

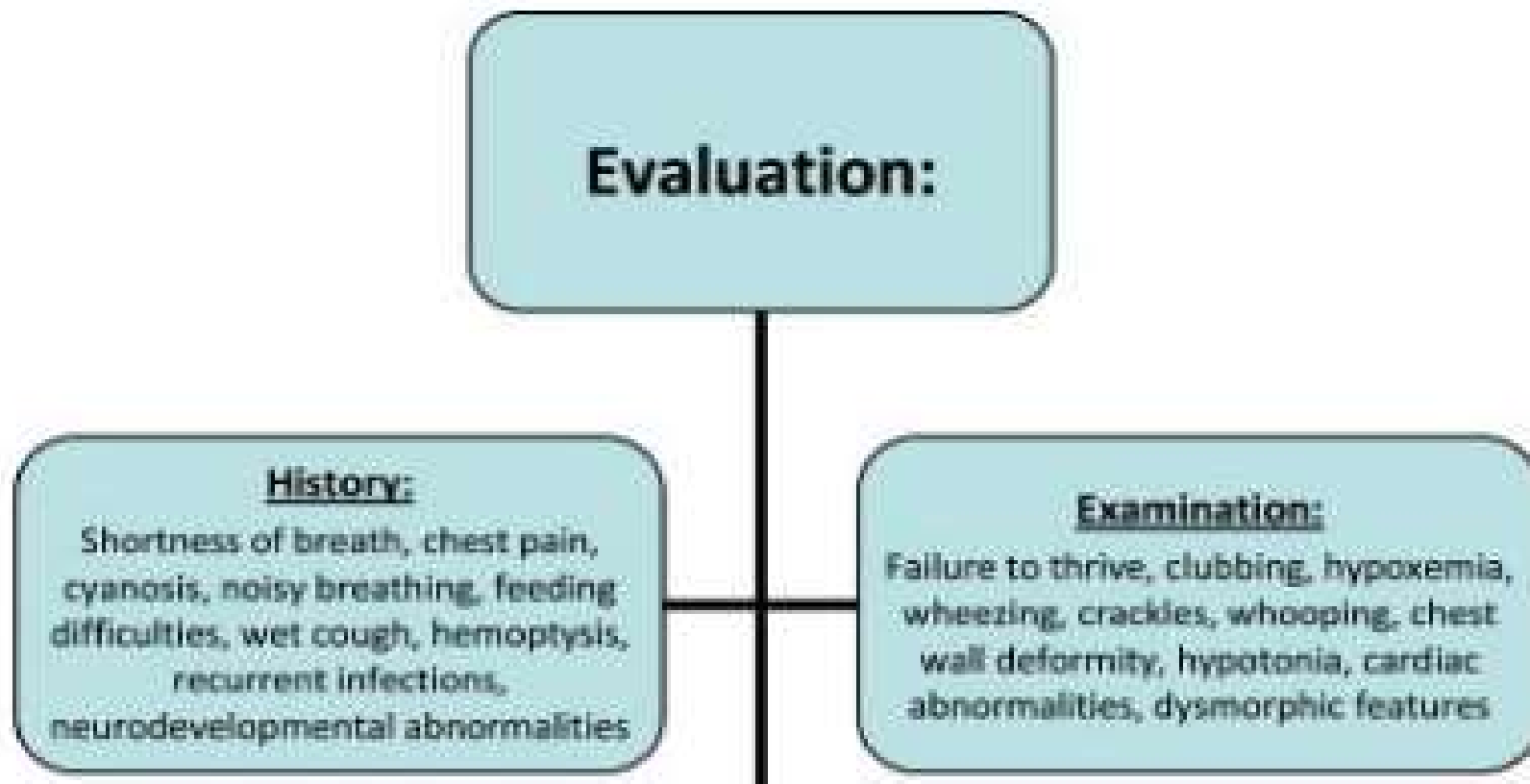
بنام خداوند جان آفرین

Chronic cough in children

Mohammad Ali
Pourmirzaiee



Approach to chronic cough in children



Chronic cough is defined as a daily cough lasting **four** weeks

The history focuses on identifying symptoms or risk factors that predict a specific cause of cough.

Specific cough pointers

- •Wet/productive chronic cough
- •Wheezing or dyspnea
- •Onset after an episode of choking (even if days or weeks prior)
- •Neonatal onset of symptoms
- •Any other associated medical conditions (cardiac, neurologic, autoimmune or immunodeficiency, or suspicion thereof)

History : Medications

- Previous response to antihistamines → a component of rhinitis and postnasal drip
- Response to inhaled bronchodilators(ICS) → possible asthma.
- Angiotensin-converting enzyme (ACE) inhibitors → are well-established causes of chronic cough.
- Cytotoxic drugs → interstitial lung disease(ILD).
- Immunosuppressive medications such as TNF inhibitors → are associated with increased risk for pulmonary infections, including with fungal and mycobacterial pathogens.

HISTORY IMPORTANCE (an example)

PICADAR		
Does the patient have a daily wet cough that started in early childhood?	Yes – complete PICADAR No – STOP. PICADAR is not designed for patients without a wet cough	
1. Was the patient born pre-term or full term?	Term	2
2. Did the patient experience chest symptoms in the neonatal period (e.g. tachypnoea, cough, pneumonia)?	Yes	2
3. Was the patient admitted to a neonatal unit?	Yes	2
4. Does the patient have a situs abnormality (situs inversus or heterotaxy)?	Yes	4
5. Does the patient have a congenital heart defect?	Yes	2
6. Does the patient have persistent perennial rhinitis?	Yes	1
7. Does the patient experience chronic ear or hearing symptoms (e.g. glue ear, serous otitis media, hearing loss, ear perforation)?	Yes	1
Total score =		

Past medical history

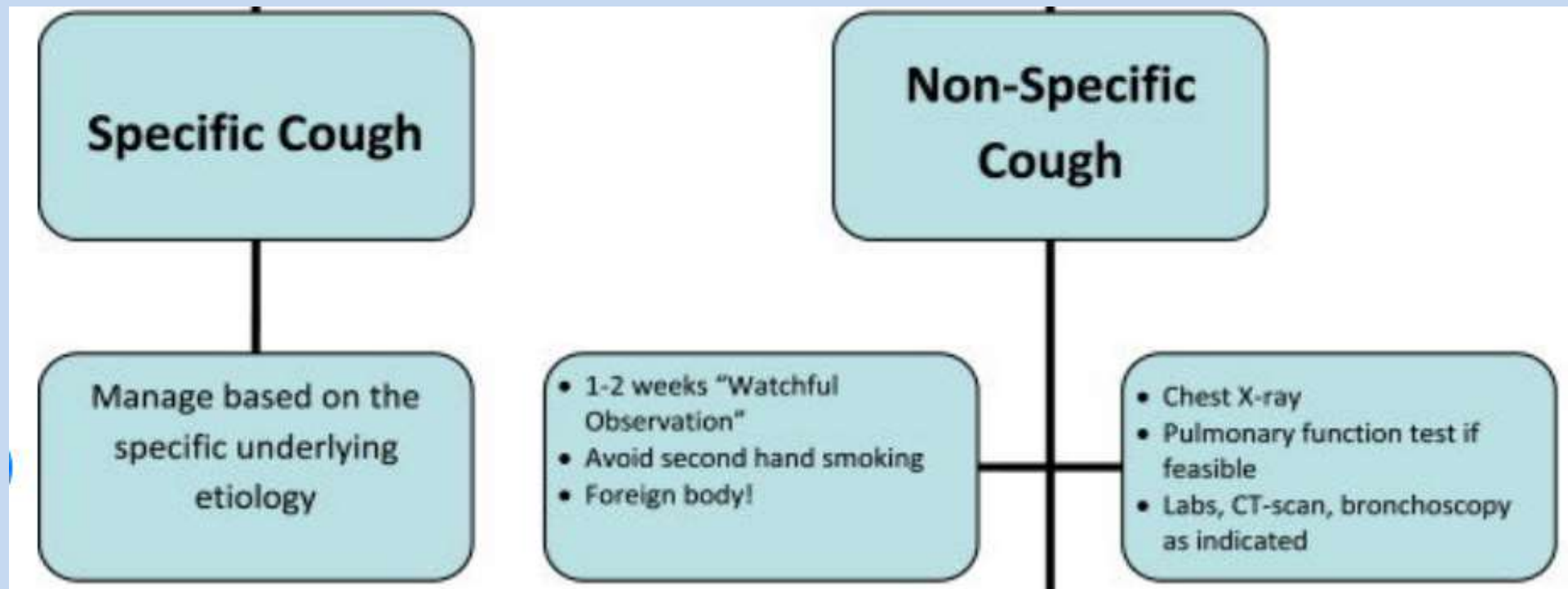
- Neonatal history – LBW and/or premature neonates are at risk for asthma-like disorders, bronchiectasis, and recurrent infections.
- Respiratory viral infection – Cough that begins with a respiratory viral infection suggests a post-infectious syndrome, which is a common cause of nonspecific chronic cough.
- Previous hospitalizations– Recurrent or un resolving pneumonia in one lobe or segment of the lung may also be caused by obstruction or anatomic abnormality in that airway and warrants further investigations (usually bronchoscopy and chest scans)

Physical examination

- **Skin** : Eczema – Suggests atopic disease.
- **Appearance** : Poor growth or thinness – Suggests chronic illness.
- **Head and neck** : Allergic shiners, nasal polyps –Suggests allergic disease.
- **Ears** : Tympanic membrane scarring –Suggests the possibility of PCD.
- **Mouth** : Hoarseness –Suggests aspiration or vocal cord dysfunction.

Physical examination

- **Heart** : Dextrocardia – in δ ·% PCD.
- **Abdomen** : Situs inversus – PCD.
- **Genitourinary** : Rectal prolapse – CF.
- **Extremities** : Edema – Suggests cardiac disease. Cyanosis or digital clubbing – Suggests bronchiectasis or interstitial lung disease.



Specific cough refers to an underlying physiologic cause (which is usually but not always of pulmonary origin)

Nonspecific cough: does not have an identifiable cause after a reasonable evaluation

Wet-Cough

Dry-Cough

Antibiotics
(Amoxicillin/Clav)
for 2 weeks

Trial of ICS medium
dose for 4-6 weeks

Follow-up after therapy:
If not resolving then consider
referral to specialist

Follow-up after therapy:
If not resolving then consider
referral to specialist

Suspicion of asthma

- Supportive evidence includes wheezing and a chronic dry and *paroxysmal cough that is triggered by exercise, cold air, sleep, or allergens.*
- A history of **eczema, recurrent wheezing, or a family history of atopic disease** supports the possibility of asthma.
- Asthma may also present with recurrent **right middle lobe atelectasis**, thought to be due to relatively poor collateral ventilation in the right middle lobe.

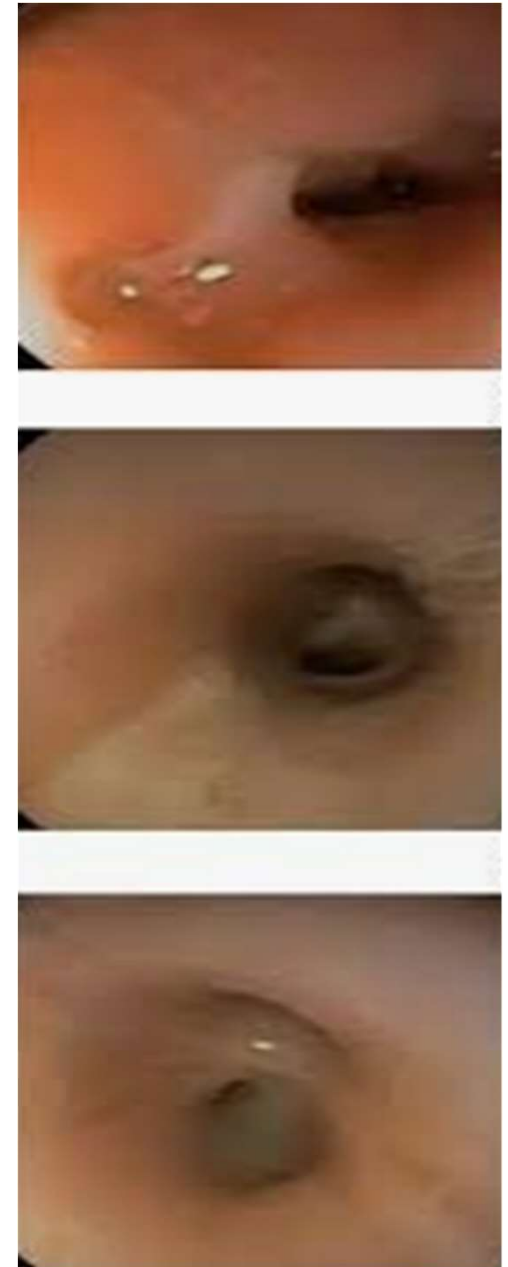
Evidence of asthma?

- Dry cough and history of bilateral wheeze or exertional dyspnea, **plus:**
- No focal findings, expiratory wheeze on examination
- Spirometry (if performed) shows reversible obstructive defect or is normal
- $F_{eNO} \geq 25$ ppb (if measured) Δ



Wet or productive cough

- This symptom is always **pathologic** and warrants treatment and/or investigations for a chronic endobronchial infection.
- **Protracted bacterial bronchitis (PBB)**: an isolated chronic wet-moist cough in a child who otherwise appears well and absence of symptoms, signs, or laboratory evidence suggestive of an alternative cause of the cough, with resolution of the cough after antibiotic treatment(amoxicillin-clavulanate).



Classical cough sounds

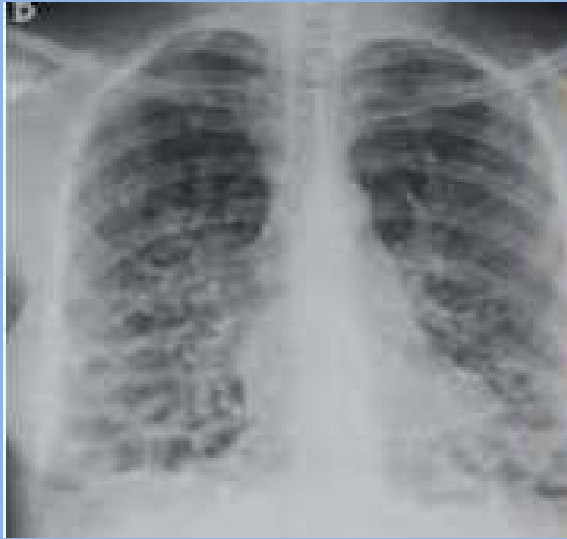
- **Barking or brassy cough** suggests a process in the trachea or more proximal airways, such as airway **malacia** (with or without vascular and other causes of trachea compression).
- **Honking ("Canadian goose-like")** ,Tic or habit cough is typically more prominent during office visits and **absent during sleep**; an initial upper respiratory tract may be a triggering event. The typical age range for children with these disorders is 5 to 18 years.
- An **inspiratory "whoop" and paroxysmal cough** suggests infection with **pertussis** or parapertussis; this characteristic cough can be retriggered by subsequent upper respiratory illness. Whoop is often absent in infants with pertussis .

CXR

- A chest radiograph should be obtained as part of an evaluation in children with chronic cough.
- An abnormal CXR (other than perihilar bronchial thickening) is an important pointer for specific cough.



CXR definitive diagnosis examples



Flexible bronchoscopy indications

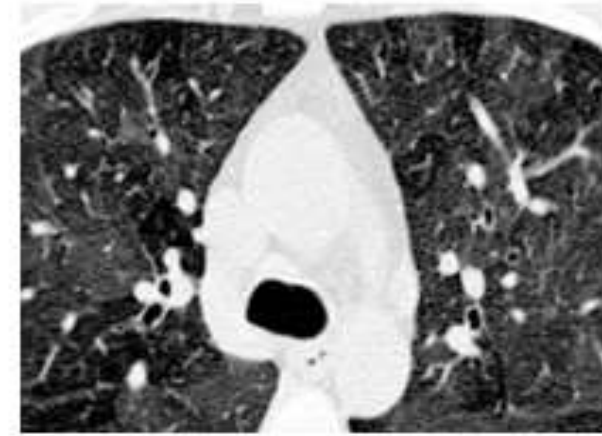
- Urgent bronchoscopy : for suspected **foreign body aspiration**.
- Bronchoscopy is also valuable in the evaluation of suspected **airway malacia ,TEF and stenosis**.
- To perform **BAL**; for bacterial, fungal, and mycobacterial cultures.
- **Cilia brushings** can also be taken for patients with suspected ciliary dyskinesia.

Sinus imaging

- **Sinusitis is not a common cause of chronic cough** in children, except in association with an immune defect predisposing to chronic airway infection.
- For patients with clinical features strongly suggestive of sinusitis (mucopurulent drainage, chronic nasal obstruction, facial pressure) an empiric trial of treatment for sinusitis may be undertaken.
- **There is poor correlation between sinus radiography or CT and clinical disease.**
- Imaging reveals some sinus abnormality in 70 to 80 percent of asymptomatic patients.

Chest CT scans indications

- To further evaluate the underlying etiology.
- If mass seen on the CXR.
- For non-resolving pulmonary consolidation.
- If a vascular abnormality(sling or ring) is also suspected contrast CT may be indicated.



Tests for tuberculosis

- In settings where tuberculosis is endemic or has a high prevalence , particularly if the child is at high risk for exposure, standard tests (TST or IGRA) for tuberculosis should be considered.
- This may be relevant even in the absence of obvious signs and symptoms in the child because tuberculosis infection can be subtle.

Esophageal pH monitoring

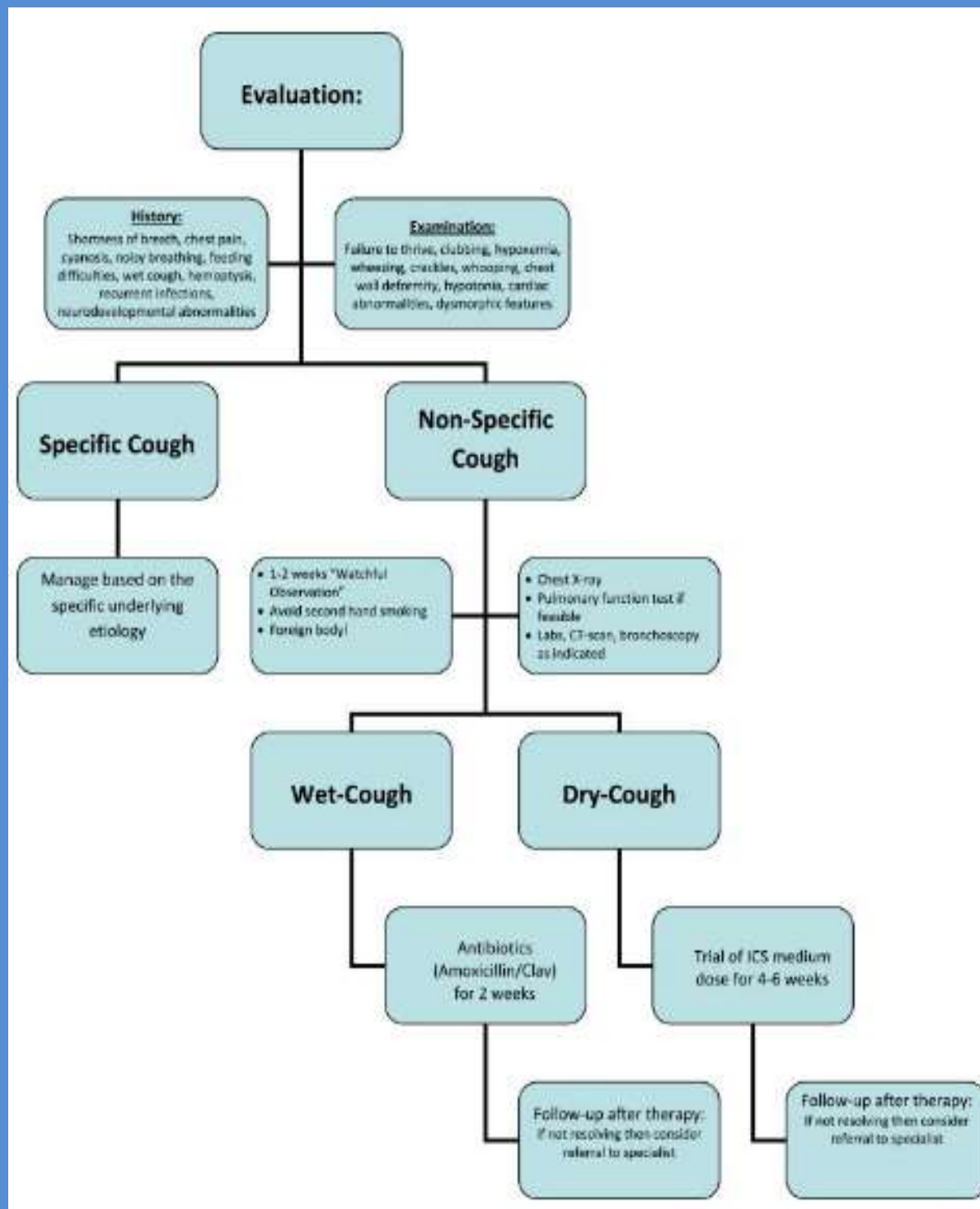
- It remains controversial whether GERD (acid or non-acid) is an important cause of isolated chronic cough in children.
- Most authorities suggest that this is not a common cause.
- In children with neurologic abnormalities, GERD may be associated with aspiration.
- In selected children, esophageal monitoring may be undertaken to determine if the episodes of coughing are associated with reflux events, but results are often inconclusive.

Other tests

- Other tests may be required, depending on the suspected diagnoses.
- These include evaluations for aspiration and swallowing dysfunction (eg, video fluoroscopic swallowing test), PFT , or echocardiogram.
- Tests for atopy include skin prick testing or radio allergosorbent testing (RAST) is usually not recommended in the assessment of children with chronic cough (Practice Guideline Chest. 2017 Apr;151(4):875-883. chest.2016/12/025. Epub 2017 Jan 16)

Management of chronic cough

- **Cough suppressants** – cough suppressants and codeine **are not recommended** for the treatment of chronic cough in children.
- **Avoidance of tobacco smoke** – There is evidence that environmental exposure to tobacco smoke increases respiratory infections and thus the risk for chronic cough in children.
- **Alternative therapies** – **Honey** is an option for treating cough in children ≥ 1 year and has a modest beneficial effect on nocturnal cough.
- A systematic review of 14 randomized trials indicated honey was more effective than diphenhydramine and dextromethorphan in reducing cough frequency and severity.



Principal references:

١-disorders of the respiratory tract in children.

٢-Pediatric pulmonology online journal.

٣-UpToDate

Thank
you!