

Aphasia, Acquired Childhood

Indexing Metadata/Description

- › **Title/condition:** Aphasia, Acquired Childhood
- › **Synonyms:** Acquired childhood aphasia; childhood aphasia, acquired; acquired childhood dysphasia; dysphasia, acquired childhood; childhood dysphasia, acquired
- › **Anatomical location/body part affected:** The brain (usually the left hemisphere), anatomy of communication
- › **Area(s) of specialty:** Pediatric Genetic and/or Neurological Disorders
- › **Description:** Acquired childhood aphasia is the term used to describe a language disorder that occurs as a result of brain damage in childhood.^(1,2) Because acquired childhood aphasia is considered to be a loss or deterioration of language skills, the child experiencing the language deficits must have previously obtained intact, developmentally appropriate language skills prior to sustaining brain damage⁽¹⁾
- › **ICD-10 codes**
 - R47.01 aphasia
 - G40.8acquired aphasia with epilepsy (Landau-Kleffner)

(ICD codes are provided for the reader's reference, not for billing purposes)

- › **Reimbursement:** Reimbursement for therapy will depend on insurance contract coverage; no specific issues or information regarding reimbursement has been identified
- › **Presentation/signs and symptoms:** Children with acquired childhood aphasia present with “language disruptions” similar to those observed in adults with acquired aphasia.^(1,3) Children with aphasia have types similar to those seen in adults, including expressive aphasia (Broca's aphasia), receptive aphasia (Wernicke's), anomic aphasia, conduction aphasia, and transcortical aphasia.⁽¹⁾ (For detailed information on assessment and treatment of adult aphasia, see the series of Clinical Reviews on this topic.) Positive symptoms of aphasia include:
 - Anomia: difficulty finding the correct word^(1,2)
 - Use of empty or filler words: such as “thing,” “stuff,” “you know,” and “uh”/“um”⁽²⁾
 - Incorrect grammatical constructions⁽¹⁾
 - Paraphasias: word substitutions such as “chair” for “stool”; phonemic substitutions such as “spool” for “stool”; nonword substitutions (i.e., neologisms) such as “flimly” for “stool”^(1,2)
 - Jargon: strings of unintelligible speech generally made up of multiple neologisms^(1,2,4)
 - Poor language comprehension⁽²⁾
 - Inability to follow commands
 - Difficulty grasping the point of a conversation
 - Verbal perseveration⁽¹⁾
 - Word deafness: an inability to comprehend the meaning of words despite intact hearing abilities^(2,4)

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March 4, 2022

Causes, Pathogenesis, & Risk Factors

- › **Causes:** Acquired childhood aphasia is the result of brain damage. Generally, acquired aphasia in children results from damage to the left hemisphere of the brain.⁽⁵⁾ Damage to the left basal ganglia, thalamus, and left subcortical areas of the brain has been shown to result in acquired childhood aphasia^(5,6)
- › **Pathogenesis:** Brain damage that results in acquired childhood aphasia usually is caused by stroke; however, it might also result from traumatic brain injury (TBI), a brain tumor, infection, or neurological disease, such as Landau-Kleffner syndrome (LKS)^(1,5,7,8,9)
- › **Risk factors:** As it results from brain damage, the risk factors for acquired childhood aphasia are the same risk factors as for brain damage. Below are risk factors associated with specific types of acquired childhood brain damage
 - Childhood stroke (incidence ~ 3.3/100,000 children)⁽¹⁰⁾
 - Meningitis⁽¹⁰⁾
 - Congenital heart disease⁽¹⁰⁾
 - Sickle cell anemia⁽¹⁰⁾
 - Coagulation disorders⁽¹⁰⁾
 - Arterial dissection⁽¹⁰⁾
 - Varicella infection⁽¹⁰⁾
 - Moyamoya disease⁽¹⁰⁾
 - Genetics/heredity⁽¹⁰⁾
 - Vascular malformations⁽¹⁰⁾
 - Brain tumor⁽¹⁰⁾
 - Head trauma⁽¹⁰⁾
 - Lyme disease⁽²⁷⁾
 - Atypical Kawasaki disease⁽²⁸⁾
 - Childhood brain tumor (for detailed information on childhood brain tumor risk factors, assessment, and treatment, see *Clinical Review...Brain Tumors in Childhood: Speech Therapy*; CINAHL Topic ID Number: T708892)
 - TBI
 - Age – very young children (0–4 years), teenagers and young adults (ages 15–24), and adults over 60 are at the highest risk⁽¹¹⁾
 - Bicycle and motorcycle riders are also at high risk⁽¹¹⁾
 - Sex – increased risk for males vs. females⁽¹¹⁾
 - For detailed information on TBI, see the series of Clinical Reviews on this topic
 - LKS
 - Presence of arachnoid cysts⁽¹²⁾
 - For detailed information on LKS, see *Clinical Review...Landau-Kleffner Syndrome: Communicative Disorders*; CINAHL Topic ID Number: T709047

Overall Contraindications/Precautions

- › See specific **Contraindications/precautions to examination** and **Contraindications/precautions** under Assessment/Plan of Care

Examination

- › **Contraindications/precautions to examination**
 - For an evaluation of a child's language abilities, the parents or the primary caregiver should always be available to provide additional information and/or support as needed
 - Review medical history prior to evaluation/treatment; review input from a variety of professionals (physical therapist [PT], occupational therapist [OT], physician, school personnel)

- For bilingual children, the speech-language pathologist (SLP) should make every effort to thoroughly evaluate all languages that the child spoke prior to the onset of aphasia. Suggestions for bilingual evaluations follow below. (For detailed information on assessment and treatment of bilingual children, see *Clinical Review...Language Disorders: Bilingual School-Aged Children*; CINAHL Topic ID Number: T709066 and *Clinical Review...Language Disorders: Bilingual Infants and Toddlers*; CINAHL Topic ID Number: T709065)

› History

• History of present illness/injury

- **Mechanism of injury or etiology of illness:** When did the child first exhibit symptoms of aphasia? Was there a precipitating event, medical or otherwise? Refer to neurological reports for information on site and size of brain lesion
- **Developmental history:** Was the child a quiet or vocal infant? Did the child coo, babble, or imitate sounds as an infant? When did the child say his or her first word? At what age did the child begin to name objects or persons? At what age did the child start to put words together (e.g., “Daddy up”)? Were the child’s first words easy or difficult to understand? In addition to completing a history of the child’s communication development, obtain information on the child’s motor, social, and cognitive development
- **History of the pregnancy and delivery:** Did the child’s mother have any illnesses, accidents, or complications while pregnant with the child? Did the mother take any medications during pregnancy? What was the length of the pregnancy? What was the duration of the delivery? What was the child’s weight at birth? Were there any complications or unusual circumstances during birth or shortly after? What were the Apgar scores?
- **Course of treatment**
 - **Medications for current illness/injury:** Determine what medications physician has prescribed; are they being taken? Medications commonly prescribed for children with aphasia include:
 - steroids⁽⁸⁾
 - intravenous immunoglobulin (IVIG)⁽⁴⁾
 - antiseizure medications^(1,13)
 - **Diagnostic tests completed:** Usual tests for this condition are the following:
 - CT scan^(4,12)
 - EEG: measurement of brain waves^(4,8,9,12)
 - Magnetoencephalography (MEG): used in children with LKS; similar to EEG; used to measure magnetic fields produced by electrical currents of the brain. Might assist with diagnosis of LKS as well as localization of seizure activity if surgery is being considered⁽⁷⁾
 - MRI⁽¹²⁾
 - Polysomnography: full-night sleep study⁽¹⁴⁾
 - **Home remedies/alternative therapies:** Document any use of home remedies (e.g., ice or heating pack) or alternative therapies (e.g., acupuncture) and whether they help
 - **Previous therapy:** Document whether patient has had speech, occupational, or physical therapy for this or other conditions and what specific treatments were helpful or not helpful. Has the child ever received early intervention services for speech, physical, or occupational therapy?
- **Aggravating/easing factors:** For example, noisy, distracting environment; communication partner, time of day, language used (for bilingual children), fatigue, stress
- **Nature of symptoms:** Document nature of symptoms
 - What types of language errors does the child make?
 - Is the child’s aphasia fluent or nonfluent?
- **Rating of symptoms:** Use a visual analog scale (VAS) or 0–10 scale to assess symptoms at their best, at their worst, and at the moment (specifically address if pain is present now and how much)
- **Pattern of symptoms:** Document changes in symptoms throughout the day and night, if any (A.M., mid-day, P.M., night)
 - Does the child have increased difficulty in certain environments? Home? School?
 - Does the child have increased difficulty with specific conversational partners? Peers? Teachers? Siblings?
- **Sleep disturbance:** Document number of wakings/night
- **Other symptoms:** Document other symptoms patient might be experiencing that could exacerbate the condition and/or symptoms that could be indicative of a need to refer to physician (emotional or behavioral disorders, cognitive disorders)
- **Respiratory status:** Does the child require supplemental oxygen? Nasal cannula? Does the child have a tracheostomy tube? Does the child require ventilator support?

- **Psychosocial status:** Children with childhood stroke (who are therefore at risk for acquired childhood aphasia) have an increased incidence of psychiatric disorders, according to some studies.⁽⁵⁾ Refer to neuropsychological reports for complete information regarding child's cognition
- **Hearing:** Does the child have hearing loss? Does the child require/wear hearing aids or have cochlear implants? A hearing screening with an audiometer is within the scope of practice of an SLP and should be performed with all pediatric speech and language evaluations.⁽¹⁸⁾ If the child fails the hearing screening, a referral to audiology should be made for a full audiological evaluation
- **Barriers to learning**
 - Are there any barriers to learning? Yes__ No__
 - If Yes, describe _____
- **Medical history**
 - **Past medical history**
 - **Previous history of same/similar diagnosis:** Has a speech or language disorder ever been diagnosed in the child? A learning disorder or learning disability?
 - **Comorbid diagnoses:** Ask patient and/or parent/caregiver about other problems, including diabetes, cancer, heart disease, or psychiatric disorders
 - **Medications previously prescribed:** Obtain a comprehensive list of medications prescribed and/or being taken (including OTC drugs)
 - **Other symptoms:** Ask child or parent about other symptoms that are present
- **Social/occupational history**
 - **Patient's goals:** Document what the child and parents or caregiver hope to accomplish with therapy and in general
 - **Vocation/avocation and associated repetitive behaviors, if any:** As a result of or in addition to aphasia, the child might experience difficulty in school in subjects such as mathematics, reading, and writing.⁽⁵⁾ It is important to determine the child's premorbid level of academic achievement in order to compare to current function. Did the child ever attend daycare or a nursery center? Did teachers ever report any problems or make recommendations about speech therapy? What grade is the child in now? What kind of grades or test scores does the child usually achieve? What are the child's best subjects? Worst subjects? How does the child feel about school? Does the child receive special classes or instruction at school, or have they required them in the past? What extracurricular activities does the child enjoy? For example, does the child participate in recreational or competitive sports, drama, or music?
 - **Functional limitations/assistance with ADLs/adaptive equipment:** Does the child use a walker, wheelchair, or leg braces? Does the child require/wear glasses? Does the child use an alternative or augmentative communication device?
 - **Living environment:** With whom does child live (e.g., caregivers)? Identify if there are barriers to independence in the home; any modifications necessary? Is the child exposed to any other languages at home or in school? If so, what percentage of time is English spoken around/to the child? What percentage of time is another language spoken around/to the child?
- › **Relevant tests and measures: (While tests and measures are listed in alphabetical order, sequencing should be appropriate to patient medical condition, functional status, and setting)**
 - **Arousal, attention, cognition (including memory, problem solving):** Children with aphasia might also exhibit cognitive changes such as impaired memory and attention skills⁽²⁾
 - **Speech and language examination (including reading)**
 - **Speech:** Complete a motor speech evaluation and document the presence of dysarthria or apraxia of speech
 - **Language:** A thorough examination of language abilities must be administered for children with aphasia. Standardized aphasia batteries (e.g., Western Aphasia Battery, Boston Diagnostic Aphasia Examination) are normed on adults, but could be utilized in an examination of a child with aphasia depending on the child's age and premorbid language abilities⁽²⁵⁾
 - Bilingual children or second-language learners
 - Bilingual and monolingual SLPs are able to assess bilingual children.⁽¹⁵⁾ (For detailed information on assessment and treatment of bilingual children, see *Clinical Review...Language Disorders: Bilingual School-Aged Children*, referenced above and *Clinical Review...Language Disorders: Bilingual Infants and Toddlers*, referenced above)
 - In order to appropriately and accurately assess a child who does not speak the same language as the evaluating clinician, the SLP must research the linguistic and cultural background of that child⁽¹⁵⁾

- According to the American Speech-Language-Hearing Association (ASHA), in the absence of a bilingual SLP trained support personnel can be utilized in the assessment of bilingual speakers. These include professional interpreters or translators, bilingual diagnosticians, bilingual speech-language pathology assistants, bilingual professional staff, trained adult first-language speakers from the community, or a family member or friend⁽¹⁵⁾
- There is a lack of appropriate standardized testing materials available for bilingual children, especially for language assessments.⁽¹⁶⁾ The following are standardized tests modified for non-English-speaking children; however, they are all translated from English and normed on a monolingual (English-speaking) population, so results must be interpreted with this in mind⁽¹⁶⁾
 - Spanish Preschool Language Scale-3 (PLS-3)⁽¹⁶⁾
 - Spanish Language Assessment Procedures (SLAP)⁽¹⁶⁾
 - Clinical Evaluation of Language Fundamentals Spanish (CELF-Spanish)⁽¹⁶⁾
 - Test de Vocabulario en Imagenes Peabody (TVIP)⁽¹⁶⁾
- Informal testing
 - A spontaneous speech or storytelling sample might be qualitatively analyzed as an informal test of aphasia.⁽¹⁷⁾

Fluency, grammatical errors, and paraphasias should be recorded; repeated speech-sample analysis can be performed throughout therapy as a measure of progress
- **Voice:** Complete a brief assessment of the voice and refer to otolaryngologist for instrumental examination if laryngeal pathology is suspected. An evaluation of the voice and vocal function should include observations of:
 - Vocal tremor
 - Excessive or limited pitch variation
 - Excessive or limited loudness variation
 - Abnormal nasality
 - Wet phonation
 - Hoarseness and/or breathiness
 - For detailed information on evaluation of the voice and voice disorders, see the series of Clinical Reviews on this topic
- **Reading:** If developmentally and age appropriate, assess reading abilities. Document premorbid reading ability. The components of the reading evaluation will depend on the age of the child and developmental level. These components might include letter identification, letter-sound identification, phonological awareness skills, sight-word reading, fluency, and reading comprehension⁽²⁶⁾
- **Oral mechanism exam and related tests:** An extensive oral mechanism examination should be completed with all children experiencing speech or language difficulties. Oral mechanism exam should evaluate:
 - **Facial muscles:** Is the face symmetrical at rest? Is the face symmetrical while making movements (smiling, raising the eyebrows, closing the eyes)? Are there any abnormal movements (twitching, spasms, grimacing)? Is the child drooling or mouth breathing?
 - **Lips:** Are the lips symmetrical at rest? Are the lips symmetrical during movements? Is ROM normal? Is strength normal? Is lip tissue healthy? Is there any scarring or cleft?
 - **Tongue:** Is the tongue normal in appearance? Any atrophy? Any discolorations? Any bleeding? Is ROM normal? Is strength normal?
 - **Hard palate:** Is the hard palate intact? Any signs of fistulas, fissures, or scarring? Are height and width normal? Any prostheses present? Is coloration normal?
 - **Soft palate:** Is coloration normal (should be pink and white)? Any signs of cleft or bifid uvula? Does the child sound hyper- or hyponasal during conversational speech? Place a small mirror under the child's nose during production of nonnasal sounds; fogging or clouding might indicate nasal emission, which would indicate a referral to an otolaryngologist
 - **Teeth:** Are there any teeth missing? Are the teeth in good repair? Does the child wear braces or retainers? Is there a significant over- or underbite?
- **Perception** (e.g., visual field, spatial relations): Neglect is a visual-spatial disorder that results in a person failing to describe, respond to, or be oriented to stimuli in the neglected space. Visual-spatial deficits, including neglect, sometimes occur in children following brain damage; they usually occur following a right-sided hemispheric lesion.^(5,6) Children with acquired aphasia should be screened for neglect, visual field cuts, visual-spatial skills, and vision impairment; if child reports visual deficits, refer to ophthalmology for further testing

• **Special tests specific to diagnosis**

- Boston Diagnostic Aphasia Examination–Third Edition (BDAE-3): standardized test for aphasia; includes animal naming, automatic naming, complex ideation material, oral agility, sentence and paragraph reading, and receptive naming.⁽⁶⁾ Test is normed for adults; however, it might provide useful information when developing goals
- Boston Naming Test (BNT): standardized test of naming ability⁽⁶⁾
- Children’s Acquired Aphasia Screening Test (CAAST): adapted from the Aphasia Screening Test for adults; this test is for children aged 3 to 7 years; examines listening, understanding, speaking, pre-reading, pre-writing, and gesture⁽¹⁹⁾
- Clinical Evaluation of Language Fundamentals–Fifth Edition (CELF-5): standardized test normed for children aged 5 to 21 years; used to diagnose developmental language disorders⁽⁶⁾
- Peabody Picture Vocabulary Test–Fourth Edition (PPVT-IV): normed for individuals aged 2 1/2 to 90 years; standardized test for receptive vocabulary^(6,9,20)
- Test for Reception of Grammar–Second Edition (TROG-2): standardized test of receptive language; for individuals aged 4 years and up⁽¹⁷⁾
- Token Test for Children (TTC): standardized test for assessing receptive language; normed across children aged 3 years to 12 years, 11 months^(6,20)

Assessment/Plan of Care

› **Contraindications/precautions**

- **Children with this diagnosis might be at risk for falls; follow facility protocols for fall prevention and post fall-prevention instructions at bedside, if inpatient. Ensure that patient and family/caregivers are aware of the potential for falls and educated about fall-prevention strategies. Discharge criteria should include independence with fall-prevention strategies**
- Patients with this diagnosis might be at risk for dysphagia; follow recommended protocols for swallowing safety and post feeding instructions at bedside, if inpatient. Ensure that the patient and family/caregivers are aware of the potential for dysphagia and educated about safe feeding strategies
- Clinicians should follow the guidelines of their clinic/hospital and what is ordered by the patient’s physician. The summary presented below is meant to serve as a guide, not to replace orders from a physician or a clinic’s specific protocols

› **Diagnosis/need for treatment:** The diagnosis of acquired childhood aphasia is made when there is a loss or deterioration of language skills following brain damage in a child who previously had intact language⁽¹⁾

› **Rule out:** For a child to be considered aphasic, prior language acquisition must have taken place; hence, acquired childhood aphasia usually is not diagnosed in children under the age of 2.⁽¹⁾ Additionally, the SLP must rule out or identify coexisting speech or language disorders, including but not limited to the following:

- Acquired dysarthria: a disorder in which the speech sounds are distorted due to oral-motor weakness because of an underlying subcortical or peripheral lesion.⁽¹⁾ For detailed information about acquired dysarthria, see the series of Clinical Reviews on this topic
- Acquired stuttering: although stuttering symptoms can occur in children with childhood aphasia, such children will have confrontation naming errors in addition to syllable repetitions.⁽¹⁾ For detailed information about acquired stuttering, see *Clinical Review...Stuttering: Neurogenic*; CINAHL Topic ID Number: T709167
- Developmental language disorders: disorders in which child language development is impaired or delayed; usually starts early in language development without a known cause.⁽¹⁾ For detailed information about developmental language disorders, see the series of Clinical Reviews on this topic
- Mutism: although children with childhood aphasia might present initially with mutism-type symptoms, aphasic children generally respond to language stimulation by SLPs with some level of spontaneous speech; children with mutism do not.⁽¹⁾ (For detailed information on assessment and treatment of mutism, see *Clinical Review...Selective Mutism*; CINAHL Topic ID Number: T708637)

› **Prognosis:** Prognosis for acquired childhood aphasia depends on several factors, and the effectiveness of speech therapy varies from child to child.⁽¹⁷⁾ The age at which a child acquires aphasia does not appear to affect prognosis.⁽⁵⁾ The persistence of paraphasias across the course of therapy is a poor prognostic indicator.⁽¹⁷⁾ Children who develop aphasia following TBI appear to be more likely to achieve complete recovery of language than those who have had a stroke.⁽⁵⁾ Most children with acquired aphasia will reacquire their language skills slowly and steadily with speech therapy intervention.⁽²⁾

Experts theorize that children have a better chance of recovery than adults due to greater levels of neural plasticity.⁽¹⁾ For this reason, it appears as though recovery takes place as undamaged parts of the brain take over the linguistic functions of the damaged areas^(1,20)

- › **Referral to other disciplines:** Even when children with acquired aphasia recover language abilities, they might continue to experience difficulty in school with reading, writing, and mathematics.^(1,2) Refer child to learning disabilities specialist if child, parent, or teacher reports persistent academic difficulties. Children with aphasia might also present with mood swings, depression, and socially inappropriate behavior; refer to psychology or psychiatry in the case of reported or observed change in temperament or behavior.^(2,20) If the child has visual deficits, refer to ophthalmology for further testing
- › **Treatment summary:** Treatment for acquired childhood aphasia will focus on restoring language abilities and/or developing compensatory strategies
 - The SLP might focus on increasing the patient’s listening skills and/or attention span⁽²⁾
 - Additionally, the child will learn and practice strategies to improve word-finding abilities⁽²⁾
 - Compensatory strategies might focus on bypassing the impaired language system and getting information across through the use of visual or tactile techniques⁽²¹⁾
 - Multiple case studies involving children with acquired childhood aphasia demonstrate improved comprehension and expression when words and concepts are introduced with the use of written words, which is referred to as written word therapy^(22,23)
 - Written word therapy is often introduced in the classroom^(22,23)
 - Auditory training and cued articulation were effective treatment protocols utilized in a classroom case study of a child with LKS and subsequent acquired childhood aphasia⁽²³⁾
 - Sign language is described in several case studies and anecdotal reports as being a useful method of communication in children with acquired aphasia^(9,13,23,24)

Problem	Goal	Intervention	Expected Progression	Home Program
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<p>Reduced communication skills</p>	<p>Increase child's language skills</p>	<p>Written word therapy (22,23)</p> <p>Language is taught through written word to bypass the impaired auditory channel. Demonstrated effective through case studies of children with acquired aphasia (22,23)</p> <ul style="list-style-type: none"> - Ideas are presented visually and given color codes according to part of speech (i.e., red for nouns, yellow for verbs, green for adjectives, blue for prepositions and conjunctions, and brown for adverbs) - The child is taught that meaning is dependent on word order (i.e., "The dog had 4 puppies" is a meaningful sentence; however, the child is not able to change word order and state: "The puppy had 4 dogs") - Therapist and child can create written stories with "speech balloons" drawn around the words to indicate oral communication 	<p>Words and concepts are introduced slowly. As the child becomes comfortable with each word, the colors then visual prompts are removed; finally, language skills are expected to improve</p>	<p>None specified</p>
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<p>Reduced communication skills</p>	<p>Increase child's ability to communicate and express needs and wants</p>	<p><u>Sign language</u> (9,13,23,24)</p> <p>When the child is unable to comprehend spoken words or produce words verbally, they might be successful using sign language. Signs can be taken from American Sign Language (ASL), Paget-Gorman Sign System, or other formal signed languages; however, signs developed with the child's family members might be just as effective for communicating desires</p>	<p>The child, teachers, and family will use sign language to increase successful communication</p>	<p>Signs should be taught to and used with teachers, family members, and friends, if possible</p>
<p>Impaired ability to participate in classroom activities</p>	<p>Improve child's reading abilities</p>	<p><u>Classroom modifications</u></p> <p>The SLP should work with the child's parents and teachers to facilitate success in the classroom; develop an individualized education program (IEP) in collaboration with the child's school and family. Ideas from one case study of a child with LKS include:⁽⁹⁾</p> <ul style="list-style-type: none"> -Use of computer program with visual and auditory reinforcements to help sustain child's attention -Training child in phonemic awareness (sound/symbol pairings) with one-on-one instruction, color coding, and sounds -A 1:1 aide might improve academic performance 	<p>Modifications in the classroom are intended to improve the child's reading performance and attention</p>	<p>None specified</p>

<p>Reduced auditory comprehension</p>	<p>Increase child's comprehension of the spoken word</p>	<p>Auditory training (23)</p> <ul style="list-style-type: none"> -“Go-games” – child is trained to perform a task, such as putting a ball in a bucket, in response to a sound -Once the child has learned to respond to the presence of sounds, he or she is taught to perform different tasks in response to different sounds; initially sounds (such as banging a drum) are made within the child's view, then behind a screen so the child must rely on auditory input only -The next stage involves using onomatopoeic sounds (such as a lion's roar) to match with pictures -Finally, the child is trained to distinguish between word pairs 	<p>Child will learn to discriminate environmental sounds and slowly progress towards discriminating spoken words</p>	<p>A tape of the session can be provided for the parent to play back to the child at home for increased stimulation</p>
<p>Reduced speech production</p>	<p>Improve child's expressive language skills</p>	<p>Cued articulation (23)</p> <ul style="list-style-type: none"> -A visual cue is provided to the child for each consonant sound -Visual cue (made with the therapist's hand), spoken sound, and written letter are presented together -Child is encouraged to create the sounds themselves 	<p>Child's sound repertoire will increase; sounds are then shaped into syllables, then into words</p>	<p>None specified</p>

Reduced participation in activities due to poor language skills	Increase child's involvement in school and family activities	Compensatory strategies -Use a visual daily schedule with pictures at home and school ^(9,23) -Use of a frequency modulation system to reduce background noise (thereby reducing distraction) and provide a louder and clearer auditory input ⁽⁹⁾	Use of strategies will increase child's participation in school and extracurricular activities	Strategies should be used at home and school
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Desired Outcomes/Outcome Measures

- › Attainment of normal or near-normal language abilities
 - BDAE-3
 - BNT
 - CAAST
 - CELF-5
 - PPVT-IV
 - TROG-2
 - TTC
- › Improved functional communication (e.g., augmentative and alternative communication [AAC], signed language)
- › Improved QOL
- › The progress of school-aged children with IEPs will be measured quarterly to yearly using goals set by the IEP team

Maintenance or Prevention

- › Maintenance of language skills should happen naturally as the child becomes comfortable with oral communication again and uses language on a daily basis. If the child, parents, or teacher notices a decline in the child's language performance, see physician immediately to rule out a new source of brain damage

Patient Education

- › The American Speech-Language-Hearing Association (ASHA) helps persons with speech, language, and hearing disorders receive services to help them communicate successfully. Resources on communication and communication disorders are available from <https://www.asha.org/public/speech/>

Coding Matrix

References are rated using the following codes, listed in order of strength:

M Published meta-analysis	RV Published review of the literature	PP Policies, procedures, protocols
SR Published systematic or integrative literature review	RU Published research utilization report	X Practice exemplars, stories, opinions
RCT Published research (randomized controlled trial)	QI Published quality improvement report	GI General or background information/texts/reports
R Published research (not randomized controlled trial)	L Legislation	U Unpublished research, reviews, poster presentations or other such materials
C Case histories, case studies	PGR Published government report	CP Conference proceedings, abstracts, presentation
G Published guidelines	PFR Published funded report	

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