

the child who stutters: to the pediatrician

6th edition



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Risk Factor Chart

Place a check next to each that is true for the child

Risk Factor	Elevated Risk	True for Child
Family history of stuttering	A parent, sibling, or other family member who still stutters	
Age at onset	After age 3½	
Time since onset	Stuttering 6–12 months or longer	
Gender	Male	
Other speech production concerns	Speech sound errors or trouble being understood	
Language skills	Advanced, delayed, or disordered	

Please see pages 4 and 5 for more information.

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6th edition

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The Child Who Stutters: To the Pediatrician

Etiology

Although the etiology of stuttering is not fully understood, there is strong evidence to suggest that it emerges from a combination of and interaction between constitutional and environmental factors.^{3,14,36,40,42,43} Geneticists have found indications that a susceptibility to stuttering may be inherited and that it is more likely to occur in boys.^{10,12,17,18,22,32,43} Further support for inheritance comes from twin studies that have demonstrated a higher concordance for stuttering among both members of identical twin pairs than fraternal twin pairs.^{3,42} Congenital brain damage is also suspected to be a predisposing factor in some cases. For most children who stutter, however, there is no clear evidence of brain damage.^{3,22,43}

Brain imaging studies conducted in many laboratories throughout the world indicate

Take-Home Message

Parents don't cause stuttering, but there is a lot they can do to help.

Suggestions for parents can be found on the inside of the back cover.



that adults who stutter show distinct anomalies in brain function.^{2,4,9,11,16,26,38} Young children who stutter also may show differences in brain structure and function that resolve for those who recover, but may remain for those for whom stuttering persists.^{5,6,7,13,15,23,25,37} In contrast with typical speakers, individ-

uals who stutter may show deactivation of left-hemisphere sensorimotor centers and overactivation of homologous right-hemisphere structures during both stuttered and nonstuttered speech. It is hypothesized that the essential defect is a lack of sensorimotor integration necessary to regulate the rapid movements of fluent

The term "disfluency" means a hesitation, interruption, or disruption in speech. It may be normal or, as in the case of stuttering, it may be abnormal.

The terms "speech-language pathologist" and "speech clinician" are used interchangeably to refer to a person professionally educated in the assessment and treatment of stuttering.

Risk Factor Chart <i>Place a check next to each that is true for the child</i>		
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speech. Both temporary fluency (induced through singing or choral reading) and longer-lasting fluency (as a result of treatment) appear to positively influence the activation patterns.^{3,27,29,31}

The onset of stuttering is typically during the period of intense speech and language development as the child is progressing from greater use of two-word utterances to the use of complex sentences, gen-

erally between the ages of 2 and 5, but sometimes as early as 18 months. The child’s efforts at learning to talk and the normal stresses of development in the social context may be the immediate precipitants of the brief repetitions, hesitations, and sound prolongations that characterize early stuttering as well as typical disfluency.^{1,3,8,20,21,28,33,41} These first signs of stuttering gradually diminish and then dis-

appear in most children, but some children continue to stutter. Some may begin to exhibit longer and more physically tense speech behaviors as they respond to their speaking difficulties with embarrassment, fear, or frustration, and/or in efforts not to stutter. Prognosis for positive outcomes is more likely if referral to a speech-language pathologist for parent counseling and treatment is made before the child has developed a serious social and emotional response to stuttering.^{14,19,24,30,31,34,39}

Prevalence, Incidence, and Risk Factors for Chronicity

About 5% of all children go through a period of stuttering that lasts six months or more. Three-quarters of those who begin to stutter will recover by late childhood, leaving about 1% of the population with a long-term problem. The sex ratio for stuttering appears to be almost equal at the onset of the disorder, but studies indicate that among those children who continue to stutter, that is, school-age children, there are three to four times as many boys who stutter as girls.^{3,14,20,22,33,35,43}

Risk factors that predict a persistent problem rather than natural recovery include the following:^{1,14,21,35,37,41,42,43}

• Family history

There is now strong evidence that about 60 percent of all children who stutter have a family member who stutters. The risk that the child is actually stuttering instead of just having typical disfluencies increases if that family member is still stuttering. There is less risk if the family member outgrew stuttering as a child.

• Age at onset

Children who begin stutter-

ing before age 3 1/2 are more likely to outgrow stuttering; if the child begins stuttering before age 3, there is a much better chance the child will outgrow it within 6 months.

• Time since onset

Between 75% and 80% of all children who begin stuttering will show improvement within 12 to 24 months. If the child has been stuttering longer than 6 months or if the stuttering has worsened, he may be less likely to outgrow it on his own. If he has been stuttering longer than 12 months with no improvement, there is an even smaller likelihood he will outgrow it.

• Gender

Girls are more likely than boys to outgrow stuttering. In fact, three to four boys continue to stutter for every girl. Why this difference? First, it appears that during early childhood, there are innate differences between boys' and girls' speech and language abilities. Girls tend to talk (and stutter) earlier and before other skills (e.g., speech motor control) are well developed. Second, during this same period, parents, family members, and others often react to boys somewhat differently than girls. Therefore, it may be that more boys stutter than girls because of basic differences in boys' speech and language abilities and differences in their interactions with others.

• Other speech and language factors

A child who speaks clearly with few, if any, speech errors would be more likely to outgrow stuttering than a child whose speech errors make him difficult to understand. If the child makes frequent speech errors such as substituting one sound for another or leaving sounds out of words, or has trouble following directions, there should be more concern. Some children who begin stuttering have expressive and/or receptive language difficulties.

Longitudinal research studies by many investigators including Drs. Ehud Yairi and Ncoline G. Ambrose and colleagues at the University of Illinois provide excellent information about the development of stuttering in early childhood. Their findings are helping speech-language pathologists determine who is most likely to outgrow stuttering versus who is most likely to develop a lifelong stuttering problem. Research reports include:

Yairi, E., & Seery, C.H. (2023). *Stuttering: Foundations and Clinical Applications, Third Edition* (in press). Plural Publishing, Inc.

Ambrose N.G., Yairi E., Loucks T.M., Seery C.H., Throneburg R. (2015). Relation of motor, linguistic and temperament factors in epidemiologic subtypes of persistent and recovered stuttering: Initial findings. *Journal of Fluency Disorders*, 45:12-26. doi: 10.1016/j.jfludis.2015.05.004. Epub 2015 Jun 1. PMID: 26117417; PMCID: PMC4546885.

Yairi, E., & Seery, C.H. (2015). *Stuttering: Foundations and clinical applications*. Pearson.

Yairi E. (2013). Defining stuttering for research purposes. *Journal of Fluency Disorders*, 38(3):294-8. doi: 10.1016/j.jfludis.2013.05.001. Epub 2013 Jun 6. PMID: 24238391.

Yairi, E. & Ambrose, N. (2013). Epidemiology of stuttering: 21st century advances. *Journal of Fluency Disorders*, 38(2) 66-87.

Yairi, E. & Ambrose, N. (2005). *Early Childhood Stuttering: For Clinicians by Clinicians*, ProEd, Austin, TX.

Yairi, E. & Ambrose, N. (1999). Early childhood stuttering: Persistence and recovery rates. *Journal of Speech, Language, and Hearing Research*, 42, 1097-1112.

Ambrose, N. & Yairi, E. (1999). Normative disfluency data for early childhood stuttering. *Journal of Speech, Language, and Hearing Research*, 42, 895-909.

Yairi, E. & Ambrose, N. (1992). A longitudinal study of stuttering in children: A preliminary report. *Journal of Speech, Language, and Hearing Research*, 35, 755-760.

Take-Home Message

Stuttering is not only about overt moments of stuttering but also about its impact on overall communication.

Others are well within the norms or above in language skills. **In fact, advanced language skills may be more of a risk factor for some children whose stuttering persists. However, severity at onset is not necessarily indicative of chronicity.**^{3,28,35,37,42}

At present, none of these risk factors appears, by itself, sufficient to indicate a persistent problem; rather it is the cumulative or additive nature of such factors that appears to differentiate children for whom stuttering comes and goes versus those for whom stuttering comes and stays.

Physician's Role

The physician is often the first professional to whom a parent turns for help.³⁹ Knowing the difference between typical developmental speech disfluency and potentially chronic stuttering enables the physician to advise parents and refer when

appropriate. Early intervention for stuttering—which may range from parent counseling and indirect treatment to direct instruction—can be a major factor in preventing and/or decreasing the impact of persistent stuttering.

Data from several different treatment approaches indicate substantial recovery if treatment is initiated in the preschool years.^{3,14,21,30,31,34}

Differential Diagnosis

Typical developmental disfluency and early signs of stuttering may be highly similar. Thus, diagnosis of a stuttering problem is made holistically. It is based upon both direct observation of the child and information from parents about the child's speech in different situations and at different times. Stuttering is highly influenced by communication context. The following section should help the physician make appropriate referrals as needed.

Typical Disfluency

Between the ages of 18 months and 7 years, many children pass through stages of speech disfluency associated with the complexities of learning how to talk. Children with typical disfluencies between 18 months and 3 years will exhibit easy,

effortless repetitions of sounds, syllables, and words, especially at the beginning of sentences. These occur usually about once in every 10 sentences.

After 3 years of age, children with typical disfluencies are less likely to repeat sounds or syllables but will instead repeat whole words (I-I-I can't) and phrases (I want...I want... I want to go). They will also commonly use fillers such as "uh" or "um" and sometimes switch topics in the middle of a sentence, revising and leaving sentences unfinished. This also is true of children learning more than one language.

All children may be disfluent at any time and are likely to increase their disfluencies when they are tired, excited, upset, have a lot to say, or when they feel rushed to speak. They also may be more disfluent when they ask questions or when someone asks them questions.^{21,24}

Their disfluencies may increase in frequency for several days or weeks and then be hardly noticeable for weeks or months, only to return again.

Many children with typical disfluencies appear to be unaware of them, showing no signs of tension, struggle, or frustration. Parents show a wider range of reactions to typical disfluencies than their children do. Many parents will not notice their child's

disfluencies or will treat them as typical or expected.

However, some parents may be more sensitive to or less knowledgeable about speech development and will become concerned and have questions about typical disfluencies. These parents often benefit from referral to a speech clinician. Follow-up information about stuttering and suggestions for responding positively to their children's attempts to speak will be beneficial.

Milder Stuttering

Milder stuttering may begin at any time between the ages of 18 months and 7 years but frequently begins between 2 and 5 years when language development is particularly rapid. Some children's stuttering first appears under conditions of normal stress, such as when a new sibling is born or when the family moves to a new home.

Children who stutter mildly may show the same sound, syllable, and word repetitions as children with typical disfluencies but may have a higher frequency of repetitions overall as well as more repetitions each time.

For example, instead of one or two repetitions of a syllable, they may repeat it four or five times, as in "Ca-ca-ca-ca-can I have that?"

They may also occasionally prolong sounds, as in

Take-Home Message

Early treatment for children who stutter is important and can make a difference.

"MMMMommy, it's mmmmy ball." In addition to these speech behaviors, children with milder stuttering may show signs of reacting to their disfluencies.

For example, they may blink or close their eyes, look to the side, or tense their mouths when they stutter.

Another sign of milder stuttering is an increase in the consistency of the presence of disfluencies. As suggested earlier, typical disfluencies will appear for a few days and then disappear. Mild stuttering, on the other hand, tends to appear more regularly. It may occur only in specific situations, but it occurs in these situations more frequently. A third sign associated with milder stuttering is that the child may not be deeply concerned about the problem but will notice it and may be temporarily annoyed or frustrated by it. Children whose stuttering is milder may even ask their parents why they have trouble talking.

Parents' responses to milder stuttering will vary.^{14,21,24,30} Most will be at least mildly concerned

about it and wonder what they should do and whether they have caused the problem. These parents will need reassurance that they do not cause stuttering. They need suggestions for responding naturally and positively. A few will truly not notice it; still others may be quite concerned. Concerned parents often benefit from referral to a speech clinician.

More Severe Stuttering

Children with more severe stuttering usually show signs of physical struggle, increased physical tension, and attempts to hide their stuttering and/or avoid speaking. Although severe stuttering is more common in older children, it can begin anytime between ages 1½ and 7 years. In some cases, it appears after children have been stuttering mildly for months or years. In other cases, more severe stuttering may appear suddenly and consistently from one day to the next.

More severe stuttering is characterized by speech disfluencies

in practically every phrase or sentence; often moments of stuttering are one second or longer in duration. Prolongations of sounds and silent blockages of speech are common.

The child with more severe stuttering, may, like the child stuttering mildly, exhibit behaviors associated with stuttering moments: eye blinks, eye closing, looking away, or physical tension around the mouth and other parts of the face. Moreover, some of the struggle and tension may be heard in a rising pitch of the voice during repetitions and prolongations. This child may also use extra sounds like “um,” “uh,” or “well” to begin a word on which he expects to stutter or when he is stuck and can’t get the first sound out.

This stuttering is more likely to persist, especially in children who have been stuttering for 18 months or longer, although even some of these children will naturally recover.

The frustration and embarrassment associated with real difficulty in talking may create a fear of speaking and impact the child’s willingness to talk and engage in communication. For example, they may appear anxious or guarded in situations in which they expect to be asked to talk and may refuse to speak. While the child’s stuttering will probably occur every day, it will likely be more apparent on some days than others.

Parents of children who stutter more severely inevitably have some degree of concern about whether their child will always stutter and about how they can best help. Many parents may wonder why their child is stuttering and feel responsible for the problem. Most are concerned about the impact on their child’s communication across settings.

Parents will benefit from information about stuttering and suggestions for encouraging their children to keep talking and communicate their thoughts and feelings. Some guidelines are summarized in Table 1 on page 14.

Referral to a speech clinician for follow-up is typically helpful for parents and their children.

Counseling Parents

Counseling Parents of a Child with Typical Disfluencies

If a child appears to be typically disfluent in everyday speaking environments, parents should be reassured that these disfluencies are like the mistakes every child makes when he or she is learning any new skill, like walking, writing, or bicycling. Parents should be advised to accept the disfluencies without any discernable reactions or comments.

Parents may find it helpful to speak with their child in an unhurried way, use shorter, simpler sentences, and ask fewer direct questions when the child is having a hard time speaking.

They will also want to arrange times the child can talk to them in a quiet, relaxed environment without outside interference, such as TV, electronics, phones, or other people. They should not instruct the child to talk more slowly or to say a disfluent word over again. Instead, they should concentrate on calmly listening to what their child is saying — focus on the *message* (i.e., what their child is trying to tell them) — during one-on-one talking times. We call them “special times” in our video *7 Tips for Talk with the Child Who Stutters*, which is available at www.StutteringHelp.org/videos.

Counseling Parents of a Child with Milder Stuttering

Parents of the child who has a milder stuttering problem should be advised not to show concern or alarm but instead be patient listeners as much as possible. Their goal is to provide a comfortable speaking environment and to minimize the child’s frustration.

Parents are usually upset when their child repeats sounds or words, but they should be reassured that

these are just slips and tumbles as the child is learning to match his ability to speak with the many ideas he wants to express.

If the parents let the child know that stuttering is acceptable to them, this can help the child's speech and language develop without increased physical tension and struggle.

They should also be encouraged to talk openly about talking just as they would any other topic (e.g., a skinned knee).

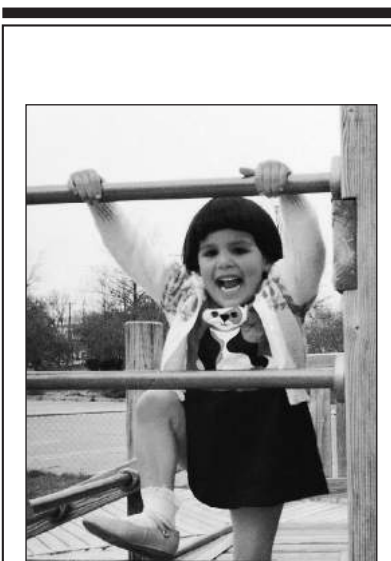
While parents may provide models of a more relaxed way of speaking, they should refrain from criticizing, showing annoyance, or telling the child to "slow down" or "stop talking."

It is also important for parents to provide daily opportunities for one-on-one conversations with the child in a quiet setting, starting with one-on-one time lasting 5 to 10 minutes, every day, if possible.

These are times when the child has chosen the activity and can experience the enjoyment of talking about anything he or she wants.

If the child asks about the problem, parents should talk about it matter of factly:

"Learning to talk is really complicated. It takes time, and lots of children get stuck on their words. It's okay; it's a lot like learning to ride a bike. It's a little bit tricky at first."



Take-Home Message

**Talk openly
about stuttering,
acknowledging that
"sometimes words
are hard to say."**

Parents may model going a bit more slowly or tell the child that they will wait if the child seems to be in hurry when talking or asking for help.

If the child's stuttering persists for four to six weeks or more despite these efforts on the parents' part, or if the parents would like additional information and/or support, the child should be referred to a speech-language pathologist

(see later section on referral).

Treatment of the child with milder stuttering may be indirect and focused on helping the parents understand stuttering and learn how to create an environment in which the child feels positive and fairly relaxed about speaking, both at home and in the treatment setting.

If additional support and/or formal treatment is needed, the speech-language pathologist may provide additional modeling for the parents, talk with the child, and/or show the child how to speak more easily, without increased physical tension and struggle. Oftentimes, stuttering gradually diminishes into something more like typical speech.^{14,21,24} Some approaches train the parents to work more directly with the child to recognize those times when the child is more fluent and increase these times.^{21,31}

Counseling Parents of a Child with More Severe Stuttering

The child with more severe stuttering should be referred immediately to a qualified speech-language pathologist for an evaluation, further counseling for parents, and treatment. Because more severe stuttering may develop when a child struggles or becomes fearful of stuttering, anything that helps the child react less negatively,

take disfluencies in stride, and feel positive about speaking will be of benefit.

Parents should try to convey acceptance of the child regardless of the stuttering by paying attention to **what** the child is saying rather than to the stuttering. The speech-language pathologist working with the child might also encourage the parents to nod, empathize, or comment on the child's courage for "hanging in there," when the child has a particularly hard time on a word:

*"I'm glad you kept trying.
Now I know just what you
wanted to tell me."*

In addition, the child with more severe stuttering would benefit from being able to share his or her frustration with his or her parents. A speech-language pathologist experienced with the management of stuttering can help parents know how best to respond.

Professional treatment of more severe stuttering often consists of helping the child overcome the fear of stuttering and, at the same time, teaching the child to speak, regardless of stuttering, in a slower, more relaxed fashion.

In addition, treatment is focused on helping the child's family create an atmosphere of acceptance that is conducive to successful communication.^{21,24,30,42}

As mentioned earlier, some speech-language pathologists may choose to train the parents to provide some aspects of therapy in the home.^{3,21,24,31}

Treatment results depend on the nature of the child's problem, the presence of other strengths and challenges, relationship-building and skills of the therapist, and the ability of the family to provide support for communication.

When to Refer to a Speech-Language Pathologist

Consultation with a speech-language pathologist experienced in stuttering, whether by telephone, email, or in person, can be helpful to parents as they consider how best to help their child. Children with more severe stuttering should be referred immediately for evaluation. Children who have milder stuttering and have not shown marked improvement within six to eight weeks should also be referred for consideration of further assessment. These children will be given treatment if it is warranted, parents will receive support and guidance, and the child will be followed carefully.

Some children with milder stuttering may receive treatment. In addition, parents

may receive counseling to help them focus on communication and address any negative feelings the child may have about the problem.

As Table 1 on page 14 suggests, children with typical disfluency do not need to be referred unless the parents would benefit from additional information, guidance, and/or reassurance about their child's talking. The parents and professional can then stay in contact as needed.

Speech-language pathologists should have a Certificate of Clinical Competence (CCC-SLP) from the American Speech-Language-Hearing Association, and should also be licensed by the state in which they practice. Certification requires a master's degree from an accredited university, a national examination, and a year of supervised internship.

Because stuttering is no longer required as an area in which speech-language pathologists must have hands-on experience to obtain their CCC-SLP, you will want to make sure you refer to a therapist who has had extensive experience working with the disorder.

The Stuttering Foundation provides referrals to qualified speech-language pathologists in most areas of the country and overseas.

Conclusion

Pediatricians are often the first professionals to whom parents turn for advice about their child's disfluencies and can help in the prevention of stuttering.³⁹

Early identification of children who are stuttering, particularly those more at risk for chronic stuttering, and appropriate referral are critical.

Moreover, effective parent counseling can often create an environment conducive to healthy communication in the family, supporting both those children who outgrow their disfluencies and those who may continue.

The authors of this booklet often meet adults who stutter whose parents were told, "Don't worry, he'll outgrow it" resulting in missed opportunities for therapy when the disorder is most treatable and provision of support for parents to understand stuttering and support their children's communication. We have repeatedly found that when children are referred early, treatment is most effective in the short-term and the long-term, even in cases of more severe stuttering.

Early intervention can prevent childhood stuttering from becoming a persistent problem that adversely impacts social, academic, and occupational success.

Take-Home Message

Early intervention can help prevent the potentially negative consequences of stuttering.

References

- Ambrose, N. G., & Yairi, E. (1999). Normative disfluency data for early childhood stuttering. *Journal of Speech, Language, and Hearing Research*, 42(4), 895–909. <https://doi.org/10.1044/jslhr.4204.895>
- Belyk, M., Kraft, S. J., & Brown, S. (2015). Stuttering as a trait or state: An ALE meta-analysis of neuroimaging studies. *The European Journal of Neuroscience*, 41(2), 275–284. <https://doi.org/10.1111/ejn.12765>
- Bloodstein, O., Ratner, N.B., & Brundage, S.B. (2021). *A handbook On Stuttering* (7th ed.). Plural Publishing.
- Brown, S., Ingham, R. J., Ingham, J. C., Laird, A. R., & Fox, P. T. (2005). Stuttered and fluent speech production: An ALE meta-analysis of functional neuroimaging studies. *Human Brain Mapping*, 25(1), 105–117. <https://doi.org/10.1002/hbm.20140>
- Chang S. E. (2014). Research updates in neuroimaging studies of children who stutter. *Seminars in Speech and Language*, 35(2), 67–79. <https://doi.org/10.1055/s-0034-1382151>
- Chang, S. E., Angstadt, M., Chow, H. M., Etchell, A. C., Garnett, E. O., Choo, A. L., Kessler, D., Welsh, R. C., & Sripada, C. (2018). Anomalous network architecture of the resting brain in children who stutter. *Journal of Fluency Disorders*, 55, 46–67. <https://doi.org/10.1016/j.jfludis.2017.01.002>
- Chang, S. E., Garnett, E. O., Etchell, A., & Chow, H. M. (2019). Functional and neuroanatomical bases of developmental stuttering: Current insights. *The Neuroscientist: A Review Journal Bringing Neurobiology, Neurology and Psychiatry*, 25(6), 566–582. <https://doi.org/10.1177/1073858418803594>
- Conture, E. G., Kelly, E. M., & Walden, T. A. (2013). Temperament, speech and language: An overview. *Journal of Communication Disorders*, 46(2), 125–142. <https://doi.org/10.1016/j.jcomdis.2012.11.002>
- Craig-McQuaide, A., Akram, H., Zrinzo, L., & Tripoliti, E. (2014). A review of brain circuitries involved in stuttering. *Frontiers in Human Neuroscience*, 8, 884. <https://doi.org/10.3389/fnhum.2014.00884>
- Drayna, D., & Kang, C. (2011). Genetic approaches to understanding the causes of stuttering. *Journal of Neurodevelopmental Disorders*, 3(4), 374–380. <https://doi.org/10.1007/s11689-011-9090-7>
- Etchell, A. C., Civier, O., Ballard, K. J., & Sowman, P. F. (2018). A systematic literature review of neuroimaging research on developmental stuttering between 1995 and 2016. *Journal of Fluency Disorders*, 55, 6–45. <https://doi.org/10.1016/j.jfludis.2017.03.007>
- Frigerio-Domingues, C. E., Gkalitsiou, Z., Zezinka, A., Sainz, E., Gutierrez, J., Byrd, C., Webster, R., & Drayna, D. (2019). Genetic factors and therapy outcomes in persistent developmental stuttering. *Journal of Communication Disorders*, 80, 11–17. <https://doi.org/10.1016/j.jcomdis.2019.03.007>
- Garnett, E. O., Chow, H. M., & Chang, S. E. (2019). Neuroanatomical correlates of childhood stuttering: MRI indices of white and gray matter development that differentiate persistence versus recovery. *Journal of Speech, Language, and Hearing Research*, 62(8S), 2986–2998. https://doi.org/10.1044/2019_JSLHR-S-CSMC7-18-0356
- Guitar, B. (2019). *Stuttering: An Integrated Approach to Its Nature and Treatment* (5th ed.). Wolters Kluwer.
- Hosseini, R., Walsh, B., Tian, F., & Wang, S. (2018). An fNIRS-based feature learning and classification framework to distinguish hemodynamic patterns in children who stutter.

IEEE Transactions on Neural Systems and Rehabilitation Engineering, a publication of the IEEE Engineering in Medicine and Biology Society, 26(6), 1254–1263. <https://doi.org/10.1109/TNSRE.2018.2829083>

16. Ingham, R. J., Ingham, J. C., Euler, H. A., & Neumann, K. (2018). Stuttering treatment and brain research in adults: A still unfolding relationship. *Journal of Fluency Disorders*, 55, 106–119. <https://doi.org/10.1016/j.jfludis.2017.02.003>

17. Kang, C., & Drayna, D. (2012). A role for inherited metabolic deficits in persistent developmental stuttering. *Molecular Genetics and Metabolism*, 107(3), 276–280. <https://doi.org/10.1016/j.ymgme.2012.07.020>

18. Kang, C., Riazuddin, S., Mundorff, J., Krasnewich, D., Friedman, P., Mullikin, J. C., & Drayna, D. (2010). Mutations in the lysosomal enzyme-targeting pathway and persistent stuttering. *The New England Journal of Medicine*, 362(8), 677–685. <https://doi.org/10.1056/NEJMoa0902630>

19. Kefalianos, E., Onslow, M., Block, S., Menzies, R., & Reilly, S. (2012). Early stuttering, temperament and anxiety: Two hypotheses. *Journal of Fluency Disorders*, 37(3), 151–163. <https://doi.org/10.1016/j.jfludis.2012.03.002>

20. Kefalianos, E., Onslow, M., Packman, A., Vogel, A., Pezic, A., Mensah, F., Conway, L., Bavin, E., Block, S., & Reilly, S. (2017). The history of stuttering by 7 years of age: Follow-up of a prospective community cohort. *Journal of Speech, Language, and Hearing Research*: 60(10), 2828–2839. https://doi.org/10.1044/2017_JSLHR-S-16-0205

21. Kelman, E., & Nicholas, A. (2017). *Practical Intervention for Early Childhood Stammering: Palin PCI Approach* (2nd ed.). Routledge.

22. Kraft, S. J., & Yairi, E. (2012). Genetic bases of stuttering: The state of the art, 2011. *Folia Phoniatrica et Logopaedica: Official Organ of the International Association of Logopedics and Phoniatrics (IALP)*, 64(1), 34–47. <https://doi.org/10.1159/000331073>

23. Kreidler, K., Hampton Wray, A., Usler, E., & Weber, C. (2017). Neural indices of semantic processing in early childhood distinguish eventual stuttering persistence and recovery. *Journal of Speech, Language, and Hearing Research*: 60(11), 3118–3134. https://doi.org/10.1044/2017_JSLHR-S-17-0081

24. Millard, S. K., Zebrowski, P., & Kelman, E. (2018). Palin Parent-Child Interaction ther-

apy: The bigger picture. *American Journal of Speech-Language Pathology*, 27(3S), 1211–1223. https://doi.org/10.1044/2018_AJSLP-ODC11-17-0199

25. Mohan, R., & Weber, C. (2015). Neural systems mediating processing of sound units of language distinguish recovery versus persistence in stuttering. *Journal of Neurodevelopmental Disorders*, 7(1), 28. <https://doi.org/10.1186/s11689-015-9124-7>

26. Neef, N. E., Anwander, A., & Friederici, A. D. (2015). The neurobiological grounding of persistent stuttering: From structure to function. *Current Neurology and Neuroscience Reports*, 15(9), 63. <https://doi.org/10.1007/s11910-015-0579-4>

27. Neumann, K., & Foundas, A. L. (2018). From locations to networks: Can brain imaging inform treatment of stuttering? *Journal of Fluency Disorders*, 55, 1–5. <https://doi.org/10.1016/j.jfludis.2017.08.001>

28. Ntourou, K., Conture, E. G., & Lipsey, M. W. (2011). Language abilities of children who stutter: A meta-analytical review. *American Journal of Speech-Language Pathology*, 20(3), 163–179. [https://doi.org/10.1044/1058-0360\(2011/09-0102\)](https://doi.org/10.1044/1058-0360(2011/09-0102))

29. Olander, L., Smith, A., & Zelaznik, H. N. (2010). Evidence that a motor timing deficit is a factor in the development of stuttering. *Journal of Speech, Language, and Hearing Research*: 53(4), 876–886. [https://doi.org/10.1044/1092-4388\(2009/09-0007\)](https://doi.org/10.1044/1092-4388(2009/09-0007))

30. Onslow, M., & Kelly, E. M. (2020). Temperament and early stuttering intervention: Two perspectives. *Journal of Fluency Disorders*, 64, 105765. <https://doi.org/10.1016/j.jfludis.2020.105765>

31. Onslow, M., & O'Brian, S. (2013). Management of childhood stuttering. *Journal of Pediatrics and Child Health*, 49(2), E112–E115. <https://doi.org/10.1111/jpc.12034>

32. Raza, M. H., Gertz, E. M., Mundorff, J., Lukong, J., Kuster, J., Schäffer, A. A., & Drayna, D. (2013). Linkage analysis of a large African family segregating stuttering suggests polygenic inheritance. *Human Genetics*, 132(4), 385–396. <https://doi.org/10.1007/s00439-012-1252-5>

33. Reilly, S., Onslow, M., Packman, A., Cini, E., Conway, L., Ukoumunne, O. C., Bavin, E. L., Prior, M., Eadie, P., Block, S., & Wake, M. (2013). Natural history of stuttering to 4 years of age: A prospective community-based study. *Pediatrics*, 132(3), 460–467. <https://doi.org/10.1542/peds.2012-3067>

34. Richels, C. & Conture, E. (2010). Indirect treatment of childhood stuttering: Diagnostic predictors of treatment outcome. In B. Guitar and R. McCauley (Eds.), *Treatment of stuttering: Conventional and Controversial Interventions* (pp 18-71). Lippincott, Williams & Wilkins.

35. Singer, C. M., Hessling, A., Kelly, E. M., Singer, L., & Jones, R. M. (2020). Clinical characteristics associated with stuttering persistence: A meta-analysis. *Journal of Speech, Language, and Hearing Research*: 63(9), 2995–3018. https://doi.org/10.1044/2020_JSLHR-20-00096

36. Smith, A., & Weber, C. (2017). How stuttering develops: The Multifactorial Dynamic Pathways theory. *Journal of Speech, Language, and Hearing Research*: 60(9), 2483–2505. https://doi.org/10.1044/2017_JSLHR-S-16-0343

37. Walsh, B., Christ, S., & Weber, C. (2021). Exploring relationships among risk factors for persistence in early childhood stuttering. *Journal of Speech, Language, and Hearing Research*, 39, 2909-2937. https://doi.org/10.1044/2021_JSLHR-21-00034

38. Watkins, K. (2016). Differences in the brains of people who stutter. *Stuttering Foundation Summer Newsletter*, 24(2).

39. Winters, K. L., & Byrd, C. T. (2020). Pediatrician referral practices for children who stutter. *American Journal of Speech-Language Pathology*, 29(3), 1404–1422. https://doi.org/10.1044/2020_AJSLP-19-00058

40. Yairi, E., & Ambrose, N. (1992). A longitudinal study of stuttering in children: A preliminary report. *Journal of Speech and Hearing Research*, 35(4), 755–760. <https://doi.org/10.1044/jshr.3504>

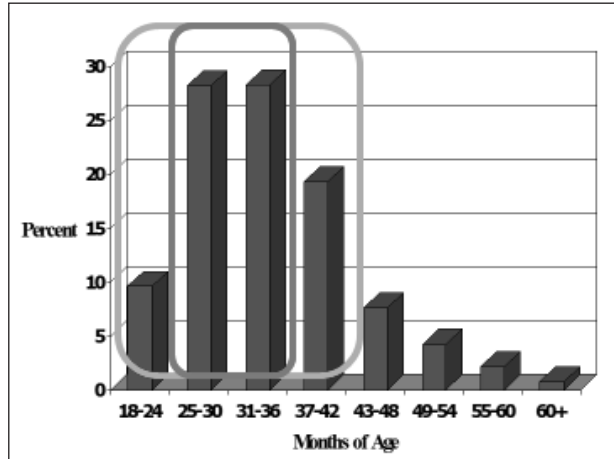
41. Yairi, E., & Ambrose, N. G. (1999). Early childhood stuttering I: Persistency and recovery rates. *Journal of Speech, Language, and Hearing Research*: 42(5), 1097–1112. <https://doi.org/10.1044/jshr.4205.1097>

42. Yairi & Ambrose (2005). *Early childhood stuttering: For Clinicians by Clinicians*. Austin, TX: Pro-Ed.

43. Yairi, E., & Ambrose, N. (2013). Epidemiology of stuttering: 21st century advances. *Journal of Fluency Disorders*, 38(2), 66–87. <https://doi.org/10.1016/j.jfludis.2012.11.002>

44. Yairi, E., & Seery, C.H. (2023). *Stuttering: Foundations and Clinical Applications, Third Edition* (in press). Plural Publishing, Inc.

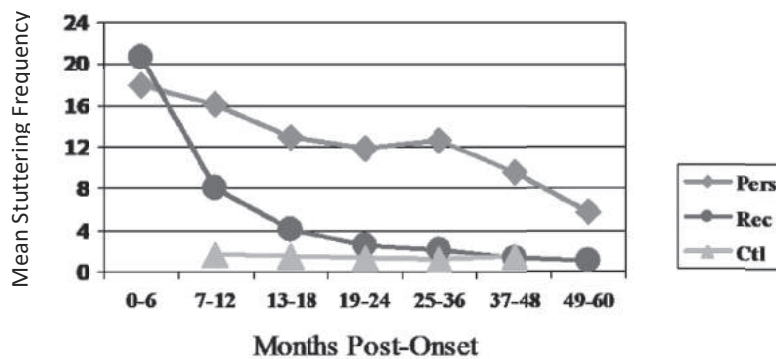
Appendix A



Age distribution of stuttering onset: 56% of onset occur from 24 to 36 months of age; 79% from 18 to 42 months of age.

Time Post Onset	Percent Recovery This Time	Remaining Chance of Recovery	Percent Persistent Stuttering
2 years	31%	70%	21%
3 years	63%	16%	21%
4 years	74%	5%	21%
5 years	79%	0%	21%

Rates of Natural Recovery and Persistency by Year Post Onset (based on Yairi & Ambrose, 2005).



Long-term trends of stuttering frequency in children who persisted in stuttering, those who recovered naturally, and normally fluent control children.

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Table 1: Physician's Checklist for Referral

	The Child With Typical Disfluencies	The Child With Milder Stuttering	The Child With More Severe Stuttering
Speech behavior you may see or hear:	<input type="checkbox"/> Occasional (not more than once in every 10 sentences), brief, (typical 1/2 second or shorter) repetitions of sounds, syllables or short words, e.g., li-li-like this.	<input type="checkbox"/> Frequent (3% or more of speech), long (1/2 to 1 second) repetitions of sounds, syllables, or short words, e.g., li-li-like this. Occasional prolongations of sounds.	<input type="checkbox"/> Very frequent (10% or more of speech), and often very long (1 second or longer) repetitions of sounds, syllables or short words. Frequent sound prolongations and blockages.
Other behavior you may see or hear:	<input type="checkbox"/> Occasional pauses, hesitations in speech or fillers such as "uh," "er," or "um," changing of words or thoughts.	<input type="checkbox"/> Repetitions and prolongations begin to be associated with eyelid closing and blinking, looking to the side, and some physical tension in and around the lips.	<input type="checkbox"/> Similar to mild stutterers only more frequent and noticeable; some rise in pitch of voice during stuttering. Extra sounds or words used as "starters."
When problem is most noticeable:	<input type="checkbox"/> Tends to come and go when child is: tired, excited, talking about complex/new topics, asking or answering questions, or talking to unresponsive listeners.	<input type="checkbox"/> Tends to come and go in similar situations, but is more often present than absent.	<input type="checkbox"/> Tends to be present in most speaking situations; far more consistent and non-fluctuating.
Child reaction:	<input type="checkbox"/> None apparent	<input type="checkbox"/> Some show little concern, some will be frustrated and embarrassed.	<input type="checkbox"/> Many are embarrassed and some are also fearful of speaking. May avoid speaking and/or stuttering.
Parent reaction:	<input type="checkbox"/> None to a great deal	<input type="checkbox"/> Most concerned, but concern may be minimal.	<input type="checkbox"/> All have some degree of concern.
Referral decision:	<input type="checkbox"/> Refer when parents are concerned, need information, and/or additional support.	<input type="checkbox"/> Refer if continues for 6 to 8 weeks or if parental concern justifies it.	<input type="checkbox"/> Refer as soon as possible.

Table 2: Questions to Ask Parents

Note: These questions are listed in order of the seriousness of the problem. If a parent answers “yes” to any question other than number 1, it suggests the possibility of stuttering rather than typical disfluency.

1. Does the child repeat parts of words rather than whole words or entire phrases? (For example, “a-a-apple”)?
2. Does the child repeat sounds more than once every 8 to 10 sentences?
3. Does the child have more than two repetitions? (“a-a-a-a-apple” instead of “a-a-apple”)?
4. Does the child seem frustrated or embarrassed when he has trouble with a word?
5. Has the child been stuttering more than six months?
6. Does the child raise the pitch of his voice, blink his eyes, look to the side, or show physical tension in his face when he stutters?
7. Does the child use extra words or sounds like “uh” or “um” or “well” to get a word started?
8. Does the child sometimes get stuck so badly that no sound at all comes out for several seconds when he’s trying to talk?
9. Does the child sometimes use extra body movements, like tapping his finger, to get sounds out?
10. Does the child avoid talking, use substitute words, or quit talking in the middle of a sentence because he might stutter?

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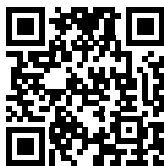
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Suggestions for Parents of Children Who Stutter

Experts agree that most children who stutter benefit from having the time to speak. These guidelines represent a number of ways that adults can help promote the child's communication.

1. Reduce the pace. Speak with your child in an unhurried way, pausing frequently. Wait after your child finishes before you begin to speak. Your own easy relaxed speech will be far more effective than any advice such as “slow down,” or “try it again slowly.” For some children, it is also helpful to introduce a more relaxed pace of life for awhile.

2. Full listening. Try to increase those times that you give your child your undivided attention and are really listening. This does not mean dropping everything every time your child speaks. It does mean putting down phones and looking at the child.

3. Asking questions. Asking questions is a normal part of life, however, try to resist asking one after the other. Sometimes it is more helpful to comment on what your child has said and wait. Starting a question with “I wonder” takes the pressure off the child to respond quickly.

4. Turn taking. Help all members of the family take turns talking and listening. Children find it much easier to talk when there are fewer interruptions.

5. Building confidence. Use descriptive praise to build confidence. An example would be, “I like the way you picked up your toys. You're so helpful,” instead of “good job.” Praise strengths unrelated to talking as well, such as athletic skills, being organized, or independent.

6. Special times. Set aside a few minutes at a regular time each day when you can give your undivided attention to your child. This quiet, calm time—no TV, electronics, or phones—can be a confidence builder for young children. As little as five minutes a day can make a difference.

7. Normal rules apply. Discipline the child who stutters just as you do your other children and just as you would if your child didn't stutter.

* * *

For more information on stuttering, and ways to help your child, write or call the nonprofit

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These materials are available at a nominal cost:

If Your Child Stutters: A Guide for Parents, Revised 8th edition, Publication No. 0011, 64 pages,
Stuttering and Your Child: Questions and Answers, 5th edition, Publication No. 0022, 64 pages,
Do You Stutter: A Guide for Teens, 4th edition, Publication No. 0021, 72 pages.

The following videos are available in English and Spanish free online at StutteringHelp.org/Videos and YouTube.com/StutteringFdn:

- *7 Tips for Talking With the Child Who Stutters*
- *Help! My Child is Stuttering*
- *Stuttering and Your Child: Help for Parents*
- *Stuttering: For Kids, By Kids*
- *Stuttering: Straight Talk for Teens*

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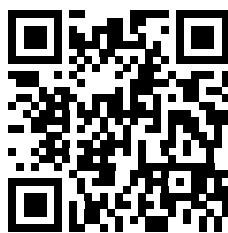
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