

## Hey! It works! Evidence-based approaches to voice therapy



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ArkSHA State Convention, October 2014

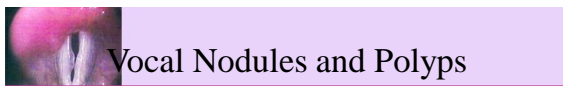
## Workshop goals

- Discuss assessment and treatment of those voice disorders that are hyperfunctional in origin;
- Describe the diagnostic probe and explain its importance in voice therapy;
- Explain procedural aspects of selected probes;
- Generate child voice goals that are easy to operationally define and to measure.

## Muscle Tension Dysphonia

- The most prevalent voice disorder in both children and adults.
- A consequence of vocal hypertension and/or hyperfunction.
- Considered **functional**.
- These functional behaviors over time lead to organic changes, such as swelling, nodules and polyps.

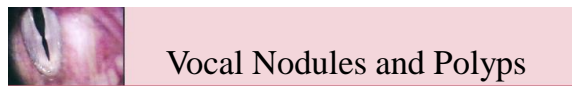
## Vocal nodules and polyps



### Vocal Nodules and Polyps

#### Nature & Etiology

- Benign lesions usually occurring at the anterior-middle third aspect of the vocal fold
- Nodules are generally bilateral and occur due to repeated and chronic vocal abuse
- Polyps are generally unilateral and are often precipitated by a single vocal event
- Both types of lesions are resolved with behavioral voice therapy (Holmberg, 2001; Yamaguchi, 1986; McFarlane & Watterson, 1990)



### Vocal Nodules and Polyps

#### Vocal quality

- Often characterized by severe dysphonia
- Diplophonia
- Air escape and short utterances
- Low pitch and rough, breathy and hoarse vocal quality
- Client often coughs and clears throat and complains of globus (sensation of fullness at the laryngeal level)

## Vocal Nodules and Polyps



- Patient: 42 year old school teacher and recreational singer.
- Complaints: Upper respiratory infection and sequela of two months' duration, accompanied by excessive coughing, throat clearing. Patient reports heavy vocal use and vocal fatigue (MTD).
- Assessment: Perceptually, patient presents with low speaking frequency and occasions of fry at the ends of phrases. Endoscopy revealed puffy vocal folds bilaterally with thick mucus throughout the supraglottis. Polyp was observed at the medial margin of the right vocal fold with the right ventricular fold impinging slightly on the TVF.

## Vocal Nodules and Polyps Intervention



- Interview patient regarding vocal demands and vocal overuse. If possible, employ ambulatory monitoring.
- Redirection
- Tone focus
- Pitch shift up using nasal glides



## Vocal Nodules and Polyps Intervention



- Yawn-sigh followed by breathy voice.
- Breathy voice with open mouth approach.
- Pitch shift up
- “Silent” yawn-sigh
- “Boom”

## Vocal Abuse and Misuse Reductions

- Replace coughing and throat clearing with sniff swallow and silent cough.
- Use voice amplification.\*
- Speak and sing within the appropriate pitch range and loudness.
- Reduce/eliminate smoking, caffeine and alcohol use.
- Monitor exercise behaviors.

# Child Voice Evaluation & Intervention

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## Initial Interview with Child and Family

- Explore organic factors that may underlie behavioral abuse and overuse (URIs, asthma, reduced hearing acuity).
- Familial influences
- School activities (large classrooms, playground, choir)
- Extracurricular
  - Sports
  - Martial arts



## Descriptive Terminology

- Clapping hands
- Balloons
- Airflow through palms with and without marble
- Audio and videotape child interacting with parents, siblings and peers.
- Review videotapes of normal and pathologic vocal folds.



## Vocal Hygiene

- Identify times of vocal abuse.
- Explore alternative methods (gestures, whistling).
- Increase water intake.
- Replace coughing and throat clearing with sniff-swallow and silent cough.
- Designate Quiet Times at home.

## Just Right Voice

- Incorporate “Just Right Voice” theme throughout therapy, school and home.
- Child identifies “Just Right Voice” qualities.
- Just Right Voice goals book is issued to the child. Child, siblings, parents and educators establish goals.
- May develop thematic books that child can read and color; later these books may be incorporated into a play.



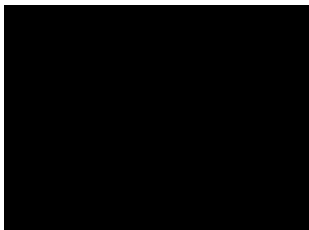
## Pair Clients

- Visi-Pitch analysis
- Audiotape or videotape is a suitable alternative
- Facilitation techniques:

Yawn sigh    Easy onset  
Glottal fry    Breathy voice  
Inhale rose    Confidential tone  
Focus        Blending  
Tongue protrusion /i/  
Spontaneous speech



## Vocal nodules in a child



## Community Intervention

- Day One
- Client, siblings and clinicians perform play.
- Discussion period (children identify healthy and abusive vocal qualities).
- Children watch videotape of laryngeal function and make models of larynges.

## Community Intervention

- Day Two
- Review play.
- Screen segments of popular movies and cartoons.
- Experiment with moist and dry consistencies (noodles, flowers).
- Create larynges out of construction paper.
- Teacher may incorporate protocol into lesson plans.

## Community Intervention

- Child must be aware of dysphonia.
- Motivators must be identified.
- Child should easily demonstrate voice techniques.
- Sibling, peer, parental and teacher support.
- Child should be able to monitor and adjust vocal behavior internally.



## The Role of the School-Based SLP

- Why do many students with voice disorders fail to receive speech services?
- Because it is thought that their disability does not adversely affect educational performance.



## Individuals with Disabilities Education Act

- Has “educational performance” ever been defined in federal regulations?
- No. But, the Department of Education and the Office of Special Education Programs, issued a number of policy letters interpreting this phrase.
- Education performance, under IDEA, “Includes effect upon academic and non-academic areas.”

## Furthermore. . .

- If the presence of a speech-language impairment has been established by a SLP through appropriate appraisal procedures, the receipt of services is not conditional upon academic performance. A child who is achieving at grade level **can still qualify** as having a speech language disability.

Andrews (2002, 593)

## Impact of Voice Disorders on Education

- Dysphonia may seriously limit classroom participation
- Social-emotional implications of a voice disorder are many
- Children with a limited number of vocal strategies may be evaluated negatively
- Many occupations demand efficient verbal communication skills. Poor voice is more difficult to change in later life

Andrews, 2002 (Appendix E, 586-594)

## Sample IEP Worksheet

- *Present level of Education performance*
- Communication
- *Based on:*
- Voice screening and survey\*and clinical observations. Charlie is a 9-year-old male with grade-appropriate speech and language skills, however, his vocal quality, pitch and loudness are not within normal limits, as measured by the following:

\*Boone, DR, 2004; Lee, Stemple, Glaze and Kelchner, 2004

## Voice Screen Findings

- Breath support: Charlie presents with too little breath support for speech. He produces about 3 words per phrase. Average words per phrase is 8.
- MPT: Charlie's MPT is 6 seconds. The average MPT for same age peers is 16 seconds.
- Pitch: Charlie presents with a pitch that is below normal limits for same age peers. His speaking frequency is about a G3 (196 Hz), which is about 40-60 Hz below normal.
- Quality: Charlie presents with a hoarse voice that sometimes turns into a whisper. The GRBAS revealed a score of moderate/severe dysphonia.

## Effects of Disability on Participation in General Curriculum

- When Charlie contributes in class, it is observed that his voice is hoarse at least 50% of the time, and aphonic (no voice) 30% of the time. His teacher states that he speaks in a "rough" and "low voice," and that from the week of 3/14- 3/18, he lost his voice on three occasions. His vocal nodules have been verified by a medical doctor. Charlie's hoarse voice interferes with his ability to participate in daily educational interactions.

## Effects of Disability on Participation in General Curriculum

- Priority educational needs:
- To improve the quality of Charlie's voice so that he can participate in all educational activities during the day.
- Measurable Annual Goal:
- During all oral school activities, Charlie will use vocal hygiene and voice strategies to produce a clear, age-appropriate voice 4/5 days a week for three school weeks.

## Short-term Objectives

- Charlie will identify and modify vocal abuse and overuse occasions with 90% accuracy by logging these events in his daily “JRV” book.
- Charlie will discriminate between JRV samples of himself and two of his peers with 90% accuracy.
- Charlie will demonstrate and teach vocal hygiene and voice strategies to family members and friends, as documented in his “JRV” book.
- Charlie will engage in JRV when communicating orally in his classes as measured by his instructors, in 8/10 opportunities.

## Evaluation Plan

- Charlie’s progress toward annual goals will be measured by:
- Teacher/clinician observations.
- Voice quality, pitch and loudness data collected on a weekly basis.
- Review of Charlie’s JRV book and related charts on a weekly basis.

## References

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- Boone, D.R. (1993). *The Boone Voice Program for Children* (2<sup>nd</sup> ed.), Austin, TX: Pro-Ed.
- Finnegan, D.E. (1984). Maximum phonation time for children with normal voice. *Journal of Communication Disorders*, 17, 309-317.
- Goldman-Eisler, F. (1968). *Psycholinguistics: Experiments in spontaneous speech*. New York: Academic Press.
- Lee, L.L., Stemple, J.C., Glaze, L. Kelchner, L.N. (in press). Quick screen for voice, and supplementary documents for identifying pediatric voice disorders. *Language Speech and Hearing Services In the Schools*.

## Hey, it works! Evidence-based approaches to functional aphonia



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## What is muscle tension dysphonia (MTD)?

- MTD is a persistent dysphonia associated with excessive laryngeal and related musculoskeletal tension.
- Tension may result in hyperfunctional true and/or false vocal fold vibratory patterns.

## MTD

- Patient is an educator who has not been able to work for 4 months secondary to dysphonia.
- Fiberoptic evaluation at Stanford revealed muscle tension dysphonia.
- Client currently prescribed with PPIs and antihistamines.
- Produces voice when she clears throat and laughs.
- Note normal voice that “chains” off of the throat clear. 🗨️

## What are diagnostic probes?

- Boone once wrote that . . .
- Instead of confronting the client, what is the preferred approach?
- Diagnostic probes are strategically selected therapy approaches designed to target a more optimal vocal response from the patient.
- A large part of voice intervention involves determining which probe(s) elicit the desired vocal response.

## Why is biofeedback so important?

- Auditory feedback is supported by motor planning and programming theory (Duffy, 2005).
- It suggests that humans are able to alter and adapt motor equivalent voice and speech behaviors through integration of sensory information from peripheral mechanoreceptors. 🗨️

## Counseling

### Digital manipulation

Putting the voice problem in its proper perspective can often free the patient from overwhelming concern.

- Digital manipulation: Finger pressure can be applied to the thyroid cartilage for a number of reasons. UVFP, pitch shift down, massage, or to feel for tension. 🗨️



## UVFP

- Onset often sudden, following surgery, endotracheal intubation, viral infections, tumors, trauma. Most cases are idiopathic
- Usually unilateral, whereby the paralyzed fold is positioned at the paramedian
- Often accompanied by dysphagia
- Treated with medical procedures or behavioral therapy. Medical procedures usually deferred for 9-12 months. May involve muscle nerve reinnervation, injecting fold with collagen or medialization thyroplasty.



## Vocal Fold Paralysis Intervention

- Case study: Male s/p surgery and radiation for thyroid cancer.
- Right UVFP.
- Patient reported dysphonia and dysphagia
- Phonation is breathy and diplophonic.
- Fo: 104 Hz with RAP of 2.98%; shimmer 12.2%



## Vocal Fold Paralysis Intervention

- Half-swallow boom
- Head turn
- Digital manipulation
- Tone focus
- Pitch shift
- Tongue protrusion /i/
- Inhalation phonation
- Nasal-glides (yummy, yummy).
- Personal amplification system

\*See McFarlane, SC, Watterson, TL & Von Berg, S (1999) Behavioral intervention in the presence of unilateral vocal fold paralysis: Indications, diagnosis, techniques and interpretation. *Phonoscope*, Appendix B, pp 211-215.



## Digital manipulation

- Ask the client to phonate. Feel the position and tension of the larynx. Larynx should easily “wiggle” from side to side.
- In this case of MTD, the larynx was elevated in the pharynx.



## Focus

- Kinds of problems: The most common problems we see in patients with voice disorders is the voice sounding as if it is coming from. . .
- Good focus of the voice is characterized by the voice coming from the middle of the mouth.
- A voice focused high in the head is a more efficient voice.



## Elimination of abuses

- Kinds of problems: In this case, it was coughing and throat clearing.
- Time is given early in the assessment process to identify possible vocal abuses.
- Ask the client to plot her daily vocal abuses on a graph.
- Educate in vocal hygiene & silent cough and sniff swallow.
- See Iowa Phonetics site.





## Head positioning

- Kinds of problems: Clients with vocal HF often experience a better more relaxed voice by placing the head in a different position.
- The best voicing tasks to search for good head position are the nasal-glides and vowels.
- Mirror provides good visual biofeedback.



## Nasal/glide stimulation

- Kinds of problems: These sounds facilitate easier-produced, better sounding voice in individuals with vocal HF.
- Studies found that nasal/glides revealed better voicing patterns.
- Clinicians should feel comfortable explaining the resonance changes that occur with nasals and glides.

## Yawn-sigh

- Kinds of voice problems: One of the most effective therapy techniques for minimizing tension effects of vocal HF.
- What is happening physiologically during vocal HF?
- What happens during yawn-sigh?
- If the patient can perform the yawn-sigh, what does that mean about laryngeal massage?



## Relaxation

- Some individuals with vocal HF tend to overreact to environmental stressors and operate on “fast idle.”
- There are a number of approaches to relaxation, including open throat relaxation, and even chewing
- The client should envision and be conscious of an open throat during the prolonged inhalation.



## Pitch inflections

- Kinds of problems: Many clients with vocal HF speak with little pitch inflection because of throat and mandibular tightness.
- Pitch inflection up for this client revealed a speaking frequency more consistent with her age and gender.
- Nasals are effective for eliciting an easy inflection up without hyperfunction.



## Redirection

- Kinds of problems: Clients sometimes have difficulty “finding” their voices, especially after lengthy periods of dysphonia.
- Redirection helps the client search for a type of phonation that is easy and conducive to good voice.
- Once this is discovered, the sound is redirected into a speaking voice.



## Chant talk

- Kinds of problems: Often seen in HF. This technique reduces the effort in talking.
- Often preceded by warbles. 🗣️
- If client is uncomfortable with this technique, explain that it is temporary, and is used only to develop a relaxed, easy voice.

## Amplification

- Confidential Voice
- This technique is breathy without turning into a whisper; phonation is reduced in amplitude.
- Reduces the risk of continued vocal hyperfunction.
- Confidential voice slows speaking rate and creates a more open, relaxed airway. 🗣️

## Auditory feedback

- Kinds of problems: organic, neurogenic and functional.
- Clients benefit from hearing their voices immediately, using a reliable instrument, such as a smart phone, iPad or digitized playback system. 🗣️ 🗣️

## Auditory feedback

- Novel sentences: Encourages client to think more about *what* she is going to say rather than *how* she is going to say it. 🗣️ 🗣️
- Counseling: Again, explain the anatomy and physiology of the laryngeal structure; provide visuals; and imbue confidence in client that **she is her own clinician!**



# No More Vocal Abuse!



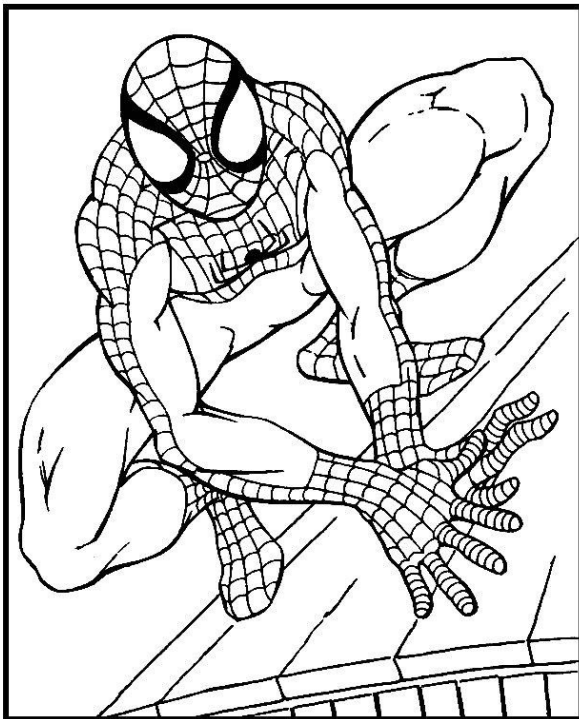
**How to make it go away  
and make my voice better  
This book belongs to a superhero  
named:**

---

This will help me become a voice superhero. I will first learn about my voice, and then I will learn what I need to do to make it go back to normal. It is up to me to work hard and battle the things that are not good for my voice and do the things that will help my voice.

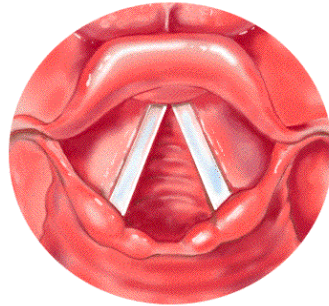


I need to do good things with my voice and stay away from the bad things. If I don't take care of my voice, I can get nodules (the villain). These are like the calluses I get on my hands, but they are on my vocal folds. They can get angry and become red, swollen, and sore and feel like a sore throat. These nodules can make my voice rough, squeaky or scratchy. These nodules can even make it hard for me to talk.

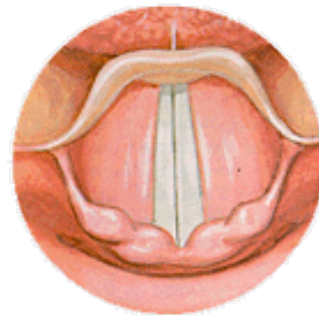


**Here are some pictures of what my vocal folds look like normally and some pictures of what they look like with nodules.**

Normal Larynx

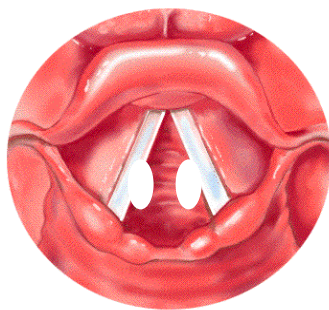


When I am breathing in

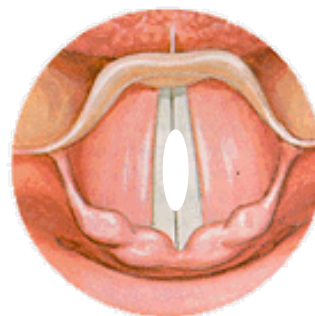


When I am talking

Vocal Nodules



Breathing in



Talking

## QUESTIONS ABOUT MY VOICE

What does my voice sound like to me?

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Do I like my own voice?

---

Are there times when your voice sounds worse or better?

---

Are there times when I yell and scream?

---



<http://www.mon-coloriage.com>

# Bad things that can hurt my voice.

- Yelling
- Screaming
- Loud crying
- Loud singing
- Clearing my throat and coughing
- Making loud sounds
- Drinking sodas





Instead of **YELLING** and  
**SCREAMING** I can...

- Whistle
- Wave my hands to my friends
- Jump up and down

..... to get their attention

**Can I think of other options that  
are QUIET?**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_



Sometimes I may feel like I want to yell because I'm mad or upset, but DON'T!



Instead, I will try scribbling or hitting a pillow.

Can I think of any other ideas?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

Crying loudly is another kind of vocal abuse that hurts my vocal folds. If I get hurt or I am sad or mad, I will try to cry softly and not scream.



# No loud singing



SHHHH.....

If I have to sing in a play at school, or in class or anywhere else, I will remember to sing very softly. My teacher can help me remember 😊

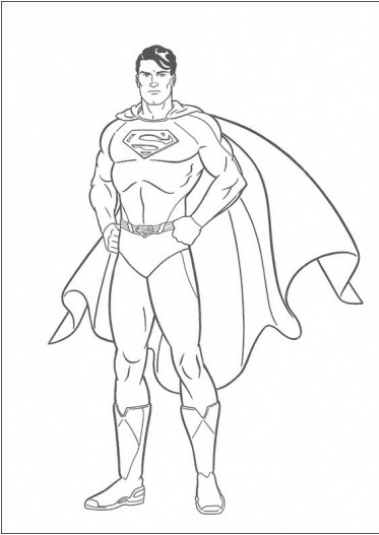
I can also hum or just listen to music.

It hurts my vocal folds the most when I cough and clear my throat 😞



I will swallow or get a drink of water whenever I need to cough or clear my throat.

I will NOT make loud sounds like the sounds of trucks, cars, airplanes or animals.



**Hmmmm....**

Can I think of other ways to make noises without using my voice?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

If I get sick and catch a cold or a sore throat, I must.....

1. Get lots of rest and sleep.
2. Drink lots and lots of water.
3. Not talk unless I have to.

And if I get laryngitis and lose most of my voice, I must Not talk at all!

# Remember to not scream or yell

Count the times I yelled, screamed, talked over noise, made loud noises, cleared my throat ....

Day of the week	<u>SUN</u>	<u>MON</u>	<u>TUES</u>	<u>WED</u>	<u>THURS</u>	<u>FRI</u>	<u>SAT</u>
Week #1							
Week #2							
Week # 3							
Week #4							
Week #5							
<u>TOTAL</u>							



When I am playing games  
with friends and family,  
choose the quiet options!

Count the times...

Day of the week	<u>SUN</u>	<u>MON</u>	<u>TUES</u>	<u>WED</u>	<u>THURS</u>	<u>FRI</u>	<u>SAT</u>
Week #1							
Week #2							
Week # 3							
Week #4							
Week #5							
<u>TOTAL</u>							

# How much water, soda and other drinks did I have?

<u>Kind of drink</u>	<u>SUN</u>	<u>MON</u>	<u>TUES</u>	<u>WED</u>	<u>THURS</u>	<u>FRI</u>	<u>SAT</u>
Water							
Caffeine Drinks							
Milk							
Juice							
Sports Drinks							
<u>TOTAL</u>							



# DAILY JOURNAL ENTRIES

Talk about how my overall vocal performance for each day was...

- 1) Rate + (positive) or – (negative).
- 2) Problem areas
- 3) Questions and concerns about the use of my voice

Sunday\_\_\_\_\_

\_\_\_\_\_

Monday\_\_\_\_\_

\_\_\_\_\_

Tuesday\_\_\_\_\_

\_\_\_\_\_

Wednesday\_\_\_\_\_

\_\_\_\_\_

Thursday\_\_\_\_\_

\_\_\_\_\_

Friday\_\_\_\_\_

\_\_\_\_\_

Saturday\_\_\_\_\_

\_\_\_\_\_

# FUN VOICE ACTIVITIES for CHILDREN



By: Cynthia Manuel

## Voice Activity Rationales and Directions

### *Fun Activity #1:*

**Rationale:** The purpose of this activity is to elicit productions of connected speech, so we can observe the children's respiration. The simple predictable text that is repeated over and over in this story helps the children exhibit their abilities without interruption of thought. Pay attention to how they are breathing as they speak. Watch for proper support, length, quality, loudness and strength of their breaths.

**Directions:** During this activity, you will read the story out loud to the children the first time. Then have them begin to follow along with you as you fade your voice out. The children will then finish the rest of the story on their own.

---

### *Fun Activity #2:*

**Rationale:** The purpose of this activity is to elicit spontaneous phonation during conversational speech. You will be looking at the quality, strain, effort, pitch, intensity and variability of the children's voices.

**Directions:** The children will be engaged in conversation after you prompt them with an array of engaging animal pictures. You will ask them what their favorite animal is or if they could make up an animal, what would it be? Then you will ask them to describe their favorite animal. For example: What does it look like? What does it eat? Where does it live? What does it do fun?

---

### *Fun Activity #3:*

**Rationale:** The purpose of this activity is to observe the children's production of certain sounds to assess the resonance of their voice. You want to make sure that their velum is working properly and opening and closing during appropriate sounds and allowing air through their nose only during certain sounds. Engaging the children in a variety of vocal activities that elicit sounds associated with hypernasality, hyponasality and nasal emission is important. In order to do this, you need to test the children's ability to produce nasal sounds (m and n), vowel sounds with voiced consonants and production of consonants that produce an outward production of air from the oral cavity.

**Directions:**

1<sup>st</sup> - Ask the children, "*What do you say when a food tastes really good?--- Mmmmmmmm! Or Mmm..mmm...good!*" Then have them repeat after you. "*Maybe on Monday your Mommy can make many yummy muffins.*"

2<sup>nd</sup> - Have the children repeat the silly sentences as you show them the illustrations.

*Billy buys a brown puppy.*

*Give Dad the green gum.*

*Pete the pirate bakes a cake.*

## Fun Activity #4

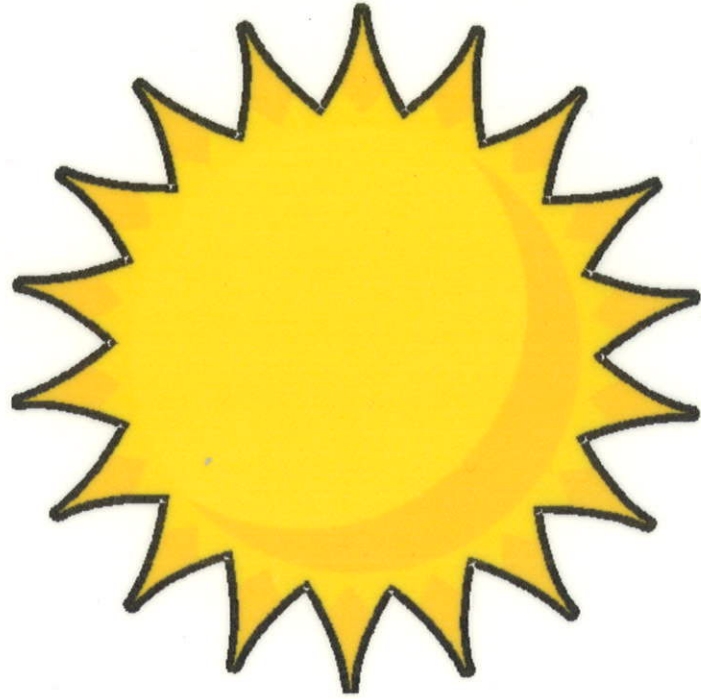
**Rationale:** The purpose of this activity is to look at the children's vocal range and flexibility. This is important to first find out what their normal pitch is and how loud they are when they are speaking. This can tell you if they are talking too loud or too soft, which could affect how they communicate and are heard by their peers. The amount of time a child is able to sustain a constant stream of voice is important to see if they have proper breath support for speaking. Lastly, you will be engaging the children in an activity that tests their ability to vary the pitch of their voice from high to low.

1<sup>st</sup> – Have the children count from 1 to 10 as they count the number of cookies they see on the page.

2<sup>nd</sup> - Then ask the children if they would like to “eeeeeeeeeeeeeat” the cookies? When they respond with yes, and then have them say “I would like to eeeeeeeeeeeeat the cookies.”

3<sup>rd</sup> - To get a maximum phonation time for the children, you will have to demonstrate first and then have them respond. Explain to the children that you are going to pretend to slide down a long dark tunnel and need to take a “big” breath in and then let it out slowly as you say “aaaaaaaaah” all of the way down without being too loud. You will place your finger at the starting point of the spiral on the page and take a deep breath in. Then follow the spiral with your finger as you say “ah” until you reach the end. Then use your finger again as you instruct the children to do it.

4<sup>th</sup> - To elicit a range in the children's pitch, you will ask them who puts out fires. Then after they respond with firefighters, ask them what they drive to the fire. Then ask them if they know the sound the fire engine makes as it is on its way to put out the fire. Demonstrate and then have them respond.

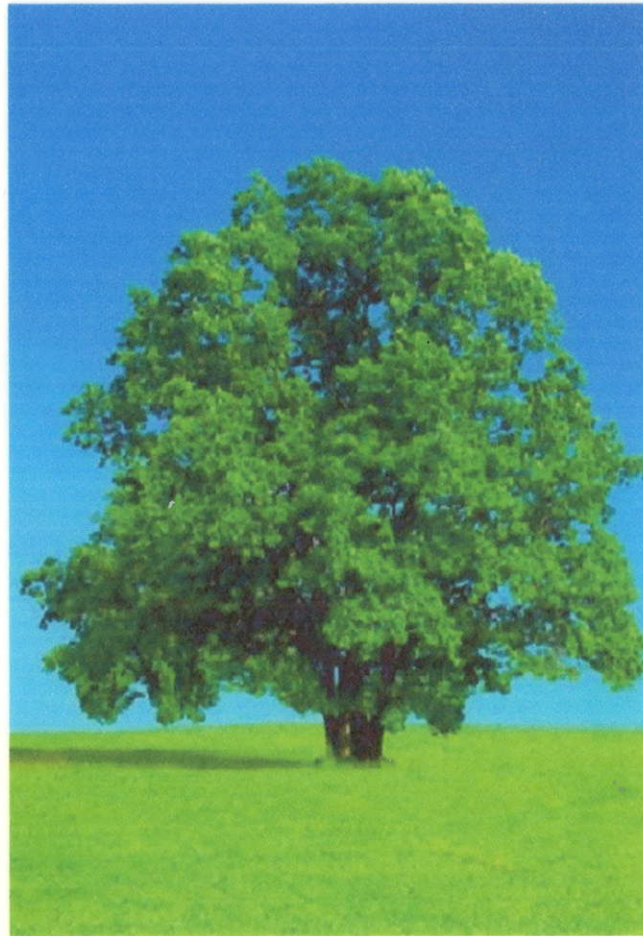


**Yellow sun, yellow sun, what do you  
see? I see a white cloud looking at me.**





**White cloud, white cloud, what do you  
see? I see a green tree looking at me.**



**Green tree, green tree, what do you  
see? I see a red flower looking at me.**



**Red flower, red flower what do you  
see? I see a purple butterfly looking at  
me.**



**Purple butterfly, purple butterfly  
what do you see? I see blue bird  
looking at me.**



**Blue bird, blue bird what do you  
see? I see an orange cat looking at  
me.**



**Orange cat, orange cat what do you  
see? I see a black dog looking at me.**



**Black dog, black dog, what do you  
see? I see a father looking at me.**



**Father, father, what do you see? I  
see my children smiling at me.**







*“What do you say when a food tastes  
really good?”*

*Mmmmmmmm! -- Mmm..mmm...good!”*

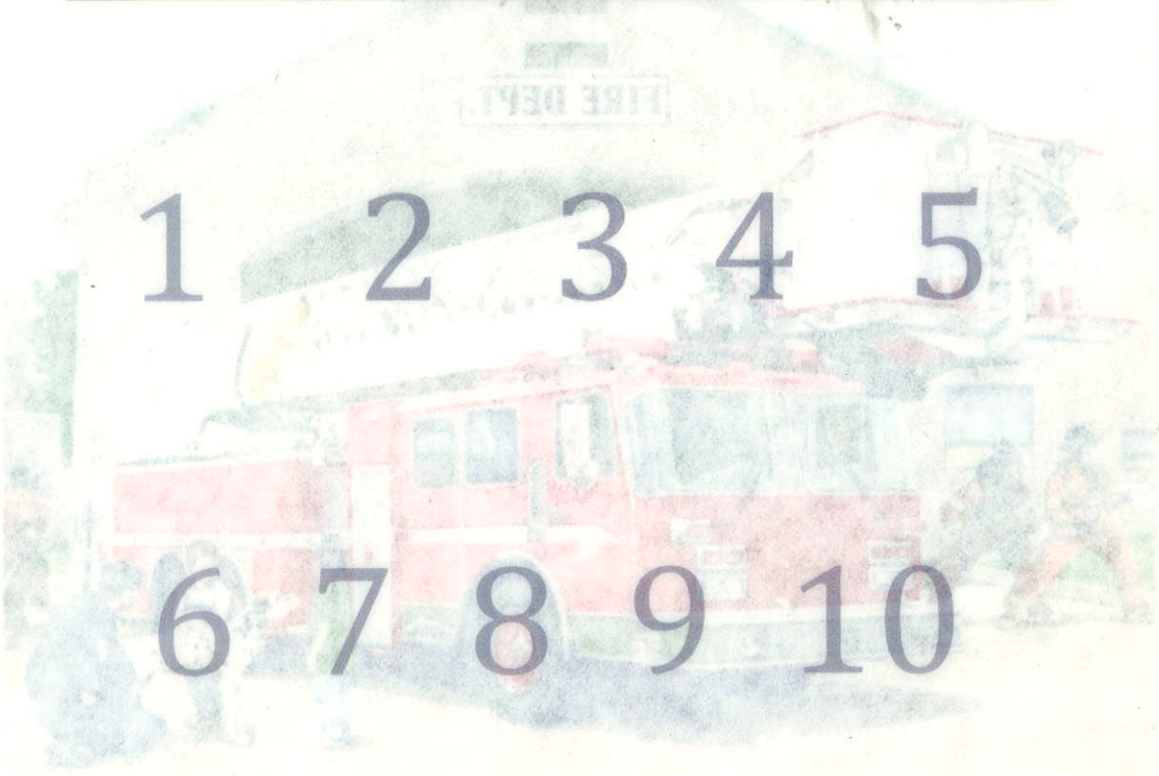


*“Maybe on Monday your Mommy can  
make many yummy muffins.”*

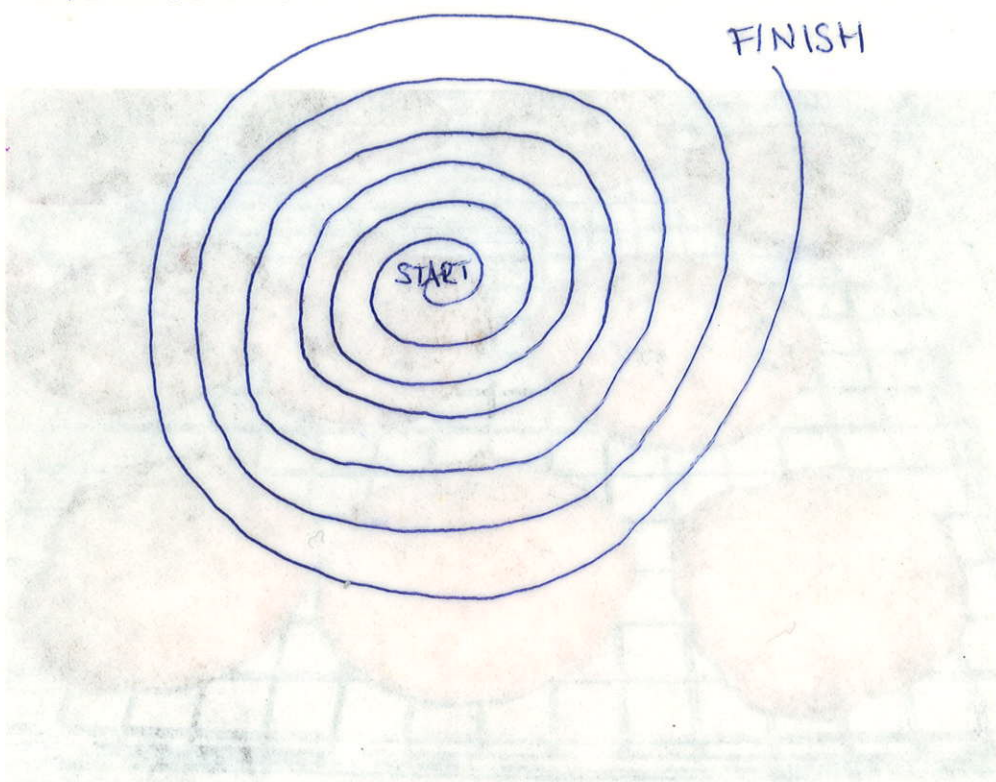
*Billy buys a brown puppy.*

*Give Dad the green gum.*

*Pete the pirate bakes a cake.*



Say "aaaah"



# Your Child's Voice

Your child can use his or her voice in healthy ways or in ways that can be harmful and result in problems. These problems most often occur during spring season. This is the time for outside play and allergies; and team sports are often a part of life. It's natural for children to yell, cheer, shout and make truck, plane and animal noises while playing. They may even excessively cough or clear their throats because of summer colds. All of these behaviors combined cause stress on the vocal folds, and as a result, vocal nodules may develop, which are callous-like growths. Nodules tend to interrupt good voicing and speech, which could be a problem in school. There are many things that can be done to reduce the chance of, or eliminate, vocal nodules. The following is a home program that will help you and your child work with the speech therapist to increase good voice habits.

## **A typical vocal hygiene program will consist of:**

- Identifying the causes of the vocal problems;
- Modifying behaviors that cause distress to the vocal folds; like yelling;
- Learning how to take deep breaths and relax the muscles in the throat;
- Taking time to speak slowly and clearly;
- Staying properly hydrated throughout the day;
- Avoiding caffeinated beverages, such as sodas, which do not hydrate like water does.

**Some general tips that you as a parent can use at home:**

- Make a list of situations in which your child may misuse his or her voice.
- Become a careful listener (e.g., is there a lot of throat clearing at home or yelling at soccer practice?).
- Remind your child to use a softer, gentler voice.
- Develop signals to help your child remember to use an appropriate voice (i.e., based on therapy suggestions).
- Suggest alternatives to yelling at sporting events (e.g., noisemakers, signs, clapping).
- Discourage the use of non-speech noises while playing (e.g. plane sounds, beeping, car noises, etc.).
- Turn down radio and TV volume when talking.
- Suggest some quiet time activities, if your child is sounding hoarse.
- Model good vocal behavior.

**We will be working on the three facilitating techniques in therapy, which your child will also be working on at home. These include the following:**

1. Just right voice
2. Chant talking
3. Yawn-sigh

Every day, your child should be quietly practicing these techniques in the morning and at night for a maximum of 10 minutes, so he or she doesn't get

tired. These times should be referred to as “warm up” and “cool down” times, which will help the processes, become routine.

Before beginning the techniques, it is important for your child to work on overall relaxation of the body. Encourage your child to take a few breaths and relax from his head all the way down to the toes.

1. Increasing loudness will involve working with the therapist to find his best pitch level. Then your child can practice this at home by sustaining vowel and eventually words and phrases.
2. Chant talk is practiced by imitating chants such as monotone singing. Eventually moving towards reading and conversational speech.
3. Yawn-sigh technique practice involves beginning to yawn and making an easy “sigh” on the exhale. Once this is mastered, then open-mouthed vowels and words that begin with /h/ will be introduced. Then they can move on to phrases and sentences. The following are examples of words and sentences that can be used for practice.

### **Yawn-sigh technique: H-Words of One Syllable**

ha	hip	hunt	have
had	him	hurt	hue
hair	hit	hut	who
half	hill	hood	heave
hall	his	ham	howl
hand	hint	heap	how
hang	high	heard	heed
hard	hi	hilt	heel
has	hike	hinge	heat



hat	hot	heave	hug
hatch	hock	howl	hum
hate	halt	he'll	hack
haul	hop	he'd	hoof
have	hold	hole	hoot
hay	home	hence	whom
he	hook	hey	whose
head	hope	hex	hood
heads	horn	heart	hub
health	horse	hail	huff
hear	how	whip	hull
held	huge	hid	hide
help	house	he's	hedge
hem	how	hers	held
hen	huge	herd	hurl

### **Yawn-Sigh Technique: 6-Syllable Sentences**

1. Come to see our harvest.
2. Jimmy's heart can be fun.
3. Harmless games can be fun.
4. Play your harmonica.
5. Sally hesitated.
6. John is heading homeward.
7. Can you catch his homerun?
8. He hit Herman too hard.
9. Hold his hammer for him.
10. The food was horrible.

11. We enjoyed his houseboat.
12. Hardly anyone left.
13. A man is human too.
14. Hike over this big hill.
15. The cowboy yelled "howdy."

**\*\*You will also receive a child anti-vocal abuse booklet and chart packet and journal. The book is for your child to read and learn about his or her voice and vocal behaviors that may cause vocal fold swelling and make the voice sound different. The charts are for your child to complete and ask for your help if needed. The charts allow your child to keep track and monitor vocal behaviors in hopes he or she will make healthier voice production choices.**

## Clinical Forum

# Quick Screen for Voice and Supplementary Documents for Identifying Pediatric Voice Disorders

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oice is the product of a combination of physiologic activities, including respiration, phonation, and resonance. A voice disorder is present when a person's quality, pitch, and loudness differ from those of a person's of similar age, gender, cultural

**ABSTRACT:** Three documents are provided to help the speech-language pathologist (SLP) identify children with voice disorders and educate family members. The first is a quickly administered screening test that covers multiple aspects of voice, respiration, and resonance. It was tested on 3,000 children in kindergarten and first and fifth grades, and on 47 preschoolers. The second document is a checklist of functional indicators of voice disorders that could be given to parents, teachers, or other caregivers to increase their attention to potential causes of voice problems and to provide the SLP with information pertinent to identification. The final document is a brochure with basic information about voice disorders and the need for medical examination. It may be used to help the SLP educate parents, particularly about the need for laryngeal examination for children who have been identified as having a voice problem.

**KEY WORDS:** voice disorders, screening voice, voice assessment, pediatric voice disorders

background, and geographic location, or when an individual indicates that his or her voice is not sufficient to meet daily needs, even if it is not perceived as deviant by others (Colton & Casper, 1996; Stemple, Glaze, & Klaben, 2000).

The incidence of voice disorders in children is often estimated at between 6% and 9% (Boyle, 2000; Hirschberg et al., 1995). However, other sources identify ranges of 2% to 23% (Deal, McClain, & Sudderth, 1976; Silverman & Zimmer, 1975). In one study, 38% of elementary school-aged children were identified as having chronic hoarseness (Leeper, 1992). Unfortunately, it is estimated that the vast majority of children with voice disorders are never seen by a speech-language pathologist (SLP; Kahane & Mayo, 1989), and children with voice disorders only make up between 2% and 4% of an SLP's caseload (Davis & Harris, 1992).

Few studies have identified the type of laryngeal pathologies that are most common to children. Dobres, Lee, Stemple, Kretschmer, and Kummer (1990) described the occurrence of laryngeal pathologies and their distribution across age, gender, and race in a pediatric sample. Data were collected on 731 patients seeking evaluation or treatment at a children's hospital otolaryngology clinic. The most frequent laryngeal pathologies were subglottic stenosis, vocal nodules, laryngomalacia, functional dysphonia, and vocal fold paralysis. For the total sample, these

pathologies were much more common in males than in females, with the youngest patients (less than 6 years old) identified as having the most pathologies. The distribution of pathologies within the races sampled (Caucasian, African American, and Asian) was similar to that found throughout the total sample.

Although it has been argued by some that treating voice disorders in children is unnecessary or even potentially harmful (Batz, 1970; Sander, 1989), others have argued for the opposite opinion (Kahane & Mayo, 1989; Miller & Madison, 1984). Indeed, Andrews (1991) suggested that unlike some other developmental disorders, maturation alone does not significantly affect vocal symptoms. Habitual patterns of poor voice use do not, as some have suggested, disappear at puberty. In other words, children do not outgrow voice disorders.

The identification and management of pediatric voice disorders is important for the child's educational and psychosocial development, as well as physical and emotional health. The underlying cause of any dysphonia must be determined because voice disorders that share the same quality deviations may have vastly different behavioral, medical, or psychosocial etiologies (see review in Stemple et al., 2000).

The majority of children with voice problems are identified by individuals other than the school SLP (Davis & Harris, 1992). Typically, the teacher, nurse, or a family member notices that a child has developed an abnormal voice quality and makes the initial contact with the SLP. These referral sources lack training in making perceptual quality judgments, so they may miss more subtle problems that need professional attention. Depending on the task, teachers may or may not be accurate in identifying children with voice deviations (see review in Davis & Harris, 1992), and many parents may assume that the child will outgrow the disorder. Perceptual voice quality evaluation can be difficult even for the SLP (Kreiman, Gerratt, Kempster, Erman, & Berke, 1993; Kreiman, Gerratt, Precoda, & Berke, 1992), so depending on untrained persons to identify these children is less than ideal.

One common method of identifying childhood communication disorders is through mass screening. Unfortunately, voice has received scant attention in most speech and language screening tools. For example, the Fluharty-2 Preschool Speech and Language Screening Test (Fluharty, 2001) has one line for clinician response to voice quality ("sounded normal; recheck may be necessary"). Similarly, one line for description of the voice is allotted on the Speech-Ease Screening Inventory (Pigott et al., 1985). These conventional one-line summaries fail to address the voice comprehensively; that is, they do not assess the three subsystems of respiration, phonation, and resonance. Voice problems are typically reduced to a generic description of quality deviation and may easily be overlooked because of such minimal opportunity for evaluation.

Identification of children with voice disorders could be facilitated with several documents. A screening tool covering multiple aspects of voice, respiration, and resonance could replace the more general voice evaluation statements that are provided on current screening tools.

Additionally, a checklist of functional indicators of voice disorders in children and adolescents that could be given to parents, teachers, or other caregivers may increase their attention to potential causes of voice problems and provide the SLP with information pertinent to identification. Finally, a brochure with basic information about voice disorders and the need for medical examination may help the SLP educate parents. These needs are addressed in the present document.

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## QUICK SCREEN FOR VOICE

A screening tool entitled Quick Screen for Voice (see Appendix A) was developed by the second author (JS). It provides more thorough delineation of tasks and measures than the more open-ended requests for observation of voice quality that are currently available on speech and language screening tests. The tool may be used for speakers of all ages, from preschool through adult.

Respiration, phonation, resonance, and vocal flexibility are the hallmarks of healthy and acceptable voice production, and all are included in this test. These subsystems of voice production are assessed separately. Lists of perceptual characteristics that are commonly associated with disorders of that subsystem are contained in each section. Definitions of each perceptual characteristic are provided in Appendix B.

The protocol is designed to be administered in 5 to 10 min. Administration time is reduced when the child's voice is judged to be normal. When abnormal signs are found in any subsection, the test form provides appropriate language for vocal behaviors that the SLP may not observe or identify without it. These identifiers can then be used when reporting findings and generating individualized educational plan (IEP) goals, if a management program is necessary.

## Directions and Scoring

The Quick Screen for Voice should be administered in a quiet area that is free of distractions. The tester should be seated close to the individual.

Perceptual characteristics of the voice are judged by listening to the individual speak. Therefore, the examiner should engage the individual in topics, such as family or friends, hobbies or other interests, favorite holidays or vacations, favorite classes in school, and so on. To assist elicitation of spontaneous speech, the individual may be asked to tell a story about pictures that are sufficiently detailed to allow a 2–3 min description or elicited sample. Recited passages, counting, or other natural samples of continuous speech may also be used.

The examiner responds to a checklist of observations that are made during the spontaneous speech and other voicing tasks. The speaker fails the screening test if one or more disorders in production are found in any section. In such cases, the individual would be scheduled to be screened again, have a more comprehensive voice evaluation, or be referred to a physician with a request that the child be examined by an otolaryngologist or other specialist.

## Field Tests and Subsequent Revisions

The screening tool was used during two formal mass speech and language screenings with preschool and school-age children, and more informally with adult graduate students taking a voice disorders class. The primary purpose of using the tool in these situations was to determine its ease and clarity of use, whether or not it contained complete lists of observations under each category, and confirmation of the criterion for passing or failing.

**Screening of kindergarten and first and fifth grade students.** The Quick Screen for Voice was used as part of a comprehensive speech, language, and hearing screening of 3,000 elementary school children in 53 school districts throughout Ohio. Half of the children were in regular kindergarten and first grade; half were in fifth grade. The school districts were chosen because they represented a wide variety of urban, rural, and suburban locations; average family income; percentage of minority population; and district expenditure per pupil. Students receiving part-time special education services were included. Students receiving full-time special education in segregated classes or separate buildings were omitted from the sample. Seven university departments participated. The screening tests were administered by trained graduate students under the supervision of licensed and certified SLPs. The students practiced administering the tests before conducting the screening.

The percentage of students failing the total screening test and each subcategory is contained in Table 1. Some individuals who fail screening tests will be found by more intensive diagnostic tests not to have a communication disorder (i.e., a false positive). Conversely, some students with a communication disorder may pass a screening, although the incidence of these false negatives is expected to be low if examiners are trained and tests are properly administered. The actual number of false positives and false negatives resulting from the mass screening is not known. Therefore, the percentage of students failing the screening was adjusted by factors that would correct for both false positives and false negatives by using the Delphi technique (Linstone & Turoff, 1975; Rothwell & Kazanas, 1997; Woudenberg, 1991). This procedure involves a series of steps to elicit and refine the perspectives of a group of people who are experts in the field. The first step was selection of the panel (in this case, a group of individuals in academic and clinical settings with extensive knowledge about similar tests and their outcomes). The second step was to survey the panel members to obtain their predictions of test outcome based on their knowledge about the current literature. The estimates were analyzed using descriptive statistics such as mean and median. If the estimates were close to each other, the values were used. If the estimates were not close, the results were cycled back to the panel members, who were asked to reconsider their answers. Respondents who were relatively far off from the average figures were asked to explain why they kept their original response, if they decided to do so.

False positives were calculated as a ratio of the number of students without a voice disorder who were incorrectly classified as having failed the test, over the total number of

**Table 1.** Results of administration of the Quick Screen for Voice to 3,000 students, half in kindergarten and first grade and half in fifth grade. The total percentage failed, percentage by subcategories of the test, and percentage after Delphi adjustment are presented. Individual percentages do not add up to the total percentage because it is possible that a child could have more than one item checked in each area.

	Percentage failing	After Delphi adjustment for false positives	After Delphi adjustment for false positives and false negatives
<b>Grades K and 1</b>			
Total	34.5	23.3	19.7
Respiration	17.4	11.3	9.6
Phonation	10.2	8.0	7.1
Resonance	3.3	3.9	2.0
Range/flexibility	29.1	17.0	15.3
<b>Grade 5</b>			
Total	20.9	18.1	14.1
Respiration	6.6	5.9	4.0
Phonation	7.5	6.5	5.6
Resonance	1.8	2.1	1.1
Range/flexibility	13.8	11.3	9.4

students failing the test. False negatives were calculated as a ratio of the number of students with a voice disorder who were incorrectly classified as having passed the test, over the total number of students passing the test. Because the actual number of false positives and false negatives was not known, the numbers used in the ratios were based on expert panel predictions. The panel first adjusted the observed scores for false positives, and then made an additional adjustment for both false positives and false negatives, combined. These percentages are contained in Table 1.

The percentage of actual failures (34.5% for kindergarten and first grade; 20.9% for fifth grade) was higher than most previous reports in the literature (Boyle, 2000; Deal et al., 1976; Hirschberg et al., 1995; Silverman & Zimmer, 1975). The percentage of children failing the present voice screening was consistent with the results of the concurrent speech and language screenings, which were also considered high (16.9%, 3.2%, and 1.2% of kindergarten and first graders, and 13.5%, 2.6%, and 1.1% of fifth graders failed language, articulation, and fluency, respectively). Overall, 39.2% of kindergarten and first graders and 29.5% of fifth graders failed all language, articulation, fluency, voice, and hearing screening, even after Delphi adjustment for false positives.

It should be noted that the highest percentages of failures on the Quick Screen for Voice were in the category of vocal range and flexibility. On the version of the tool used in the mass screening, habitual pitch, pitch inflection, loudness effectiveness, and loudness variability were based on clinician judgment of these parameters during conversational speech. The authors suspected that the failure rate on this subtest may have been inflated because of difficulty with judging these particular parameters during conversation,

especially because the parameters were not defined. Therefore, specific tasks to demonstrate pitch and loudness were substituted for the more subjective judgments. Habitual pitch and loudness are determined by having the child count from 1 to 10, repeat, but stop at “three” and hold out the /i:/. A maximum phonation time (MPT) task was also added to this section. The changes in the tool may lower the percentage of failures on this subtest.

**Screening of preschool children.** The second revision of the Quick Screen for Voice followed screening of 47 children (25 boys; 22 girls; ages 3–6 years) in a Head Start program at Arlitt preschool in Cincinnati, Ohio. None of the children who participated in this screening had been previously diagnosed with a voice disorder. Four trained graduate students completed the testing.

Results revealed that 19% (9 out of 47) of the participants failed the initial screening. Six were boys; three were girls. Subjects failed because of abnormalities in the areas of respiration ( $n = 1$ ), phonation ( $n = 4$ ), and resonance ( $n = 4$ ). No abnormalities were found in the category of nonverbal vocal range and flexibility. The 4 subjects who failed the initial screening because of resonance disturbance passed the second screening. The examiners had noted signs of a cough and nasal congestion upon initial examination, and these problems apparently resolved before the second test. The remaining 5 subjects retained the characteristics found on the initial screening and failed the second screening.

In order to determine intrajudge reliability, one examiner gave the test a second time to 5 subjects who passed the screening test and the 4 subjects who failed the phonation section. The second test was administered a week following the first, and the results of the initial test were not available to her. Interjudge agreement was measured by having two of the graduate students independently test 5 subjects who failed any portion of the screening test and 6 subjects who passed it. Both intrajudge reliability and interjudge agreement were excellent (100% for each measure). Finally, all subjects who failed the initial screening were tested again 5 months later. No intervention was provided between screening tests. The 5 subjects who failed the second screening also failed the third.

**Final version of the tool.** Clinicians participating in both the preschool and school-age screenings provided feedback to the authors about their experiences with the screening tool. Suggestions for improving directions, ease of use, and lists of observations under each category were incorporated into subsequent revisions, all of which were considered minor. The clinicians agreed with the pass/fail criterion provided a second screening was considered for any child who demonstrated signs of illness, such as congestion resulting from an upper respiratory infection.

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## FUNCTIONAL INDICATORS OF VOICE DISORDERS IN CHILDREN AND ADOLESCENTS

The identification of children with voice disorders in the schools does not rely on annual screening of every child. Although policies differ across districts, the usual practice

is to screen only certain grades each year. Some evidence exists that teachers can be a reliable referral source if they are asked to make a gross dichotomous judgment (refer/do not refer) and if they are encouraged to overrefer if in doubt (Davis & Harris, 1992).

The Functional Indicators Checklist (Appendix C) is an informal probe that is designed to detect evidence of consistent voice differences that can represent a potential voice disorder resulting from underlying medical, voice use, or emotional factors. The checklist uses symptoms or situational-based judgments that are identifiable to parents, teachers, and other caregivers of children and adolescents. The specific probe items are nonstandardized, and there is no critical number of positive signs that suggest a need for further referral. Rather, the “yes/no” format is intended to summarize an inventory of impressions about the speaker’s ability to use effective voice in the “real world.”

The checklist items were derived from the authors’ experience with common case history questions that are useful in signaling a potential *threat* to voice quality. The probes are intended to “operationalize” specific judgments of voice production and quality. For example, rather than querying abstract constructs related to voice loudness or endurance, a representative functional indicator was selected and was related directly to academic interference, which is a key qualification standard for service in the schools (e.g., “Can’t be heard easily in the classroom when there is background noise”). Because information is sought about vocal competence, as well as overall speaker confidence in the functional communicative environment, probe items were included to assess the emotional impact of voice differences (e.g., “Doesn’t like the sound of his/her own voice” or “Is teased for the sound of his/her voice”).

The Functional Indicator Checklist is a quick and easy supplement that may cross-validate the other Quick Screen judgments made for voice production. For example, the item “Voice sounds worse after shouting, singing, or playing outside” will provide the screener with information about variability and potential voice use factors that may support audio-perceptual judgments of vocal instability. Although the checklist is meant to be a supportive adjunct to the Quick Screen, it may also be used as a follow-up survey.

Finally, the Functional Indicators Checklist can lend support to any future treatment plans if the real world ties to communication needs are sufficiently meaningful to children and adults. A child may certainly not care about the pitch, loudness, or quality of his or her vocal signal, but may respond more willingly to goals that are designed to create a voice that is loud enough to call a play on the baseball field, or answer a question from the back of the class, or doesn’t hurt or sound “scratchy” at the end of the day. These and other functional voice connections can inform the treatment process and provide direct applications to generalization and treatment outcome measures.

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## YOUR CHILD’S VOICE

“Your Child’s Voice” (see Appendix D) is a document that was developed to help SLPs educate the parent of a

child who has been identified with a voice disorder. It was developed in response to comments to the authors by a number of otolaryngologists that parents had only a vague sense of why they were instructed to bring their child for evaluation. SLPs have limited time to provide information to parents, and parents tend to retain more of the information if it is supplemented in writing. Lack of parental follow-up on the SLP's request for laryngeal examination by a physician is a primary concern of school-based clinicians (Leeper, 1992). The American Speech-Language-Hearing Association Preferred Practice Patterns for the Profession of Speech-Language Pathology (1997) states:

All patients/clients with voice disorders must be examined by a physician, preferably in a discipline appropriate to the presenting complaint. The physician's examination may occur before or after the voice evaluation by the speech-language pathologist. (Section 12.7)

"Your Child's Voice" provides some basic information about how voice is produced; how a voice disorder might affect a child's education; and common causes of voice disorders, including voice misuse, medical problems, and personality-related issues. This is followed by an explanation of purpose and procedures of the voice evaluations conducted by the otolaryngologist and SLP. The importance of medical examination is emphasized, and some suggestions are provided for circumstances where the otolaryngology examination is not covered by insurance. A section about various types of management is provided, along with resources for more information. It is suggested that the SLP conclude the document with some information specific to the voice problem of the child in question.

The Functional Indicators Checklist and "Your Child's Voice" documents have not been tested formally. However, they have been used by many SLPs who attended previous presentations by the authors. Informal feedback has been very positive.

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## **ADDITIONAL CONSIDERATIONS: ETIOLOGIES WITH LOWER INCIDENCE**

Etiologies with lower incidence than those due to vocal misuse or abuse may also be identified through the use of the Quick Screen for Voice and the Functional Indicators Checklist. There are increasing numbers of children in special and regular education who have extensive medical problems that may result in voice disorders or laryngeal pathologies. With advancements in the field of neonatology, the numbers of medically fragile babies now surviving and being served by the public school system are increasing. For example, the number of premature babies born in the United States has increased significantly over the past 20 years according to recent reports. Currently, close to 12% (460,000) of babies born annually are premature (defined as < 37 weeks gestation) (Barrett, 2002). These children may be at higher risk for developmental, learning, and academic special needs; however, they are also more likely to have required multiple medical procedures in infancy that can result in injury to the larynx. Such procedures can include

multiple and/or traumatic intubations, routine deep suctioning, and/or tracheotomy. Furthermore, coexisting conditions of severe gastroesophageal reflux, pulmonary compromise, multiple medications, and/or chronic dysphagia may result in altered laryngeal and subsequent phonatory function.

Laryngeal/phonatory sequelae may coexist with multiple and/or chronic medical conditions, or in some instances, laryngeal injury may be the only remnant of a previously medically fragile child's history (for more information, see Woodnorth, 2004). Whenever vocal symptoms are present (e.g., voice sounds weak or strained, uses a lot of effort to talk, complains of vocal fatigue) in students with a complicated medical history, the SLP should consider requesting a further laryngeal/voice evaluation. Occasionally, the vocal symptoms indicate a previously undetected laryngeal pathology, such as vocal fold paralysis or laryngeal joint fixation. Etiologies underlying vocal fold paralysis are neurological and may result from disorders of the central nervous system or cranial nerve ten (vagus). Laryngeal joint fixation occurs when the regular position of a cricoarytenoid joint is dislocated secondary to some type of trauma. In either case, if the immobile vocal fold remains in a close to midline position, voice symptoms may be minimal. However, an immobile vocal fold may migrate from its original resting position, resulting in a change to voice quality. These vocal symptoms may worsen through elementary and teenage years as the larynx grows.

Increasingly, the relationship between medically fragile infant conditions and later success in primary and secondary education is being studied. Most investigations focus on the correlation between early health difficulties and later speech, language, intellectual, and academic performance. There are those that specifically examine early pulmonary compromise with later pulmonary function, which in turn can influence phonatory function (Doyle et al., 2001; Gross, Iannuzzi, Kveslis, & Anbar, 1998; Lewis et al., 2002). However, few studies have investigated chronic laryngeal impairment and associated voice disorders in the medically fragile child.

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## **CONCLUSION**

The literature suggests that the vast majority of children with voice disorders are never evaluated by an SLP (Kahane & Mayo, 1989). To rectify this situation, SLPs must be prepared to use their knowledge, listening training, and interpersonal skills to intervene. Educating the classroom teacher and families about indicators that put children at risk for laryngeal pathologies may make those with the closest child contact more reliable referral sources. If screening is warranted, the SLP may find the Quick Screen for Voice preferable to the more typical one-line response to voice quality deviation, because it encompasses all aspects of voice production (respiration, phonation, resonance, and vocal range and flexibility). The descriptors for vocal behaviors used in the test may also be helpful when reporting findings or writing IEP goals. Finally, the

obstacle of receiving medical clearance for therapy typically requires educating the parent and, occasionally, the primary care physician. "Your Child's Voice" can be used as a supplement to the parent conference.

Although voice disorders have a lower incidence than many other types of communication disorders, all SLPs recognize their responsibility to use their knowledge, listening training, and interpersonal skills to identify and manage these children. The authors hope that the documents provided here will improve clinician intervention while reducing the time demands inherent in an increasingly complex profession.

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## APPENDIX A. QUICK SCREEN FOR VOICE

Name: \_\_\_\_\_

Birth Date: \_\_\_\_\_ Screening Date: \_\_\_\_\_ Age: \_\_\_\_\_

Speech-Language Screening Date: \_\_\_\_\_ Passed \_\_\_\_\_ Failed \_\_\_\_\_

If failed, describe communication status: \_\_\_\_\_

Hearing Screening Date: \_\_\_\_\_ Passed \_\_\_\_\_ Failed \_\_\_\_\_

If failed, describe hearing status: \_\_\_\_\_

Pertinent medical and social history: \_\_\_\_\_

**Directions:** The Quick Screen for Voice should be conducted in a quiet area. Elicit verbal activities, such as spontaneous conversation, picture description, imitated sentences, recited passages, counting, and other natural samples of voice and speech, or perform the tasks requested. The screening test is failed if one or more disorders in production are found in any area, indicating that a more thorough evaluation is needed.

**Mark all observations that apply, as the individual produces connected speech:**

### Respiration

- |                          |  |                          |                                    |
|--------------------------|--|--------------------------|------------------------------------|
| <input type="checkbox"/> | Inhalatory stridor or expiratory wheeze            | <input type="checkbox"/> | Limited breath support for speech  |
| <input type="checkbox"/> | Infrequent breaths; talking too long on one breath | <input type="checkbox"/> | Reduced loudness or vocal weakness |
| <input type="checkbox"/> | Normal respiration for speech                      |                          |                                    |

### Phonation

- |                          |  |                          |  |
|--------------------------|--|--------------------------|--|
| <input type="checkbox"/> | Rough or hoarse quality  | <input type="checkbox"/> | Breathy quality                              |
| <input type="checkbox"/> | Vocal strain and effort  | <input type="checkbox"/> | Aphonia                                      |
| <input type="checkbox"/> | Persistent glottal fry   | <input type="checkbox"/> | Hard glottal attacks                         |
| <input type="checkbox"/> | Conversational pitch is too high or too low                      | <input type="checkbox"/> | Conversational voice is too loud or too soft |
| <input type="checkbox"/> | Conversational voice is limited in pitch or loudness variability |                          |  |
| <input type="checkbox"/> | Normal voice quality   |                          |  |

### Resonance

- |                          |   |                          |   |
|--------------------------|---|--------------------------|---|
| <input type="checkbox"/> | Hyponasality (observed during humming, nasal consonant contexts: Mommy makes me muffins; Man on the moon; Many men make money, etc.). | <input type="checkbox"/> | Nasal turbulence or audible nasal emission (observed during pressure consonant contexts: Counting from 60 to 69; Popeye plays baseball; Give Kate the cake; Buy Bobby a puppy, Take a ticket to Daddy, etc.). |
| <input type="checkbox"/> | Consistent mouth breathing  |                          |   |
| <input type="checkbox"/> | Hypernasality (observed during vowel and oral consonants)   | <input type="checkbox"/> | Juvenile resonance characteristics  |
| <input type="checkbox"/> | Normal resonance  |                          |   |

### Nonverbal Vocal Range and Flexibility

Model the series of nonverbal tasks that are described on the test form. Multiple trials are allowed. Visual cues such as hand gestures, moving a toy car across the table (for maximum phonation time) or up and down a hill (for pitch range), etc. may be used to supplement the auditory model.

1. Habitual pitch and loudness task: "Count from 1 to 10. Repeat, but stop at 'three' and hold out the /i:/."

- |                          |                                |
|--------------------------|--------------------------------|
| <input type="checkbox"/> | Abnormal pitch and/or loudness |
| <input type="checkbox"/> | Normal pitch and loudness      |

2. Maximum phonation time (MPT) task: “Take your biggest breath and hold out an /a:/ as long as possible.”  
Record time with a secondhand.

_____	Number of seconds /a/ was sustained.		
_____	MPT less than:	<b>Age (years)</b>	<b>Normal Mean in Seconds (Range)*</b>
		3	7 (3–11)
		4	9 (5–15)
		5	10 (5–16)
		6–7	13 (5–20)
		8–9	16 (5–29)
		10–12	20 (9–39) Males
			16 (5–28) Females
		13–17	23 (9–43) Males
			20 (9–34) Females
		18+	28 (9–62) Males
			22 (6–61) Females

*Note.* MPT values are related to age and height; multiple attempts also influence results.  
\*Data summarized from Kent, Kent, & Rosenbek (1987)

\_\_\_\_\_ MPT within normal limits

3. Pitch range task: “Make your voice go from low to high like this (demonstrate upward pitch glide on the word ‘whoop’). Now go down from your highest to low (demonstrate rapid downward pitch glide like a bomb falling).” Or, model and elicit a fire siren sound.

- \_\_\_\_\_ Little pitch variation
- \_\_\_\_\_ Voice breaks in pitch glides up or down
- \_\_\_\_\_ Acceptable pitch range and flexibility

Other Comments or Observations

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## APPENDIX B. DEFINITIONS OF THE VARIABLES USED IN THE QUICK SCREEN FOR VOICE

### Respiration

*Inhalatory stridor or expiratory wheeze:* Sound heard on inhalation or exhalation, indicating an obstruction at some point in the airway that creates airflow turbulence

*Limited breath support for speech:* Failure to create a sufficient amount of air to support connected utterances; frequent need to replenish the breath supply; typically, failure to inspire beyond the tidal breathing range

*Infrequent breaths; talking too long on one breath:* Failure to replenish breath often, or failing to take sufficient breaths so that utterances extend beyond end-tidal breathing into the expiratory reserve

*Reduced loudness or vocal weakness:* Soft voice, or one that sounds fatigued, possibly due to diminished respiratory support

### Phonation

*Rough or hoarse quality:* Quality deviation of the voice reflecting aperiodic vibration of the vocal folds during phonation

*Breathy quality:* Quality deviation of the voice reflecting a larger than normal glottal opening, allowing excessive airflow through the vocal folds during phonation

*Vocal strain and effort:* Tension, strain, and/or effort needed to speak; this may include difficulty initiating or maintaining phonation, and may also include supporting evidence of visible neck or jaw tension

*Aphonia:* Absence of voicing, which may be intermittent or constant; may occur as voice “cutting out” or whisper, and can be accompanied by apparent strain, tension, or effort

*Persistent glottal fry:* Rough, low-pitched, tense voice quality that often occurs at the end of sentences, reflecting tightly approximated vocal folds with flaccid edges vibrating at a low fundamental frequency

*Hard glottal attacks:* A manner of initiating voicing characterized by rapid and complete adduction of the vocal folds prior to the initiation of phonation

*Conversational pitch is too high or too low:* Relative to the speaker’s age and sex, the voice is maintained at an inappropriate average fundamental frequency

*Conversational voice is too loud or too soft:* Relative to the speaker’s age and sex, the voice is maintained at an inappropriate average intensity

*Conversational voice is limited in pitch or loudness variability:* The voice lacks normal variations in fundamental frequency or intensity, leading to reduction in pitch or loudness variations; monopitch or monoloudness may be considered the extremes

### Resonance

*Hyponasality:* Reduction in nasal resonance during the production of nasal consonants /m, n, N/, reflecting blockage in the nasopharynx or the entrance to the nasal cavity

*Consistent mouth breathing:* Open-mouth posture; the need to breathe through the mouth because of possible nasal airway obstruction

*Nasal turbulence or audible nasal emission:* Also called nasal rustle, nasal turbulence is frication heard as air pressure is forced through a partially opened velopharyngeal valve; audible nasal emission, also called nasal air escape, is inappropriate airflow through the nose during speech, typically occurring on high pressure consonants because of velopharyngeal dysfunction; either characteristic may be a consonant-specific learned behavior

*Hypernasality:* Sound entering the nasal cavity during production of vowels or liquid consonants due to velopharyngeal dysfunction, resulting in excessive acoustic nasal resonance

*Juvenile resonance characteristics:* Child-like quality to the voice; often accompanied by high pitch and abnormal tongue posture, giving the voice an immature sound, usually seen in teenage girls and women

### Nonverbal Vocal Range and Flexibility

*Habitual pitch and loudness task:* Relative to the speaker’s age and sex, the appropriateness of pitch or loudness during a sustained vowel is noted

*Maximum phonation time task:* The length of maximum phonation time is noted; norms are provided by age category to help the examiner decide whether or not MPT is within normal limits

*Pitch range task:* Ability to vary the pitch of the voice, and the presence of voice breaks during the gliding activity, are noted; the pitch range increases with age from approximately one-half octave for preschool children to over two octaves for adults

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## APPENDIX C. FUNCTIONAL INDICATORS OF VOICE DISORDERS IN CHILDREN AND ADOLESCENTS

Please check all that apply to this child:

- Coughs, clears throat, or chokes frequently
- Has difficulty breathing or swallowing
- Complains of a sore throat often
- Voice sounds rough, hoarse, breathy, weak or strained
- Loses his/her voice every time s/he has a cold
- Always sounds “stuffed up,” like during a cold; or sounds like s/he is talking “through the nose”
- Voice sounds worse at different times of the day (morning, after school, evening)
- Sounds different from his/her friends of the same age and sex
- Voice sounds worse after shouting, singing, playing outside, or talking for a long time
- Uses a lot of effort to talk; or complains of vocal fatigue
- Yells, screams, or cries frequently
- Likes to sing and perform often; participates in acting and/or singing groups
- Participates in sports activities or cheerleading activities that require yelling and calling
- Has difficulty being understood by unfamiliar listeners
- Can't be heard easily in the classroom or when there is background noise
- Talks more loudly than others in the family or classroom
- Voice problem is interfering with his/her performance at school
- Doesn't like the sound of his/her voice; or is teased for the sound of his/her voice
- Attends many loud social events (parties, concerts, sports games)
- Seems tired or unhappy a lot of the time
- Is facing difficult changes, such as death, divorce, financial problems
- Does not express his/her feelings to anyone
- Lives with a family that uses loud voices frequently
- Smokes, or is exposed to smoke at home or at a job
- Uses alcohol
- Eats “junk food” frequently; or complains of heartburn or sour taste in the mouth
- Drinks beverages that contain caffeine; or drinks little water
- Has allergies, respiratory disease, or frequent upper respiratory infections
- Has hearing loss or frequent ear infections
- Takes prescription medications (please list)
- Has a history of injuries to the head, neck, or throat (please describe)
- Has had surgeries (please describe)
- Was intubated at birth or later (please describe)
- Has a chronic illness or disease (please describe)

My primary concern about this child's voice is (please describe):

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## APPENDIX D. YOUR CHILD'S VOICE

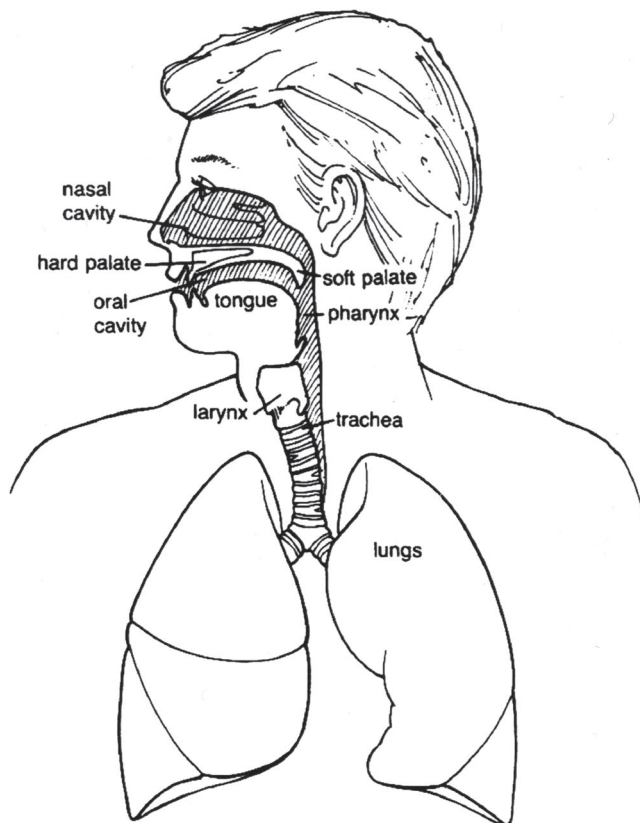
Your child has been identified as having a **voice disorder**, meaning that his/her voice sounds different from that of other children of the same age and sex. The purpose of this pamphlet is to provide you with information about the cause, diagnosis, and management of voice disorders.

### How Is Voice Produced?

Figure 1 contains the primary structures in the vocal tract. The larynx is a system of cartilages, muscles, and ligaments in the neck (pharynx). It sits on top of trachea, the passageway to the lungs. The passageway to the stomach is behind the larynx and trachea. The larynx is covered when we swallow, so food does not enter the trachea.

The larynx contains thin membranes, called vocal folds. The vocal folds sit in an open position during breathing. When a person wants to speak, muscles close the folds, and air from the lungs causes them to vibrate. The sound the vocal folds make then resonates through the mouth (or nose, for some sounds) and speech is created. The combination of breathing, vibrating the vocal folds, and shaping or resonating the vibration creates the distinct sound you recognize as your child's voice. A problem with any part of the voicing process may lead to a voice disorder.

**Figure 1.** The vocal tract.



### How Might a Voice Disorder Affect a Child's Education?

The effects of a voice disorder may decrease the child's ability to interact effectively in the classroom setting. Speech may be difficult to hear or understand, and the child may be less likely to participate in daily educational activities, such as volunteering answers or reading aloud. A childhood voice disorder may also decrease the potential for developing a normal adult voice.

### What Are Common Causes of a Voice Disorder?

**Laryngeal pathologies** are changes in the larynx and vocal folds that are associated with voice disorders. Many factors contribute to the development of laryngeal pathologies, including **voice misuse**, **medical problems**, and **personality-related issues**. Each of these is described below.

#### Voice Misuse

The majority of laryngeal pathologies are due to the way a child misuses the voice. Children often engage in loud talking, screaming, or shouting, such as at sports events. They may enjoy making vocal noises during play, imitating motorcycles, action figures or monsters. Habits such as these may harm young voices. Excessive coughing or throat clearing may also damage the vocal folds.

Sometimes children learn to speak in an incorrect manner, such as using a very low pitch level. Or, the child may be so eager to communicate that he/she does not pause for enough breaths to support the voice.

The vocal folds are covered by a thin layer of mucous membrane, somewhat similar to the lining of the cheek. If a child drinks caffeinated soft drinks and little water, this membrane can become dry. Other sources of dryness may be exposure to smoke, dust, or dehumidified air.

The examples presented are habits that may cause irritation to the vocal folds. Constant irritation may lead to vocal fold changes, such as swelling (edema), redness, or callous-like growths called vocal nodules.

#### Medical Causes

Some children develop voice disorders because of a medical problem. An infant may be born with structural defects of the larynx. Neurologic problems, such as vocal fold paralysis, can occur. Chronic upper respiratory or other viral infections, allergies, and gastrointestinal disorders are other examples of medical problems that may lead to laryngeal pathologies. The larynx may be damaged during an accident or surgery. Finally, some medications have side effects that may contribute to changes in vocal fold vibration.

A resonance problem is a special category of voice disorders related to how the sound travels through the oral and nasal cavities after it leaves the larynx. The hard palate separates the two cavities, and the soft palate acts like a valve to open or close the nasal area. The sound should resonate in the oral cavity for all vowels and consonants except *m*, *n*, or *ng*, which resonate in the nasal cavity. A resonance imbalance occurs when the sound takes the wrong path, or when the sound is distorted due to a problem encountered as it travels through the cavity. For example, if a child sounds like he/she has a cold (hyponasality), it may be due to a blockage somewhere between the nose and mouth. Enlarged adenoids are one common cause of hyponasality. If sound is heard coming through the nose when it should not be present

(hypernasality or nasal turbulence), there may be an incomplete closure of the soft palate. Children born with a cleft palate are among those who may develop resonance problems.

### Personality-Related Causes

The larynx is very sensitive to emotions. Therefore, a child's voice disorder may be due to the way he or she feels, physically and emotionally. For example, a child experiencing overall tension because of anxiety encountered in school or at home may also tense the muscles that control the voice, and this can lead to a voice disorder. Occasionally, difficulties in the child's life may become so severe that he/she may unconsciously develop a voice disorder in an attempt to avoid the stressful situation. Other types of voice disorders are related to personality development or hormonal changes during puberty.

## How Will I Know the Cause of My Child's Voice Disorder?

It is important to note that no one can tell the cause of a voice disorder by the way a child sounds. A child with a vocal nodule caused by yelling and screaming can have the same voice characteristics as the child with a laryngeal pathology due to a medical problem. In order to determine the cause of your child's voice problem, the vocal folds must be examined.

## Who Will Examine My Child, and How Will It Be Done?

Although some primary-care physicians will examine the vocal folds, most refer the child to an Ear, Nose and Throat specialist (ENT). Another name for an ENT is an **otolaryngologist**. The otolaryngologist will determine the presence and cause of any **laryngeal pathology**.

The otolaryngologist may view the vocal folds by one of several methods. Some physicians place a small mirror in the child's mouth to visualize the folds. Others use a small flexible scope inserted into the child's nose. This procedure is called nasendoscopy, and it can also be used to examine a child with a resonance problem. A third method, called videostroboscopy, involves placing a small video-scope in the child's mouth. When attached to a special instrument called a stroboscope, the vocal folds can be viewed during their vibration. Both nasendoscopy and videostroboscopy provide a view of the vocal folds or other structures on a television monitor.

None of the procedures used to examine the child with a voice disorder is harmful, and children tolerate them well. Sprays may be used to temporarily numb the nose or back of the throat to eliminate any mild discomfort.

Some otolaryngologists work in collaboration with **speech-language pathologists** who specialize in voice disorders. The speech-language pathologist (SLP) will determine the effect of the laryngeal pathology on **voice production**. The SLP in your child's school may have already conducted a voice evaluation.

## What if the Otolaryngologist's Exam Is Not Covered by My Insurance, or I Cannot Afford It?

Most private insurance, managed care plans, and Medicaid cover the costs of diagnostic procedures. To determine coverage of your

specific insurance, you are encouraged to discuss this issue with the provider-relations representative. Should your insurance be one of the few that does not cover this examination, you may negotiate a reasonable payment plan with most otolaryngology offices. The speech-language pathologist at your child's school may also provide information about funding sources.

## How Will My Child's Voice Disorder Be Corrected?

Methods of correcting your child's voice disorder depend entirely upon the cause. Treatment may be managed through voice therapy provided by a speech-language pathologist, medical management provided by an otolaryngologist, or a combination of the two.

Because the cause of a voice disorder cannot be determined by the characteristics of the voice, the speech-language pathologist in your child's school cannot conduct voice therapy until a physician provides a medical diagnosis. Parents know their child's vocal habits and are sometimes convinced the problem is due to misuse. As an example, they may feel the voice disorder will simply go away if the child stops screaming. Unfortunately, the most vocally-abusive child may have a coexisting medical condition requiring medical management. **For the child's protection, the American Speech-Language-Hearing Association's Preferred Practice Patterns (1997) require medical examination prior to voice therapy.**

Most **voice problems due to misuse or abuse** can be eliminated through voice therapy. The child learns to eliminate the causes of the voice problem and ways to change the manner of speaking. Vocal exercises or other activities may be combined with learning healthy vocal habits to eliminate the problem and prevent future recurrence.

**Medically-caused voice problems** are typically managed through medication or surgery. Sometimes voice therapy is needed after medical intervention.

The speech-language pathologist, working closely with you and other individuals in the child's life, often manages **personality-related voice problems**. Sometimes a psychologist or classroom teacher is included in the therapy process.

## Where Can I Find More Information About Voice Disorders?

Many resources exist to provide information about voice disorders. The speech-language pathologist at your child's school and the otolaryngologist will have suggestions specific to your child's voice disorder. Textbooks about voice disorders are available through university or medical libraries.

The American Speech and Hearing Association is a national organization serving all individuals with communication disorders. For information, call 1-800-498-2071, or use the address <http://www.asha.org> on the Internet.

## The Following Information Is Specific to My Child

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## Selected Behavioral Voice and Speech Intervention Techniques Task Rationales and Descriptions

*\*All techniques are modeled by the clinician prior to instructing the client*

### **Yawn-sigh with anterior tongue posturing**

*What is yawn-sigh?* Yawn-sigh is one of the most effective therapy techniques for minimizing tension effects of vocal hyperfunction.

*How is yawn-sigh useful?* The exercise lowers the larynx and widens the pharynx, preparing the vocal tract for easy, effortless voice and enhanced resonance.

*Procedure:* Explain the physiology of the yawn. Instruct the client to yawn and feel with the fingers the widening of the pharynx and lowering of the larynx. Encourage an easy opening of the mouth. Instruct the client to relax and drop his jaw, as if performing an easy yawn. Instruct the client to keep his tongue forward in his mouth (tongue tip behind lower teeth). Instruct the client to take a deep breath and then say /hhhhaaaa/ softly. Model /hhhhaaaa/, extending the /h/ as if producing a sigh. Cue the client to notice the open and relaxed posture in the mouth and throat. Follow with open vowel phrases, such as, “He has it, Who did it? Easy does it; eat the peach; overeasiness. . .”

### **Inhale rose**

*What is inhale rose?* Inhale rose is similar to yawn-sigh, yet the mouth is closed on inhalation and exhalation.

*How is the exercise useful?* Just like yawn-sigh, inhale rose is intended to widen the pharynx and lower the larynx for open, relaxed phonation.

*Procedure:* The client is instructed to yawn with the mouth closed, just as any of us would do if we yawned at an important meeting. The client inhales through the nose, and the yawn results in a wide, open space in the pharynx, and a lowering of the larynx. Encourage the client to produce a soft hum upon exhalation. This can be followed with a light affirmative /uhmhuh/.



Follow with soft open-vowel phrases, such as “Easy does it; eat the peach, even now. . .”

## **Nasal/glide stimulation**

*What is nasal glide stimulation?* Nasals, glides and liquids are phonemes that take little effort to produce, unlike fricatives, affricates and stops. They are voiced and produced with a relatively open vocal tract. Nasal glides are used extensively in a specific training approach called resonance therapy.

*Why is nasal-glide stimulation useful?* These phonemes are produced with an open vocal tract and they are easy to sustain. Therefore, there is little effort to produce them. Using words that contain many nasals and glides/liquids, usually coupled with other techniques, often helps the client produce desired target vocalizations (e.g. my name means money). The m, n, ng, ny, y, r, and l sounds also have a forward focus, which is desirable.

*Procedure:* Begin with monosyllabic and polysyllabic words that contain these phonemes. Encourage the client to string these words together in a continuous chant, such as “Miami millionaire” and “Wherewereyou?” Discourage any breaks in the chant stream. When an easy forward vocal quality is achieved, move on to inflected speech using the same stimuli.

## **Tone focus**

*What is tone focus?* The vibration or “buzz” of acoustic energy to the nose, cheek and lip region.

*How is tone focus useful?* Clients with vocal hyperfunction tend to place undue attention on the larynx while attempting to produce voice. They mistakenly believe that if they push more forcefully at the vocal cords the voice will emerge stronger. This approach tends to excessively increase glottal and supraglottal resistance during phonation, thus the voice is produced in a strained and strangled manner.

While the voice may indeed be louder, it’s almost always rougher in vocal quality and the voice quickly fatigues. The goal of tone focus is to transfer the patient’s focus on the energy of the voice from the larynx to the nose, cheeks and lips. Nasal or facial focus eliminates overvalving at the glottis and supraglottis, thus opening the aditus for enhanced vocal resonance.

*Procedure:* The clinician demonstrates focus by placing fingers lightly at the bridge of his or her nose and gently humming. The client feels this buzzing on the clinician’s face. The patient is instructed to follow the clinician’s model. The client is encouraged to hum up and down a scale while feeling for the amplitude of the buzz. Once the client is comfortable with the facial buzz, the client is instructed to use chant talk employing words loaded with nasals, liquids and glides (yummy yummy, miamimillionaire, maninthemoon). When chant talk is established, move on to inflected phrases embedded with additional sounds, and then to connected speech.

Encourage the client to use the affirmative /mmhuh/ whenever he or she needs to reestablish focus. This strategy can be used in conversations, before answering a phone call and any time the

client needs to produce an easy, relaxed voice with the focus in the face.





**Pitch shift** May be applied using tone focus and nasals]

*What is pitch shift?* Pitch shift is usually a slightly elevated speaking pitch.

*How is pitch shift useful?* It is well known that there is no “optimum” pitch at which an individual should necessarily speak. Nevertheless, speaking at the very bottom of one’s pitch range can be fatiguing and abusive to the laryngeal mechanism. Establishing a slightly higher pitch elongates the vocal folds, thus allowing for easier vibration at midline.

*Procedure:* Instruct the client to produce an /i/ at the target pitch. Transition to chant talk, then to inflected speech, reading passages then normal conversation. Play the productions back on a tape recorder to reinforce the new pitch. Generalization activities can range from having the client remember to produce the target pitch when she sees a common household item to providing the client with a small pitch pipe. One client, an avid golfer, remembered to produce her new pitch whenever she saw a golf tee.

**Tongue protrusion /i/**

*What is tongue protrusion /i/?* The protrusion of the tongue outside the lips to the extent comfortable to the patient (try at least an inch) while producing a high-pitch /i/ with alternating up and down movement of the mandible.

*How is tongue protrusion /i/ useful?* When protruded, the back of the tongue is pulled out of the oral pharynx, and the pharynx and laryngeal aditus are open to produce easy, clear voice. The production of the voice with the tongue protruded is sufficiently novel to break poor habituated vocal habits, often associated with hyperfunction.

*Procedure:* Ask the client to drop his jaw slightly and to protrude his tongue slightly, beyond his lower lip. Ask the client to produce a high-pitched /i/, keeping the tongue forward and the jaw relaxed. Next ask the client to perform pitch slides using the /i/ vowel. Once improved vocal quality is achieved, ask the client to sustain the /i/ vowel, and then produce the /i/ vowel in syllables with nasal sounds. At this point, the client can put his tongue back into his mouth, but the relaxed sensation is still present and the tongue is still forward. Eventually, have the client produce words and phrases with the /i/ vowel.

**Easy onset**

*What is easy onset?* Easy onset is a technique that reduces hard glottal attack

*Why is easy onset useful?* This technique is useful because it encourages the client to begin phonation with a “puff” of air between the vocal folds. This breathy phonation discourages hard, staccato closure behaviors that may have been adopted at an earlier time.

*Procedure:* Model the word hi with a breathy and extended h at the beginning. Have the client repeat the word hi, and tell the client to imagine a pillow of air between the vocal folds before he starts the word. Once the easy onset is mastered, use the following contrast pairs: heat/eat, had/add, hall/all, hand/and, hat/at, hear/ear, his/is, hit/it, hold/old, ham/am.

### **Confidential tone**

*What is confidential tone?* Confidential tone is a speaking technique that is reduced in loudness. We encourage combining this technique with a voice amplifier.

*Why is confidential tone useful?* Clients with vocal hyperfunction may demonstrate a voice that is too loud. The prolonged use of inappropriate loudness levels may result in pathologies of the vocal folds, such as nodules or polyps. Confidential tone is not a whisper. It is not elevating or lowering the pitch. It is simply a reduction of loudness in the voice.

*Procedure:* Confirm that the client is not HOH. The clinician speaks to the client as if he is the recipient of a special message or secret. Phonation is fully voiced but attenuated in amplitude. The client follows the model. Tape record regular voice and confidential tone so that the client may appreciate the difference between the two.

### **Glottal fry**

*What is glottal fry?* Glottal fry is a technique that calls for relaxed vocal folds and very little respiratory support.

*Why is glottal fry useful?* Glottal fry serves for a relaxed vocal fold mechanism and pharynx.

*Procedure:* Model glottal fry for the client. Glottal fry requires minimal subglottic pressure and airflow, so if the vocal folds are optimally relaxed, it can be easily produced. The vocal tract and facial muscles should also be relaxed for this exercise to be successful. If the client cannot automatically produce glottal fry once it has been modeled, ask the client to let out half of his breath and then say /i/, sliding down in pitch until a low “popping” sound is heard. Glottal fry can be achieved upon exhalation or upon inhalation if the client is not stimuable upon exhalation. Make sure the tongue is forward and the mouth is slightly open. If the client is unable to produce glottal fry after several attempts, discontinue, especially if the client is producing hyperfunctional voice.

## Vocal Health Program

### Vocal Overuse

Keep a diary and log all of the times throughout the day that the voice is used professionally and socially. Note the number of occasions that the voice is used unnecessarily or excessively. Monitor telephone conversations, chats with colleagues in the hallways, and singing in the shower. Do you speak above noise? In the car? During flight travel? Do you tend to talk on too little air and find yourself trying to squeeze the voice out? These behaviors may contribute to vocal fatigue and trauma to the vocal mechanism. Try not to push the voice when the throat is tight or voice is low. Instead, take plenty of catch up breaths for speech, engage in *tone (facial) focus* exercises and *confidential tone*.

### Vocal abuse

Coughing and throat clearing frequently contribute to the swelling of the vocal folds because the vocal folds are slamming together during these actions. An analogy would be clapping your hands. If you clapped continuously throughout the day, eventually blisters would develop on your palms. The same is true for the vocal folds. When the vocal folds are swollen, they do not vibrate efficiently so we are tempted to “push” the voice out. This maladaptive behavior serves to drive the vocal folds together even harder, resulting in increased swelling.

Irritants may exacerbate an already irritated throat from a cold or fever. Irritants may be smoking, smog, dust, allergens and caffeine consumption. To help reduce the vocal abuse, perform the following techniques:

- Silent cough. Cough with the vocal folds apart. You know they are apart when you cough and no sound is produced.
- Sniff-swallow. Sniff and then swallow the mucous. Follow with a drink of water.

Keep a daily log of vocal abuses. There should be no more than five episodes of coughing and throat clearing reported per day.

### Hydration

Drink at least 1.5 quarts of water per day, unless there are medical reasons that contraindicate this practice (CHF, edema). If vocal demands are excessive, drink even more water. Avoid caffeinated drinks and alcohol; these are drying. Decaffeinated teas are fine. Water hydrates the body and laryngeal mechanism. Water thins the mucous in the throat. Therefore, the urge to clear the throat ceases.

## **Vocal Health Program II**

### **Modify lifestyle and diet**

Acid reflux is a major contributor to throat irritation and coughing and throat clearing. Many individuals may have acid reflux and yet not feel it. If you experience a constant irritation in the throat with occasional sour taste in the mouth, you may have acid reflux. Consult your doctor for acid reflux testing. Begin a behavioral anti-reflux regimen that includes avoiding food consumption three hours before retiring for the evening and avoiding hot and spicy and fat-laden foods. Sleep with the head of the bed elevated, and avoid excessive quantities of liquids right before bed. See the attached regimen for additional precautions.

Use a personal amplification system during the workday when speaking to groups. Personal amplification systems may be purchased at local electronics stores, but the fidelity is not always what the speaker desires. Several speech pathologists have recommended the Chattervox [www.chattervox.com](http://www.chattervox.com) and Sonivox , [SLP@griffinlab.com](mailto:SLP@griffinlab.com).

## Weekly Documentation of Vocal Use

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Throat-clearing							
Coughing							
Yelling or shouting							
Singing							
Alcohol/caffeine intake							
Continuous talking							
Talking to someone in another room							
Socializing Mom's group Telephone							
Other							