# Signs and symptoms in respiratory tract conditions

Anna Piwowarczyk

**Department of Peadiatrics with Clinical Assessment Unit** 



# **Upper Respiratory Tract**



Anatomy





Development of sinus cavities

- The ethmoid and the maxillary sinuses form in the third to fourth gestational month (present at birth). Fully developed by 14 years of age.
- The ethmoid sinuses drain into the middle and superior meatus.
- The sphenoid sinuses are generally pneumatized by 5 years of age. Undeveloped at birth.
- The frontal sinuses appear at age 7 to 8 years but are not completely developed until late adolescence.

AAP 2001

#### **UPPER RESPIRATORY** TRACT INFECTIONS (URTI)

VITAMIN C

SNOT





SNEEZING

















COUGH

SURGICAL MASK

# Symptoms in respiratory tract

- Dyspnea
- Cough
- Apnoea
- Wheezing
- •

**Dyspnea** - nonpainful but uncomfortable awareness of breathing that is inappropriate to the level of exertion;

leads to:

 increased activity of the respiratory muscles retractions = chest indrawing: supraclavicular (soft tissue above clavicles) intercostal (indrawing of the skin between ribs) subcostal (just below the costal margin)
 stimulation of neurotransmitter receptors

 increased pCO2 concentration

#### different severity of signs Dyspnea Tachypnea Age • Pnea Ortopnea an infant 60 breaths/min • Gasping younger than 30 • Nasal flaring days • Respiratory muscles work 2- to 12-50 breaths/min Decreased physical month-old activity • Cyanosis 40 breaths/ min 1- to 5year-old Interrupted speech/cough

Tachypnea is an important predictive sign of pneumonia in febrile children younger than 2 years of age

Pediatrics in Review, AAP, 2002

Dyspnea – the most frequent etiology

- acute respiratory infections (ARI)
- asthma triggered by viruses,
- enlarged tonsils,
- allergic rhinitis,
- foreign body aspiration

Elshout G et al., 2013

## Cough

a common symptom that ranges in significance (a reflex response to stimuli that irritate receptors in the larynx, trachea, or large bronchi)



Acute – chronic Productive – dry Specific - nonspecific



The most common causes of acute cough in children

- Infection
- Alergic rhinitis
- Aspiration

The most acute respiratory infections in children resolve within 4 weeks

Chang AB, Chest 2017

# Chronic cough

#### > 4 weeks in children 14 years and younger

> 8 weeks but an individualized management needed (this threshold used to define chronic cough in adults)

> Chang AB 2016 Shields 2008

### classically recognizable cough sounds in children/

"specific cough pointers"

Туре	Cause
Barking	Tracheomalacia, habit cough (habit cough). If acute: Croup
Paroxysmal cough (with or without inspiratory whoop)	Pertussis and parapertussis
Staccato cough	Chlamydia in infants
Honking or 'goose- like' cough	Habit cough (tic cough) - worsens when child is anxious or attention is focused and is <b>absent</b> <b>during sleep.</b> Cough improves with distraction or suggestion and can be voluntarily suppressed
Wheezing	Asthma, foreign body aspiration
Cough conected feeding	GERD

© 2020 UpToDate

# Cough - alarming symptoms ("pointers")



- Neonatal period
- Associated with feeding
- Sudden onset of symptoms
- Chronic productive
- Failure to thrive
- Exacerbation of cough
- Associated with symptoms of chronic disease
- Associated with fever

#### Apnea



- Norm intervals 5-10 s during sleeping, maks. 15 s
- Types:
  - obstructive
  - central
  - mixed

# Apnea of prematurity

#### Incidence

Term newborns: ok. 0,1% 34. - 35 g.w.: 5–7% 30. – 31 g.w.: 50%

#### cessation of breathing for more than 20 seconds

#### or

 shorter respiratory pause associated with oxygen desaturation and/or bradycardia (< 100/') in infants younger than 37 weeks gestation

# Noisy breathing

U

**Stertor -** created in the nose or the back of the throat; typically lowpitched and most closely sounds like nasal congestion you might experience with a cold, or like the sound made with snoring



**Stridor** is a higher-pitched; occurs with obstruction in or just below the voice box; can occur during inspiration, expiration, or both dependengly on the level of obstruction



Wheezing is a high-pitched; occurs during expiration; typically due to narrowing, spasm, or obstruction of the smaller airways in the lungs

Stridor (entirely or predominantly inspiratory) – common causes

acute

- Foreign body aspiration
- Anaphylaxis
- Infectious (croup subacute onset)
- Laryngomalacia (chronic)

# Adventitious (added) sounds

- crackles (sometimes called rales) (pneumonia, bronchiolitis, cardiac failure)
- wheezes (asthma, bronchitis, foreing body aspiration)
- rhonchi (secretions in large airways)



#### Differential diagnosis

![](_page_23_Picture_0.jpeg)

### Differential diagnosis