The common cold in adults: Treatment and prevention

AUTHORS: Daniel J Sexton, MD, Micah T McClain, MD, PhD
SECTION EDITORS: Mark D Aronson, MD, Martin S Hirsch, MD
DEPUTY EDITOR: Jane Givens, MD, MSCE

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INTRODUCTION

The common cold is a benign, self-limited syndrome representing a group of diseases caused by members of several families of viruses. It is the most frequent acute illness in the United States and throughout the industrialized world [1]. The term "common cold" refers to a mild upper respiratory viral infection involving, to variable degrees, nasal congestion and discharge (rhinorrhea), sneezing, sore throat, cough, low-grade fever, headache, and malaise. The common cold is a separate and distinct entity, distinguishable from influenza, bacterial pharyngitis, acute bronchitis, acute bacterial sinusitis, allergic rhinitis, and pertussis.

Treatment and prevention for the common cold are reviewed here. The epidemiology and clinical manifestations of colds are discussed separately (see "The common cold in adults: Diagnosis and clinical features"). Of note, these data reference management of symptoms due to common cold viruses circulating prior to the onset of the COVID-19 pandemic (due to severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2]). While there may well be overlap in effect (see "COVID-19: Management of adults with acute illness in the outpatient setting", section on 'Symptom management and recovery expectation'), how these recommendations apply to mild illness due to SARS-CoV-2 infection remains an area of evolving research.

PROGNOSIS

For most people and most colds, symptoms are self-limited. The common cold is usually an uncomplicated illness; however, occasionally, patients may develop complications (eg, sinusitis, lower respiratory tract disease, asthma exacerbations, acute otitis media). (See "The common cold in adults: Diagnosis and clinical features", section on 'Incubation period and symptom duration' and "The common cold in adults: Diagnosis and clinical features", section on 'Complications'.)

MILD SYMPTOMS

Most patients with mild symptoms do not require any symptomatic therapies. Such patients should be advised to return for review if their condition worsens or exceeds the expected time for recovery [2,3]. (See "The common cold in adults: Diagnosis and clinical features", section on 'Incubation period and symptom duration'.)

MODERATE TO SEVERE SYMPTOMS

Symptomatic therapy remains the mainstay of common cold treatment. Patients with moderate to severe symptoms may use a variety of therapies to relieve symptoms.

Although extensive, published reports on treatment of the common cold often suffer from methodological flaws: inconsistent definitions of disease, different measured symptom outcomes, mixing of subjective and objective findings, and variable age ranges. Furthermore, most trials are complicated by the underlying (and generally incorrect) assumption that the "common cold" is a single entity rather than a collection of widely varying viral etiologies, each with its own pathophysiologic idiosyncrasies. Together, these often result in important inconsistencies in reported findings. Commonly considered interventions with sufficient data available for evaluation are discussed below.

Therapies that may be effective — The following therapies may be effective and are options for patients with moderate to severe symptoms. Choice of therapy will depend on what symptoms predominate, and we do not favor any one of the following treatments over others.

Analgesics — Available data suggest that acetaminophen and nonsteroidal antiinflammatory drugs (NSAIDs) are roughly equivalent at relieving some symptoms (eg, headache, ear pain, muscle and joint pains, malaise, and sneezing) associated with common cold, and that short courses of standard doses in this setting are generally safe and well-tolerated [4-6]. In one randomized trial involving nearly 400 patients with upper respiratory tract infections, acetaminophen and NSAIDs were more effective than placebo in reducing headache, achiness, and feverish discomfort [5]. NSAIDs may be helpful in decreasing some cold symptoms (headache, ear pain, muscle and joint pain), but a meta-analysis found that NSAIDS did not improve cough or nasal discharge and did not significantly reduce the total symptom score or duration of colds [6].

Antihistamine/decongestant combinations — The combination of antihistamines and decongestants may be more beneficial than either component alone. Antihistamine use alone in patients with the common cold, however, is of minimal benefit and frequently results in troublesome side effects. (See 'Antihistamines' below.)

In a systematic review of combination products, the number needed to treat for symptom benefit compared with placebo was 3.9 [7]. For antihistamine-analgesic-decongestant products, the number needed to treat for benefit was 5.6. Patients experienced more adverse effects (drowsiness, dry mouth, insomnia, and dizziness) with combination products compared with control interventions, but the difference was not significant.

Intranasal/inhaled cromolyn sodium — Various formulations of intranasal or inhalational cromolyn sodium are available over the counter. Cromolyn sodium administered intranasally and/or by inhalation may improve cold symptoms. A randomized study of 118 adult patients with symptoms of rhinorrhea, throat pain, or cough for less than 24 hours compared the use of sodium cromoglycate dry powder (20 mg per inhalation in spincaps), sodium cromoglycate aqueous nasal spray (5.2 mg per dose), or matching placebos every two hours during waking hours on days 1 and 2, and four times daily on days 3 to 7 [8]. Symptoms resolved faster in patients treated with sodium cromoglycate than with placebo. Side effects were mild and did not differ among the three treatment groups.

Intranasal ipratropium bromide — Symptoms of rhinorrhea and sneezing may be improved by the use of intranasal ipratropium bromide, though nasal congestion is not affected. A systematic review of seven trials comparing ipratropium and placebo (2144 participants) found improvement in rhinorrhea with ipratropium, although the possibility of inadequate blinding raises the potential for bias [9]. The systematic review found a twofold increase in side effects (nasal dryness, blood-tinged mucus, and epistaxis) in patients assigned to ipratropium.

Therapies with minimal or uncertain benefits — We generally start treatment with therapies that may be effective. Treatments for which the balance of benefits to harms seems small or uncertain may be reasonable options in some patients who are not able to tolerate the more effective therapies.

Dextromethorphan — Evidence supporting the use of dextromethorphan for acute cough due to the common cold is limited and generally poor in quality, with various studies showing mixed results [8,9]. However, even in those studies which do demonstrate a statistically significant benefit, the benefit is found to be small (12 to 36 percent reduction in cough events) [8]. Given the lack of consistent important benefit in published studies, the minor nature of the relief seen in positive trials, and potential for side effects from

misuse, we do not routinely use dextromethorphan for acute cough due to the common cold [8,10,11].

Decongestants — Topical and oral decongestants, such as pseudoephedrine, may offer mild relief of nasal congestion associated with the common cold when used alone [12,13]. A 2007 meta-analysis suggested a net 6 percent decrease in subjective symptoms after a single dose of decongestant compared with use of a placebo [13]. Repeated doses of nasal decongestants produced a small and probably clinically insignificant benefit (approximately 4 percent) over three to five days.

- **Oral** – Phenylephrine is less effective than pseudoephedrine for treatment of rhinitis symptoms. Most studies suggest that 10 mg of phenylephrine (the dose commonly used in most cold products) is not more effective than placebo [10,14]. In the United States, the sale of medications containing pseudoephedrine is restricted, as it can be used to manufacture amphetamine drugs [11].

- **Topical** – Topical decongestant use should be limited to two to three days because rebound rhinitis can occur after 72 hours of use. The use of topical decongestants may occasionally be complicated by nosebleeds, agitation, insomnia, and worsened hypertensive control in patients with preexisting hypertension. (See "An overview of rhinitis", section on 'Nasal decongestant sprays'.)

Saline nasal spray — Saline nasal sprays may help nasal symptoms of the common cold. A 2015 systematic review of saline nasal irrigation for acute upper respiratory infections concluded that there may be symptomatic benefits, but there was limited evidence to support this conclusion, as the available trials were small and had a high risk of bias [15].

Expectorants — The expectorant guaifenesin had a marginal effect compared with placebo in one randomized trial [16]. However, a 2014 systematic review concluded that there was no good evidence for or against the effectiveness of over-the-counter medications (including guaifenesin, mucolytics, and combination medications) for acute cough [17].

Honey — Honey is helpful in improving symptoms of upper respiratory tract infection with cough in children [18,19] and may also be helpful in symptom management in adults. In a meta-analysis of 14 randomized trials and observational studies including adults and children with viral upper respiratory infection, treatment with honey or honey-containing preparations reduced cough frequency and severity [20].

Herbal products — Herbal preparations, including those derived from the roots of *Pelargonium sidoides* (EPs 7630) and the extract of elderberry (*Sambucus fructi*) have been evaluated for the management of upper respiratory tract symptoms. However, high-

quality, valid evidence of the efficacy of these botanical products is lacking [21-24], and further studies are needed before these botanical products can be recommended.

Zinc — Although zinc preparations may decrease cold symptom severity and duration, we suggest not using zinc because of uncertain benefits and known adverse effects, particularly irreversible anosmia when administered intranasally. In some systematic reviews, zinc may be associated with a reduction in the duration and severity of cold symptoms [25,26]. In one review, zinc doses greater than 75 mg daily were effective in reducing the duration of cold symptoms, but lower doses were not [25]. In another systematic review including 17 trials, zinc reduced symptom duration (mean difference -1.65 days, 95% CI -2.5 to -0.8) in adults; however, there was significant heterogeneity among trials [26]. Adverse effects, including bad taste and nausea, were common in the zinc group in all studies.

The US Food and Drug Administration (FDA) issued a public health advisory advising that over-the-counter zinc-containing intranasal products (Zicam) should not be used because of multiple reports of permanent anosmia [27]. Zinc is also available in a homeopathic preparation as intranasal zinc gluconate for the treatment and prevention for colds. This formulation has also been found to cause hyposmia and anosmia [28]. Zinc sulfate preparations that are syrup or lozenges seem to be better tolerated than some tablet forms [29].

Ineffective therapies — Evidence does not support the use of these therapies for treatment of the common cold.

Antibiotic therapy — The common cold is caused by viruses and there is no indication for antibiotic therapy in the absence of evidence of secondary bacterial infections. Treatment with antibiotics for uncomplicated upper respiratory tract infections causes more harm than benefit [30]. A systematic review of randomized trials in patients (including children) with upper respiratory symptoms for fewer than seven days found that the persistence of symptoms was identical in groups who received antibiotics or placebo (risk ratio [RR] 0.95, 95% CI 0.59-1.51) [31]. Adults who received antibiotics had a significantly greater risk of adverse effects (RR 2.62, 1.32-5.18).

In spite of this evidence, antibiotics continue to be prescribed inappropriately in many practices. In a retrospective cohort study of over 180,000 patients 66 years or older with nonbacterial upper respiratory infections, the majority of which were common colds, 46 percent received an antibiotic prescription [32]. Improved rapid diagnostic tests and practitioner education initiatives are needed in order to reduce such overutilization.

Antihistamines — Antihistamine use alone in patients with the common cold is of minimal benefit and frequently results in troublesome side effects. First-generation

antihistamines, such as diphenhydramine, may alleviate rhinorrhea and sneezing, but their use is limited by side effects such as sedation and drying of the eyes, nose, and mouth [16]. A systematic review of 18 trials concluded that antihistamines improved the severity of symptoms slightly more often than placebo for the first one to two days of treatment but offered no benefit after 6 to 10 days of treatment [33]. The sedating antihistamines may have small symptomatic benefits, but these were clinically non-significant and outweighed by the frequency of side effects.

Antiviral therapies — Antiviral and NSAIDs have been studied for the treatment of the common cold, with some evidence of effectiveness. However, the results cannot be directly applied to patients with naturally occurring colds until the efficacy, safety, and practicality of treatment with antiviral therapy has been demonstrated, and they are not generalizable to the majority of colds. Directed antiviral therapy for the common cold is complicated by the wide array of potential viral etiologies, rarity with which an etiologic agent is identified, and paucity of agents with proven efficacy.

The combination of antiviral and NSAIDs was tested in a randomized clinical trial involving 150 healthy adults experimentally inoculated with rhinovirus, where patients were randomly assigned to treatment with intranasal interferon (IFN)-alpha-2b (active against rhinovirus) plus chlorpheniramine and ibuprofen, intranasal placebo plus chlorpheniramine and ibuprofen, or intranasal and oral placebos [34]. Subjects receiving the regimen containing intranasal IFN had a 33 to 73 percent reduction in symptom scores as well as significantly reduced volumes of nasal mucus production and reduced virus concentrations in their nasal mucus. The incidence of nasal dryness, nasal irritation, and blood-tinged nasal mucus was similar in all three study groups. Although this study showed benefit of antiviral therapy with rhinovirus infections, these results are not generalizable to the majority of colds, which are non-rhinovirus in origin. Topical interferon for intranasal use is not currently available.

Vitamins and herbal remedies

- Vitamin C – Vitamin C is often touted as a natural remedy for the common cold. A 2013 meta-analysis of 29 trials (n = 11,306) showed a small but significant 8 percent reduction in the duration of cold symptoms in adults regularly taking vitamin C supplements (at least 200 mg/day) [35]. This reduction was of uncertain clinical relevance. The meta-analysis also showed that vitamin C given therapeutically after symptom onset did not reduce symptom duration or severity.

- **Echinacea** – The use of echinacea for treatment of upper respiratory tract infections (including the common cold) is discussed separately. (See "Clinical use of echinacea", section on 'Treatment'.)

Other

- Codeine – Although codeine is effective in suppressing chronic cough, trials in patients with acute cough due to the common cold have found no consistent benefit of codeine compared with placebo [17].

- **Intranasal glucocorticoids** – Topical glucocorticoids are not effective in treatment of the common cold [36,37].

- **Heated, humidified air** – Available data do not support the use of heated, humidified air for management of the common cold. A 2017 systematic review (six trials, 387 participants) with two trials providing data for pooling did not find unequivocal evidence that warm vapor inhalation reduced symptoms [38]. Results were inconsistent regarding its effect on nasal airway resistance, and one study showed no difference in viral shedding between treatment and placebo groups. Minor side effects (eg, nasal discomfort or irritation) were infrequently reported. Another randomized trial (performed in a "real-world" clinical setting) that was not included in the systematic review also found no symptomatic benefit for the use of heated, humidified air and an infrequent (2 percent) incidence of mild thermal injury [4].

PREVENTION

Most prevention strategies for the common cold have focused on the use of vitamins, minerals, herbs, and lifestyle changes. However, no vitamin or herbal product has been shown conclusively to impact the incidence of the common cold.

Hand hygiene — Hygienic techniques (table 1) such as handwashing have been shown to prevent the spread of respiratory viruses, especially from younger children [39].

Face coverings (face masks) — High-quality data on the efficacy of face coverings as an isolated intervention for reducing transmission of most common respiratory viruses are lacking, in large part due to the immense challenge of designing, implementing, and conducting such studies. However, the COVID-19 pandemic due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has provided evidence supporting the utility of face coverings for reducing the spread of this novel coronavirus (see "COVID-19: Epidemiology, virology, and prevention", section on 'Wearing masks in the community'), and available data suggest overlap in the modes of transmission of SARS-CoV-2 and common cold viruses [40,41]. Supporting data for this conclusion and its application to the common cold include:

- Face masks have been shown to substantially decrease the spread and concentration of exhaled droplets of the size expected to transmit SARS-CoV-2 and other similar viruses [41]. Face masks can reduce respiratory particle emissions by up to 90 percent [42] and can also provide meaningful reduction of exposure to particle transmission [43].

- Several ecological studies have demonstrated a reduction in COVID-19 transmission when masks are consistently worn [44]. For example, in a study of an outbreak of SARS-CoV-2 on the *USS Theodore Roosevelt*, wearing facemasks reduced infections by up to 70 percent [45].

- Available data from 2020 to 2021 demonstrate a profound reduction in the number of reported cases of influenza and other respiratory viral infections during the SARS-CoV-2 pandemic [46,47]. In one study, influenza infections were reduced from 13.7 to 0.73 percent, while respiratory syncytial virus (RSV) infections were reduced from 4.64 percent to zero [46]. These data strongly suggest that the combined effect of a number of nonpharmacologic interventions, including mask wearing, social distancing, enhanced personal hygiene, reduced travel, and temporary lockdowns, has had a large impact on transmission of these other common infections.

Taken together, these data strongly suggest a protective role for the wearing of facemasks to prevent infection with many of the viral causes of the common cold, especially in conjunction with social distancing, hand hygiene, and other nonpharmacologic measures. However, the implications of these observations for public health policies for the prevention of respiratory viruses other than SARS-CoV-2 are unclear.

Ineffective or uncertain preventive measures

Probiotics — Higher-quality, specific trials are needed before concluding whether probiotics have a role in the prevention of respiratory tract infections in adults. A 2015 meta-analysis of 12 randomized trials including both children and adults comparing placebo with probiotics (various strains of lactobacilli and *Bifidobacterium*) found that probiotics decreased the number of individuals experiencing at least one episode of acute respiratory infection (odds ratio [OR] 0.53, 95% CI 0.37-0.76) and mean duration of illness (mean difference -1.89, 95% CI -2.03 to -1.75) [48]. The study also found that probiotic use decreased the number of prescribed antibiotics. Overall, the quality of the evidence was low or very low.

Exercise — There have been conflicting reports regarding the efficacy of exercise in preventing the common cold. A 2015 systematic review and meta-analysis found four randomized trials that evaluated the effect of exercise on the number of acute respiratory infections per year [49]. However, only two were included in the meta-analysis due to lack of clarity of data in the other two [50,51]. The meta-analysis found no differences in the number of acute respiratory infection episodes between exercise and nonexercise groups.

The two randomized trials that were included had disparate results. One randomized trial of 115 overweight, sedentary, postmenopausal women found that moderate intensity exercise sustained over one year appeared to decrease the incidence of self-reported colds [50]. The risk of cold was three times higher in the control group (once weekly stretching) compared with the intervention group (exercising five times a week). Several factors may have influenced these results: the diagnosis of cold was based on self-reporting, the overall incidence of upper respiratory infections was not different between groups, and the rate of influenza vaccine usage was higher among controls. A subsequent randomized trial, compared no intervention with exercise (45 minutes daily at home plus 2.5 hours per week of group sessions) or mindfulness meditation [51]. There was no effect of exercise on the incidence of acute respiratory illness, severity of symptoms, or missed work days, although there were trends toward a positive effect; meditation was associated with self-reported decreased global symptom severity and fewer missed days.

Sleep — There are some data suggesting that duration of sleep influences overall risk of developing the common cold. In one clinical trial, individuals were experimentally inoculated with human rhinovirus and those who slept <5 hours per night at baseline were almost threefold more likely to develop a cold than those who slept >7 hours per night [52]. However, the generalizability of these findings to naturally acquired infections or infections with other cold viruses has not been proven.

Zinc — A systematic review of two randomized trials in children found that zinc sulfate, taken for a minimum of five months, decreased the rate of development of colds and school absence [53]. The generalizability of this finding to adults, in whom colds occur less frequently, is not known. Additionally, intranasal zinc may cause anosmia, and it is felt that the risks outweigh any potential benefit thus far observed in clinical trials. (See 'Zinc' above.)

Vitamins

- Vitamin C – A 2013 meta-analysis of 29 trials showed that regular supplementation with vitamin C did not significantly reduce the incidence of colds [35]. However, there was a 50 percent decrease in the incidence of colds in a subset of patients exposed to vigorous activity, especially in extreme conditions (marathon runners, skiers, and soldiers in sub-arctic). The reasons for the apparent benefit in this subset of patients are uncertain.

- **Vitamin D** – A role for vitamin D in the prevention of upper respiratory infections was suggested by data from a United States survey population (3rd NHANES) that found a relationship between higher serum levels of 25-hydroxyvitamin D and fewer reported respiratory infections [54]. However, two large randomized trials found no difference in the incidence of upper respiratory infections for groups receiving vitamin D3 (monthly injection [55] or oral supplement 1000 international units/day [56]) or placebo. (See "Vitamin D and extraskeletal health", section on 'Immune system'.)

- Vitamin E – Existing data do not convincingly support the use of vitamin E in the prevention of the common cold. The efficacy of vitamin E (200 international units/day) in preventing respiratory tract infections was addressed in a randomized controlled trial in older adult nursing home residents [57]. Although vitamin E did not have a statistically significant positive effect on the overall risk of lower respiratory infections, a post hoc analysis suggested a modest reduction in the incidence of the common cold (0.67 versus 0.81 per person per year, relative risk [RR] 0.83, 95% CI.68-1.01) in patients receiving vitamin E. In addition, fewer patients treated with vitamin E had multiple colds (40 versus 48 percent). Findings from such post hoc analyses should be viewed with skepticism unless further studies confirm a benefit. In addition, studies have shown that higher-dose vitamin E (400 international units/day or greater) may increase all-cause mortality and should be avoided [58]. (See "Overview of vitamin E".)

Herbal products — No herbal product has been conclusively shown to significantly impact the incidence of the common cold [59,60].

Other

- **Gargling –** A randomized trial in 387 healthy adults compared self-reported symptoms of upper respiratory infection over 60 days in three groups: usual care (controls), gargling with water three times daily, and gargling with povidone-iodine [61]. Patients who gargled with water, compared with controls, reported fewer incidents of cold symptoms (hazard ratio [HR] 0.64, 95% CI 0.41-0.99) while no effect was seen for those who gargled with povidone. The subjective outcome in this unblinded trial call into question the validity of these findings.

- **Leukotriene receptor antagonists** – A single study suggested that leukotriene receptor antagonists (LTRAs, such as montelukast) may decrease the incidence of common cold-like symptoms in children with asthma [62]. This finding was confirmed by a subsequent trial in adults [63]. Thus far, cold symptom prevention with LTRAs has not been studied in patients without asthma.

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have

about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topics (see "Patient education: Sinusitis in adults (The Basics)" and "Patient education: Acute bronchitis (The Basics)" and "Patient education: What you should know about antibiotics (The Basics)")
- Beyond the Basics topics (see "Patient education: The common cold in adults (Beyond the Basics)" and "Patient education: Acute sinusitis (sinus infection) (Beyond the Basics)" and "Patient education: Acute bronchitis in adults (Beyond the Basics)")

SUMMARY AND RECOMMENDATIONS

- **Symptoms generally self-limited** – For most people and most colds, symptoms are self-limited. The usual course and duration of illness is up to one and a half weeks. (See 'Prognosis' above.)
- **Therapy not warranted for patients with mild symptoms** – Patients with mild symptoms most often do not require any symptomatic therapies. Patients should be advised to return for review if their condition worsens or exceeds the expected time for recovery. (See 'Mild symptoms' above.)
- **Symptomatic therapy an option for patients with moderate to severe symptoms** – Symptomatic therapy remains the mainstay of common cold treatment. Patients with moderate to severe symptoms may use a variety of therapies to relieve symptoms. (See 'Moderate to severe symptoms' above.)
  - **Treatments that may have efficacy** – Choice of therapy will depend on what symptoms predominate, and we do not favor any one of the following treatments over others. (See 'Therapies that may be effective' above.)
    - Analgesics may be used to relieve associated symptoms (eg, headache, ear pain, muscle and joint pains, malaise, and sneezing). (See 'Analgesics' above.)

    - Symptomatic treatments for nasal symptoms that have moderate evidence of efficacy include a combination product containing an antihistamine and a decongestant, intranasal/inhaled cromolyn sodium, or intranasal ipratropium bromide. (See 'Antihistamine/decongestant combinations' above and 'Intranasal/inhaled cromolyn sodium' above and 'Intranasal ipratropium bromide' above.)
  - **Treatments of minimal or uncertain benefit** – Decongestants, saline nasal spray, cough suppressants, and expectorants, and honey are of minimal or uncertain benefit. (See 'Therapies with minimal or uncertain benefits' above.)

    Although zinc sulfate lozenges and syrup may decrease cold symptom severity and duration, we suggest not using any zinc preparations because of uncertain benefits and known toxicities, including irreversible anosmia when administered intranasally (**Grade 2C**). (See 'Zinc' above.)
- **Ineffective therapies** – There is no evidence to support the use of antibiotics, antihistamines, antiviral therapies, or vitamins and herbal remedies in the treatment of the common cold. Antibiotic treatment causes more harm than benefit. (See 'Ineffective therapies' above.)
- **Prevention** - Hygienic measures such as handwashing (table 1), facemasks, and social distancing, especially when unwell, can reduce the spread of respiratory viruses. No vitamin or herbal product has been shown conclusively to impact the incidence of the common cold. (See 'Prevention' above.)

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