Disease Focus

RESPIRATORY INFECTIONS: HOW TO MINIMISE THE IMPACT

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Accurate diagnosis of respiratory tract infection can be difficult in primary care, particularly in older patients. Time constraints meaning that most consultations allow less than six minutes to deal with patients' clinical problems – with much of the time devoted to achieving political and financially driven targets – can make it even more difficult. In this article, we provide practical tips on how to recognise and treat common respiratory infections.

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Common respiratory symptoms presented by patients include coughing, wheezing, shortness of breath, difficulty sleeping because of these symptoms, chest discomfort or pain and exercise intolerance. There are many underlying causes of these symptoms and the challenge in primary care is to make a working diagnosis and manage the patient appropriately, while also addressing other incidental health promotion issues.

Given the broad remit, we will assume that asthma and COPD without infection have been excluded (for detailed description of how to diagnose these conditions, see the International Primary Care Respiratory Group Guideline on diagnosing respiratory disease).[1] I will describe the differentiating features and offer a practical, logical approach to diagnosis and deciding on treatment options.

Andrew Davidhazy

"While many patients with respiratory infections present with an expectation that they will be prescribed antibiotics, these are often not indicated"

While many patients with respiratory infections present with an expectation that they will be prescribed antibiotics, these are often not indicated. Research shows that antibiotics are prescribed fairly frequently for patients with suspected or confirmed respiratory infection, often without any benefit whatsoever.[2, 3]

How do we decide when to use antibiotics? It would be wonderful to be able to state a clear answer to this question – but this is really not possible! In practice, there are seldom clear, definite indications, based either on the patient's history or clinical examination that provide us with accurate information to decide when to prescribe antibiotics. However, there are some guiding principles that are helpful.

CHARACTERISING THE PROBLEM: HAS THE PATIENT GOT A RESPIRATORY INFECTION?

Patients with respiratory infections do not always present with respiratory symptoms. For example, someone with *Mycoplasma pneumoniae* infection or sinusitis may complain of headache, and feeling exhausted and unwell but have no clinical signs on examination whatsoever. Alternatively, a patient may present with symptoms of a cough, with purulent sputum, a high temperature, reduced oxygen saturation and clear clinical signs on auscultation of their chest.

In essence, we need to decide whether our patient has an acute, chronic, or acute on chronic problem, also whether the problem can be managed in the community or whether the person needs referral to a specialist, and if so, is this urgent, or not?

SINUSITIS

Sinusitis is defined as 'inflammation of one or more of the paranasal sinuses' and is characterised as acute (lasting < 4 weeks), subacute (lasting 4-8 weeks) or chronic if lasting over 8 weeks.[4] Patients with acute sinusitis may present initially with symptoms of a viral upper respiratory tract infection – fever and runny nose. This may soon progress to include a purulent nasal or postnasal discharge, headache and facial pain.

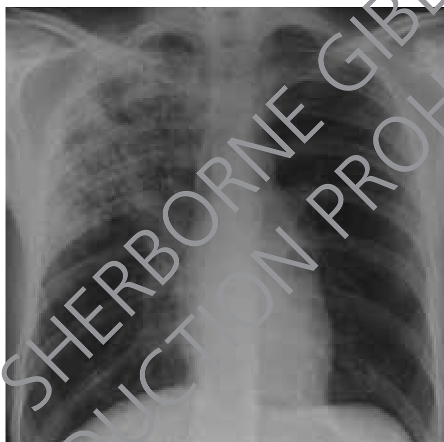
Clinical signs include raised temperature and tenderness when tapping the bones overlying the ethmoidal, frontal and maxillary sinuses. Examination should include a thorough history and examination of the nose with a nasal speculum and, if pus is present, a swab for microscopy, culture and sensitivity testing. The presence of nasal polyps in children should prompt an urgent referral to exclude cystic fibrosis, which predisposes them to recurrent sinusitis.

Key questions for patients with respiratory symptoms

- Does the patient have an acute or chronic problem, or an acute on chronic problem?
- Are investigations required?
  If so, can these be done in the community or is hospital referral required?
  If referral is required – is this urgent or can the patient wait?

Common respiratory infections in primary care

- Sinusitis
- Pharyngitis
- Otitis media
- Lower respiratory tract infections:
  Bronchiolitis
  Acute bronchitis
  Pneumonia



X-ray showing features of pulmonary tuberculosis

Common organisms responsible for acute sinusitis are *Streptococcus pneumoniae* and *Haemophilus influenzae. Moraxella catarrhalis*, Staphylococci and viral infections account for most of the other cases. If clinically indicated, beta-lactam antibiotics such as amoxicillin are effective in many patients, and should be prescribed for 10-14 days. Clarithromycin, azithromycin or doxycycline are alternatives in patients who are allergic to beta-lactam antibiotics. Patients with chronic or recurrent acute sinusitis should be investigated further.[4]

There is no place for sinus X-rays in the primary care setting. They are difficult to interpret and offer little assistance in planning how to manage the patient. If an X-ray is contemplated, the patient should be referred to a specialist for further investigations.

Nasal douching

On a practical level, nasal douching may often be helpful in alleviating symptoms of chronic sinusitis. Patients should make up 0.5 litre of warm water containing a 1/4 teaspoon of salt in solution. This should be sniffed into the nose, a handful at a time, and then blown out gently through the nose. Patients should be instructed to scoop the salt solution in handfuls, to enable them to sniff it into their nose.

They should use the whole 0.5 litre every day for a month, then once weekly if their symptoms improve. The only side-effect is that the mouth may fill with water drained from the sinus when tilting the head later in the day.

PHARYNGITIS AND OTITIS MEDIA

These are often caused by viral infections and therefore antibiotics are not indicated for the majority of patients. However, these infections can sometimes act as a precursor to a bacterial infection. Use of a delayed prescription for an antibiotic (see box) may help reassure patients and reduce the overuse of antibiotics.

LOWER RESPIRATORY TRACT INFECTIONS AND COMMUNITY-ACQUIRED PNEUMONIA IN CHILDREN

Many children present in primary care with respiratory symptoms and the majority do not require antibiotics. The first step is to exclude chronic diseases, particularly asthma, which is so common in childhood. Taking a detailed history in every child presenting with respiratory symptoms may help exclude those with chronic illness.

Delayed prescriptions for antibiotics are often helpful in respiratory infections

Patients should be told that:

- their symptoms are caused by an infection
- it is likely this is due to a virus
- virus infections do NOT respond to antibiotics

and that:

- a prescription has been issued – not to be taken to the pharmacist yet
- the purpose is so the patient can start the medication as soon as it is needed
- they should only use the medication if their symptoms get worse or if they are not improving

and also:

- to contact the doctor again if they are concerned or getting worse (this must be written in the record).

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Failure to thrive should start the alarm bells ringing. As mentioned previously, any child with nasal polyps (often visible with an otoscope speculum inserted carefully, to avoid the septum, in the nostrils) should be referred to exclude cystic fibrosis. Children who attend recurrently with respiratory symptoms (more than four times a year) should be investigated for asthma.

Children with respiratory symptoms and fever may be suffering from upper or lower respiratory tract infection and need to be examined appropriately. In particular, their chest should be auscultated with a stethoscope.

Signs of chest infections include: raised temperature, increased respiratory rate, use of accessory muscles of respiration (alae nasi, intercostal muscles, sternocleidomastoids and scalini), crackles in the chest, increased vocal fremitus and resonance and bronchial breathing. The presence of some or all of these may indicate a need for hospital referral, particularly in the case of young children with signs of severe bronchiolitis or pneumonia (see box).

Most of these infections are viral, and commonsense advice should suffice – plenty of fluids, steam inhalation, over-the-counter analgesics and antipyretic medication. If the child is not improving, the parents should be advised to bring them back for more advice. I advise use of paracetamol in most cases, and not non-steroidal anti-inflammatory drugs (NSAIDs) unless advised specifically by a doctor, because these can cause indigestion and vomiting and are potentially dangerous in patients with allergies and asthma.

The British guidelines for children with community-acquired pneumonia

These provide helpful advice for health professionals when deciding whether to admit a child to hospital:

Indicators for admission to hospital in infants:

- oxygen saturation ≤92%, cyanosis
- respiratory rate >70 breaths/minute
- difficulty in breathing
- intermittent apnoea, grunting
- not feeding
- family not able to provide appropriate observation or supervision.

Indicators for admission to hospital in older children:

- oxygen saturation ≤92%, cyanosis
- respiratory rate >50 breaths/minute
- difficulty in breathing
- grunting
- signs of dehydration
- family not able to provide appropriate observation or supervision.

Children diagnosed with lower respiratory tract infection treated in the community will usually resolve over a period of a few weeks. However, we need to maintain a high index of awareness that they may deteriorate. Parents should be advised to contact the surgery if their child is not improving.

With the difficulty in getting appointments in busy practices, follow-up appointments could be arranged at the initial consultation (perhaps for 48 hours), which the parent should be instructed to cancel if the child is improving. Parents should be advised what to look out for, including: persisting fever, lethargy or exhaustion, breathing difficulty and signs of dehydration (this is unlikely if the child is drinking and passing urine).

Antibiotic management in children with community-acquired pneumonia (CAP)

- Young children presenting with mild symptoms of lower respiratory tract infection need not generally be treated with antibiotics.
- Amoxicillin is first choice for oral antibiotic therapy in children under the age of five years because it is effective against the majority of pathogens which cause CAP in this age group, is well tolerated, and cheap. Alternatives are co-amoxiclav, cefaclor, erythromycin, clarithromycin and azithromycin.
- *Mycoplasma pneumoniae* is more prevalent in older children, so macrolide antibiotics may be used as first-line empirical treatment in children aged five and above.
- Local conditions and advice from microbiologists may be helpful in guiding decisions on antibiotic treatment in the community setting.

From the BTS Guidelines

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COMMUNITY-ACQUIRED PNEUMONIA (CAP) IN ADULTS

The British Thoracic Society guidelines define community-acquired pneumonia in adults as:

- symptoms of an acute lower respiratory tract illness (cough and at least one other lower respiratory tract symptom)
- new focal chest signs on examination
- at least one systemic feature (either a symptom complex of sweating, fevers, shivers, aches and pains and/or temperature of 38°C or higher)
- no other explanation for the illness, which is treated as CAP with antibiotics.

Pneumonia, particularly in elderly patients and those with co-morbid conditions reducing their immune status (such as diabetes mellitus), is a potentially fatal condition. Patients presenting with recent-onset high fever, pleuritic pain (aggravated by respiration), dyspnoea, and tachypnoea, should have a thorough chest examination, including pulse, blood pressure, respiratory rate and pulse oximetry.

All areas of the chest should be percussed, and auscultated. The presence of dullness to percussion, increased vocal fremitus, localised crackles and bronchial breathing all indicate focal pneumonia and their presence should prompt an urgent referral to hospital in view of the morbidity and mortality associated with this condition.

Unfortunately, in many cases, clear signs are not evident on examination and we need to make a clinical judgment in deciding whether to simply order an outpatient chest X-ray examination or refer the patient to hospital. A chest X-ray is the gold standard for diagnosing patients presenting with pneumonia in primary care.

TREATING CAP IN ADULTS

Adults with a suspected diagnosis of community-acquired pneumonia should be considered for possible admission to hospital, depending on co-morbid conditions, severity of symptoms and support at home. In patients not admitted, treatment must include an antibiotic (usually high-dose amoxicillin 500 mg three times daily, or a macrolide for those with penicillin allergy): fluids, antipyretic medication and very careful daily follow-up, by phone, in the surgery, or in the patient's home.

Patients who do not improve on this therapy should again be considered for hospital admission and, if not, the addition of a macrolide antibiotic (such as erythromycin or clarithromycin) might help. The local microbiologist may be able to advise on current community infections and appropriate antibiotic therapy.

Post-treatment follow-up is very important in adult patients with CAP. Patients with lung cancer sometimes present for the first time with pneumonia - a repeat chest X-ray after six weeks may help to rule this out. Patients from Africa and South Asia (particularly those who are not overweight) may have pulmonary tuberculosis and a Mantoux test may be helpful in ruling this out.

COPD EXACERBATIONS

According to the NICE Guideline, an exacerbation of COPD is defined as 'a sustained worsening of the patient's symptoms from their usual stable state which is beyond normal day-to-day variations, and is acute in onset'.

The mortality rate following COPD exacerbations is high, so patients should be provided with self-management plans which include a course of oral steroids and appropriate antibiotics for the severity of their COPD (see box). Patients should be instructed to initiate their therapy at the onset of an exacerbation, especially if their sputum is purulent.

Antibiotics for COPD exacerbations

Antibiotics are indicated for exacerbations of COPD in:

- Patients with exacerbations of COPD with the following three cardinal symptoms: increased dyspnoea, increased sputum volume, and increased sputum purulence.
- Patients with exacerbations of COPD with two of the cardinal symptoms, if increased purulence of sputum is one of the two symptoms.

Choice of antibiotic is influenced by the presence of adverse risk factors such as: presence of co-morbid diseases, severe COPD, frequent exacerbations (more than 3 /yr), and antimicrobial use within the last 3 months.

Choice of appropriate antibiotics for patients with COPD exacerbations depends on the severity of the exacerbation, the patient's underlying COPD severity and presence of co-morbidities, and allergic status for beta-lactam antibiotics.

For mild uncomplicated exacerbations, amoxicillin and tetracyclines are appropriate. For patients with COPD and risk factors for poor outcome (see box) or co-morbidities, co-amoxiclav is an appropriate alternative. Patients not responding to these treatments should be considered for hospital admission or hospital at home according to local protocols.

Indications for hospital assessment or admission for COPD exacerbations

- Marked increase in intensity of symptoms, such as sudden development of resting dyspnoea
- Severe underlying COPD
- Onset of new physical signs (*eg* cyanosis, peripheral oedema)
- Failure of exacerbation to respond to initial medical management
- Significant co-morbidities
- Frequent exacerbations
- Newly occurring arrhythmias
- Diagnostic uncertainty
- Older age
- Insufficient home support.

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In this paper, I have tried to share my own approach to some of the common respiratory infections encountered in primary care. This is not intended, and cannot be, a definitive guide to the management of these conditions and the range of guidelines quoted provides further information and guidance.

more information

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