Prevention and Treatment of Viral Upper Respiratory Infections

Non-influenza viral upper respiratory infections (URIs), or common colds, are the most common infections experienced by human beings. They account for more than 25 million doctor visits and 40 million lost days of school and work annually in the United States.[1] These numbers dramatically increase when influenza infections are included. While there is no cure for these viral infections, there are many things that patients can do to decrease their likelihood of contracting such an illness and, if they do get it, to minimize the length and severity of symptoms. The following focuses on a number of approaches that might be woven into a Personal Health Plan (PHP).

Physical Activity

Growing evidence indicates that moderate amounts of regular exercise improve immune function and decrease the risk of developing a URI.[2] However, there is a transient depression of immune function with associated *increased* risk of URI after periods of intense, prolonged exercise such as training for and/or running in a marathon.[3] For general health, including prevention of upper respiratory infections, consider recommending 30-40 minutes of aerobic exercise most days of the week at an intensity that allows talking but not singing.

Surroundings

A number of simple hygiene and environmental tactics can be used to prevent spreading or contracting viral URIs.[4]

- Sneezing and coughing into tissues keeps the viruses from spreading, especially when the tissues are immediately discarded and hands are then washed.
- If no tissue is available, one should sneeze or cough into the bend of the elbow.
- Avoid, as much as is practical, prolonged contact with anyone who has a cold.
- The importance of hand-washing cannot be underestimated.
- Keep the hands out of contact with the eyes, nose and mouth.
- Keeping the kitchen and bathroom countertops clean is important, especially when someone in the family has a common cold. Children's toys should be washed before and after play when someone in the house has a cold.
- Focus on temperature and humidity. Keeping an affected individual’s room warm but not overheated is important. If the air is dry, a cool-mist humidifier or vaporizer can moisten the air and help ease congestion and coughing. A clean humidifier may help to prevent the growth of bacteria and molds.

The common cold is also influenced by social factors, and both acute and chronic stress can increase the risk of infection. A series of studies showed that certain psychosocial variables predicted whether volunteers would become infected when they were exposed to one of the most common viruses implicated in URIs. Variables that predicted infection and increased

symptom severity and duration include childhood socioeconomic status, number and quality of social relationships, acute and chronic stress, and negative emotion.[1]

Nutrition

General

Nutrition may be the single most important factor in optimizing immune function because it can have a positive or negative impact depending on dietary patterns. Antioxidant micronutrients (vitamins and minerals which are only required in small amounts) such as selenium, zinc, fatty acids, and vitamins E, A, and D help regulate the function of the immune system.[5] Nutritional and supplemental intake of flavonoid polyphenols seems to decrease URI incidence. Flavonoids are rich in foods such as dark-colored berries, green tea, onions, apples, citrus fruits, and soybeans.[6] Studies have shown that a diet insufficient in macronutrients (protein, carbohydrate, and fat) leads to more frequent bouts of chronic infections.[7] Although evidence is lacking, staying well-hydrated with a variety of fluids including water, broth, tea, etc., is frequently recommended. For more information, see the "Nutrition" overview.

Vitamins, minerals, and other dietary supplements that are commonly used for viral URI's are discussed later in this document.

Recharge

Sleep and immune function seem to influence each other. Both sleep deprivation and acute illness (such as a viral infection) increase inflammatory markers that have been found to make us more tired. Studies have shown that sleep deprivation leads to decreased immune function, leading to increased frequency of infections and decreased response to immunizations such as the influenza vaccine. In contrast, sleep strengthens the immune response; most immune cells' response to challenges (e.g., viral infections) peak at night.[8] Adequate sleep appears to be 7-8 hours per night. Too much sleep (greater than 10 hours), however, has been associated with increased risk of cardiovascular disease.[9]

Family, Friends, & Co-Workers

Interpersonal relationships are an extremely important aspect of our overall well-being. Indeed, their quality can impact how well our immune systems can protect us from disease. Studies have found that more negative or hostile behaviors during discussions focused on conflict, marital disruption, or the chronic stress of caring for a relative with Alzheimer's disease can suppress immune function. There is some evidence to suggest that *quality* interpersonal relationships can be protective against these types of immune changes.[10,11] Even in clinician- and provider-patient interactions, patients seem to recover more quickly from URIs when they feel cared for by their health care practitioner.[12] While encouraging patients to foster healthy relationships and treating them with sincere compassion may not "cure" a cold, it can significantly influence how often and how long patients are impacted by symptoms.

Spirit & Soul

Individuals with higher levels of spiritual well-being, including participation in formal religion, seem to have better cardiovascular, neuroendocrine, and immune function.[13,14] Taking an

appropriate spiritual history is a part of supporting overall health in all individuals, including optimizing immune function. For more information, see the "Spirit and Soul" overview.

Mind & Emotions

Mindfulness Meditation

Mindfulness meditation has been studied in relation to immune function. This type of meditation is a practice that fosters an ability to take a step back and notice our reactions to external stimuli, giving people a chance to pause and choose how they will respond. Some studies have shown regular mindfulness practices to lead to more robust antibody responses to the influenza vaccine.[15] Others have failed to show this relationship, but they did correlate optimism, less anxiety, and lower perceived stress with high antibody levels following immunization.[16] Mindfulness meditation has also been associated with decreased symptom severity in the common cold.[17]

Resources and an introduction to a variety of centering practices including meditation and centering prayer can be found in the Meditation for Health and Happiness module.

Guided Imagery

Guided Imagery is a technique used by trained professionals to help patients relax and focus on images associated with personal issues they are confronting. It may include interactive, objective guidance to encourage patients to find solutions to problems by exploring their existing inner resources. There has been some preliminary evidence that Guided Imagery in children that addresses stress and encourages relaxation may reduce the duration of symptoms due to upper respiratory tract URIs, including colds.[18]

Dietary Supplements

Note: Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

Vitamin C

Some evidence supports use of vitamin C at doses ranging from 200-500 mg daily for prevention or early intervention at first onset of symptoms of a URI.[1] In a subset of studies in people living in extreme circumstances, including soldiers in subarctic exercises, skiers, and marathon runners, vitamin C has led to significant reductions in the risk of developing colds by approximately 50%.[19] When taken preventive, vitamin C may have a mild impact on common cold duration and severity, but this is of questionable clinical significance. Vitamin C consumption of 200 mg per day seems to be the threshold for this impact, and this can easily be obtained through nutrition, rather than supplementation. However, there may be benefit of using higher-dose vitamin C within the first 24 hours of an upper respiratory tract infection, up to 8g daily (in divided doses) for 5 days.[20,21]

While supplements can certainly be used, regular intake of vitamin C-rich fruits and vegetables such as citrus fruits (e.g., oranges and grapefruit) and their juices, red and green peppers, kiwifruit, broccoli, strawberries, cantaloupe, baked potatoes, and tomatoes are likely to have additional health benefits (and be more pleasurable to consume) than swallowing a pill.

Zinc

Studies that have looked at concentrated dosing of zinc with URIs have had very mixed results. Overall, zinc-containing products seem to be beneficial for reducing the duration of symptoms of the common cold in adults by about 1.6 days, but adverse effects such as bad taste and nausea may limit their usefulness. Zinc from supplements taken prophylactically does not seem to prevent the common cold.[22] Zinc lozenges (dosed greater than or equal to 75 mg/day given within 25 hours of symptom onset) can decrease duration of URI symptoms, including cough.[23] Recommended doses range from 9-24 mg every 2 hours while awake and still symptomatic, starting within 48 hours of symptom onset. Regular use of higher doses can interfere with copper absorption. Nasal preparations have been associated with loss of smell.[1] As with vitamin C, including foods rich in zinc as part of a healthful diet can also be reasonably supported. Foods to consider include oysters, red meat, poultry, seafood such as crab and lobsters, and fortified cereals. Other foods containing lower levels of zinc include beans, nuts, whole grains, and dairy products.

Garlic (Allium sativum)

While there are dozens of reported health benefits of garlic, data is limited in its usefulness in upper respiratory infections. The data that does exist, however, supports that garlic has a role in decreasing frequency of URIs and shortening duration if a cold is experienced.
Many garlic products are available, but they are of varying quality. It is preferred to eat raw or lightly cooked crushed garlic.[1] One palatable use of garlic is to pack a jar with garlic cloves and cover with honey. Let this sit in a lightly covered jar for two weeks. At first onset of URI symptoms, combine 1-2 tbs of the honey with 1-2 tbsp of lemon juice and one-half cup of warm water. Gargle and/or drink. The garlic cloves can be eaten, chopped in the tea, or used for cooking.

Honey

Honey has been studied as an antitussive in children and found to be better than both no treatment and diphenhydramine, but not better than dextromethorphan.[24] Honey can also add to the expectorant properties of other herbs when used in teas.[25]

Andrographis and Siberian Ginseng

Andrographis (*Andrographis paniculata*) is native to Asia with a long history of use in Indian medicine. Individual studies and systematic reviews support its role in treatment of URIs. A specific product called Kan Jang®, which combines andrographis with Siberian ginseng (*Eleutherococcus senticosus*), also seems to be superior to placebo, especially when started within 72 hours of symptom onset. There is preliminary evidence that andrographis, when taken prophylactically, can reduce the risk of developing a URI by 50% after two months of continuous treatment. This herb is generally well tolerated. It can, however, cause gastrointestinal distress, urticaria, fatigue, and headache. In high doses, it may cause transient elevation of liver enzymes.[1,26]

Dosing:

- For treating the common cold: A combination of a specific andrographis extract, standardized to contain 4-5.6 mg andrographolide, plus Siberian ginseng (Kan Jang, Swedish Herbal Institute) 400 mg, 3 times daily

- For preventing the common cold: 200 mg daily, 5 days per week
- For relieving fever and sore throat in pharyngotonsillitis: 3-6 gm daily
- For influenza: A combination of a specific andrographis extract 178-266 mg, standardized to contain 4-5.6 mg andrographolide, plus Siberian ginseng 20-30 mg (the product studied was Kan Jang, from the Swedish Herbal Institute), 3 times daily for 3-5 days[26]

Astragalus (*Astragalus membranaceus*)

Astragalus is an important medicinal plant in Chinese medicine that seems to have antiviral and immune boosting properties.[1] Although data is limited, there is some preliminary evidence that supports its efficacy in reducing the risk of catching the common cold.[27]

Dosing:

- Tea: 3-6 tbsp of dried, chopped root, simmered in 2-4 cups of water for 10-15 minutes
- Capsule: 1-3 gm of dried, powdered root daily
- Tincture: 2-4 mL, 3 times daily

While astragalus is generally safe, it should not be used in an acute infection. Those with autoimmune diseases should consult with a clinician before use due to its immune-boosting effects.[25]

Echinacea (*Echinacea angustifolia, Echinacea pallida, Echinacea purpurea*)

There have been a plethora of studies and literature reviews around the efficacy of echinacea for the prevention and treatment of URIs. Overall, the data seems to support its role in decreasing the duration and symptom severity.[1,28] The best evidence appears to be for preparations containing *Echinacea purpurea* species and three specific commercial formulations. These are Echinaforce, made by Bioforce AG; EchinaGuard by Nature's Way; and Echinacin, by Madaus. A relatively large 2016 study (involving nearly 700 people) of Echinaforce showed a significant decrease in URI episodes when it was used for prevention, as well as decreased duration of URI and use of additional medications when it was used for URI treatment.[29] The herb also seems to be most potent when taken as early as possible in the course of the illness and taken for 7-10 days.[30]

Dosing:

- Tea: Steep 1-2 tsp of Echinacea leaf/flower in 1 cup boiling water, or boil 1 tsp of root in 1-2 cups of water for 10 minutes.
- Tincture: When coming down with a cold, take either a tincture of Echinacea root or the expressed juice from fresh *E. purpurea* above-ground parts stabilized in alcohol. Every 2 hours, take 1-2 mL directly or diluted in water.
- Capsule: Dose varies on product.

Taken early in the onset of illness, echinacea shortens the duration of the illness by 1-2 days. Use with caution if a person is taking medications such as itraconazole, lovastatin, fexofenadine, or birth control pills due to potential inhibition of certain liver enzymes. Also use with caution in those with allergies to members of the Asteraceae (daisy) family.[25]

Elderberry (*Sambucus nigra*)

Clinical research shows that some elderberry extracts might reduce flu-like symptoms. Sambucol by Nature's Way at a dose of 15 mL (1 tbsp) four times daily seems to reduce the symptoms and duration of influenza infection when given within 48 hours of symptoms. On average, this elderberry extract seems to reduce the duration of symptoms by 56%. Another study of elderberry lozenges (ViraBLOC by HerbalScience) taken at 175 mg four times daily for 2 days, started within 24 hours of initial symptoms, significantly improved flu-like symptoms compared to placebo.[31] Avoid use of unripe berries and other plant parts as they contain compounds that can cause nausea, vomiting, diarrhea, dizziness, and confusion.[25]

American ginseng (*Panax quinquefolius*)

Ginseng is considered an adaptogenic herb—one that brings balance, homeostasis, and healing. Several trials have shown decrease in episodes of cold and flu and decreased duration and severity and symptoms with regular use of this herb. The specific product was an American ginseng extract called CVT-E002 (Cold-FX made by Afexa Life Sciences, Canada), taken at 200 mg twice daily over a three- to four-month period during influenza season.[32] For treatment of acute infection, ginseng at 100 mg twice daily for 9 days has been used. Ginseng is generally well tolerated. The most common side effect is insomnia. It can also infrequently cause tachycardia, palpitations, and hypertension.[1]

Probiotics

Probiotics are live bacteria that are thought to support healthy gastrointestinal function. A 2015 Cochrane review and meta-analysis of 12 studies involving 3,720 participants found that, while quality of evidence was low, regular intake of probiotics decreased the number and duration of URIs, antibiotic use, and URI-related absences from school.[33] Strains that appeared to be beneficial include *Lactobacillus rhamnosus* and *Lactobacillus* GG (in one study) and *Lactobacillus acidophilus* and *Bifidobacterium animalis*. The dose is 5-10 billion colony-forming units (CFUs) twice daily.[1]

Bee Propolis

Propolis is a resinous material from poplar and conifer buds used by bees for maintaining their hives. Many propolis preparations are contaminated with beehive by-products. There is some evidence that propolis might decrease the duration of cold symptoms by 2.5 times compared with placebo in patients with rhinovirus infection. The typical dose is typically 500 mg daily.[34]

Oscillococcinum

Homeopathy is a very safe modality for treatment of URIs, but studies vary in quality and size. Available data suggests some homeopathic remedies may be comparable to conventional treatment with fewer side effects.[35] Oscillococcinum is a homeopathic dilution of duck liver and heart extracts frequently used to prevent and treat infection with the influenza virus. While reviews of the studies show no evidence that it has a role in *prevention* of the flu, there is some preliminary evidence that it might reduce the duration of symptoms by a minimal amount (approximately 0.28 days).[36]

Pelargonium (*Pelargonium sidoides*)/Umckaloabo

Pelargonium is a genus of flowering plants mostly native to southern Africa that have long been used medicinally in that part of the world. Studies have shown efficacy of a product called Umckaloabo for URI symptoms of cough, fatigue, phlegm production, and hoarseness. The product is available in alcohol-containing and alcohol-free formulations. Dosing can be followed according to the packaging. Allergic reactions have been reported, but the product generally seems to be safe.[1,25] EPs 7630 is a specific herbal extract from the roots of *Pelargonium sidoides* that has been shown to improve URI symptoms and lead to more rapid remission of symptoms.[37]

Sinupret®

Sinupret® is an herbal combination product that has been found to have antiviral activity against several viruses known to cause the common cold.[38] It contains gentian root (*Gentiana lutea*), primrose flower (*Primula veris*), sorrel herb (*Rumex acetosa*), European elder flower (*Sambucus nigra*), and European vervain (*Verbena officinalis*). The dose is one tablet 3 times daily for 7-14 days. It is to be avoided in pregnant and lactating women and children.[39]

Licorice (*Glycyrrhiza glabra*)

The tissue-coating properties of licorice root give it utility in the symptomatic treatment of sore throats and coughs. Licorice also has antiviral activity again influenza viruses that seems to be related to increased interferon-gamma production by T cells and changes resulting in reduced virus uptake by cells.[28]

Dosage:

- Lozenge: 1 lozenge every few hours for several days to soothe inflamed tonsils and throats
- Tea: For nagging cough, especially when associated with URI causing nasal drip, boil 1-2 tsp of chopped licorice root in 2 cups water for 10 minutes. Strain, cool, and take a half cup 3-4 times daily for up to seven days.

The doses above are typically safe. However, the higher doses and long term use typically needed to treat gastritis or heartburn can cause hypertension and electrolyte imbalances if the deglycyrrhizinated (DGL) form of licorice is not used.[25]

Sage

Sage mouthwashes and gargles have been approved for use against sore throat in Germany by the German Commission E.[40]

Dosage:

- Gargle: For a sore throat, steep 1 tsp chopped sage in 1 cup water for 10 minutes. Strain and drink or use as a gargle (+/- salt).[25]

Thyme

The culinary herb thyme has antispasmodic and expectorant activities which allow it to calm coughs and help clear bronchial mucus.

Dosage:

- Tea: 1-2 tsp dried leaves and flowers can be steeped in 1 cup hot water and taken 3 times daily. Adding honey can increase the expectorant and antitussive properties. Covering the tea while steeping can help prevent important volatile oils from evaporating.[25]

Thyme Cough Syrup

- 2 tbsp dried thyme (or 4 tbsp fresh)
- 1 tsp lemon juice
- 1 cup water
- 1/2 cup organic honey

Pour 1 cup of near-boiling water over thyme and steep 10 minutes, covered. Strain and add honey and lemon juice. Refrigerate for up to one week. For children 18 months and older, give 1 tbsp as needed. Those who don't like the flavor of thyme can substitute fennel seed and prepare it the same way. Simmer the seeds gently on low heat for 15 minutes, then strain.

Eucalyptus (*Eucalyptus globulus*)

Eucalyptus as an essential oil has a menthol-like effect that can relieve chest and sinus congestion. Consider recommending the following:

- Bring large saucepan of water to a boil and pour into heat-proof bowl.
- Add 2 drops eucalyptus oil, 2 drops lavender oil, and 2 drops tea tree oil.
- While keeping eyes closed, cover head and bowl with a towel and inhale vapors for three minutes.[25]
- All three oils can also be used in a bath. Add 6-7 drops in a full tub or 1 drop massaged under the collar bones while in the shower.

Other Interventions

Nasal Irrigation

Nasal irrigation with saline solutions is one of the most effective treatments for chronic rhinosinusitis, and it empowers patients in that they are able to treat themselves without the need for physician input.[1] Here is an instructional handout on Medicine Nasal Irrigation, including a comment on water quality.[41] While saline is frequently quite sufficient, at times the addition of 1 drop of eucalyptus oil or use of Alkalol (a product found at most major drug store chains) in the saline solution offers a menthol-like intensity that can increase its decongestant effect. These both can be quite intense and patients should be warned about that if its use is suggested.

Resource Links

- Nutrition overview: https://www.fammed.wisc.edu/integrative/resources/modules/nutrition-nourishing-fueling/
- *Passport to Whole Health*: https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport_to_WholeHealth_FY2020_508.pdf

- Meditation for Health and Happiness: https://www.fammed.wisc.edu/integrative/resources/modules/meditation/
- Medicine Nasal Irrigation: https://www.fammed.wisc.edu/files/webfm-uploads/documents/research/nasalirrigationinstructions.pdf
- Spirit and Soul overview: https://www.fammed.wisc.edu/integrative/resources/modules/spirit-soul-meaning-purpose/

Author(s)

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