



Speech, language, hearing delays: Time for early intervention?

A wait-and-see approach may not be best for the child exhibiting delayed development. This review—complete with extensive resource lists—can facilitate an expeditious referral.

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PRACTICE RECOMMENDATIONS

› Consider using age-specific published milestones, such as those found online at the American Speech-Language-Hearing Association's site, to evaluate children's developmental progress. **C**

› Consult your state's early intervention agency (cited in this article) for assistance in referring children for further evaluation and possible treatment. **C**

Strength of recommendation (SOR)

- A** Good-quality patient-oriented evidence
- B** Inconsistent or limited-quality patient-oriented evidence
- C** Consensus, usual practice, opinion, disease-oriented evidence, case series

A young mother in your practice arrives with her 2-year-old son for a well-child visit. She remarks that, although her son uses a few single words to indicate hunger and other needs, her sister's child at the same age had begun using multiple words to ask questions and express her wishes. She's concerned about whether her son's behavior is normal. As you start to engage the child, you note that he responds only after you repeat his name a few times. Are these observations indicative of a typical delay in development, or are they clues to a serious medical issue or communication disability? Given the absence of any known medical problem or evident physical or intellectual disability, how would you proceed in this case and in counseling the mother?

Developmental screening minimizes adverse long-term consequences

Speech, language, and hearing delays and disorders in children can lead to learning and socialization problems that may persist into adulthood. Health care providers who monitor speech, language, and hearing development in children can guide parents, as needed, to appropriate services for further assessment or treatment¹ and direct them to advocacy programs such as the Center for Parent Information and Resources (formerly the National Dissemination Center for Children with Disabilities).²

A useful tool at well-child visits is the Denver II, a quick developmental screening test to help identify a variety of disorders of intelligence, language, mental health, and motor and self-help skills.³

Suspicion of a developmental delay not likely due to a medical issue or congenital abnormality requiring examination by an otorhinolaryngologist could warrant referral of the child for early intervention (EI).

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TABLE 1

Average milestones for hearing, understanding, and talking: Birth to 5 years⁸

Birth to 1 year

What should my child be able to do?

Hearing and understanding	Talking
<p>Birth-3 months</p> <ul style="list-style-type: none"> Startles to loud sounds Quiets or smiles when spoken to Seems to recognize your voice and quiets if crying Increases or decreases sucking behavior in response to sound 	<ul style="list-style-type: none"> Makes pleasure sounds (cooing, gooing) Cries differently for different needs Smiles when sees you
<p>4-6 months</p> <ul style="list-style-type: none"> Moves eyes in direction of sounds Responds to changes in tone of your voice Notices toys that make sounds Pays attention to music 	<ul style="list-style-type: none"> Babbling sounds more speech-like with many different sounds, including p, b, and m Chuckles and laughs Vocalizes excitement and displeasure Makes gurgling sounds when left alone and when playing with you
<p>7 months-1 year</p> <ul style="list-style-type: none"> Enjoys games like peekaboo and pat-a-cake Turns and looks in direction of sounds Listens when spoken to Recognizes words for common items like “cup,” “shoe,” or “juice” Begins to respond to requests (eg, “Come here” or “Want more?”) 	<ul style="list-style-type: none"> Babbling has both long and short groups of sounds such as “tata upup bibibibi” Uses speech or non-crying sounds to get and keep attention Uses gestures to communicate (waving, holding arms to be picked up) Imitates different speech sounds Has one or 2 words (bye-bye, dada, mama), although they may not be clear

1 to 2 Years

What should my child be able to do?

Hearing and understanding	Talking
<ul style="list-style-type: none"> Points to a few body parts when asked Follows simple commands and understands simple questions (“Roll the ball,” “Kiss the baby,” “Where’s your shoe?”) Listens to simple stories, songs, and rhymes Points to pictures in a book when named 	<ul style="list-style-type: none"> Says more words every month Uses some 1- or 2-word questions (“Where kitty?” “Go bye-bye?” “What’s that?”) Puts two words together (“more cookie,” “no juice,” “mommy book”) Uses many different consonant sounds at the beginning of words

Communication disorders and their manifestations

Communication—the ability to receive, process, comprehend, and transmit information—is essential for a successful life.⁴ Speech, language, and hearing impairments affect a child’s ability to send (speak, write, or gesture) and receive (hear, interpret, or decipher) messages.

Speech impairments

Beginning at birth, we systematically develop speech sounds and an ability to use these sounds to convey meaning by forming words and using language.⁵ Speech and language pathologists make a distinction between speech and language impairments.⁶

Speech disorders may involve problems of articulation, fluency, voice, or resonance.

CONTINUED

TABLE 1

Average milestones for hearing, understanding, and talking: Birth to 5 years⁸
(cont'd)

2-3 Years

What should my child be able to do?

Hearing and understanding	Talking
<ul style="list-style-type: none"> • Understands differences in meaning (“go-stop,” “in-on,” “big-little,” “up-down”) • Follows 2 requests (“Get the book and put it on the table”) • Listens to and enjoys hearing stories for longer periods of time 	<ul style="list-style-type: none"> • Has a word for almost everything • Uses 2 or 3 words to talk about and ask for things • Uses k, g, f, t, d, and n sounds • Speech is understood by familiar listeners most of the time • Often asks for or directs attention to objects by naming them • Asks why? • May stutter on words or sounds

3 to 4 Years

What should my child be able to do?

Hearing and understanding	Talking
<ul style="list-style-type: none"> • Hears you when you call from another room • Hears television or radio at the same volume as other family members • Understands words for some colors, such as red, blue, and green • Understands words for some shapes, such as circle and square • Understands words for family, such as brother, grandmother, and aunt 	<ul style="list-style-type: none"> • Talks about activities at school or at friends’ homes • Talks about what happened during the day. Uses about 4 sentences at a time • People outside of the family usually understand the child’s speech • Answers simple “who,” “what,” and “where” questions • Asks when and how questions • Says rhyming words, like hat-cat • Uses pronouns such as I, you, me, we, and they • Uses some plural words such as toys, birds, and buses • Uses a lot of sentences that have 4 or more words • Usually talks easily without repeating syllables or words

4 to 5 Years

What should my child be able to do?

Hearing and understanding	Talking
<ul style="list-style-type: none"> • Understands words for order, such as first, next, and last • Understands words for time, such as yesterday, today, and tomorrow • Follows longer directions, such as, “Put your pajamas on, brush your teeth, and then pick out a book” • Follows classroom directions, such as, “Draw a circle on your paper around something you eat” • Hears and understands most of what is said at home and in school 	<ul style="list-style-type: none"> • Says all speech sounds in words. May make mistakes on sounds that are harder to say, such as l, s, r, v, z, ch, sh, th • Responds to “What did you say?” • Talks without repeating sounds or words most of the time • Names letters and numbers • Uses sentences that have more than one action word, such as jump, play, and get. May make some mistakes, such as “Zach got 2 video games, but I got one” • Tells a short story • Keeps a conversation going • Talks in different ways depending on the listener and place. May use short sentences with younger children or talk louder outside than inside

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 One study noted that primary care physicians had low confidence in providing information to families about early intervention resources.

About 8% to 9% of preschool children have speech disorders, and approximately 5% of school-age children have speech or language impairments.⁷

■ **Problems of articulation** are heard in such instances as substituting a “w” for an “r” (“wabbit” for “rabbit”) or in distorting or omitting sounds or syllables (“tato” for “potato”). Considering that articulation involves the precise coordination of about 70 muscles (tongue, lips, velum, vocal folds, etc), development of this skill normally goes through phases of inaccurate sound productions. Concerns arise when these phases persist or are atypical.

■ **Speech fluency/stuttering** is the uncontrollable blocking of speech, sound prolongation (“wwwwater”), or repetition of a sound, syllable, or word during speaking (“pu-pu-pu-puppy”).

■ **Problems of voice** include symptoms such as hoarseness, an exceptionally weak voice or one that is too high or too low, or abnormal resonance (hyper- or hyponasality, which gives the impression the child is talking “through the nose” or is constantly congested).

■ **Using common milestones as reference points.** The American Speech-Language-Hearing Association (ASHA)⁸ lists the milestones for speech development (English and Spanish) at <http://www.asha.org/public/speech/development/chart.htm>. For example, between 12 and 24 months of age, a child should be learning vocabulary (“doggie, nana”), combining 2 words (“mommy car”), asking 2-word questions (“where daddy?”), and producing a variety of speech sounds. These milestones represent an average and some children may not master all the items in a category until they reach the upper limit of the age range (TABLE 1).⁸ Roth et al⁹ found that intervention benefited preschoolers with speech and language disabilities when applied earlier than previously recommended. In other words, avoid the “wait-and-see” option. Busari and Weggelaar,¹⁰ studying referral recommendations for children who are “slow to speak,” concluded that EI may diminish further consequences later in the child’s life.

ASHA launched a campaign to increase

awareness of communication disorders across the lifespan and to encourage early identification (<http://identifythesigns.org/>).¹¹ The site has basic lists of signs of common speech and language disorders and hearing loss in children from birth to 4 years of age. This period in a child’s life is “an important stage in early detection of communication disorders.”

Language impairments

Language impairments affect 3 domains of language: form (grammar/syntax), content, or use. These domains are governed by rules specific to the language spoken in the home. Language impairment can interfere with comprehension and formulation of messages. About 2% to 3% of preschoolers have language disorders.¹²

Language impairments may be observed in one or more of the language components, including phonology (rules of the sounds in the language), lexicon (vocabulary), morphology (word markers—eg, final “s” to make the plural of “cat”), syntax (word order) and pragmatics (socially appropriate speech, gesture, eye contact, and language use).

While there is great variability in typical development, atypical language development can be a secondary characteristic of other physical or developmental problems attributed to other conditions such as autism spectrum disorder (ASD), cerebral palsy, childhood apraxia of speech, dysarthria, intellectual disability, or selective mutism.¹³

■ **Verbal communication difficulties** may appear in expressive and receptive language.¹⁴ *Receptive language* is the ability to comprehend language communicated by another person.⁶ Receptive language (processing) skills can be demonstrated as follows. If a child is asked “Do you like cats?” she must first decide to whom the question is directed (to her and not someone else). She must then search her long-term memory for the word/concept “cat” (compared with dog, a similar concept; or with mat, a similar-sounding word), and process the word “like” (compared with “dislike”). Now the child understands the question and can decide on an answer.

Expressive language is a child’s ability to speak; the mental process used to produce

TABLE 2

Resources for early identification and intervention in communication disorders

Resource	Information
American Speech-Language-Hearing Association (ASHA) www.asha.org/public/	Communication skills, milestones, disorders, and treatment resources across the lifespan; for parents and professionals
CDC's "Learn the signs. Act early" campaign www.cdc.gov/actearly/milestones/index.html http://www.cdc.gov/ncbddd/actearly/hcp/index.html	Children's developmental milestones from 2 months to 5 years; checklists for parents Children's developmental milestones and Early Intervention for health care providers
National Institute on Deafness and Other Communication Disorders http://www.nidcd.nih.gov/health/voice/pages/speechandlanguage.aspx	Speech and language development checklists
National Institute on Deafness and Other Communication Disorders http://www.nidcd.nih.gov/health/hearing/pages/silence.aspx	Hearing loss and its effects on communication; identification and management options
Center for Parent Information and Resources http://www.parentcenterhub.org/repository/ei-overview/	Early Intervention: overview and process
National Institute of Mental Health http://www.nimh.nih.gov/health/publications/a-parents-guide-to-autism-spectrum-disorder/what-are-the-symptoms-of-asd.shtml	Autism spectrum disorder; a guide for parents
First Signs, Inc http://www.firstsigns.org/	Early warning signs of autism spectrum disorder; for parents and professionals
The Autism Screening Test https://m-chat.org/about.php	Autism screening test to identify children 16-30 months who should receive a more thorough assessment for possible early signs of autism spectrum disorder or developmental delay

CDC, Centers for Disease Control and Prevention.

speech and communicate a message.⁶ To answer, "Yes, I like cats," the child retrieves the concept "cat" from memory (cognition and semantics: the meanings of words, their relationships and usage), finds the right words (vocabulary), puts them in the right order (syntax), uses the right verb tense (grammar/morphology), assembles the right sounds in order, initiates the neuromotor acts (phonology/speech production), and communicates that she understands what cats are and that she likes them (pragmatics; socially/contextually appropriate responses).

■ Resources on language development.

Typical language development, the length of which varies among children, must be practiced in a rich linguistic environment. Some children are adventurous with language. They babble, talk, and communicate in a carefree manner. Others are cautious. They may wait until they are sure of their skills before attempting a new word. Usually, concern about a child's speech and language development arises if there is no speech, if speech is

not clear, or if speech or language is different from that of peers.

The Centers for Disease Control and Prevention, under their "Learn the signs. Act early" campaign (www.cdc.gov/actearly), has published checklists of children's developmental milestones from 2 months to 5 years of age on social, communication, cognitive, and motor skills. Health care providers helping parents determine if their child's communication is developing normally can find information and materials at <http://www.cdc.gov/ncbddd/actearly/hcp/index.html>.¹⁵

Hearing impairments

Moeller et al¹⁶ surveyed 1968 primary care physicians on their attitude, practices, and knowledge of universal hearing screenings for newborns. They noted limitations in awareness of EI options for infants with hearing loss: proper times and places for referrals, available communication modalities, cochlear implant candidacy, and professionals in their locale with expertise on hearing

TABLE 3

Links to early intervention government agencies by state

Alabama	http://rehab.alabama.gov/individuals-and-families/early-intervention
Alaska	http://dhss.alaska.gov/ocs/Pages/infantlearning/default.aspx
Arizona	https://www.azdes.gov/azeip
Arkansas	http://humanservices.arkansas.gov/ddds/Pages/FirstConnectionsProgram.aspx
California	http://www.dds.ca.gov/earlystart/
Colorado	http://www.eicolorado.org
Connecticut	http://www.birth23.org/
Delaware	http://www.dhss.delaware.gov/dms/epqc/birth3/directry.html
Florida	http://www.floridahealth.gov/alternatesites/cms-kids/families/early_steps/early_steps.html
Georgia	http://www.gadoe.org/Curriculum-Instruction-and-Assessment/Curriculum-and-Instruction/Pages/Early-Intervention-Program.aspx
Hawaii	http://health.hawaii.gov/eis/
Idaho	http://www.healthandwelfare.idaho.gov/Children/InfantToddlerProgram/Earlyinterventionservices/tabid/404/Default.aspx
Illinois	http://www.dhs.state.il.us/page.aspx?item=31889
Indiana	http://www.in.gov/fssa/4655.htm
Iowa	http://www.earlyaccessiowa.org
Kansas	http://www.ksits.org
Kentucky	http://chfs.ky.gov/dph/firststeps.htm
Louisiana	http://new.dhh.louisiana.gov/index.cfm/page/139/n/139
Maine	http://www.maine.gov/doe/cds/
Maryland	http://www.marylandpublicschools.org/MSDE/divisions/earlyinterv/infant_toddlers/index.html
Massachusetts	http://www.mass.gov/eohhs/gov/departments/dph/programs/family-health/early-intervention/
Michigan	http://www.michigan.gov/mde/0,4615,7-140-6530_6809-127141--,00.html
Minnesota	http://education.state.mn.us/MDE/JustParent/EarlyLearnKReadi/HelpMeGrow/
Mississippi	http://msdh.ms.gov/msdhsite/_static/41,0,74.html
Missouri	http://dese.mo.gov/se/fs/

loss. These knowledge gaps involved some medical issues, such as hearing loss genetics and later-onset hearing loss in infants and children. They also found low confidence in providing information to families about how to proceed with EI and in discussing intervention needs and resources.

Adverse effects of hearing loss.

Hearing loss can be unilateral or bilateral, conductive or sensorineural, and can range in severity from mild to profound. According to the National Institute on Deafness and Communication Disorders (NIDCD), one in every 350 infants is born with a significant

hearing loss, and others become deaf due to childhood illness or injury.¹⁷ According to ASHA,¹⁸ hearing loss can affect children in 4 major ways:¹⁹ delays in the development of receptive (comprehension) and expressive communication skills; a language deficit that causes learning problems and reduces academic achievement; communication difficulties that often lead to social isolation and poor self-concept; and impact on vocational choices and options.²⁰ NIDCD provides a checklist to determine a child's hearing status at <http://www.nidcd.nih.gov/health/hearing/silence.asp>.¹⁷

TABLE 3

Links to early intervention government agencies by state (*cont'd*)

Montana	http://www.dphhs.mt.gov/dsd/homebasedservicestofamilies/earlyinterventionservices.shtml
Nebraska	http://edn.ne.gov/cms/
Nevada	http://health.nv.gov/beis.htm
New Hampshire	http://www.dhhs.nh.gov/dcbcs/bds/earlysupport/
New Jersey	http://www.nj.gov/health/fhs/eis/
New Mexico	http://nmhealth.org/about/ddsd/cpb/fit/
New York	http://www.health.ny.gov/community/infants_children/early_intervention/
North Carolina	http://www.beeearly.nc.gov
North Dakota	http://www.nd.gov/dhs/services/disabilities/earlyintervention/
Ohio	http://www.helpmegrow.ohio.gov/en/Early%20Intervention/Early%20Intervention.aspx
Oklahoma	http://www.ok.gov/health/County_Health_Departments/Carter_County_Health_Department/SoonerStart_Early_Intervention/
Oregon	http://www.ode.state.or.us/search/results/?id=252
Pennsylvania	http://www.portal.state.pa.us/portal/portal/server.pt/community/early_intervention/8710
Rhode Island	http://www.eohhs.ri.gov/Consumer/ConsumerInformation/Healthcare/PeoplewithSpecialNeedsandDisabilities/Children/EarlyIntervention.aspx
South Carolina	http://www.ddsn.sc.gov/CONSUMERS/EARLY-INTERVENTION/Pages/default.aspx
South Dakota	https://doe.sd.gov/oess/sped_CEIS.aspx
Tennessee	http://www.tn.gov/education/teis/
Texas	http://www.dars.state.tx.us/ecis/
Utah	http://www.utahbabywatch.org
Vermont	http://dcf.vermont.gov/cdd/cis/IDEA_Part_C_early_intervention
Virginia	http://www.infantva.org
Washington	http://www.del.wa.gov/development/esit/Default.aspx
West Virginia	http://www.wvdhhr.org/birth23/
Wisconsin	http://www.dhs.wisconsin.gov/children/birthto3/
Wyoming	http://www.health.wyo.gov/ddd/earlychildhood/index.html

■ Timing of intervention is significant.

EI is critical in minimizing the deleterious effects of hearing loss and in optimizing speech and language development. Severity of hearing loss influences EI outcome, and treatment options depend on the hearing loss having occurred either before language development (prelingually) or after (postlingually). Early management of hearing impairment can improve language, especially for children with a severe or profound hearing loss.²¹

Devices and methods that promote communication development for students who are deaf or hard of hearing include the use of

hearing aids to amplify residual hearing for oral or auditory-oral approaches; the manual approach stressing sign-language (American Sign Language or Signed English); or Total Communication using both the oral and sign-language methods.

With an infant, suspicion of a hearing problem warrants referral to an otorhinolaryngologist or an audiologist for thorough evaluation. In New Jersey, an EI referral typically triggers a referral to one of these specialists. TABLE 2 lists resources for early identification and intervention in communication disorders.

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➤ **Early management of hearing impairment can improve language, especially for children with a severe or profound hearing loss.**

Autism spectrum disorder

The fifth edition of the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*²² has revised its diagnostic codes for ASD. An in-depth analysis of the new diagnosis is beyond the purview of this article, but it deserves a few comments.

The revised diagnosis of ASD consolidates the previously separate diagnoses of autistic disorder, Asperger's disorder, childhood disintegrative disorder, and pervasive developmental disorder/not otherwise specified.²²⁻²⁴ According to *DSM-5*, an individual with ASD must have 1) persistent deficits in social communication and social interactions, 2) restricted, repetitive patterns of behavior, interests or activities, 3) symptoms present in early childhood (but may not become fully manifest until social demands exceed limited capacities), and 4) symptoms that limit and impair everyday functioning.^{22,24}

Onset of the disorder must be obvious before age 3 for a child to be eligible for EI. Children who do not qualify for an ASD diagnosis under the new *DSM-5* definition may be included in a new category called social communication disorder (SCD) under "Communication Disorders" in *DSM-5*. SCD is defined as impairment in pragmatics that impacts development of social relationships and comprehension of social conversations. ASD must be ruled out before a diagnosis of SCD can be made.^{23,24}

Early intervention services

Individual states offer EI services to families to facilitate detection of developmental delays in children and to provide a comprehensive system of support designed to reduce the effects of disabilities (or to prevent learning and developmental problems later in life).⁵ The rationale for EI is that the earlier interventions are started, the less likely later interventions will be needed.²⁵ EI services are provided to children from birth through their third birthday; services are free of charge to eligible families or on a sliding payment scale determined by a family's income.

■ **Resources for information and referrals.** To access EI services on behalf of a family, contact a local hospital or point them to the CPIR (<http://www.parentcenterhub.org/repository/disability-landing/>).² For families with disabled children older than 3, consider suggesting that parents contact the local school district (even if the child isn't enrolled there) to arrange an evaluation under the Individuals with Disabilities Education Act (<http://idea.ed.gov/>).²⁶ Because individual states' EI organizations may have slightly different procedures, it is best to consult one's own state EI site for specific information regarding referrals (TABLE 3).

Efficacy of treatment

The prevalence of specific communication disorders varies widely, as do prognoses, possibly due to the variability of underlying causes (physical/biological/medical or environmental/educational).²⁷ Also, as described earlier, "communication disorder" is an umbrella term inclusive of problems as diverse as resonance (eg, hypernasality due to a submucous palatal cleft), severe language delay (eg, due to Down syndrome), or lisp (misarticulation of the "s" sound).

Is therapy effective? Speech and language pathologists use the National Outcomes Measurement System (NOMS) as an index of the outcomes of treatment on functional communication along 6 scales. The most frequent types of communication problems seen in the prekindergarten children's NOMS were "articulation" (75% of children), "spoken language production" (61%), and "spoken language comprehension" (42%). Problems in the remaining 3 scales ("pragmatics," "cognitive orientation," and "swallowing") were seen in fewer than 15% of the preschool-age students.²⁸

Articulation therapy yielded improvement in 69.3% of cases, spoken language comprehension therapy in 65.3%, and spoken language production therapy in 65.2%.²⁸ Such outcomes support regular screening of children's communication development and, as needed, referral for EI. **JFP**

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Children who don't meet DSM-5 criteria for autism spectrum disorder may be included in a new category called social communication disorder.