

Ear Nose and Throat Concerns in Children with Down Syndrome

Fuad M. Baroody, M.D., FACS
Professor of Otolaryngology-Head and Neck
Surgery and Pediatrics,
Director of Pediatric Otolaryngology



COMER CHILDREN'S HOSPITAL
THE UNIVERSITY OF CHICAGO

Outline

- **Ear issues:**
 - ◆ Hearing testing
 - ◆ Hearing screen
 - ◆ Hearing loss
 - ◆ Ear infections
- **Nose issues:**
 - ◆ Frequent episodes of nasal/sinus drainage
- **Throat issues:**
 - ◆ Obstructive sleep apnea

Otoacoustic Emissions (OAEs)

- **Advantages:**
 - ◆ Ear specific information
 - ◆ No need for sedation
- **Disadvantages:**
 - ◆ Yes/no answer about hearing loss
 - ◆ Can be affected by anatomic factors such as size of canal or middle ear fluid leading to falsely abnormal result

ABR

- **Advantages:**
 - ◆ Golden standard
 - ◆ Ear specific information
 - ◆ Quantitates the extent of hearing loss
- **Disadvantages:**
 - ◆ Difficult to distinguish conductive from nerve problems
 - ◆ Does not test all frequency ranges
 - ◆ Requires sedation if >6mos

Soundfield Audiogram/Play

- **Advantages:**
 - ◆ More like a real life situation
 - ◆ No need for sedation
 - ◆ Can evaluate response to both speech and pure tones
- **Disadvantages:**
 - ◆ No ear specific information

Pure Tone Audiometry

- Patients presented pure tones and speech at different intensities and frequencies with headphones.
- Golden standard for older children and adults.
- Provides ear specific information.
- Distinguishes conductive from sensorineural losses.

Management of Children with Hearing Impairment

- Medical Management
- Hearing Aids
- Cochlear Implants
- Genetic Counseling
- Speech/Language therapy

EAR INFECTIONS

Otitis Media with Effusion-Prevalence

- OME may occur spontaneously or following AOM.
- Approximately 90% of children have OME at some time before school age, most often between 6 mos and 4 years.
- Children experiencing OME:
 - >50% of children in first year of life
 - >60% by age 2 years
- Many resolve spontaneously within 3 mos, but 30-40% of children have recurrent OME and 5-10% of episodes last 1 yr or longer.

Child at Risk

- Distinguish the child with OME who is at risk for speech, language, or learning problems.
- **Risk factors for developmental difficulties include:**
 - Permanent **hearing loss** independent of OME
 - Suspected or diagnosed **speech and language delay** or disorder
 - **Autism**-spectrum disorder and PDD
 - **Syndromes** (eg, **Downs**) or craniofacial disorders that include cognitive, speech and language delays
 - **Blindness** or uncorrectable visual impairment
 - **Cleft palate** with/without associated syndrome
 - Developmental delay

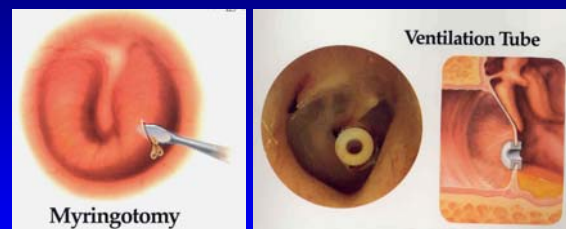
AAP Practice Guidelines. *Pediatrics* 2004;113:1412-23

Child at Risk

- Management of the hi-risk child should include:
 - Hearing testing
 - Speech and language evaluation
 - Possible speech and language therapy
 - Hearing aids or assistive listening devices
 - Management of OME
 - Repeat hearing testing after resolution of OME to determine residual deficit and attend to it

AAP Practice Guidelines. *Pediatrics* 2004;113:1412-23

Myringotomy and Tubes



- If effusion lasts >3 months
- If a child has recurring acute ear infections: $\geq 3/6$ months or ≥ 4 /yr

NOSE ISSUES

Factors Associated With The Diagnosis Of Rhinosinusitis (1996 Task Force)

• Major Factors

- Facial pain/pressure
- Facial congestion/fullness
- Nasal obstruction/blockage
- Nasal discharge/purulence/discolored postnasal drainage
- Hyposmia/anosmia
- Purulence in nasal cavity on examination
- Fever (acute rhinosinusitis only)

• Minor Factors

- Headache
- Fever (all nonacute)
- Halitosis
- Fatigue
- Dental pain
- Cough
- Ear pain/pressure/fullness

Lanza et al. *Otolaryngol Head Neck Surg* 1997;117:S1-S7

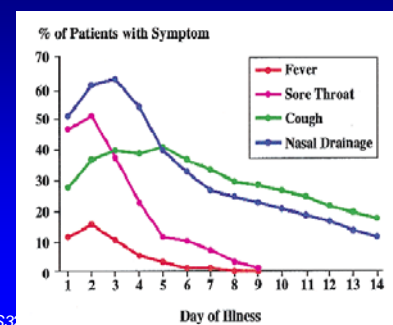
Viral URIs and Acute Bacterial Rhinosinusitis

- In the U.S., the average child has 3-8 acute viral respiratory illnesses/year.
- Almost 90% of these patients will have a self limiting viral rhinosinusitis.
- Bacterial infections complicate roughly 0.5-2% of viral rhinosinusitis.
- Avoid treating uncomplicated viral URI with antibiotics.

OHNS 2000;123:S4-S32.

Duration of Symptoms in Rhinovirus URIs

Persistence of cough and runny nose in a significant proportion of patients is entirely consistent with an uncomplicated viral cold



OHNS 2000;123:S4-S32.

Viral URIs and Acute Bacterial Rhinosinusitis

- In general, the diagnosis of acute bacterial rhinosinusitis may be made in adults or children with a viral URI if:
 - Illness no better after 10 ds
 - Illness worsens after 5-7 ds & is accompanied by some or all of:
 - Nasal drainage
 - Nasal congestion
 - Facial pressure/pain (unilateral & in the region of a particular sinus)
 - Postnasal drainage
 - Hyposmia/anosmia
 - Fever, cough, fatigue, maxillary dental pain
 - Ear pressure/fullness

OHNS 2000;123:S4-S32.

Medical Treatment

- Antibiotics are mainstay
- Antihistamines and intranasal steroids are useful especially if the child has allergies
- Avoid treating every cold with an antibiotic
- Reasonable to treat if cold symptoms persist for more than 10-14 days

Surgery

- Adenoidectomy
- Functional endoscopic sinus surgery (FESS)

Obstructive Sleep Apnea

Sleep Disordered Breathing

- **Primary Snoring:**
 - ◆ Snoring without interruptions in breathing and drops in oxygen levels
- **Obstructive sleep apnea/hypopnea syndrome (OSAHS):**
 - ◆ Snoring with breathing pauses (apnea)
 - ◆ Intermittent drops in oxygen level (hypoxia)
 - ◆ Fragmented restless sleep
 - ◆ Repeated arousals

OSAS

- OSAS is estimated to occur in 2-3% of children.
- It leads to a variety of sequelae including:
 - ◆ Cardiovascular complications
 - ◆ Failure to thrive
 - ◆ Behavioral disturbances
 - ◆ Excessive daytime sleepiness
 - ◆ ADHD
 - ◆ Poor learning

Upper Airway Obstruction/OSA Clinical Presentation

- Snoring, mouth breathing
- Sleep pauses, apneas (>10 secs)
- Frequent awakenings
- Hypersomnolence
- Behavioral problems
- Bed wetting (Enuresis)
- Growth retardation

Upper Airway Obstruction Assessment

- Careful parental observation with documentation of presence and length of apneic episodes.
- Audiotape or videotape of sleep.
- Sleep Study (Polysomnography).
- CXR, EKG, Echocardiogram if necessary.

Polysomnography

- Golden standard in evaluating OSA
- Monitors:
 - ◆ Duration and efficiency of sleep
 - ◆ EKG and EEG
 - ◆ Number of obstructive apneas and hypopneas
 - ◆ Changes in pulse oximetry (oxygen saturation in blood)
 - ◆ Number of arousals
- RDI, REM RDI, arousals, and lowest desaturations help determine severity of OSA.

Treatment of OSAS

- Most common treatment in children is removal of the tonsils and adenoids.
- Continuous positive airway pressure (CPAP).
- Nasal sprays.

OSAS and DS

- Predisposing factors for OSAS:
 - ◆ Smaller midface and mandible
 - ◆ Large tongue
 - ◆ Obesity
 - ◆ Generalized hypotonia (floppiness)

OSAS and DS

- Children with DS frequently have OSAS.
- OSAS is seen frequently in children even when it is not suspected by the physician or the parents.
- Removal of the tonsils and adenoids helps but might not completely eliminate the problem.

Special Considerations in Children with DS Preparing for Surgery

- SBE prophylaxis
 - ◆ Subacute bacterial endocarditis prophylaxis
- Neck stability
 - ◆ obtain flexion and extension films before surgery especially for tonsils and adenoids