Vocal Health Care for Children and Adolescents

Clear and pleasant voices enable children and teenagers to communicate effectively. It is essential for their social lives and development. However, children and teenagers are susceptible to behavioural and biological risk factors that may cause voice problems. In this article, common voice problems among children and teenagers and their management will be discussed.



Mechanism of voicing

While breathing out, air stream passes through the windpipe, throat and vocal cords. The vocal cords vibrate as the air stream passes through and sound is generated. The sound is shaped into speech by articulation organs in the mouth.

1. Breathing

Air stream exhaled by the lungs is the driving force of voice: stronger is the air stream, louder is the voice. Effective speech breathing requires a slow and deep inhalation through nose (to keep the air stream warm and moist). Voicing starts only when you are ready to exhale.

2. Voicing

Two vocal cords are located in the throat. During inhalation, the vocal cords separate to let air in. While speaking, laryngeal muscles in the throat contract and the vocal cords move close to each other. The vibration of vocal cords generates sound.

Narrower is the gap between vocal cords, louder is the voice. However, this would cause fatigue in laryngeal muscles and hurt the vocal cord. Effortful speech, cough and throat-clearing action would damage the vocal cords. Psychological stress would also lead to abnormal tension in laryngeal muscles. It affects the vibration in vocal cords and results in abnormal voice.

Laryngeal muscles control the pitch and loudness of voice by varying the tension in vocal cords and the aperture between them. Women and children have short and thin vocal cords so their voices are high in pitch. Whereas male adults have long and thick vocal cords making their voices low in pitch.

A layer of protective mucus forms on the surface of vocal cords to prevent wear and tear. This mucus layer can be damaged by dehydration related to dry weather, smoking (both active and passive smoking) and intake of caffeine drinks (tea, coffee and cola).

3. Resonance and voice projection

Nasal and oral cavities are the resonance boxes for human voice. When you are speaking with your optimum pitch, such resonance would make your voice clear and bright without extra effort. Speaking with mouth widely open and proper articulation makes your speech clear. Your voice can be unclear when you are suffering from nasal congestion as your nose cannot resonate your voice.

Highly effective voice production

- ✓ Relax muscles of head, neck and shoulders
- ✓ Look forward with a leveled head
- Inhale deeply and slowly
- ✓ Speak when you are ready to exhale
- ✓ Pause and breathe after every sentence
- ✓ Speak with a relaxed voice and a pitch that suits you
- ✓ Open mouth widely
- ✓ Articulate slowly and clearly
- ✓ Short breaks in long speech

Symptoms for voice problem

Do the children and teenagers around you have the following symptoms?

- Harsh or hoarse voice
- "Out of breath" while speaking
- "Loss of voice" or "off-key" while speaking
- Significant difference in voice quality between morning and evening
- Fatigue or sore throat after speaking

If they have one or two of the above, you should remind them to pay more attention in caring their voice. If they have three or more, they should seek help from professionals, e.g. ear, nose and throat (ENT) doctors or speech therapists.

Common causes of voice problem

1. Inappropriate behaviour or habit

- Shouting or speaking forcefully
- × Inappropriate vocal play e.g. imitating machine gun or tank engine with voice
- ★ Effortful cough or habitual throat clearing
- * Speaking or singing loudly for a long period of time
- Speaking too fast
- Laughing or crying loudly
- * Raising or suppressing the pitch or volume of your voice deliberately
- * Smoking, drinking alcoholic or caffeine drinks, or eating hot and spicy food
- Failure to rest the voice while having an upper respiratory tract problem e.g. common cold, flu or sore throat
- Excessive psychological stress

Management: Establish good vocal habit

- ✓ Encourage your child to include quiet play activities (e.g. drawing, puzzles) in daily routine to rest the voice.
- Adopt appropriate vocal behaviours: use medium to slow speech rate, pause and breathe after each sentence, relax your neck muscles, use a pitch of voice that is comfortable for you, speak gently with your mouth widely open.
- ✓ Lower the background noise at home/classroom e.g. lower the volume of TV set so everyone in the room can avoid speaking loudly.
- ✓ Encourage your child to use non-verbal communication (e.g. eye-gaze and gesture) in noisy situation.
- ✓ Have sufficient sleep, keep relaxed.
- ✓ Drink plenty of water or fresh fruit juice. Avoid caffeine drinks. Avoid staying in dry environment.
- Rest your voice while having a flu or chronic cough. Use swallowing saliva and drinking water to clear the throat instead of dry cough.

2. Physiological factor

- Inappropriate vocal behaviours lead to abnormal vibration of vocal cords. If abnormal vibration sustains over a long period of time, change in vocal cords such as inflammation, edema, nodule, polyp or cyst may arise. It prevents the vocal cords from achieving optimal closure or causes irregularity on vocal cords, resulting in harsh and hoarse voice.
- Vocal cord paralysis, due to diseases, injuries or operations, causes severe voice problem.
- Deformity of vocal cords secondary to cancer, injury or congenital conditions.
- Reflux of acid from the stomach irritating the vocal cords.
- Upper respiratory tract (nose, throat and windpipe) inflammation related to infection or allergy.
- Dry air, dust and smoking (active and passive) causing irritation of vocal cords.

Management: Seek help and modify environment

- ✓ Consult an ENT doctor first if having chronic voice problem, to rule to disease conditions. Then have a detailed assessment by a speech therapist for establishing correct voice production.
- Rest the voice and consult a doctor if having respiratory tract problem; use medications according to doctor's instructions. You may experience dry throat after using nasal decongestants, oral anti-inflammatory drugs or inhalers for asthma. Drink more water after their use.
- ✓ Avoid eating during the two hours before going to bed, in order to prevent gastric reflux.
- ✓ Keep home clean, in order to prevent upper respiratory tract being irritated by dust. Do not smoke in front of your children.
- ✓ In dry weather, using humidifier to keep air moist. Place a glass of water near the ventilation outlet while using air conditioner or heater.

3. Puberty-related factor

- Girls in puberty show a relatively steady pattern in vocal and laryngeal development. The pitch of voice changes from 262 Hz (C4 key on the piano) at age 9 to 220 Hz (A3 key on the piano) at age 14. That is equivalent to a change from soprano to alto in 5 years which is less drastic than that of boys. Voice problems of teenage girls are in general related to inappropriate vocal behaviours. During their menstrual periods, vocal cords of some females will become thickened temporarily due to hormonal changes and the pitch of the voice will be lowered. The pitch of voice will return to normal afterward.
- Boys in puberty show a drastic pattern of vocal and laryngeal development from age 14 to 18. The pitch of voice changes from 262 Hz (C4 key on the piano) to131 Hz (C3 key on the piano) in a period of about 6 months. That is equivalent to a change from soprano to baritone. Temporary loss of voice and occasional pitch breaks (involuntary sudden change of pitch) may occur. It becomes stable after laryngeal development has completed.
- As a result of maladjustment to their adult voice, some adult males maintain their childhood voice by using falsetto. It causes persistent stress to the vocal cords. They need to consult an ENT doctor first to rule out disease conditions; and then have a detailed assessment by a speech therapist for establishing correct voice production.

Summary

During the development of children and teenagers, inappropriate vocal habit, upper respiratory tract condition and puberty-related factor may cause voice problem. Teachers and parents should set good examples, helping children to develop appropriate vocal habits; pay attention to other factors that may affect their children's voice; and seek help promptly when problems arise.

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