Speech and language are core skills in the development of young children. They are markers of cognitive and social development, and also indicate certain features of motor development. Pediatricians routinely evaluate speech and language in well-child visits during the toddler and preschool years, as part of the developmental screening recommended by the American Academy of Pediatrics and the Center for Disease Control and Prevention [1]. Studies have indicated that speech and language delays occur at prevalence rates of 2% to 19%, depending upon how they are defined [2]. The purpose of this article is to discuss screening for language problems in a pediatric office setting.

Language and speech are distinguished for professional purposes. Speech refers to the production of sounds for the communication act. Language typically refers to four domains, each with a distinctive role. Language includes the rules that assign meaning to words and strings of words (semantics), the rules for combining words into phrases and sentences (syntax), the rules for combining the sounds of language (phonology), and the rules for the social use of language (pragmatics). Language skills include both reception and expression; that is, the child has an ability to understand an incoming message, and formulate and express an outgoing message. Language is commonly thought of in its spoken form, but it can also include a visual form, such as American Sign Language, which has all the key components of language, including a grammar system.
Atypical development of language can be classified as disordered or delayed. Delayed language will progress in a typical sequence, but at a slower rate than is normal. In contrast, disordered language has a different quality as it emerges. Certain language structures might appear out of order from the typical pattern of development. For example, a child can speak a well-formed sentence, but cannot answer “wh-” questions. Or, for another example, the child can comprehend an “if ..., then ...” conditional from a parent, but cannot properly use pronouns. The distinction between delayed and disordered language is often helpful in differential diagnosis of developmental disorders.

Delayed and disordered language can occur as a primary condition, such as a language disorder or a specific language impairment (SLI). Atypical language development is also a secondary characteristic of other physical and developmental problems that are often first manifested by language problems. These include hearing loss, mental retardation, autistic spectrum disorders, and learning disabilities. Speech problems can signal a specific physical disorder, such as speech apraxia (ie, a coordination disorder of speech articulators) or dysarthria (ie, impaired muscular function in speech production), or other neuromuscular disorders (eg, cerebral palsy) that affect speech production. Some children will show a phonological disorder that affects their ability to process speech sounds. Speech production problems can occur independently of language. Some children who have apraxia, phonological disorders, or cerebral palsy have typical language development. On the other hand, these speech disorders can co-occur with language difficulties. A combined speech and language delay occurs in 5% to 8% of preschool-aged children [2]. The majority of preschool-aged children who have language problems continue to show some form of language problem or learning difficulty throughout their childhood years, whether or not they receive intervention [3–6].

Hearing loss that is severe enough to affect language development and learning occurs in 1 to 6 per 1000 children [7]. Hearing loss will typically cause a delay in language development, rather than a disorder, during the early years of a child. Children who have hearing loss might have a reduced rate of vocabulary development, and continue to show delays in development of syntax and expanded phrases. Furthermore, they sometimes show distortions of speech sounds and prosody patterns. For these reasons, a child presenting with atypical articulation or rhythm of speech may have hearing loss, in addition to, or as a cause of, a speech disorder.

Children who have mental retardation will show a delay in development of language. Children who have mild cognitive impairment will use speech as preschoolers, but manifest delays in vocabulary development and the use of phrases. Children who have more severe impairment sometimes do not use words during their preschool years [8,9].

Children who have autistic spectrum disorders usually show a pattern of language disorder as a key component of their impairment. They may have
phonological, syntactic, semantic, or pragmatic impairments. The diagnosis of autism requires three criteria: impaired communication, impaired social interaction, and repetitive behaviors/circumscribed interests. Some young autistic children will not express any words and have limited receptive language. Others might show a disordered pattern of language. For example, they might use echolalia (ie, repeating verbatim what others have said), but cannot generate their own novel phrases. Children who have autism, even if they do well in the systematic domains of language (phonology, syntax, semantics), nevertheless commonly show significant pragmatic difficulties in their inability to initiate or sustain a conversation. It is noteworthy that approximately three fourths of autistic children also have mental retardation [10]. Therefore, autistic children who have co-occurring mental retardation might be delayed in using any expressive language, whereas autistic children who have milder cognitive impairment might speak, but show a disordered pattern of language.

Language disorders can be a primary problem that is a separate and unique condition. It is variously referred to as an expressive or mixed receptive-expressive language disorder [11], or an SLI [12]. Language disorders are often implicated in subsequent learning disabilities, such as dyslexia. Prevalence studies indicate that one third to one half of school-aged children who have SLI also have reading disorders [13]. Furthermore, approximately one half of children who have psychiatric disorders also have language impairments [14,15]. A pediatrician should think about the possibility of a language delay/disorder whenever a child presents with significant behavioral problems.

Warning signs

A toddler or preschool child who has a language disorder might often be first identified in a pediatrician’s office during a well-child check. Some parents might worry that their child has a hearing loss or a speech delay, and voice their concerns to the pediatrician. These are often parents who have older children, or who have had other experiences around young children, and therefore have a tacit sense of typical language development in children. They might comment that the child seems to have “selective hearing,” in that sometimes the child responds to what is said and other times does not. Other parents, who do not have as much experience with young children, might not voice any concerns about communication delay. In this second situation, the pediatrician might be the first to note an atypical pattern of communication during a well-child examination.

The following seven clinical case descriptions illustrate how children who have atypical language development might present in the pediatrician’s office.
Case 1: the child who has delayed onset of words

One situation is that of a child who does not use any words, or even word approximations, at 15 months of age. Sometimes the parents will realize that this represents a delay in language development. They might contrast this child’s delay in using words with the language development of older siblings or cousins. They may understand the general rule of thumb to expect first words around the first birthday. Sometimes the parents do not immediately recognize the delay, but reveal it in discussion with the pediatrician who is reviewing the child’s development. In retrospect, the parents report that the child did not coo or babble much during infancy. The parents might have described this child as a quiet baby who was not fussy or demanding.

Case 2: the shy toddler

A second scenario is of a toddler (18–24 months of age) who seems shy in the pediatrician’s office. The child might not talk to the pediatrician, and might not respond to requests such as, “Show me your nose.” It is important that the pediatrician not dismiss this as shyness during a medical examination. Rather, the pediatrician should inquire if this behavior is typical for what the child is like at home. If this lack of communication is typical for the child’s behavior at home, then the child’s behavior does not represent shyness, but more likely represents a significant communication delay. In contrast, the parents may report that the child’s use of speech and language at home is consistent with typical development, such as using 100 to 200 words and combining them in short phrases. In this variation, the pediatrician should further interview the parents to determine if the reticence to talk seems specific to the medical appointment, or if the child shows a more generalized reticence to speak when outside the household, including with more familiar persons such as extended family members. If the reticence is specific to the medical visit, the pediatrician can monitor the child’s progress over the next several visits. If the reticence seems generalized, the pediatrician might want to consider the possibility of selective mutism, and refer the child to a mental health practitioner for an evaluation [16].

Case 3: the child who gestures but does not speak

This is a situation of a child who uses gestures but not words. The child might use extensive gestures such as nodding/shaking the head, pointing, shrugging, and showing objects. Some children even include sound effects to signify objects, but not use words. The gesturing suggests that the child is motivated to communicate, but lacks expressive ability. This pattern can be suggestive of a motor speech disorder, such as apraxia, or of a hearing loss.
Case 4: the child who does not seem to understand words

Another scenario is of a child who does not seem to hear or listen. The child does not turn to look when a person calls the child’s name and does not inhibit when admonished, “No!” Parents may speculate that the child is willfully ignoring them, or that the child has an “attention problem”; however, over time they notice that the child does not seem to recognize other words, even when the child is attentive to the parents. For example, the child does not seem to recognize or look at objects or people named by the parents. Obviously, a first hypothesis for this is hearing loss; however, some children will show this pattern even after a recent hearing examination reveals normal hearing acuity. This situation is suggestive of a receptive language problem or mental retardation.

Case 5: the child who has language regression

Some children will present with a history of language regression. Parents will report to the pediatrician that the child was saying words between 12 and 18 months, and then stopped saying words. Language regression is sometimes implicated in autism. About one fourth of autistic children show developmental regression between 15 and 21 months [17]. This includes loss of words (usually at the stage of the first 10 words), and regression of other social interests. One must be careful in interpreting this type of regression, however; a careful interview of the parents might indicate that the child had a history of atypical development, including in social interaction, before the regression, and that the few words that were used and then lost might not have been used meaningfully. Furthermore, there are no systematic studies that compare prevalence of regression among children who have autism, specific language impairment, and mental retardation. This early type of language regression might suggest some type of atypical development, but it has not been proven to be a unique and specific indicator of autism [18]. In contrast, a more severe pattern of regression occurs with a smaller group of autistic children (approximately 8%) after the second birthday, and includes the loss of phrases of two or more words. This more profound regression is associated with autism and disintegrative disorders such as Rett syndrome and childhood disintegrative disorder [17].

Case 6: the child who uses echolalia

Sometimes a pediatrician will meet a preschooler who uses echolalia, which is repeating verbatim what someone else has said. With immediate echolalia, the child repeats back what has just been said. With delayed echolalia, the child repeats a phrase, sentence, or even a passage that was previously heard, such as a line from a favorite movie. Echolalia is not unique to autism, but frequently represents disordered language. Younger children who have typically developing language commonly use short holistic
phrases (e.g., uttering a formulaic phrase without any type of grammatical analysis). For example, when children acquire a 100-word vocabulary, this includes about 20 phrases [19]. Children who have disordered language often show a pattern of syntactic impairment, however. They have difficulty analyzing the grammar of messages that come to them, and they have difficulty building grammatically sound expressive utterances. In lieu of their own unique phrases, they might substitute memorized, holistic phrases. This over-dependence on holistic phrases is a marker of atypical, disordered language. Children who have various language-based disorders demonstrate this, including children who have specific language impairment or autism.

Case 7: the child who has suspected hearing loss

A child may present with suspected hearing loss. The American Academy of Pediatrics recommends that if a parent is concerned that a child cannot hear, the pediatrician should assume that this concern is true until the child can be fully evaluated [7]. With the advent of neonatal hearing screening, many congenital hearing problems are identified at birth. In the United States, 45 states and the District of Columbia have legally mandated or voluntary compliance programs to screen newborn hearing [20]. Not all childhood hearing loss can be identified at newborn screening, however, because of the less than 100% accuracy of screening tests, because of progressive hearing loss, and because of acquired hearing loss caused by known or unknown etiology [7,21]. Post-lingual hearing loss (i.e., hearing loss after spoken language is established) is sometimes difficult to pick up at first, because it often has a gradual effect on language. Signs of progressive post-lingual hearing loss include a parent report that the child does not seem to be listening, a gradual decline in the precision of speech articulation, a lack of progress in vocabulary acquisition, and a pattern of the child speaking better than listening.

Screening measures for language development

The US Preventive Services Task Force evaluated the use of brief, formal screening instruments for speech and language delays in young children that can be used in a primary care setting [1,2]. The Task Force focused on measures which require 10 minutes or less to complete—a necessary criterion in busy clinical settings. The results indicated that there was no sufficient evidence that screening instruments are any more reliable or effective than using physician observations or parental concerns to identify children who need further evaluation. The Task Force noted that there is no single “gold standard” for screening, because measures and terminology are used inconsistently. The Task Force recommended further research in this area, but did not recommend the use of screening instruments. It noted
that in clinical evaluations, the most salient risk factors for speech and language problems include family history of speech/language delay, male gender, and perinatal factors. Family history should cover three generations to include siblings, parents, and grandparents. Speech/language delays in relatives might present in different variations, including late talkers, learning disabilities, dyslexia, special education services, history of speech therapy, or stuttering. Perinatal factors include preterm, low birth weight, birth difficulties, toxemia, and poor sucking [2].

Many of the formal screening measures are compilations of items from more extensive developmental inventories. It appears that the creators of the instruments tried to identify the most salient items for the screening measures. The Task Force determined that the use of the formal measures was not time or cost efficient, and deferred to pediatrician and parent concerns as indicators of potential problems. This leaves the question of what are reasonable indicators for a pediatrician’s clinical evaluation of a child. Table 1 offers guidelines for raising concerns and referring a child to a specialist for further evaluation. Items for this chart were taken from four sources of normal development of language skills: Denver Developmental Screening Test II [22], the Rossetti Infant-Toddler Language Scale [23], and schedules of language development from the American Speech-Language-Hearing Association [24] and the Child Development Institute [25]. Table 1 identifies items at age levels that exceed norms by 25% to 50%, as well as adding noteworthy clinical features of echolalia and regression.

**Referrals**

Children’s speech and language can be evaluated at any age when there is a suspicion of delay or disorder. The most common referral is to a speech-language pathologist for an evaluation. Some speech-language services, such as at a hospital or clinic, might have audiological services associated with them. In such settings, a hearing examination is part of the assessment protocol. If the speech-language service does not have audiology services available, or if the pediatrician suspects that hearing loss is the primary problem, then the pediatrician should make a direct referral to an audiologist or an otologist for a hearing evaluation.

The US federal IDEA law (Individuals with Disabilities Education Act) requires that special education services be provided to children who have learning difficulties, including those who have speech, language, and hearing problems. Each state has its own procedures for implementing that law, but has services available for children from birth to 21 years of age. The early intervention services in a particular state can provide speech-language evaluations of toddlers and preschoolers upon parent request. This is an appropriate resource for a pediatrician who suspects atypical language development. In addition, speech-language pathologists are available at
hospitals, clinics, and in private practice. They have standard methods for assessing language difficulties, and can make recommendations regarding treatment and intervention. This early intervention is available through the state education system. In addition, some children can obtain private therapy services. Early intervention for speech and language problems is often effective in improving communication skills, when compared with no treatment [2]. A meta-analysis of treatment with young children who have speech and language difficulties, and no co-occurring conditions, shows promising results [26]. Children who have expressive phonological or language difficulties show significant improvement with treatment. There is mixed evidence for the efficacy of treatment for children who have expressive syntax problems, although it appears that intervention for this type of problem is more effective if the child does not also have receptive language difficulties. Current evidence is inconclusive for the efficacy of treatment with children who have receptive phonology or language problems. Interventions of longer duration (>8 weeks) appear to be more effective than interventions of shorter duration.

### Parent counseling

A pediatrician who identifies atypical language development in a child will need to discuss this concern, and an appropriate referral, with the child’s parents. In this context, the pediatrician counsels the parents about the suspected problem and how it should be managed. The goals of such
counseling are to provide hope and information. Hope focuses on reassuring the parents that there are things they can do to improve their child’s situation. The pediatrician can reassure the parents that there are professionals and services available to their child, so the parents do not have to face this alone. The goal of information is to help the parents have a clear understanding of their child’s problem, while minimizing any misunderstanding or misinterpretation of the situation.

In meeting the information goal, the pediatrician should be careful not to prematurely diagnose the child’s problem before the child has had a thorough evaluation by a specialist. For example, because autism is such a publicly recognized disorder, it is a common mistake for parents, and some professionals, to assume that an early language disorder automatically signals autism. The lay public has been sensitized to autistic symptoms, which include communication problems; however, the public is less well-versed on other developmental disorders that also have language impairment as a symptom, such as mental retardation and specific language impairment. If possible, the pediatrician should focus the discussion on the behaviors of the child, rather than the diagnosis of the child. Talk with the parents about verbs—what the child does—rather than nouns—what the child is. The pediatrician can express concern about the child’s behaviors (ie, problems with language), and can talk to the parents about the need for further evaluation by specialists. As much as possible, the pediatrician should defer differential diagnosis to the specialists.

If the parents bring up concerns about a specific diagnosis, such as autism, then the pediatrician can expand their range of information. For example, the pediatrician might confirm that the language disorder could possibly reflect autism, but that there are other disorders that are also associated with disordered language. The point is to help the parents stay open to various possibilities and not become prematurely set in understanding the child’s difficulty in one particular way. The pediatrician can explain other possible diagnoses that might be in play. Although it can be unsettling for parents to hear of the possibility of mental retardation, this is unlikely to be any less upsetting than a diagnosis of autism. If the parents can consider the possibility of autism, then they can hear alternatives that include other significant impairments.

Following the child’s development over time is an important diagnostic tool for counseling parents. The child’s changes and response to intervention over time can clarify the scope and persistence of the child’s problems. As the child’s communication skills improve, one can determine if other behavioral or developmental problems persist, or if these co-occurring problems improve along with the communication. For example, a child’s social behavior is often linked with the level of communication facility [27]. A young child’s social isolation may appear to be a primary disorder, such as attributable to autism; however, as the child’s communication improves, the child might have more skills to expand on social opportunities with
adults and children. If social behavior and interests improve with communica-
tion progress, this argues against a primary social deficit seen in autistic
disorders. Furthermore, recognition of this social behavior-communication
link can help parents understand why their child behaves in a certain way,
and can help them learn more effective techniques in managing behavior
problems (eg, use management techniques adjusted to communication level
rather than chronological age).

The child’s periodic visits with the pediatrician afford an opportunity for
the pediatrician to review the child’s rate of progress with the parents. During
these reviews, it is helpful to note the child’s intra-individual changes since the
previous visit, and not merely focus on the child’s current status compared
with age-based norms. This focuses on the positive growth of the child, rather
than accentuating the child’s continuing differences with typical development.

With the other counseling goal of hope, the pediatrician can also focus on
verbs, what parents can do to help their child, rather than nouns, what their
child is. Many parents are anxious and concerned for their child. The pedi-
atrician can reduce anxiety by giving parents activities to bind their anxiety
into constructive action. For example, a pediatrician can recommend a par-
practical ideas on how to use toys and books in a developmentally appropri-
ate manner to stimulate communication with their children. It provides
many specific suggestions, and offers developmental guidelines to help par-
ents understand where their child’s developmental skills fall in a sequence.
Another helpful book for parents is Childhood Speech, Language, and
Listening Problems [29], which explains different communication problems
and advises parents on resources that are available for helping their child.
By recommending books such as these, the pediatrician provides hope to
parents by giving them positive activities, so they can do something to
improve their child’s problem.

Hope is also offered by reassuring parents that they are not alone in their
quest to determine what is wrong with their child and how to improve that sit-
tuation. The pediatrician can explain that with a referral, the parents will meet
knowledgeable specialists who will help the parents further investigate the lan-
guage problem. The pediatrician can explain to the parents that there are a va-
riety of services and programs available for children who have communication
problems, and that children often improve in their communication abilities.
Wise pediatricians do not offer false hope—that everything will be okay.
Rather, they offer the realistic hope that there are professionals who can
work with the children and parents, after an appropriate diagnosis is made,
and that many times the children show positive response to such programs.

Summary

In summary, atypical language development is an important symptom of
a variety of developmental difficulties. At the present time, parent and
pediatrician impressions of atypical communication are as good an indicator of problems as any type of formal screening measure. A pediatrician should be aware of the range of problems that can be represented by a language disorder, and subsequent articles discuss these implications in more detail. The pediatrician is usually the lead person in spotting atypical development. Whenever a communication disorder is suspected, children are old enough for an evaluation by specialists. Early intervention with speech and language therapy is often effective in helping to improve a child’s communication disorder. Pediatricians can effectively counsel parents by using the guiding principles of providing hope and information.

References