

## Cough

### Essential History

#### Ask about:

- The pattern and progression of cough
  - Duration
  - Frequency of discrete cough episodes
  - Wet or dry cough
  - Intervals between cough:
    - Cough every day
    - Days or weeks between cough episodes
  - Character
    - Paroxysmal
      - Consider pertussis (whooping cough)
    - Barking
      - Consider laryngotracheal infection (croup)
  - Timing - coughing at night or during sleep?
    - Consider asthma
  - Any preceding infection?
    - Post bronchiolitic cough can last few weeks
  - Triggers
    - Exercise (consider exercise induced asthma)
  - Symptoms on waking (eg, phlegm production / fruity cough)
  - Recent travel
  - Immunisation history
    - BCG (Bacillus Calmette-Guérin) vaccination
    - DTP (diphtheria, tetanus, pertussis) vaccination
- The age at onset
  - In children < 3 months
    - Congenital or anatomical origin
    - Requires a more aggressive approach toward evaluation
  - Sudden-onset cough in toddlers with or without history of choking
    - Foreign body aspiration especially if no suggestion of upper respiratory tract infection
    - Requires active approach toward testing (eg, bronchoscopy)
  - Cough beginning at > 6 months of age
    - May suggest airway hyperreactivity

- Cough beginning relatively suddenly in adolescents (especially during psychosocial stress)
  - Possible psychogenic origin (eg, diagnosis of exclusion)
- Family history of:
  - Allergies
  - Atopy
  - Asthma
  - Immune deficiency
  - TB (history of contact with TB)
- Environmental history
  - Smoking (where appropriate) / smokers in the household
  - Exposure to mould in house / bedroom
  - Air pollution
  - Dust mites
  - Pets
  - Exposure to other children
    - At school
    - Attending nursery / child care
    - Siblings

## ‘Red Flag’ Symptoms and Signs

### Ask about:

- Neonatal onset
  - Suggests congenital anomalies
- Faltering growth
- Associated retching, choking
- Fever
- Cough during feeding
  - Suck or swallow dysfunction increases the risk of aspiration
    - Tracheoesophageal fistula with aspiration
- Cough after feeding
  - Spitting up, retching, or arching of the back
  - Gastro-oesophageal reflux

### Look for:

- Respiratory distress (see Dyspnoea)
  - Tracheal tug, sub-costal, intercostal recessions
- Cyanosis
- Stridor or wheeze

- Paroxysmal nature
  - Consider pertussis (whooping cough)
- Fever
- Clues to a more severe underlying process
  - Faltering growth
  - Developmental delay
  - Clubbing
  - Heart murmur
  - Hepatomegaly / splenomegaly
  - Lymphadenopathy

## Differential Diagnosis / Conditions

- Acute versus chronic (> 3 weeks' duration) cough
  - Chronic cough requires a more extensive evaluation plan
- Upper, lower, or mixed airway origin
  - Upper airway cough
    - Croupy
    - Throaty
    - Honking
  - Lower airway cough (wet cough)
    - Productive with expectoration of sputum
      - Bacterial pneumonia
    - Frequent signs of severe chronic sinusitis (disease of the upper airway) in children
      - Cough / expectoration or swallowing of thick sputum that may be blood tinged
- Cough character can be a useful starting point
  - Paroxysmal
    - Pertussis (whooping cough)
  - Staccato
    - *Chlamydia* infection
  - Barking
    - Laryngotracheal infection (croup)
  - Throat clearing
    - Postnasal secretions
    - Gastro-oesophageal reflux
  - Honking
    - Psychogenic cough
      - Occurs during daytime
      - Increased frequency when more attention is paid to it

- Does not restrict physical activity
  - Does not change with physical activity
  - Absent in sleep
- Cough during feeding
  - Suggests swallowing dysfunction, common in children with severe gross motor dysfunction
  - Tracheoesophageal fistula with aspiration
- Cough after feeding
  - Spitting up, retching, or arching of the back
  - Gastro-oesophageal reflux
- Associated fever
  - Upper or lower respiratory tract infection
- Cough worsening with exercise
  - Suggests reactive airway disease
  - Asthma
- Night cough
  - Postnasal drip
  - Allergy
  - Sinusitis
  - Asthma
- Previous episodes, especially with seasonal variation
  - Allergy
- Chronic cough with poor weight gain (especially if wet cough)
  - Systemic illness (eg, neuromuscular or neurodevelopmental disorder)
  - Cystic fibrosis
  - Immune deficiency
  - Heart disease

## Investigations

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team), only if the likely cause of the cough is uncertain:

- Ear, nose and throat examination
- Pulse oximetry and peak expiratory flow rate (PEFR)
- Full blood count with differential, if available
- Chest radiography

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Respiratory / Immunology Team(s)), depending on the associated symptoms and signs:

- Spirometry (in children aged 5 years and older)

- Full blood count (if not already done)
- Allergy skin prick tests
- Total IgE and radioallergosorbent test (RAST) to inhaled allergens
- Sweat test
- Immunodeficiency screen
- Tuberculin skin test
- $\alpha_1$ -antitrypsin level and phenotype (for  $\alpha_1$ -antitrypsin deficiency-related lung disease)
- Barium swallow
- Videofluoroscopy
- pH probe monitoring

The following investigations are usually considered after discussion with a paediatric respiratory specialist / immunologist:

- Flexible fiberoptic bronchoscopy with bronchoalveolar lavage
- Computerised tomography of the chest and / or sinuses
- Nasal cilia brushing
- Autoimmune blood tests including:
  - ANCA (anti-neutrophil cytoplasmic antibody)
  - dsDNA (anti-nuclear antibodies versus double-stranded DNA; diagnostic for systemic lupus erythematosus)
  - Rheumatoid factor
  - Complement

## Treatment Approach

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team), or by specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Respiratory / Immunology Team(s)):

- Discuss with the patient and family that:
  - Cough is a symptom of an underlying condition
    - Treatment of the underlying disorder (if necessary) is the primary focus
    - Cough can be an important natural response to the primary illness
    - Suppressing the cough, without effectively treating the primary disorder, may worsen the problem
- Antibiotics
  - Consider trial of therapy in presence of a long standing (> 3 weeks) moist / wet cough (if not sure please discuss with secondary / tertiary care paediatrician as necessary)

- Bronchodilators
  - Time-limited (2-3 weeks) therapeutic trial of treatment with a  $\beta$ 2-agonist (salbutamol) alone or combined with an inhaled corticosteroid may be a reasonable first step in suspected airway hyperreactivity
  - Monitor PEFV before and after treatment to assess the peak flow variability and response
  - Review the diagnosis and the need for ongoing inhaled corticosteroids
- Antihistamines
  - Can be helpful in the treatment of cough triggered by allergy

## When to Refer

Refer to specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Respiratory / Immunology Team(s)) if:

- Cough persists despite adequate therapeutic trial (bronchodilators, antibiotics)
- Cough recurs more than every 6–8 weeks
- Cough is associated with faltering growth
- Cough is associated with other systemic illness

## ‘Safety Netting’ Advice

Advise parents / carers to seek medical advice if the child:

- Develops respiratory distress (eg, tracheal tug, sub-costal, intercostal recessions)
- Develops feeding difficulties or vomiting
- Is not responding to oral antibiotics in suspected lower respiratory tract infections
- Develops paroxysmal cough (infants)

## Patient / Carer Information

***\*Please note: whilst these resources have been developed to a high standard they may not be specific to children.***

- [Coughs, colds, and ear infections in children](#) (Web page), the NHS website
- [Cough](#) (Web page), the NHS website
- [Croup - symptoms](#) (Web page), the NHS website

## Resources

### National Clinical Guidance

[Preventing the uptake of smoking by children and young people](#) (Web page), NICE public health guideline PH14, National Institute for Health and Care Excellence

## Medical Decision Support

Lightdale JR, Gremse DA; and American Academy of Pediatrics, Section on Gastroenterology, Hepatology, and Nutrition. [Gastroesophageal reflux: management guidance for the pediatrician](#). Pediatrics 2013;131(5):e1684–e1689 [PubMed]

Smith MJ. [Evidence for the diagnosis and treatment of acute uncomplicated sinusitis in children: a systematic review](#). Pediatrics 2013;132(1):e284–e296 [PubMed]

Wald ER, Applegate KE, Bordley C. [Clinical practice guideline for the diagnosis and management of acute bacterial sinusitis in children aged 1 to 18 years](#). Pediatrics 2013;132(1):e262–e280 [PubMed]

## Suggested Resources

***\*Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.***

[Salbutamol inhaler for asthma and wheeze](#) (Web page), Medicines for Children

[Simple linctus for cough](#) (Web page), Medicines for Children

[Difficulty in Breathing](#) (Web page – require log-in), Spotting the Sick Child

[Cough – acute with chest signs in children](#) (Web page), NICE clinical knowledge summary, National Institute for Health and Care Excellence

Shields MD, Bush A, Everard ML, et al; and on behalf of the British Thoracic Society Cough Guideline Group. Recommendations for the Assessment and management of cough in children Thorax 2008; 63:1-15; originally published online 28 Sep 2007

Chang AB, Gaffney JT, Eastburn MM. Cough quality in children: a comparison of subjective vs. bronchoscopic findings. Respir Res 2005;6:3 [PubMed]

Chang AB, Lasserson TJ, Kiljander TO. Systemic review and meta-analysis of randomized controlled trials of gastro-oesophageal reflux interventions for chronic cough associated with gastro-oesophageal reflux. BMJ 2006;332:11–17 [PubMed]

Saito J, Harris WT, Gelfond J. Physiologic, bronchoscopic, and bronchoalveolar lavage fluid findings in young children with recurrent wheeze and cough. Pediatr Pulmonol 2006;41:709–719 [PubMed]

Schroeder K. Over-the-counter medications for acute cough in children and adults in ambulatory settings. Cochrane Database SystRev 2004;4:CD001831 [PubMed]

Steel RW. Rhinosinusitis in children. Curr Allergy Asthma Rep 2006;6:508–512 [PubMed]

Wright AL, Holberg CJ, Morgan WJ. Recurrent cough in childhood and its relation to asthma. Am J Respir Crit Care Med 1996;153:1259–1265 [[PubMed](#)]

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