Identification and Remediation of Pediatric Fluency and Voice Disorders

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ABSTRACT

Early identification of pediatric disfluency and voice disorders is advisable because these disorders may progress to lifelong communicative impairments if left untreated. Especially with disfluency or stuttering, it is critical that an informed differential diagnosis be made to determine whether a speech pattern represents normal disfluency or actual stuttering. Voice disorders can be overlooked as laryngitis, when in fact the problem may be organic in origin. This article describes characteristics of both disorders, etiologic factors, and checklists to assess children for referral to an otolaryngologist and/or speech-language pathologist. Medical and therapeutic treatment recommendations also are discussed.

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When children cannot communicate well, the difficulty often is because they have articulation or language disorders, but other difficulties also may adversely affect children's abilities to express themselves. Problems with fluency (stuttering or cluttering) and voice quality can impair communication. Pediatric nurse practitioners need to be prepared to respond to parents' questions about voice and fluency issues and, when appropriate, to make referrals for evaluation and possible treatment. This article presents a basic overview of the nature of fluency and voice disorders and provides guidelines for identifying children who should be referred, and to whom.

FLUENCY DISORDERS

Two different terms relate to fluency disorders. The more frequent and best known is stuttering, which may include repetitions of words or parts of words, prolongations of sounds, and/or the temporary blockage of speech. A second type of disfluency, cluttering, occurs far less frequently than stuttering, and results in speech that is "rapid, dysrhythmic, sporadic, unorganized, and frequently unintelligible" (Daly, 1992, p. 107). A rapid rate and lack of organization of ideas distinguishes cluttering from stuttering. Because stuttering is considerably more common, with a prevalence of approximately 1% of the pediatric population (Guitar, 1998), it will be the focus of this article. If, however, a child exhibits rapid, unorganized, and dysrhythmic speech in the absence of typical stuttering symptoms, a referral for evaluation and possible treatment for cluttering is appropriate. It

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should be noted, however, that stuttering and cluttering may co-exist in the same child (St. Louis & Myers, 1997).

Normal Disfluency and Stuttering

As early as the beginning of the 20th century, researchers in child language noticed transient periods of disfluency occurring in the speech of young children who otherwise seemed to be developing normally (Brandenburg, 1915). Not until the 1930s and 1940s, however, did systematic research begin to investigate the existence of these normal disfluencies, that is, stuttering-like occurrences in the speech of typically developing children (Adams, 1932). It is now well accepted that some children, beginning between the approximate ages of 2 to 4 years, easily repeat sounds, syllables, or words but are not necessarily stuttering (Yairi & Ambrose, 1999). Some of the repeating, pausing, and general confusion with expressive speech is normal. It may reflect the complexity of the language structures the child needs to master, the difficulty the child is experiencing in coordinating his oral movements efficiently, or the distraction associated with environmental stress or excitement. These normal disfluencies generally peak in frequency between 2 and 3½ years of age and diminish thereafter, although episodic increases and decreased may be noticed throughout childhood (Guitar, 1998). For some children, however, the appearance of disfluencies marks the onset of true stuttering.

Causes of Stuttering

Although stuttering was one of the earliest communication disorders to be studied (Brandenburg, 1915) and has been the subject of numerous research articles, it remains one of the most challenging and least understood disorders. A persistent question concerning stuttering is its etiology. What causes stuttering? Some persons suggest a biologic basis through genetic influences, and some evidence exists for this position. Fifteen percent of stutterers have a first-degree relative (mother, father, sibling, or child) who is a current or recovered stutterer (Felsenfeld, 1997). Other investigators suggest that stuttering arises from environmental factors such as competition for speaking turns or pressure to communicate at a time when the child is still learning language (Johnson & Leutenegger, 1955). Still others purport biologic factors interacting with environmental factors (Conture, 2001). According to one interpretation of the latter theory, when a child is under stress, the coordination of the muscles of speech appear to fail. This failure of coordination, coupled with an overload of communication pressure, such as accelerated speech rate, interruptions, complex language demands, and anticipation of speech difficulty, may have a negative impact on speech fluency (Logan & LaSalle, 1999). Conditioning and other learning factors appear to contribute to maintaining the problem. Over-concern, noticeable anxiety, or negative reactions of parents can draw attention to a child's speech and consequently exacerbate the disfluent pattern. Peers' reactions also may affect stuttering. Recent evidence indicates that children as young as 3 years notice disfluencies in the speech of others and by 5 years attach a negative value to the disfluencies, that is, the stutterers are doing "something wrong" (Ezrati-Vinacour, Platzky, & Yairi, 2001).

Stuttered speech may be characterized by involuntary prolongations of sounds, inability to start a word, or repetitions of parts of a word or whole words.

Occasionally medication has been observed to cause stuttering-like symptoms. Burd and Kerbeshian (1991) reported the case of a 3-year-old child who started stuttering after stimulants were taken. In a 1994 study, three children began stuttering after taking theophylline (Rosenfield, McCarthy, McKinney, & Viswanath, 1994). Stuttering symptoms resolved after medication was discontinued. Although these cases are rare, if a child begins stuttering after initiating or changing medications involving either of the aforementioned types, the role of medication should be investigated.

Prevalence of Stuttering

Approximately 5% of the population, at some point during their lives, has experienced true stuttering for at least 6 months (Guitar, 1998). Typically the onset of stuttering occurs before a child's fourth birthday and is termed developmental stuttering. Disfluencies that do not begin until adulthood are often associated with psychogenic or neurogenic factors (Brady, 1998). (For information concerning adult onset of stuttering, see Baumgartner [1999] and Helm-Estabrooks [1999]). Both the onset and course of developmental stuttering varies by individual child. In the majority of children, onset is mild and devoid of struggles to speak, much like normal disfluencies. In approximately one third of stuttering children, onset is abrupt, with severe and frequent fluency disruptions (Yairi, 1997). Approximately 74% of children who begin true stuttering show remission within 4 years, but for the remaining 26%, stuttering becomes chronic (Yairi & Ambrose, 1999).

Although males are more likely to stutter than females, the ratio is not consistent across ages. In young children, the male to female ratio is 2:1, but in adulthood it increases to 5:1 (Ambrose, Cox, & Yairi, 1997).

Primary Characteristics of Stuttering

Stuttered speech may be characterized by involuntary prolongations of sounds, inability to start a word, or repetitions of parts of a word or whole words. In the majority of children who stutter, repetitions affect only parts of words, often the initial syllable (eg, "da-da-da-daddy"). Repetitions usually number three or more per syllable. Children who stutter also may prolong sounds (eg, "ssssoup"). Infrequently a young stutterer will have a tense pause with articulators, that is, lips, jaw, tongue, and vocal folds, fixed in one position. Children who are beginning to stutter may show some momentary frustration and even say something to their parents about the disfluencies, but their concern seems largely transient (Guitar & Conture, 2001).

TABLE 1 Health care provider's checklist for referral*

Variables	The child with normal disfluencies	The child with mild stuttering
Speech behaviors	Repetitions of sounds, syllables, or words that are occasional (not more than 1 in every 10 sentences) and brief (½ second or shorter)	Repetitions of sounds, syllables, or words that are frequent (3% or more of speech) and long (1/2 to 1 second); occasional sound prolongations
Other behaviors	Occasional pauses, hesitations/fillers (eg, "uh," changing words/thoughts)	Repetitions and prolongations begin to be associated with eyelid closing and blinking, looking to side, and some physical tension in and around lips
When noticed	Tends to come and go when child is tired, excited, talking about complex topics, asking/answering questions/talking to unresponsive listeners	Tends to come and go in similar situations, but often is more present than absent
Child reaction	None apparent	May show some concern/be frustrated or embarrassed
Parent reaction	Varies from none to a great deal	Most parents are concerned, but concern may be minimal
Referral decision	Refer only if parents are moderately to overly concerned	Refer if continues for 6 to 8 weeks or if parental concern justifies

*Data from Guitar & Conture, 2001.

TABLE 2 Overview of various voice disorders affecting children*

Disorder	Description	Cause	Treatment
Vocal nodules	Bilateral benign growths on anterior vocal cords	Vocal abuse	Surgery and/or voice therapy
Vocal polyps	Unilateral benign growths of anterior vocal cords	Atmospheric irritation	Medical treatment and/or voice therapy
Juvenile papilloma	Wartlike lesions	Viral infection	Surgery and voice therapy
Laryngeal web	Membranous attachment between vocal cords	Congenital acquired	Surgery and voice therapy
Extrinsic trauma	Fracture or displacement of extrinsic laryngeal cartilages	Motor vehicle accident or injury	Surgical reconstruction and voice therapy
Intrinsic trauma	Fracture or displacement of intrinsic laryngeal cartilages	Intubation	Surgical reconstruction and voice therapy
Vocal cord paralysis	Damage to superior and/or recurrent laryngeal nerves	Tumor	Laryngoplasty and/or voice therapy
Hypernasality	Excessive nasal resonance	Veol-pharyngeal insufficiency	Surgery and/or voice therapy
Hyponasality	Decreased nasal resonance	Nasal airway obstruction	Surgery and/or voice therapy
Vocal cord dysfunction	Paradoxical vocal cord movement	Idiopathic, psychogenic, asthma, gastroesophageal reflux disorder	Voice therapy

*Data from Boone & McFarlane, 2000; Green & Mathieson, 2001; McFarlane, Watterson, Lewis, & Boone, 1998; Murray, 1998; Poirer et al., 1996.

Secondary Characteristics

In a struggle to free himself or herself from the throws of dysrhythmia, the child who continues to stutter may develop facial grimaces, eye blinks, or body movements that become a consistent part of that individual's stuttering pattern. These behaviors are known as secondary characteristics because they are a response to the tension of stuttering. The child may avoid making eye contact, saying particular words, or engaging in selected verbal interactions (eg, phone calls, class participation, presentations, and reading aloud) (Guitar, 1998).

Identifying Beginning Stuttering

Parents and professionals who work with children may have difficulty determining if a young child is experiencing normal disfluencies or if they are beginning to stutter. In both cases part-word and single-syllable word repetitions may occur. Children who are beginning to stutter experience more frequent disfluencies, and individual disfluencies contain a greater number of repetitions of grammatical units, that is, sounds, syllables, or words. Although a clear dividing line does not exist between the frequency of disfluencies of these two groups of children, most researchers agree that a child who is disfluent only once in every 10 sentences is presenting more as a child with normal disfluencies than a beginning stutterer. Normally, disfluent children repeat grammatical units once ("I-I want to go") or, less frequently, twice ("ba-ba-baby"). Children who are beginning to stutter may have two, but

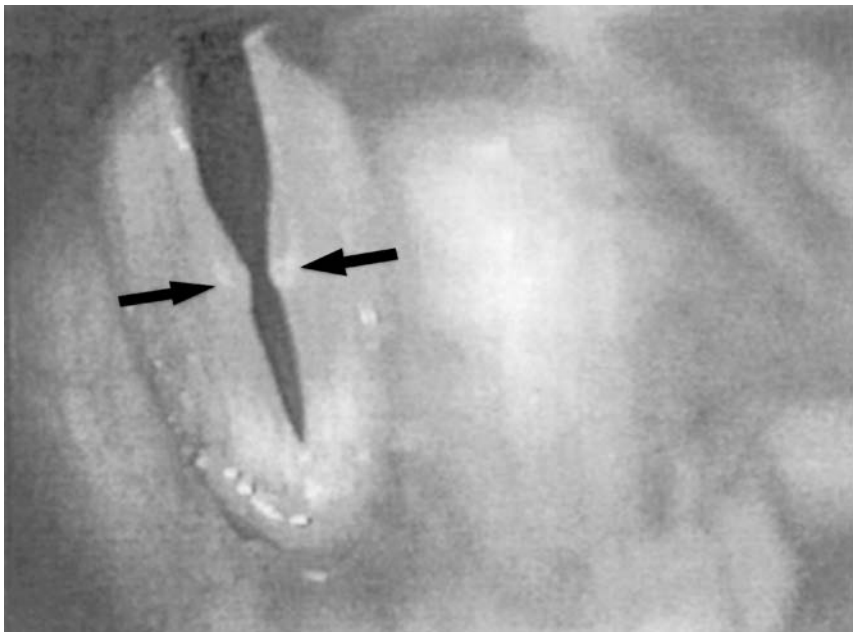

FIGURE 1 Vocal cord nodules. (Reprinted with permission from Boone DR, McFarlane SC. The voice and voice therapy [6th ed.]. Boston: Allyn and Bacon; 2000.)

usually more repetitions of a grammatical unit ("My-my-my-my daddy is going" or "Da-da-da-daddy"). Children who are beginning to stutter may repeat whole words and the initial sounds of words, but repetitions of normally disfluent children tend to more frequently involve whole words. Guitar (1998) suggests that as a child who has normal disfluencies grows older, his repetitions are likely to involve even more words within the unit that is repeated, for example, "Stu went to see…Stu went to see Liza." Children who are experiencing normal disfluencies do not seem to notice that they are having difficulties with their speech. Children who stutter may show temporary frustration or awareness. Both groups of children experience periods of fluency, but such periods are shorter and less frequent for the child who is beginning to stutter. Normal disfluencies often will decrease in frequency and severity within a year of onset.

In summary, many children go through periods of speech disfluency. In some children disfluencies resolve, and in others they persist and intensify into true stuttering. Children are more in jeopardy of developing stuttering if they have a family history of stuttering, are late in learning to speak, or if language development is advanced in comparison with their oral coordination. Children who stutter are more likely to continue stuttering if they associate it with tension and frustration and try to avoid disfluencies. True stuttering may be suspected when a child usually has more than two repetitions of a speech unit (eg, "ra-ra-ra-rabbit"), or disfluencies are more frequent than one in every ten sentences. Tension and struggle in the facial muscles, especially around the mouth, are associated with true stuttering, as are behaviors such as changing or avoiding words or speaking situations. Table 1 outlines the differences in normal disfluencies and beginning stuttering.

Children who are experiencing normal disfluencies do not seem to notice that they are having difficulties with their speech.

VOICE DISORDERS

Another concern for pediatric nurse practitioners is the diagnosis and treatment of pediatric voice disorders (Table 2). A normal voice should have a pleasing quality and should not distract the listener. A voice problem exists when the loudness, pitch, or quality of the voice is not appropriate to the age or sex of the child. For example, the voice may exhibit hoarseness, breathiness, a pitch that is too high for a boy or too low for a girl, be too nasal (hypernasality) or insufficiently nasal (hyponasality), or have a volume that is too loud or soft. Pain or discomfort while speaking or singing may indicate a more significant problem.

Greene and Mathieson (2001) state that approximately 3% to 9% of the pediatric population exhibits symptoms of voice disorders. Boys tend to present with voice disorders more frequently than do girls. The word "voice" refers to sound produced by the vocal cords. The distinction between speech and voice is that speech is the final outcome of sound generated from the vocal cords. The movement of the tongue and lips in the oral cavity produces articulated speech. Voice may be described in terms of loudness, pitch, resonance, and vocal quality such as hoarseness, harshness, and/or breathiness.

From time to time, children intermittently develop hoarseness, but the symptoms subside within days. However, if the symptoms persist or recur, it is sometimes difficult to determine whether to dismiss the problem or to further investigate the possibility of vocal cord pathology.

Types of Voice Disorders

Voice disorders result from vocal abuse or misuse, lesions on the vocal cords, gastroesophageal reflux disease, extrinsic trauma, vocal cord paralysis, and velopharyngeal insufficiency, to name a few etiologies. Hoarseness, a common outcome of voice impairment, may require referral to a speech language pathologist for voice therapy. Regardless of who identifies the voice problem (eg, parent, teacher, or nurse practitioner), the child must first be seen by an otolaryngologist to determine if vocal pathology exists. Once the status of

the vocal cords is determined, the otolaryngologist will either decide to treat the child through surgery or medication or refer the child to a speech language pathologist for voice therapy. Voice therapy takes the form of evaluation of various vocal parameters such as respiration, phonation, and resonance. A treatment plan is developed to remediate the aberrant vocal quality and contributing behaviors. For example, a child with hoarseness may need therapy to elevate a low pitch, reduce straining, enhance the efficiency of respiration, reduce loud volume, and eliminate vocal abuse behaviors. Children with nasal emission of sounds may require therapy to strengthen the soft palate, establish correct articulation, and reduce hypernasality.

Vocal abuse is a significant factor in the development of hoarseness in children. Health problems that contribute to pediatric vocal abuse are frequent upper respiratory tract infections, laryngitis, hearing loss, allergic reactions, and asthma (Greene & Mathieson, 2001). Young children abuse their voice by yelling on the playground or making sounds with their voices to imitate motorcycles or other vehicles. Adolescents cheer at sports events or overuse their voice during choir or other school activities. Mild infrequent vocal abuse may result in transient laryngitis, whereas chronic persistent vocal abuse may lead to the development of vocal cord lesions. Careful review of the child's behavioral profile will help identify the possibility of vocal abuse. Another factor in children developing hoarseness is vocal misuse. Children speak on the wrong pitch or loudness level, use an inefficient respiratory pattern, or tense and push out the voice. Careful review of the child's behavioral profile by health professionals will help identify the possibility of vocal abuse versus vocal misuse. A referral to a speech pathologist is appropriate in either case to address the behavioral aspects of the disorder.

Vocal cord lesions, the majority of which result from vocal abuse, can range from vocal cord nodules (Figure 1) to polyps, juvenile papilloma, granuloma, or laryngeal webbing. Each type of lesion is discussed below.

Vocal nodules are caused by vocal abuse and are the result of a thickening of the vocal cords (Kauffman, Linagrande, & Truy, 1992). Nodules are typically bilateral, because there is often an irritation at the same site on the opposing fold. The most common symptom of nodules is hoarseness, a deep pitch, and effortful, strained voice production. Most otolaryngologists do not surgically excise nodules from the vocal cords of children but recommend voice therapy for less effortful voice production. If the abusive vocal pattern is corrected, the nodules will disappear (Boone & McFarlane, 2000). If the vocal abuse continues and is not modified through voice therapy, the nodules will become hardened and fibrotic. Even if nodules are removed and no change occurs in abusive vocal behaviors, nodules will recur.

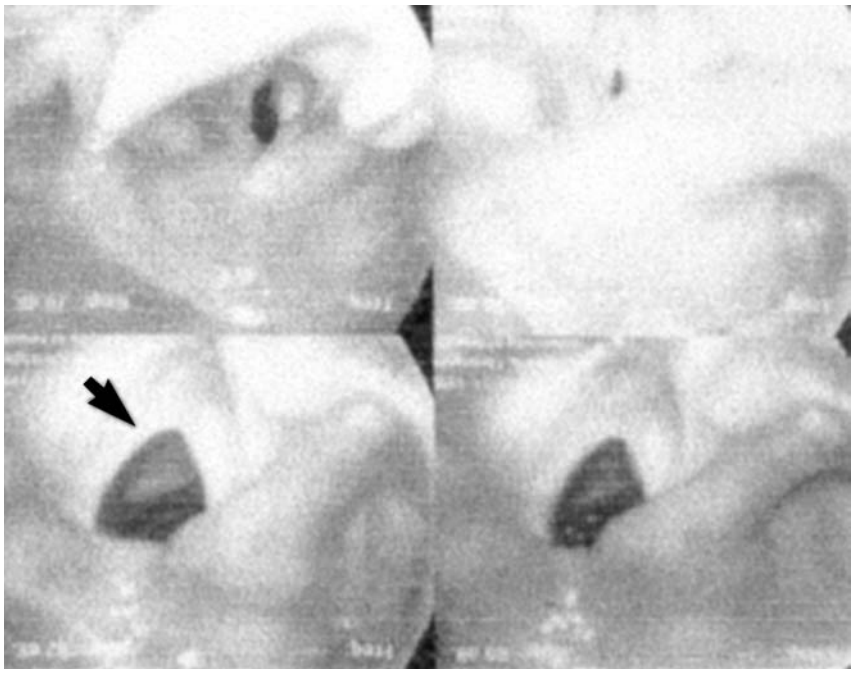

FIGURE 2 Four examples of anterior vocal cord web. (Reprinted with permission from Boone DR, McFarlane SC. The voice and voice therapy [6th ed.]. Boston: Allyn and Bacon; 2000.)

The most common symptom of nodules is hoarseness, a deep pitch, and effortful, strained voice production.

Koufman, Sataloff, and Touhill (l996) found that children with nodules also may have gastroesophageal reflux disease. By using 24-hour double-probe pH monitoring, they found that gastroesophageal reflux occurs in approximately half of patients with nodules. Symptoms of gastroesophageal reflux disease are hoarseness, pain upon initiation of the swallow, lump-in-the-throat sensation, frequent throat clearing, and a dry cough. The pain symptoms and dry cough usually are not found with nodules from vocal abuse alone. Koufman et al. suggest that voice therapy to address the hoarseness combined with antireflux medication is the most effective treatment.

Atmospheric irritation to the mucosa may lead to vocal cord polyps. In children, the most common cause is allergy. Postnasal discharge leads to chronic abusive throat clearing, resulting in vigorous approximation of the vocal cords. The polyps usually are found on one cord rather than bilaterally, as with nodules (Boone & McFarlane, 2000).

BOX When to refer for a laryngoscopy by an otolaryngologist

If a child exhibits any of these vocal behaviors, a referral to an otolaryngologist is warranted:

- Hoarseness that persists longer than 2 weeks
- A voice that worsens with use
- A voice that calls attention to itself (too loud or soft, too high or too low)
- If there has been a diagnosis of a voice problem such as:
  - Vocal cord nodule or polyp
  - Laryngeal webbing
  - Laryngitis
  - Juvenile papilloma
  - Vocal cord paralysis
  - Extrinsic or intrinsic trauma to the larynx
  - Velopharyngeal incompetence
- Noisy breathing, representative of laryngeal stridor or blockage of the airway with the vocal cords, at rest, during sleep, or during exercise
- Too much or too little air coming out of the child's nose when he or she speaks
- Frequent difficulty with liquids or foods coming out of the nose when eating or drinking
- Frequent coughing or throat clearing

The voice characteristics associated with polyps, like those of vocal cord nodules, are deep pitch, hoarseness, and straining. Voice therapy is typically prescribed following medical/surgical management of the causal factors.

Juvenile papilloma are benign neoplasms that appear as wartlike lesions growing on the vocal cords and into the trachea. They are a result of viral infection (Greene & Mathieson, 2001). Papilloma occur more frequently in boys. They generally disappear at puberty but may recur later. If so, the lesions require surgical removal. It is not uncommon for an individual to have as many as 20 surgical or laser procedures to remove the papilloma and maintain a patent airway. Vocal quality is characterized by moderate to severe hoarseness, either a very deep pitch or an intermittently high-strained pitch, and breathiness. Voice therapy by the speech language pathologist is essential to maintain vocal flexibility, because multiple surgical procedures tend to form scar tissue that stiffens the mucosa (Greene & Mathieson, 2001).

Laryngeal webbing (Figure 2) is either congenital or acquired and occurs when a membrane grows between the vocal folds (Greene & Mathieson, 2001). Infants with congenital webbing may have a hoarse cry and inspiratory laryngeal stridor. Stridor is defined as a wheezing sound produced at the level of the vocal cords. Cohen (1989) indicates that 75% of children with laryngeal webbing have symptoms at birth, with most presenting prior to 8 months of age. Children with laryngeal webbing may exhibit shortness of breath and hoarseness. Their pitch may be higher than usual because of straining and the web inhibiting the vibration of the vocal folds. Various surgical approaches are used for treatment. Temporary tracheostomy may be required if the web is obstructive to the upper airway.

Extrinsic trauma to the thyroid cartilage or hyoid bone may cause either a fracture or displacement requiring surgical reconstruction. A motor vehicle accident, sports accident, or other crush injury to the larynx can cause this condition.

Intrinsic trauma may occur after intubation for general anesthesia and is termed *intubation granuloma.* The intubation tube required for ventilation displaces the arytenoid cartilage. The voice will mimic a vocal cord paralysis, which is characterized by a lack of voice or significant breathiness (Greene & Mathieson, 2001). Other forms of intrinsic trauma stem from a misplaced feeding tube or traumatic insertion of a ventilator tube into a child's throat (Greene & Mathieson, 2001). The tissue damage because of insertion results in proliferation of granulation growth, which interferes with vocal cord closure and causes significant voice and breathing problems. Koufman (1993) states that these growths should be surgically removed, followed by voice therapy to minimize traumatic closure of the vocal cords at the surgical site.

Vocal cord paralysis can result from extrinsic trauma such as a crush injury to the larynx or from intrinsic trauma to the nerves, innervating the vocal cords (Boone & McFarlane, 2000). The voice may sound hoarse and breathy because the paralyzed cord is not approximating the midline. Voice therapy is an effective treatment for unilateral vocal cord paralysis in some cases, because the normal functioning cord may be trained to cross the midline and close against the paralyzed cord to obtain an acceptable voice (McFarlane, Watterson, Lewis, & Boone, 1998).

Velopharyngeal insufficiency, or abnormally decreased movement of the soft palate, results in hypernasality. Hypernasality is characterized by excessive nasal resonance. The voice sounds nasal with often audible emission of turbulent air through the nose. A well-known anatomic abnormality of the velopharynx is cleft palate. Murray (1998) indicates that surgical repair of cleft palate optimally takes place when the child is 6 to 12 weeks old. Surgery at this time reduces nasal regurgitation of food and liquids and facilitates speech development. Normal speech develops in 50% of children after repair of the cleft palate.

Hypernasality sometimes follows adenoidectomy. A child with a short, soft palate may have normal resonance if the adenoids obstruct a portion of the nasopharynx, thereby giving a cushion for closure. If the soft palate cannot make closure with the pharynx rather than the adenoidal pad, voice therapy to reduce hypernasality may be needed. However, if the soft palate is too short, surgery to establish alternate methods of closure may be necessary to correct the problem (Boone & McFarland, 2000).

Nasal airway obstruction contributing to hyponasality, or not enough nasal resonance, may be caused by a nasal obstruction such as a deviated septum, nasal polyps, or a highly arched hard palate (Greene & Mathieson, 2001). A lack of nasality is most evident in the articulation of the nasal consonants /m/, /n/, and /ng/. The child will sound

stopped up or blocked in resonance as if he or she has a cold. Surgery to remove the nasal obstruction may be recommended by the otolaryngologist. Voice therapy for hyponasality is commonly recommended to re-establish appropriate nasality of the nasal consonants.

A recently identified disorder termed *paradoxical vocal cord dysfunction* also is referred to as vocal cord dysfunction and is a disorder with which nurse practitioners should become familiar. Shiels, Hayes, and Fitzgerald (1995) define paradoxical as a difference in the normal movement of the vocal cords. For example, because the vocal cords normally open when air is inhaled, they will move in a paradoxical manner or close upon inspiration. Paradoxical vocal cord movement imitates asthma attacks, that is, the vocal cords close when they should open and obstruct the airway during inspiration. Stridor, a wheezing sound produced at the level of the vocal cords, and hoarseness are predominant features. The wheezing or stridor is generated at the vocal cords, not within the lung or bronchial level. Misdiagnosis of paradoxical vocal cord dysfunction as asthma can lead to unnecessary medication and even tracheostomy (Poirier, Pancioli, & Digiulio, 1996). Child athletes may exhibit the paradoxical dysfunction during sports activities. Swimmers need to take more breaths per stroke and basketball players find it difficult to continue running during a game. Relaxation and breathing techniques can be taught by the speech language pathologist as a proactive preventative measure and can eliminate the problem.

In summary, two distinct communication impairments commonly treated by speech language pathologists have been presented. However, these common treatment areas sometimes go without referral because of a lack of knowledge about which disorders to refer and unfamiliarity with the therapeutic process. It is hoped that the information found in this article will facilitate more patient referrals for therapeutic intervention of fluency and voice disorders (see Box).

WHEN TO MAKE A REFERRAL TO AN OTOLARYNGOLOGIST AND/OR SPEECH-LANGUAGE PATHOLOGIST

For voice disorders, if the child exhibits any of the vocal behaviors listed in the Box, a referral for a laryngoscope by an otolaryngologist is warranted. If a disorder is already diagnosed, a speech-language pathologist can treat the vocal symptoms.

For fluency disorders, there is cause for concern and a need for an immediate referral to a speech-language pathologist when (a) the child's speech contains frequent disfluencies (single syllable repetitions, sound prolongations, or tense pauses with fixed articulators); (b) the child shows an emotional reaction to his or her disfluent speech patten, regardless of age, recency of the disorder, or intermittent nature; (c) disfluencies are becoming more consistent across time and situations; or (d) parents are highly concerned about the child's disfluencies (Curlee, 1999).

Paradoxical vocal cord movement imitates asthma attacks, that is, the vocal cords close when they should open and obstruct the airway during inspiration.

Families may ask if postponing treatment will have a negative effect on their child's disfluencies or if the stuttering will go away without treatment. Although some children show remission of stuttering within a few months to a year after onset, it is not yet possible to predict which children will regain fluency spontaneously. Once remission is achieved and maintained for several months, however, the chances of permanent recovery is high (Yairi & Ambrose, 1999).

As a result of their investigation, Ingham and Bothe (2001) have suggested that the longer a child has been stuttering, the less successful the treatment is likely to be. They found a 27% decrease in the number of children whose treatment was successful if the children had been stuttering for at least 15 months. It is, therefore, good practice to immediately refer a child for evaluation and possible treatment if any of the conditions previously listed are observed. (Additional information concerning normal disfluencies and about stuttering in general may be obtained from the Stuttering Foundation of America, *www.stuttersfa.org*.)

HOW TO FIND A SPEECH-LANGUAGE PATHOLOGIST

A speech-language pathologist should have state licensure and the Certificate of Clinical Competence (CCC) awarded by the American Speech-Language-Hearing Association (ASHA).* Such professionals work in a variety of settings: (a) public and private schools, (b) private practice, (c) colleges and universities, (d) rehabilitation centers, (e) hospitals, and (f) specialty clinics.

When making a referral, it is important to determine if the speech-language pathologist has a particular area of expertise. Some professionals specialize in pediatric articulation and language disorders, whereas others are focused on adult-centered organic deficits such as cerebrovascular accident, head injury, or head and neck cancer. The areas of fluency and voice tend to be highly specialized and require a speech-language pathologist with expertise and knowledge concerning these specific disorders.

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*The ASHA (800/498-2071) maintains a listing of certified individuals in every state. The Web site for ASHA is *www.asha.org*. The Web site contains information for the speech-language pathologist, but also contains information for the consumer. References are provided for obtaining brochures and for the location of a professional speech-language pathologist in a particular area.

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