

CLINICAL PRACTICE GUIDELINES: APPROACH TO COUGH IN CHILDREN



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CASE SCENARIO

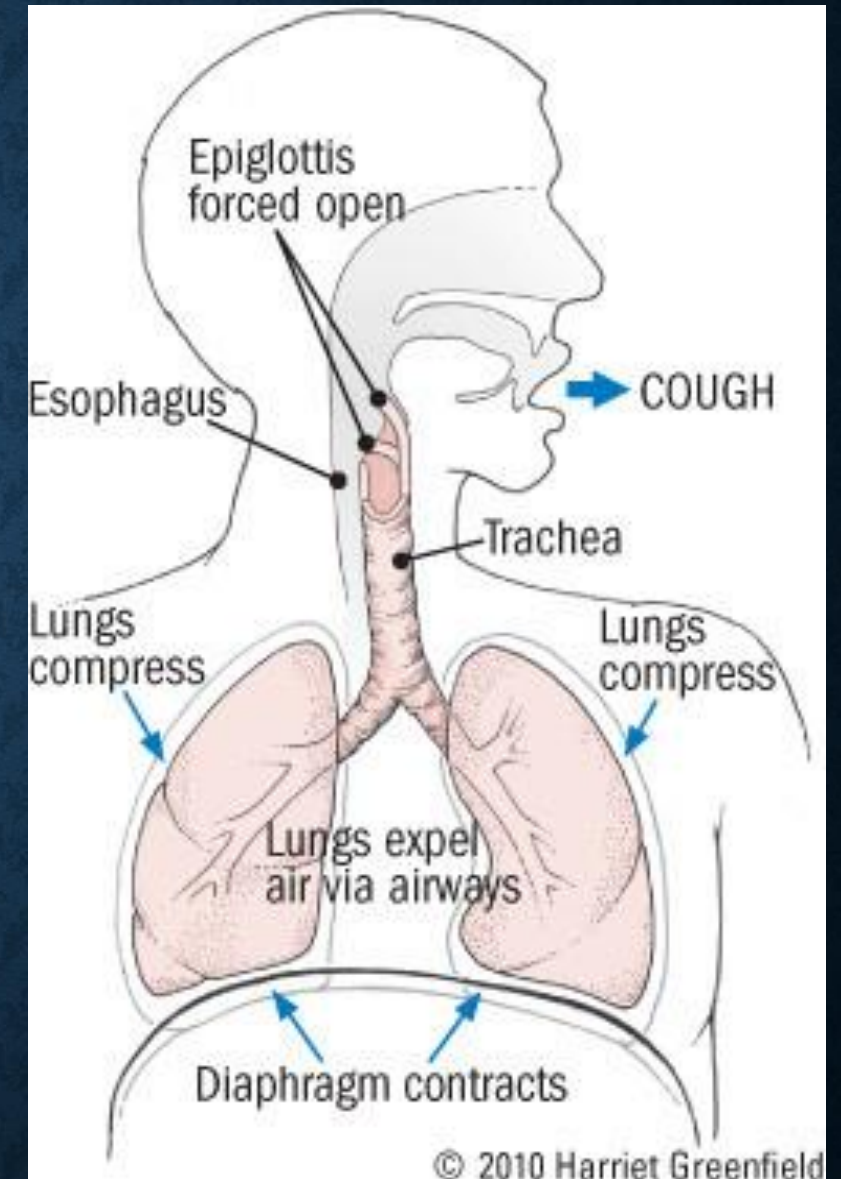
- Mother who presents to her Family physician explains that her 6-year-old son had fever, runny nose, and cough about 2 weeks ago but got better after a few days.
- Ex=temp=39 C RR=32/mint
- Chest ex=decrease air entry-diffuse rhonchi
- Q= what is next steps ??

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 primary care settings in many countries
- Persistent cough is one of the most common reasons for a child to be referred to a Family physician or pediatrician
- Normal children cough 11 times per day when they are well, and this increases in frequency and severity during winter, when upper respiratory tract infections (URTI) are frequent

- 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 course
- Alleviating and triggering factors
- Quality of cough, for example barking, wheezing or honking



- Exposure to smoking
- Diurnal variability
- Associated cold symptoms
- Relation with meals
- Wet or dry, sputum and haemoptysis

- Wheeze
- Dyspnoea
- Fever
- Failure to gain weight
- Upper airway symptoms (rhinitis, ear infections, glue ear)
- History of choking
- Contact with TB or HIV

- Possible allergies
- Immunisation 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

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

Young children (<5 years)

Infections

Gastroesophageal reflux

Congenital malformation

Asthma

Protracted bacterial bronchitis

Passive smoking & environmental
pollution

Foreign body inhalation

Older children (>5
years)

Asthma

Infection

Post-nasal drip

Protracted bacterial
bronchitis

Passive smoking

Bronchiectasis

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

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

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 (WHOOPIING) 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 their skin turning blue (cyanosis).²

- 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 actually hear the fluid moving in the airways as the child coughs.
- Doctors typically only recommend taking steps to suppress the cough if a child cannot get adequate rest.
- However, 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 that invades the lungs and causes them to fill with fluid, a cold lasts for more than a week

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

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 in, called stridor.

- These sounds can be scary for kids and parents, but they don't always warrant a trip to the emergency room. 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 (exhaling).
- If your child is coughing and wheezing without any history of asthma, contact your pediatrician or seek medical attention right away. 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, or you're just not sure your gut is right, review this list.

- A fever of 38 C or higher in an infant 2 months old or younger
- A fever of 102 degrees F or higher in a child of any age
- Blue lips
- Excessive crankiness or 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

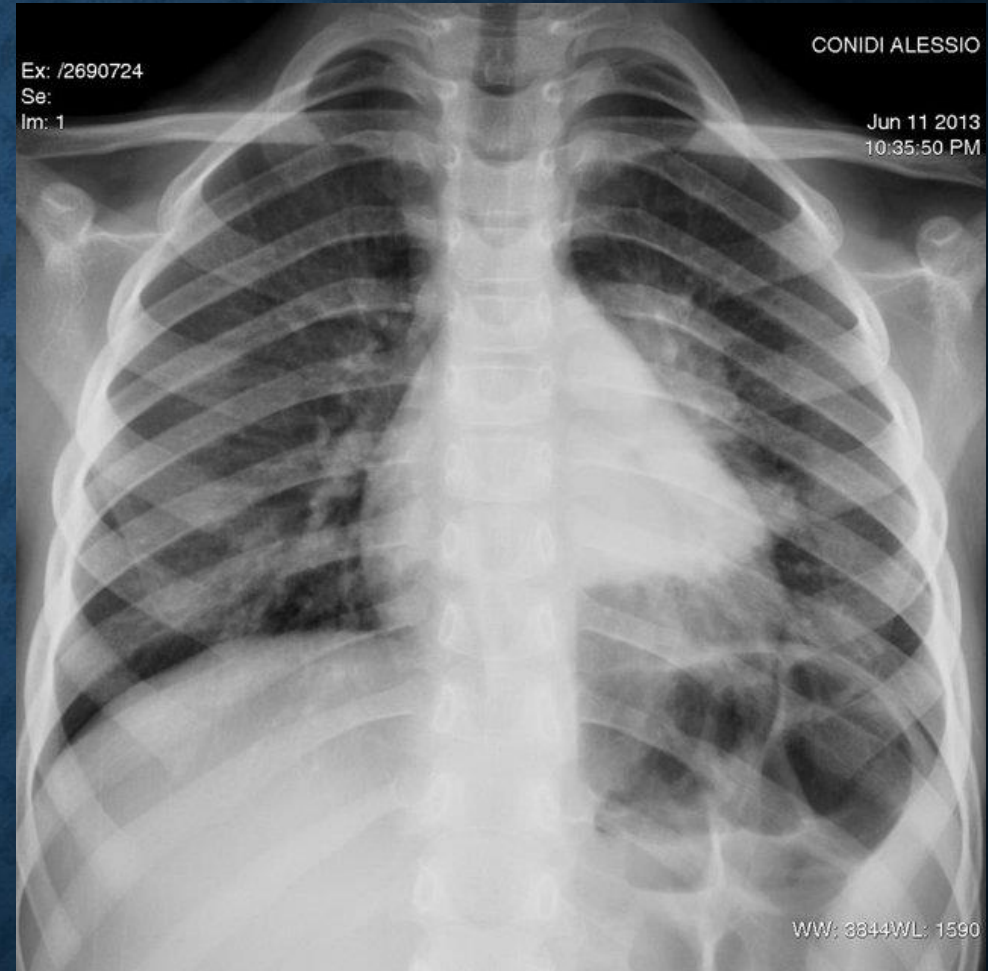
- **Children under age 2 should not be given over-the-counter cold medicines that contain a decongestant or antihistamine. They can cause a rapid heart rate and/or convulsions.⁵**
- **For older children, check with their Family physician . And remember that children should never be given medicines that 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 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 .

- 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
-

Table 3 Example of cough classification based on the quality of cough sounds.

Cough characteristic	Possible etiology
Dry, staccato	Chlamydophila
Wet	Protracted bacterial bronchitis, cystic fibrosis, bronchiectasis, pneumonia, primary ciliary dyskinesia
Barking/brassy	Croup, tracheomalacia
Barking/honking	Habit/psychogenic
Paroxysmal/ spasmodic/ whoop	Pertussis or pertussis-like syndrome

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).
- Over-the-counter 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 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 indicated to increase the awareness of the natural course and supportive measures for acute cough caused by URTI in young children

MANAGEMENT OF CHRONIC COUGH

- Efforts should be directed to identify the exact underlying cause of chronic cough in children so that a specific management plan can be initiated.
- The application of a standardized algorithm in the management of children with chronic cough improves clinical outcomes (earlier cough resolution and improved parental quality of life)

- 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 clearly 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 .
- Other possible diagnoses (e.g., asthma) should be excluded. For these children, 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) 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
Guafenesin	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.

Table 2

Supportive Measures for Infants' and Toddlers' Cold Symptoms

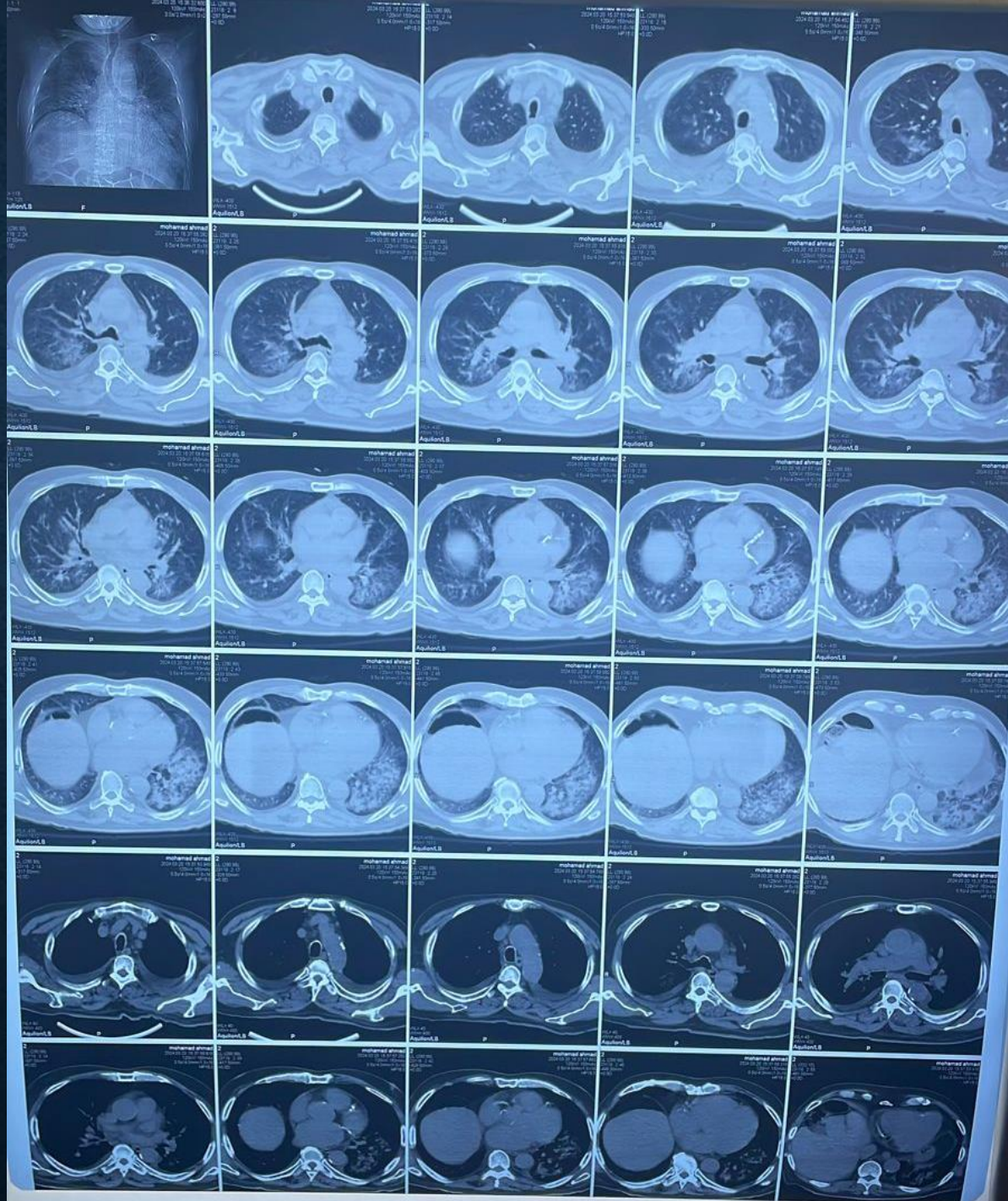
1. Use a room humidifier or vaporizer to help moisten the child's oral and nasal passages.
2. Use saline drops in the nose to moisten nares.
3. Use a bulb syringe following application of saline drops to remove mucus.
4. Keep the child well-hydrated to thin mucus and avoid dehydration.

Source: References 14, 16.

. WHEN TO CONSIDER REFERRAL FOR SUB-SPECIALIST

- Family physician 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) or recurrent
- protracted bronchitis (>2 times/year).
- Suspicion of foreign body inhalation.
- Suspicion of congenital/developmental defect.
- Chronic cough associated with persistent hypoxemia.





COVID-19

THANK YOU