

# Viral infections and persistent cough

## *Evidence for treatment options*



CPD 

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### Background

Upper respiratory tract infections (URTIs) are one of the most common presentations to Australian general practitioners. Patients often present hoping to be cured, but most URTIs are caused by viral infections, so the task of management is predominantly symptomatic. Patients may be impatient to recover from cough because of concerns from others regarding infectivity from potential SARS-CoV-2 infection. Unfortunately, the effectiveness of interventions is poorly understood and lacking a robust evidence base. As a result, URTIs are a common presentation leading to unnecessary use of antibiotics or ineffectual treatments.

### Objective

The aim of this article is to improve the management of acute cough, a common reason for consulting a general practitioner. Understanding the pathophysiology and time course of this symptom informs selection of evidence-based treatment options and supports better antibiotic stewardship.

### Discussion

URTI presentations provide fertile ground for educating patients about infections, self-management options, dealing with uncertainty and responsible use of medicines.

**ADULTS HAVE**, on average, 2–4 upper respiratory tract infections (URTIs) per year; young children having twice that number.<sup>1</sup> Typically, symptoms peak around day 3 or 4 and mostly resolve by day 7.<sup>1</sup> Sometimes cough persists well beyond the period of symptoms and infectivity. URTIs make up almost 6% of presentations to Australian general practices.<sup>2</sup> General practitioners (GPs) may be seeing an increase in presentations for post-viral cough during the COVID-19 pandemic because of concerns regarding potential infectivity of a person coughing in a public space.

Most people self-manage URTIs with over-the-counter remedies. For many of these treatments there is a deficiency of evidence, so clear guidance for patients and doctors is lacking. Antibiotic therapy is still often prescribed despite knowledge that antibiotics fail to treat viral infections.<sup>3</sup> Although the prescription of antibiotics has been slowly declining, rates are still significantly higher in Australia than in countries such as the Netherlands and Sweden.<sup>4,5</sup> It has been estimated that antibiotics in Australia are prescribed for acute respiratory tract infections (ARTIs) at rates four times greater than what is recommended by *Therapeutic guidelines*.<sup>6</sup>

This prompts the question of how Australian GPs can improve on the current management of URTIs and better

alleviate distress by avoiding unhelpful, harmful or wasteful interventions. There is evidence to support some symptomatic treatments that work and reject others as more harmful than helpful. Patients will benefit from a better understanding of the pathophysiology of ARTIs, more realistic expectations regarding prognosis and education about the benefits and limits of symptomatic treatments.

### Patients with early viral symptoms requesting antibiotics

Patients may request or even demand an antibiotic for more bothersome URTIs because of misconceptions about the disease process and a lack of awareness of the benefits and harms of antibiotics. GPs can then feel pressured to prescribe them, with the belief that patients will not be satisfied with leaving the consultation room empty-handed. A survey of GPs' reasons for prescribing antibiotics indicated that patient expectations are just one reason, alongside time pressure and patient socioeconomic factors. Additionally, some GPs had not internalised their role in antibiotic stewardship.<sup>7</sup>

A number of studies have clarified that while patients hold misconceptions about the benefits of antibiotics for colds, flu and acute bronchitis, what they really want is treatment to hasten

recovery or relieve symptoms.<sup>5,8</sup> This is consistent with a common statement from patients wanting to ‘nip the infection in the bud’. Responding appropriately to the patients’ expectations, which includes a discussion of the dangers and limitations of antibiotics and better alternative treatments, provides greater patient satisfaction.<sup>9</sup> This information should include prognosis and ‘safety netting’. Negotiating a plan to review and possibly prescribe in the unlikely event the illness deviates from the expected course could reduce the motivation to prescribe when diagnostic uncertainty is present.<sup>5</sup> A review of the evidence shows that patient-oriented interventions, such as physician-delivered explanations, written handouts and especially delayed prescriptions, may be effective in reducing unnecessary antibiotics for URTIs.<sup>10</sup>

### The evidence for symptomatic treatments of URTIs

Patients will be disappointed if they feel their illness concerns are dismissed as ‘just a virus’. The COVID-19 pandemic has increased awareness that viruses can produce more than mild infections. Providing patients with a management plan that includes information about alternative, effective symptomatic treatments has been shown to increase patient satisfaction.<sup>9</sup>

Combination sore throat lozenges or sprays containing either anti-inflammatory or local anaesthetic agents have both shown significant reduction in pain over placebo treatments.<sup>11,12</sup> There are no ‘head-to-head’ trials to demonstrate the superiority of either medication class nor clear evidence of the best delivery mechanism. It is possible that sprays have better distribution over the sides and back of the throat, although lozenges are retained and deliver medication in the mouth for longer. It is also important to provide realistic expectation that pain relief may only be partial.<sup>11</sup>

Honey has been shown to help relieve cough and sore throat in children, although most of the children in the studies included in the Cochrane review only received the intervention for one night. The effects on these symptoms in adults have not been

adequately explored, but there is good reason to think honey is likely helpful for all age groups.<sup>13</sup> Nasal saline irrigation possibly has benefits for relieving the symptoms of acute URTIs. However, the included trials were generally too small and had a high risk of bias, reducing confidence in the evidence supporting this.<sup>14</sup>

A review of intranasal oxymetazoline showed a small but statistically significant improvement in nasal congestion.<sup>15</sup> This is in contrast to a review of oral decongestants in combination with antihistamines and analgesic (cold and flu tablets), which found the effect on individual symptoms is probably too small to be clinically relevant.<sup>16</sup> It may be that topical application delivers a larger effective dose of medication to where it is needed, compared with systemic distribution throughout the body. Theoretically, combining nasal saline spray with topical nasal decongestants can assist in clearing excessive nasal mucus via improving mucociliary clearance.<sup>14</sup>

It is important to be aware of other interventions that have been shown to be ineffective or where the risks outweigh the potential minimal benefits. Antitussive and expectorant cough mixtures continue to be sold but have long failed to demonstrate any benefit beyond placebo.<sup>17,18</sup> It may be that the most beneficial component of cough mixtures is the syrup delivery vehicle, soothing the inflamed pharynx akin to the probable mechanism of honey.

There is no reliable evidence that vitamin C, echinacea, steam inhalation, rest, analgesics or anti-inflammatory drugs reduce the duration of URTIs.<sup>19–21</sup> There was some evidence that zinc lozenges may reduce cough duration when administered within 24 hours of symptom onset, but the size of benefit may not be clinically significant.<sup>18</sup> There is no randomised controlled trial evidence to recommend an increase in fluid intake for ARTIs.<sup>22</sup> Intranasal corticosteroids are no more effective than placebo for reducing URTI symptom duration or severity.<sup>23</sup>

### Patients with discoloured sputum or nasal discharge

The progression of URTIs to discoloured mucus in rhinorrhoea or cough is a

common trigger for requesting antibiotics from a GP. Yellow or green coloured mucus is traditionally interpreted as a sign of bacterial infection.<sup>24</sup>

There has been a recent call to end the false dichotomy between bacterial and viral ARTIs, as they often coexist.<sup>25</sup> The viral infection may create conditions favourable for overgrowth of commensal bacteria, which will return to normal levels on resolution of the viral infection. There is good evidence for the poor correlation between yellow or green sputum and pathological bacterial infections.<sup>26</sup> Another study found that patients producing discoloured sputum were more often prescribed antibiotics, but this was not associated with faster resolution of symptoms.<sup>27</sup>

The routine use of antibiotics for acute purulent rhinitis is not recommended because of evidence of no benefit combined with significant adverse effects and risk of antibiotic resistance.<sup>28</sup> A postnasal drip (PND) cough (also termed upper airway cough syndrome) secondary to acute rhinosinusitis and the initial viral pharyngitis is the most common explanation for a post-viral cough in the weeks following a URTI. This cough can be dry or moist, worse in the evening and on arising from sleep and associated with difficulty in clearing sticky mucus or throat discomfort.<sup>29</sup>

Effective treatments for this condition have not been firmly established, but nasal saline sprays and washes are probably effective to re-establish normal mucociliary drainage and movement of adherent phlegm.<sup>24,29,30</sup> Cough receptors in the airways are also found in the pharynx, so conceptually there may be added reduction in cough as a result of reduction in the inflammation and sensitivity in the throat. There may be a role for local anaesthetic or anti-inflammatory throat sprays for PND cough, but this potential benefit is yet to be established. However, the benefit of honey for a sore throat may explain its role in reducing cough.<sup>3</sup>

Acute bronchitis is very likely over-diagnosed in healthy young adults who present with a moist cough, but normal lung sounds on auscultation rule out a lower respiratory tract infection.

Mucus in the pharynx that produces a moist cough is frequently but erroneously described as a 'chesty cough',<sup>29</sup> leading to a major rationale for prescription of antibiotics. Even when acute bronchitis is correctly diagnosed, there is limited evidence to support antibiotic treatment,<sup>31</sup> as it is often a self-limiting condition.

### Patients with persistent non-productive cough for many weeks

Patients reattending with prolonged persistent cough should be assessed with a thorough history looking for any 'red flags', examination and consideration of investigation with a chest X-ray and spirometry. In the presence of abnormal lung sounds, a wet cough (as opposed to a moist cough) that is productive of a few teaspoons (equivalent) of phlegm suggests pathology in the lower airways, which will need specific treatment.

In one series of 131 patients with URTI and cough recruited in general practice, 78% coughed for at least one week, 35% for three weeks and one for 10 weeks.<sup>32</sup> In a systematic review of the placebo arms of controlled trials in children treated for URTIs, it took 25 days before 90% had recovered from acute cough.<sup>33</sup> An important aspect of patient education regarding URTIs and managing expectations is to warn of the potential for cough to persist for prolonged periods.

It is important to consider other reasons for the persistence of cough, the most common being a comorbid condition triggered by the URTI. Asthma is a well-known example of this phenomenon. Allergic rhinitis is another common cause of PND cough and a diagnosis that is often overlooked. The mucosal damage in the upper airways resulting from a viral infection may increase the susceptibility for airborne allergens to trigger allergic rhinitis. Any suggestion of allergic symptoms should lead to a recommendation for antihistamines, nasal saline spray or intranasal steroids.<sup>29</sup> If a cough persists for more than six weeks with no clear underlying pathology, referral to specialist cough clinics should be considered.<sup>34</sup> In children younger than 14 years of age with a wet cough lasting >4 weeks without specific

cough pointers, the diagnosis of protracted bacterial bronchitis is likely, and antibiotics are indicated.<sup>35</sup>

### Conclusion

Clear explanation of benefits and indications for treatment will increase patient self-management of URTIs and reduce usage of unnecessary interventions, especially antibiotics. Patient education should include prognosis of viral URTI and its symptoms, as well as a risk/benefit discussion regarding selected symptomatic treatments that have proven effectiveness, often superior to a course of antibiotics.

### Key points

- URTIs are a leading reason for presentation to GPs and for health expenditure.
- Despite how common and costly ARTIs are, the evidence base for treatments is patchy and poorly applied.
- Honey, anti-inflammatory or local anaesthetic sprays and lozenges, and nasal saline probably reduce the duration of PND and post-viral cough.
- Misconceptions about disease processes and benefits of antibiotics drive excessive, unnecessary usage.
- There is considerable potential for improved management of URTIs using skilful explanation and setting of realistic expectations, for example regarding the duration of cough.

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