evaluation, treatment, and rehabilitation.

ASHA-certified speech-language pathologists and audiologists have completed their master's or doctoral degree and have earned ASHA's Certificate of Clinical Competence (CCC).

**Speech-Language pathologists and audiologists work in many different types of facilities such as:**

http://www.asha.org/public/speech/development/child_hear_talk.htm?print=1
ARTICULATION

Children should be referred if one or more of the items below are failed.

1. If a three year old child makes more than 4 errors on the following consonant sounds in monosyllabic words:
   (m,n,b,p,d,t,k,g, )

2. If a five year old child makes more than 5 errors on the consonants listed in #1 plus the following in monosyllabic words:
   (f,s,sh, ch, j, r, l, br, kr, pl).

3. If child is 24 months or older and uses only vowel sounds to communicate, refer immediately.

4. If a 3 year old child is less than 60% intelligible in speech, or a 5 year old is less than 90% intelligible, refer immediately.

FLUENCY

Children 3 years or older who have dysfluencies should be referred when:

- The family physician, teacher or parent is concerned (anxious) and ........
- Child expresses concern about fluency.
- History of stuttering in family.
- Stuttering is chronic not episodic.
- Silent pauses (2 seconds or more) occur.
- Facial tics, grimaces or body spasms occur.
- Child is 7 years or older with any dysfluency.

LANGUAGE

Expressive Language

Children should be referred when one of the following items is failed on expressive language.
1. At 18 months child has at least 6-10 words (nouns).
2. At 24 months child should have at least 2 word utterances.
   For example: Daddy home. Go bye-bye. More milk.
3. At 36 months child should have 3 word sentence structures.
   For example: I want milk. My Daddy is home. I go out.
4. At 60 months child should produce major grammatical forms in 5 to 12 word utterances.
   For example: I want to go outside and see my Daddy rake the leaves.

Receptive Language

1. At 18 months child points to objects named.
2. At 24 months child carries out 2 or 3 related commands in one verbal instruction.
3. At 36 months child can be reasoned with verbally.
   Listens to explanations of how things work with recall.
4. At 60 months child will single out words in sentences for meaning (new definitions) exchanges novel ideas, enjoys longer periods of being read to (15-20 minutes) with story and details of story recalled.

VOICE

Children 3 years of age or older should be referred if:

1. The child has a detectable voice problem (pitch, loudness, monotony, resonance) with a history of any one of the following: Otitis media Chronic Screaming
   Upper resp. inf. Chronic Crying
   Allergies Vocal Cord growths
2. The child exhibits chronic-daily hypernasality.
3. The child exhibits chronic-daily hoarse or breathy voice quality for 2 or more months.
Speech, Language, & Swallowing

Language is our most human characteristic. It is essential to learning, working, and enjoying family life and friendships. There are many ways to express language. Speaking, using sign language, writing, and using computerized communication devices are some of the most common ones. The professionals who are educated to assess speech and language development and to treat language and speech disorders are speech-language pathologists (sometimes informally referred to as speech therapists). Speech-language pathologists can also help people with swallowing disorders.

Emergent Literacy
During early speech and language development, children learn skills that are important to the development of literacy (reading and writing). This stage, known as emergent literacy, begins at birth and continues through the preschool years.

Speech and Language Development
There are typical patterns of development for speech and language from birth. Find out more about language and speech and how you can improve communication.

Speech and Language Disorders
There are a wide variety of speech and language disorders, some congenital and some acquired. People of all ages experience these disorders.

ASHA Information Packets
Find out more about speech, language, and swallowing issues by ordering free information from ASHA.

Swallowing
Swallowing is a function we all take for granted. Dysphagia is the inability to swallow correctly. Find out more about this potentially life-threatening disorder.

Questions for Consumers To Ask
## Product Information (Alphabetical)

### Systems

- Aerophone II, Model 6800
- Ambulatory Phonation Monitor (APM), Model 3200
- Attenuators
- Computerized Speech Lab (CSL™)
- Digital Swallowing Workstation™
- Digital Video Recording System (DVRS), Model 9300
- Digital Video System for Swallowing™, Model 7210
- DSP Sona-Graph™, Model 5500
- Electroglottograph, Model 6103
- Facilitator™, Model 3500
- FEES Systems
- Flexible Endoscopes
- Hospital FEES System, Model 7190
- High-Speed Video System, Model 9700
- Nasometer™ II, Model 8400
- Phonatory Aerodynamic System (PAS), Model 6600
- Pulsed Dye Laser (PDL) - KayPENTAX/Cynosure
- Stroboscopy Systems
- Swallowing Signals Lab™
- Transnasal Esophagoscopy (TNE)
- Videokymography System, Model 8900
- Video Processors

http://www.kayeometrics.com/alphaprodutinfo.htm
Visi-Pitch™ IV, Model 3950

Software

- Analysis-Synthesis Laboratory (ASL), Model 5104
- Applied Speech Science for Dysarthrias, Model 5153
- Applied Speech Science for Voice & Resonance Disorders, Model 5156
- Auditory Feedback Tools, Model 3506
- Auditory Perception Program and Database (APP), Model 4343
- Disordered Voice Database, Model 4337
- Games Program, Model 5167
- IPA Transcription Tutorial, Model 4335
- Motor Speech Profile™ (MSP), Model 5141
- Multi-Dimensional Voice Program (MDVP™), Model 5105
- Multi-Speech™, Model 3700
- Neuroscience for Human Communications, Model 5155
- Palatometer Database, Model 4333
- Phonetic & Perception Simulation Programs, Model 5151
- Phonetic Database, Model 4332
- Real-Time EGG Analysis, Model 5138
- Real-Time Pitch, Model 5121
- Real-Time Spectrogram, Model 5129
- Respiration, Phonation and Prosody Simulation, Model 5152
- Signal Enhancement Program, Model 5142
- Sona-Match, Model 5127
- Sona-Speech™ II, Model 3650
- Speech Articulation: Animation of Muscle Vectors, Model 5154
- Video Phonetics Program and CD-ROM Database, Model 5150
- Voice Range Profile Program, Model 4326

Miscellaneous

- Speech Products Compatibility Chart
result in miscommunication. This is accomplished by letting the quality of the client's articulatory response govern the outcome of a story.

Our Price: $99.95

In a variety of situations, responses are elicited and the SLP records those responses by clicking phonetic symbols. After responses are elicited, an analysis is immediately available.

Our Price: $99.95

Stusoft
for
Speech:

http://www.parrotsoftware.com/ParrotStore/scripts/prodList.asp?idCategory=23
improve speech fluency. StuSoft incorporates standard speech fluency shaping techniques that can be used as part of a fluency rehabilitation regimen.

Our Price: $159.95

View Add

ATT Natural Sounding Voice

ATT Natural Sounding Voice replaces the standard Microsoft Text-to-Speech voice provided with our software. The quality of ATT product is far superior to the standard Microsoft Speech.

Our Price: $39.95

View Add
**Parrot Software**

Parrot Software is using AT&T's Natural Voices in over 100 of their products. Parrot Software's programs are used by most hospitals and rehabilitation centers throughout the U.S., including Veterans Administration Hospitals, Kaiser Permanente, The National Rehabilitation Hospital, HealthSouth Rehabilitation Centers, and The University of Michigan Hospital. Parrot Software's programs are also used in many English, French, Spanish, Portuguese, and Danish speaking countries. Their products help Alzheimer patients, stroke victims and other individuals with brain impairments or injuries regain speech, language and memory abilities as well as cognitive skills. The integration of AT&T's Natural Voices text-to-speech into Parrot's products gives patients the option of clicking on any unknown word and hear it being read in a clear, natural-sounding voice. This solution creates an effective interface for patients who are re-learning to read or speak.

**Website:** [www.parrotsoftware.com](http://www.parrotsoftware.com)