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Voice Evaluation for Pediatric and Adolescent Vocal Athletes

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VOICE EVALUATION FOR PEDIATRIC AND ADOLESCENT VOCAL ATHLETES

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Voice Pathologist & Singing Voice Specialist
Learning Objectives

After this course, participants will be able to:

- Identify physiological differences between pediatric and adult voices.
- Identify age-and training-related questions, specific to vocal athletes, to include in a traditional voice evaluation.
- Identify the most common vocal pathologies within the pediatric and adolescent vocal athlete population.

Introduction & Course Overview
Introduction & Course Overview

- Defining a Vocal Athlete
- Anatomy & Physiology of the pediatric and adolescent vocal athlete
- Development and Understanding of case history specific questions for pediatric/adolescent vocal athletes
- Common pediatric/adolescent laryngeal pathologies in vocal athletes
- Impact of pathology on vocal performance
WHAT IS A VOCAL ATHLETE?

Vocal Athlete: One who is trained or skilled in singing or speaking, which requires vocal and physical strength, agility, flexibility, and stamina.

VOCAL GYMNASTICS

PUTS THEM AT HIGH RISK OF INJURY
How many Children Participate in a Choral Ensemble Weekly?

10 Million Children Weekly!!
Chorus America, 2009
Training for Vocal Longevity
Education~Prevention~Conditioning~Wellness
Anatomy & Physiology

Understanding of the Vocal Instrument
How things are SUPPOSED to work

![Diagram showing the relationship between RESPIRATION, PHONATION, and ARTISTRY through RESONANCE.](Diagram)
Normal Vocal Fold Vibration

From Kindergarten to College
Physiologic Changes

- Smaller nasopharynx, easily occluded during infection.
- Lymph tissue (tonsils, adenoids) grows rapidly in early childhood, atrophies after age 12.
- Small oral cavity and large tongue increase risk of obstruction.
- Smaller nares, easily occluded.
- Long, floppy epiglottis vulnerable to swelling with resulting obstruction.
- Larynx and glottis are higher in neck, increasing risk of aspiration.
- Because thyroid, cricoid, and tracheal cartilages are immature, they may easily collapse when neck is flexed.
- Because fewer muscles are functional in airway, it is less able to compensate for edema, spasm, and trauma.
- The large amounts of soft tissue and loosely anchored mucous membranes lining the airway increase risk of edema and obstruction.

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Physiologic Changes (birth to puberty)

- Not mini-adults
Physiologic Changes (birth to puberty)

- Vocal ligament development
  - Layered histology begins age 7
  - 3 layers around age 13

- Laryngeal height
  - High in infants – airway protection (C2-C3)
  - Drops to C5-C7 in adults
Hormones and Voice

Boys to Men
- Androgens (testosterone)
- Increased length of VF (15-17mm)
- Thickening of vocal folds
- Change in angle of larynx (result: Adam’s Apple)
- Lung volume increase
- Avg. length of voice change 6-18 months

Girls to Women
- Estrogen & Progesterone
- Increased length of VF (11-15mm)
- Lung volume increase
- Hormonal vocal fold cycle
- Variable from onset of puberty to early 20’s
- Changes during pregnancy & menopause

Helping Vocal Athletes Navigate Puberty

- Choose age (and emotionally) appropriate repertoire
- Be FLEXIBLE with the individual singer
- Provide relevant information and reliable resources
- Reassure them of the typical changes (that are normal!)
- Help them discover (and love) their new instrument
Case History Development for Vocal Athletes
Questions to Add to Patient History

- What is the problem? (Specifically)
  - Onset, previous history of voice problems, what type of hoarseness, how is it affecting your performance
- Do you have any pressing voice commitments?
  - Will determine to some degree the treatment planning
- Career Plans: long & short term goals
  - How important is their voice, are they ready to make changes?
Questions to Add to Patient History

- Previous vocal training? (singing and speaking)
  - Where, when, who, how long, time since last lesson
- What is your practice & performance environment?
  - Background noise, practice room, orchestra, microphone use, monitor use, choral
- How much do you practice & exercise your voice?
  - Nature of the exercises (scales, arpeggio, etc.), same time each day, warm-up, cool-down, total rehearsal time, sing "cold"
- What type of music do you sing?
  - Opera, country, jazz, pop, rock, musical theater (legit or belt), choral, karaoke, gospel, contemporary Christian, folk, oratorio

Questions to Add to Patient History

- Do you abuse/misuse your singing and/or speaking voice while performing?
  - Questions related to tension, posture, breathing, abnormal voices for a specific role, singing in car, poor support, dialects
- What is your general physical condition?
  - Singing is an athletic activity, rapid weight loss, excessive work-outs
- What does your liquid intake consist of?
  - Water, soda, coffee, alcohol, tea, juice, milk
Questions to Add to Patient History

- In depth medical inquiry:
  - Do you have cold/allergy symptoms?
  - Do you have breathing problems?
  - Do you have jaw joint or other dental problems?
  - Have you ever suffered any direct trauma to the neck or throat such as whiplash or a fall?
  - Do you have abdominal problems?
  - Are you ever symptomatic for heartburn or reflux (morning hoarseness, bad breath, excessive phlegm, lump in the throat feeling)?
  - Do you or direct family members have hearing loss?

- Medical inquiry (cont.)
  - Do you have problems controlling your weight, being excessively tired, being cold when others are warm? (looking for endocrine dysfunction)
  - Do you have thyroid problems?
  - Are your menstrual cycles regular? Does your voice seem to change around the time of your menstrual cycle? Hormone replacement? Birth control?
Questions to Add to Patient History

- Medical inquiry (cont.)
  - Have you been exposed to any environmental irritants?
  - Do you live with or work with smokers? Do you smoke?
  - Have you noted any voice or body weakness? Tremor, fatigue, or loss of control?
  - Any recent medication changes? Vitamins? Herbal supplements?
  - Do certain foods seem to affect your voice?
  - Did you have any type surgical procedure prior to the onset of your voice problem?
  - What is your stress level like? How do you feel that you deal with stress?

Clinical Assessment of Vocal Athletes

- Videostroboscopic Examination
  - Great tool for teaching anatomy and physiology

- Acoustic Measures
  - Voice Range Profile
  - Fundamental Frequency
  - Frequency Range

- Aerodynamic Measures
  - Mean air flow rates
  - Maximum phonation times
  - Phonation flow volume

- Self-Rating Scales
  - Pediatric VHI
  - S-VHI (10)
Common Pathologies in Pediatric & Adolescent Vocal Athletes

We LIKE pathologic voices.....
Adele pre- and post- surgery

Pre: https://www.youtube.com/watch?v=wmCoUjOMXU

Post: https://www.youtube.com/watch?v=G_MSQJNcLw

The Accidental Artist

https://www.youtube.com/watch?v=D67S85bNPnI
Common Complaints/Symptoms

- Hoarseness (may or may not affect speaking voice)
- Voice fatigue
- Loss of frequency range
- Loss of intensity control
- Hole in the voice
- Vibrato changes
- ‘Fuzzy’ sound
- Shift in range
- Increased warm-up time
- Tickling/choking
- Chronic throat clearing
- Laryngeal pain

Most Common Vocal Injuries in Vocal Athletes

- Overuse injury/Repetitive strain
- Vocal Fatigue
- LPR/GERD
- Muscle Tension Dysphonia
- Acute laryngitis
- Laryngeal Myasthenia (muscle weakness of laryngeal muscles)
- Nodules
- Polyps
- Vascular lesions
Case Study #1 – Pediatric Vocal Fold Nodules (strobe)

Case Study #2 – Adolescent Vocal Fold Cyst (audio sample & strobe)
Case Study #3 – 17y/o male MT performer (strobe & audio)

Questions?

Thank You!