COUGH IN CHILDREN CLINICAL PRACTICE IN FAMILY MEDICINE

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OBJECTIVES

1. To understand the etiology and Classification of cough in children.
2. To develop a systematic approach to the evaluation and diagnosis of cough in children.
3. To outline evidence-based management strategies for children's acute, subacute, and chronic cough.
4. To recognize when to refer a child with cough to a specialist.

CASE SCENARIO

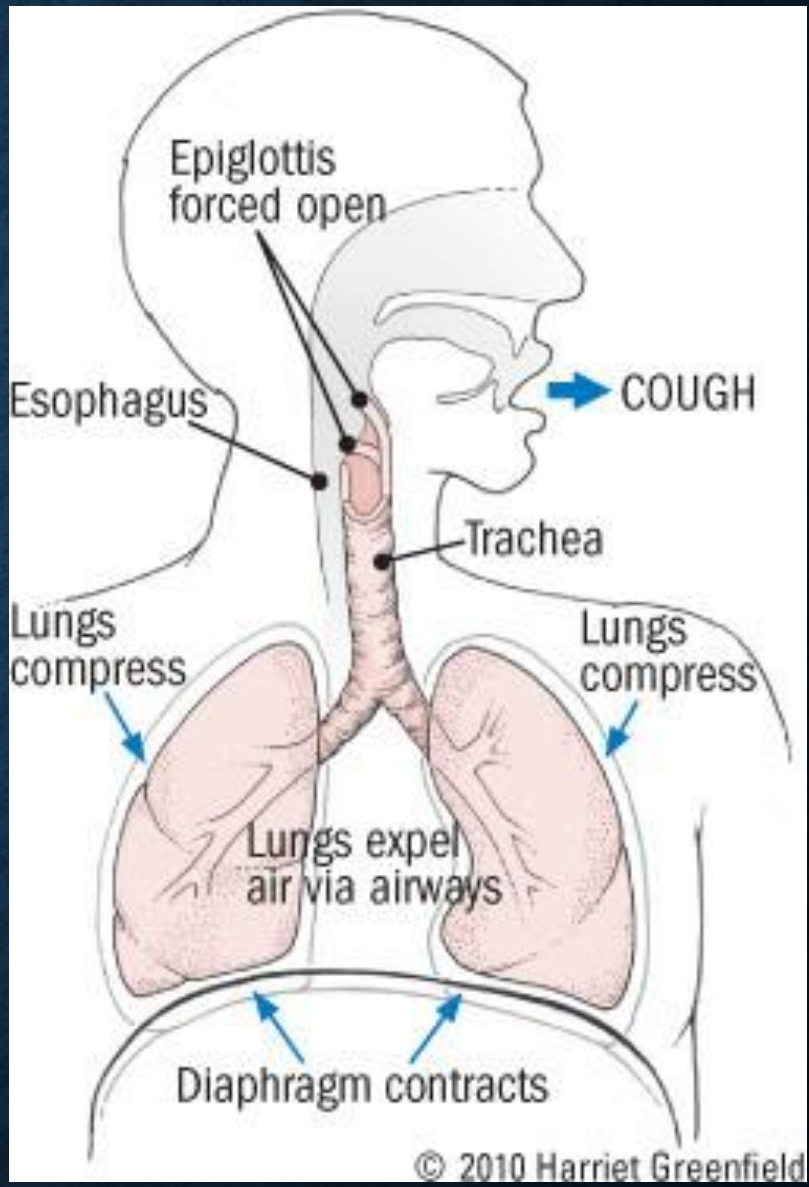
- Mother who presents to her Family physician explains that her 6-year-old son had fever, runny nose, and cough about 2 weeks ago but got better after a few days.
- Ex=temp=39 C RR=32/mint
- Chest ex=decrease air entry-diffuse rhonchi
- Q= what is next steps ??

DEFINING COUGH IN CHILDREN

- Cough is a complex physiological reflex that consists of a violent expiration to release secretions, foreign matter, overcome bronchospasm or relieve diseases of the airways and protect the respiratory system

- Cough is the most common presenting symptom to Family medicine settings in many countries
- Persistent cough is one of the most common reasons for a child to be referred to a Family physician .
- Normal children cough 1 1 times per day when they are well, and this increases in frequency and severity during winter, with upper respiratory tract infections (URTI) .

- Cough can impact a child's activity level and ability to sleep well, play or attend school and is often a source of parental anxiety.
- Cough in children is different from that in adults in terms of duration, presentation, etiology and management .



CLASSIFICATION

- Acute: cough lasting less than 2 weeks.
- Subacute: cough lasting 2 -4 weeks.
- Chronic: cough lasting more than 4 weeks.

HISTORY

- Age of onset
- Duration
- Severity
- Time .
- Alleviating and triggering factors
- Quality of cough, for example barking, wheezing .
- Exposure to smoking
- Diurnal variability
- Associated cold symptoms
- Relation with meals
- Wet or dry, sputum and haemoptysis

HISTORY-CONT.

- Wheeze
- Dyspnea
- Fever
- Failure to gain weight
- Upper airway symptoms (rhinitis, ear infections, glue ear)
- History of choking
- Contact with TB or HIV
- Possible allergies
- Immunization status
- Response to prior therapy
- Choking or coughing on swallowing
- Whether cough disappears when sleeping

EXAMINATION

- Conduct ear, nose and throat examination
- Check for nasal polyps (cystic fibrosis must be excluded)
- Check for chest deformities
- Auscultate chest
- Conduct cardiac examination
- Look for evidence of atopy
- Identify failure to thrive
- Check for digital clubbing
- Ask the child to perform their usual cough, and huff (forced expiration) while palpating the chest

COUGH TYPES

Frequent, persistent cough

Short, fast cough (with "whooping" sound)

Productive cough with persistent mucus, sneezing and nose-blowing

Dry nighttime cough

Loud, wet cough with faster breathing than normal

Barky cough

Wheezing cough

verywell

Table 1 Common etiologies of chronic cough based on child age.

Young children (<5 years)	Older children (>5 years)
Infections	Asthma
Gastroesophageal reflux	Infection
Congenital malformation	Post-nasal drip
Asthma	Protracted bacterial bronchitis
Protracted bacterial bronchitis	Passive smoking
Passive smoking & environmental pollution	Bronchiectasis
Foreign body inhalation	Psychogenic cough

Table I. Important clinical cues to describe a child's cough.

Clinical cue	Description
Age of symptom onset	Chronological age at cough onset
Wet or dry nature	Assessed through child's spontaneous cough, asking child to induce a cough or caregivers' video/audio recordings
Triggers	Cough in relation to exercise or emotion. Any pattern related to change in home or new school environment, e.g. cigarette smoke exposure, new pet, renovation
Frequency	Number of cough episodes heard per day
Timing of cough	Presence of night awakening
Accompanying features	Wheezing, breathlessness, constitutional symptoms with loss of appetite, loss of weight and unexplained intermittent fever

FREQUENT AND PERSISTENT COUGH

- If your child is coughing frequently—more than every five minutes for more than two hours—call your Family physician .
- The cough could be caused by irritation from mucus in the throat, or it could be a sign of breathing troubles.
- A frequent, persistent cough could also be a sign of asthma.
- The child might benefit from breathing treatments with an inhaler or nebulizer.

SHORT AND FAST (WHOOPING) COUGH

- Pertussis, commonly known as whooping cough, is a serious infection.
- It can affect people of any age, but it is most serious for children younger than 1 year old.
- It can be fatal in infants.
- Pertussis is characterized by a fast cough accompanied by a "whoop" sound that occurs when taking a breath.
- But infants with pertussis don't always have a cough.
- They may instead experience brief stops in breathing (apnea) and (cyanosis).
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- The best way to prevent whooping cough is with the pertussis vaccine.
- It is usually given as a combination vaccination called the DTaP, which includes protection against two other serious bacterial diseases: diphtheria and tetanus.
- The combination vaccine can be given starting at 2 months old.
- Adults should get a booster (called Tdap), especially if they are pregnant or have young children at home.

PRODUCTIVE (WET) COUGH

- A productive, or wet, cough is one that brings up mucus produced by respiratory tract.
- You can hear the fluid moving in the airways as the child coughs.
- A loud, wet cough could be a sign of a concern that requires treatment.

- Persistent green or yellow mucus with coughing, sneezing, and/or blowing of the nose indicate that your child may have developed a **sinus infection**.
- Antibiotics or allergy medication may be necessary.
- And the following are all signs of pneumonia:

An infection caused by a virus or bacteria.

- The cough is wet, and loud.
- Breathing seems faster than normal=tachypnea
- Bacterial pneumonia is treated with antibiotics, while viral pneumonia needs to run its course.
- Severe cases may require a hospitalization.

DRY NIGHTTIME COUGH

- If your child has had an annoying, on-and-off cough that gets worse at night and with activity, call the Family physician .
- It is possible your child may have asthma, a chronic condition where the airways of the lungs become inflamed and narrow.
- There may also be excess mucus, which could explain your child's coughing.

BARKING COUGH

- A child's cough that sounds like a seal or small dog barking is a sign of croup, an upper airway infection.
- This illness is most common in children under age 8 and usually starts or worsens at night.
- Children may wake during the night with a barking cough and a loud whistling sound when they breathe =stridor

- If your child wakes up with a barking cough, take them to the bathroom and turn on the hot water in the shower.
- Sit in the steamy room for 15 minutes.
- This step often relieves coughing and stridor.
- If it does, you can go back to sleep and contact the Family physician in the morning.
- If it does not help, take your child to the nearest emergency room.

WHEEZING COUGH

- People often confuse the term *wheezing* with the sound kids make when they breathe and are congested.
- If it sounds like you can hear mucus when your child is breathing, there probably isn't anything to be concerned about.
- True wheezing is a high-pitched whistling sound when breathing out =expiration
- If your child is coughing and wheezing without any history of asthma, contact your FP or seek medical attention.
- If your child does have asthma, follow your family's asthma action plan.

WHEN TO SEE A DOCTOR

- With time and experience, most parents learn when it's time to see a doctor for a child's cough.
- If you're still uncomfortable making that call, so review this list.

- A fever of 38 C or higher in an infant 2 months old or younger
- A fever of 38.9 C or higher in a child of any age
- Blue lips-cyanosis
- Excessive sleepiness
- Labored breathing, including nostrils widening with each breath, wheezing, fast breathing, or shortness of breath
- Loss of appetite or thirst, with signs of dehydration (such as decreased urination)
- Persistent ear pain
- Severe headache
- Worsening health in general

AVOID COUGH MEDICINES

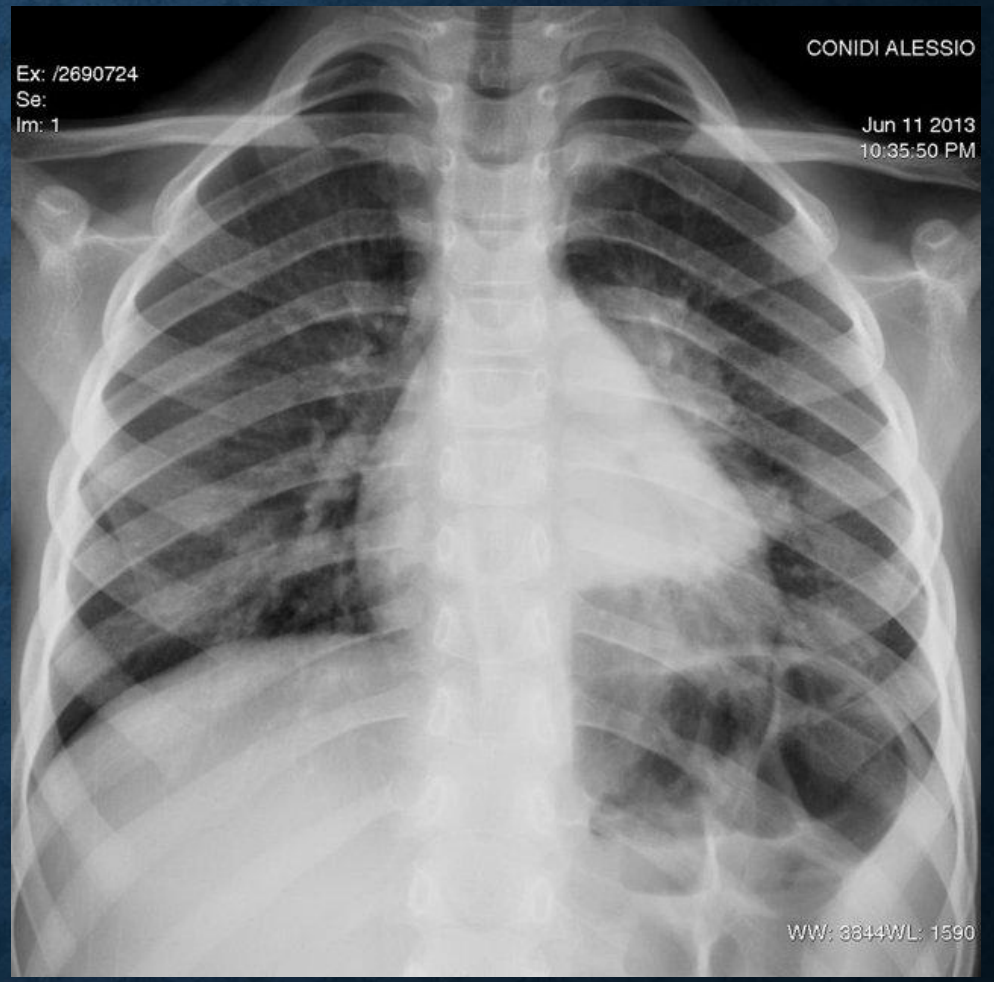
- Children under age 2 should not be given OTC cold medicines that contain a decongestant or antihistamine.
- They can cause a tachypnea and/or convulsions.
- Older children, check with their Family physician .
- Remember that children should never be given medicines that are designed to be taken by adults.

RED FLAGS

The following findings are of particular concern:

- Cyanosis or hypoxia on pulse oximetry
- Stridor
- Respiratory distress
- Toxic appearance
- Abnormal lung examination

INVESTIGATIONS



ACUTE COUGH

- The majority of acute cough attacks in children are related to viral/post-viral URTI and do not require further investigation.
- A chest radiograph CXR should be considered when signs indicate lower respiratory tract involvement, progressive nature, hemoptysis, or features of an undiagnosed chronic respiratory disorder.
- If an inhaled foreign body is suspected as the cause of an acute cough, then urgent bronchoscopy should be considered

CHRONIC COUGH

- Investigations should include chest radiograph and lung function test.
- The extended investigation should be individualized based on the clinical presentation of each patient
- feeding/swallowing assessment for aspiration, immune work-up for immunodeficiency, sweat chloride test for cystic fibrosis, CT scan for bronchiectasis, bronchoscopy for inhaled foreign bodies and/or to obtain bronchoalveolar lavage).
- For wet cough, an attempt should be made to obtain a sample of sputum.
- Allergy testing (skin prick or RAST specific testing) may be helpful in determining if a child is atopic .
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- A therapeutic trial of asthma medication can be used as a diagnostic tool for chronic cough in young children, when there is a lack of other objective indicators of asthma.
- This trial should be monitored and time-bound (6–8 weeks), and medications should be stopped after the trial period if no benefits are observed.

Table 2 Indicators of the presence of specific cough.

- Coughing initiates suddenly with a choking episode
- Coughing is progressive
- Shortness of breath — chronic or exertional
- Failure to thrive
- Hypoxemia
- Constitutional symptoms
- Clubbing
- Hemoptysis
- Chest wall abnormality
- Noisy breathing and/or abnormal lung auscultation
- Coughing with a background history of recurrent pneumonia
- Cough initiates in neonatal period
- Swallowing difficulties
- Craniofacial abnormality
- Neuromuscular disorder
- Wet cough lasting more than 3—4 weeks

MANAGEMENT OF COUGH IN CHILDREN

GENERAL CONCEPTS

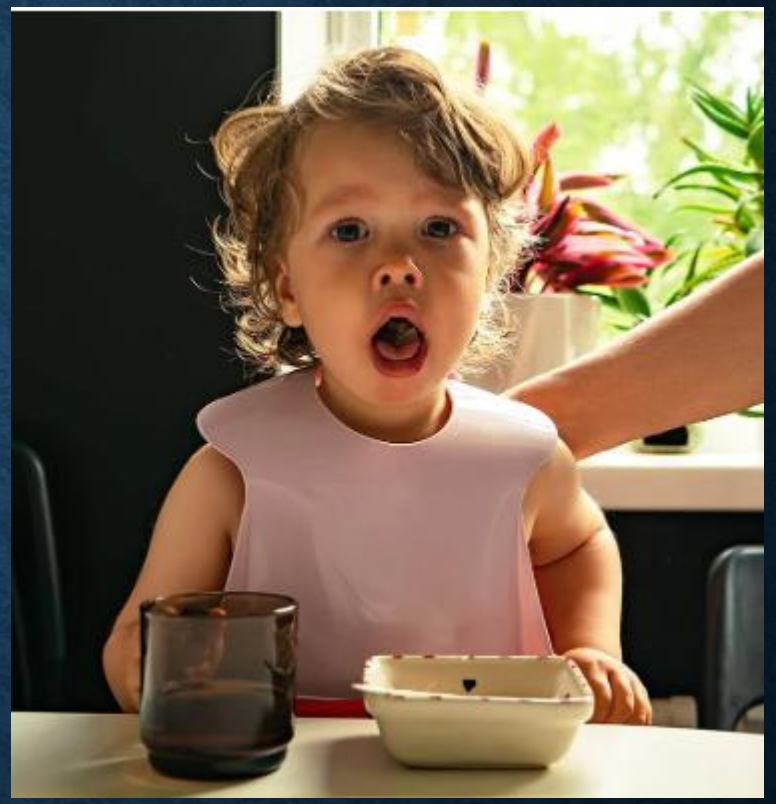
- Identify an underlying cause of cough in children.
- The etiology is related to URTI and requires only supportive measures (e.g., antipyretics, good hydration, and saline washes).
- OTC antitussives, antihistamines, and decongestants are as effective as placebo for acute cough and have the potential to cause adverse effects; thus, they should be avoided in children less than 2 years of age.
- Intranasal steroids can be effective in children with allergic rhinitis presenting with cough during the pollen season

- Bronchodilators are not effective and should be avoided in non-asthmatic children presenting with acute cough.
- Antibiotics are generally not effective and should be avoided in children presenting with acute cough caused by viral URTI.

- When pertussis infection is diagnosed, macrolide=AZITHROMYCIN, antibiotics should be prescribed early (1–2 weeks of illness).
- Specific causes of acute cough (e.g., asthma, bronchiolitis, croup, and community-acquired pneumonia) should be managed based on the evidence-based guidelines specific for such entities.

- Honey products are a natural and safe therapeutic option with a slight effect that can be considered for acute cough following URTI in children greater than 2 years of age
- Parental and community education is indicted to increase the awareness of the natural course and supportive measures for acute cough caused by URTI in young children

- Foreign body inhalation should always be considered in children with chronic cough.
- This is important, even if a choking episode was not witnessed, especially if the cough onset was abrupt.



- Protracted (i.e., persistent) bacterial bronchitis has been recently defined as a common cause of chronic cough in children and is defined as a chronic wet cough with positive bronchoalveolar lavage (Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis) that resolves with antibiotic therapy .
- A trial of prolonged antibiotics (typically amoxicillin and clavulanate for 2e4 weeks) is recommended. Such children should be followed at the end of the therapeutic trial for assessment of response and consideration of an alternative diagnosis.

- A diagnostic trial of anti-asthma therapy (namely inhaled corticosteroids=ICS) can be considered for bothersome chronic cough cases, especially in situations where objective assessment (e.g., pulmonary function testing) is lacking.
- It is important to ensure proper use of the therapy (i.e., dosage, device and compliance) and to have a well-defined period for the trial (6-8 weeks) before assessing the patient's response.

- Children with features suggestive of habit (psychogenic) cough can benefit from psychotherapy, such as suggestion and/or behavioral therapy.
- Organic causes should be excluded in those children.

Table 4

Common Pediatric OTC Cough and Cold Product Ingredients

Ingredient	Drug Class	Usual Dosage	Maximum Dosage	ARs Related to Excessive Doses
Loratadine	Antihistamine	*2-5 y:* 5 mg *≥6 y:* 10 mg	*2-5 y:* 5 mg/24 h *≥6 y:* 10 mg/24 h	Hypotension, HT, palpitations, tachycardia, hallucinations
Brompheniramine	Antihistamine	*2-6 y:* 1 mg q4h-q6h prn *6-12 y:* 2 mg-4 mg q6h-q8h prn	*2-6 y:* 6 mg/24 h *6-12 y:* 12 mg/24 h	Palpitations, paradoxical excitability
Diphenhydramine	Antihistamine	*2-<6 y:* 6.25 mg q4h *6-<12 y:* 12.5 mg q4h	*2-<6 y:* 37.5 mg/24 h *6-<12 y:* 75 mg/24 h	HT, tachycardia, chest pain
Phenylephrine	Decongestant	*2-6 y:* 2.5 mg q4h prn *6-11 y:* 5 mg q4h prn	*2-6 y:* 6 doses/24 h *6-11 y:* 6 doses/24 h	HT, angina, precordial pain, reflex severe bradycardia, peripheral vasoconstriction, arrhythmias, RD, hallucinations
Dextromethorphan	Antitussive	*2-6 y:* 2.5 mg-7.5 mg q4h-q8h *6-12 y:* 5 mg-10 mg q4h-q8h	*2-6 y:* 30 mg/24 h *6-12 y:* 60 mg/24 h	Confusion, dysarthria, stupor, nystagmus, dystonia, coma, hallucinations, tachycardia, seizures, respiratory depression
Guaifenesin	Expectorant	*2-<6 y:* 50 mg-100 mg q4h prn *6-11 y:* 100 mg-200 mg q4h prn	*2-<6 y:* 600 mg/24 h *6-11 y:* 1,200 mg/24 h	Nausea, vomiting, diarrhea, abdominal pain, nephrolithiasis

AR: adverse reaction; HT: hypertension; RD: respiratory distress.
Source: References 10, 17.

SUPPORTIVE MEASURES FOR INFANT AND TODDLERS WITH COLD

1. **Ensure Adequate Hydration**

- **Breastfeeding or formula feeding**: Offer frequent breast milk or formula to keep the child hydrated.
- **Oral rehydration solutions (if needed)**: For toddlers, small amounts of water or oral rehydration solutions can be given, especially if they are reluctant to eat or drink.
- **Avoid sugary drinks**: Stick to water, milk, or electrolyte solutions to prevent dehydration.

2. Relieve Nasal Congestion

- **Saline nasal drops or spray**: Use saline drops to loosen mucus in the nasal passages, followed by gentle suction with a bulb syringe or nasal aspirator.
- **Humidifier or vaporizer**: Use a cool-mist humidifier in the child's room to keep the air moist and ease breathing.
- **Elevate the head**: Slightly elevate the head of the crib or bed (using a towel under the mattress) to help with nasal drainage.

3. Soothe a Sore Throat and Cough

- **Honey (for toddlers over 1 year)**: A small amount of honey can help soothe a cough and sore throat. *Do not give honey to infants under 1 year due to the risk of botulism.*
- **Warm fluids**: For toddlers, warm clear fluids like chicken broth or diluted apple juice can provide relief.
- **Avoid irritants**: Keep the child away from smoke, strong odors, or other environmental irritants.

4. Comfort Measures

- **Rest**: Ensure the child gets plenty of rest to support their immune system.
- **Fever management**: For mild fever, dress the child in lightweight clothing and use a lukewarm sponge bath if needed. Acetaminophen or ibuprofen (for infants over 6 months) can be used if the child is uncomfortable or has a fever over 100.4°F (38°C). Always consult a healthcare provider for dosing.
- **Skin care**: Apply a gentle moisturizer or barrier cream around the nose to prevent irritation from frequent wiping.

5. **Monitor for Complications**

- Watch for signs of worsening symptoms, such as difficulty breathing, persistent high fever, ear pain, or dehydration (e.g., fewer wet diapers, dry mouth, or lethargy).
- Seek medical attention if symptoms persist for more than 10 days or if the child shows signs of a secondary bacterial infection (e.g., ear infection, pneumonia).

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6. **Prevent Spread of Infection**

- Practice good hand hygiene and teach toddlers to cover their mouth and nose when coughing or sneezing.
- Avoid close contact with others, especially in daycare or school settings, until the child is no longer contagious.

WHEN TO CONSIDER REFERRAL FOR SUB-SPECIALIST

- Family physicians should consider referring a child to a pediatric pulmonologist for further evaluation in the following situations:
- Chronic wet cough unresponsive to antimicrobial therapy.
- Specific cough indicating an underlying disease (e.g.,cystic fibrosis or primary ciliary dyskinesia).
- Uncertain diagnosis of chronic non-specific cough.

- Partially resolved, prolonged (>3 months)
- Recurrent protracted bronchitis (>2 times/year).
- Suspicion of foreign body inhalation.
- Suspicion of congenital/developmental defect.
- Chronic cough associated with persistent hypoxemia.

THANK YOU