

The Common Cold

Taking Aggressive Action to Stay Healthy

The common cold is caused by a viral infection of the upper respiratory tract. People afflicted with a cold often cough and sneeze, are fatigued, and have runny noses, sore throats, congestion, and a low-grade fever.

Although there is no specific drug that treats the common cold, there are steps that can be taken at the very first signs of symptoms that may help ward off infection. The key is to be aggressive: treat a potential infection as a full-blown illness, taking every precaution possible, including nutrients, hormones, and sometimes drugs, along with getting as much sleep as possible.

In the United States, it is estimated that people have 500 million colds in the course of a year (Fendrick AM et al 2003), averaging three to six colds per person (Rajnik M et al 2005). Although symptoms are generally mild, colds are a major source of lost productivity and income, as well as general misery for their victims.

The virus most often responsible for the common cold is the rhinovirus. There are more than 110 different types of rhinovirus, making it impractical to figure out which one is causing any given infection (Makela MJ et al 1998). Colds can also be caused by coronaviruses, adenoviruses, coxsackieviruses, echoviruses, enteroviruses, paramyxoviruses (including several parainfluenza viruses), orthomyxoviridae (including influenza A and B), and respiratory syncytial virus (Kasper DL et al 2004).

THE IMMUNE SYSTEM: ANATOMY OF A COLD

A healthy immune system is the body's main defense against viral infection. The Life Extension Foundation's approach to the common cold is based on taking drugs, nutrients, and hormones that boost the immune response as well as directly attack viruses.

During infection with a cold, the virus comes into contact with mucous membranes in the nose or eyes. There, the virus attaches to receptors on epithelial cells. In response to infection, the immune system triggers a cascade of events, including release of inflammatory cytokines, fluid exudation, local swelling, increased mucous production, and stimulation of sneeze and cough reflexes (Pitkaranta A et al 1998). One study demonstrated that nasal symptoms began 2 hours after exposure, while cough and sore throat symptoms began 10 to 12 hours after inoculation. In the early stages, the viral count is still low and, by taking rapid action, it may be possible to help your body mount an effective immune response that prevents the cold from worsening.

Many of the symptoms of the common cold are caused by the production of cytokines. Cytokines are chemical messengers that allow cells to communicate with one another. Rhinovirus infection can increase interleukin-6 (IL-6), interleukin-8 (IL-8), and granulocyte-macrophage colony-stimulating factor (Subauste MC et al 1995). Elevated levels of these stimulatory cytokines attract white blood cells to the infected area and have direct effects on the underlying tissues, producing the commonly experienced symptoms such as mucosal swelling, irritation, and increased mucous production. Circulating cytokines also produce systemic signs and symptoms, such as fever, muscle aches, diminished appetite, and fatigue.

Levels of IL-8 directly correlate with the severity of cold symptoms (Turner RB et al 1998). IL-6 is also increased in nasal fluids in individuals infected with human rhinovirus and may affect the severity of symptoms of the cold (Zhu Z et al 1996).

HOW TO CATCH A COLD

The common cold is spread by tiny particles that remain in the air until they are inhaled, by direct contact with an infected person, or by larger airborne droplets that are launched a few feet by breathing, coughing, or sneezing. Exposure to a virus does not mean the exposed person will definitely fall sick. Several other factors are involved, such as host susceptibility, immune function, and virulence of the organism. The greatest incidence of the common cold is in the fall and spring.

Risk factors that predispose exposed individuals to infection include:

- Lack of exercise
- Lack of sleep, or poor quality sleep
- Low vitamin C intake
- Stress
- Social outlook and mood

Studies have demonstrated that increased stress greatly increases the risk of developing the common cold (Cohen S et al 1998), as well as an increase in severity of symptoms, increased mucous production, and higher concentrations of the cytokine IL-6 (Cohen S et al 1999).

People with increased social ties are less susceptible than isolated people to acquiring a cold upon exposure to a cold virus. They also have decreased mucous production, shed less virus, and have improved clearance of mucous in the nasal passages (Cohen S et al 1997). In addition, people who have a positive outlook and generally tend to be happy and relaxed have a lower risk of developing a cold (Cohen S et al 2003a).

Diagnosis of the common cold is usually based on symptoms, which will likely include headache, runny or congested nose, watery eyes, body ache, fatigue, sore throat, cough, and possibly low-grade fever. With the exception of disease caused by the influenza viruses, viral detection is rarely necessary in otherwise healthy individuals because of the lack of organism-specific treatment. Therefore, the diagnosis of the common cold is typically based entirely on symptoms.

Conventional Treatment of the Common Cold

A typical pharmacy is stocked with dozens of medications aimed at treating symptoms associated with the common cold. In the vast majority of cases, most people with colds rely on over-the-counter remedies that may include decongestants, antihistamines, fever and pain reducers, and cough suppressants. However, many cold medications provide far more ingredients than are needed to ease symptoms, may or may not be effective, and can have a host of undesirable side effects (Smith MB et al 1993). A simple cough suppressant or oral decongestant may be all that is needed for satisfactory relief. If a cold formula is necessary, read packaging information carefully to avoid drug interactions. Over-the-counter formulations often have other ingredients in common as well, and taking more than one product at a time increases the chances not only of drug interactions but of overdoses. In particular, many (or perhaps most) over-the-counter cold formulations contain acetaminophen as a pain reliever and fever reducer. This has led to inadvertent acetaminophen overdoses, including fatalities (Gunn VL et al 2001).

A few studies have investigated the use of antiviral medications to treat rhinovirus. Interferon alfa-2a (Gwaltney JM Jr et al 2002), interferon gamma (Sethi SK et al 1997), and ribavirin (Bernstein JM et al 1989) are among the medications that may offer a reduction in symptoms. However, these are not typically used in clinical practice.

Nonpharmacologic therapies for the common cold include:

- **Steam and humidifiers.** Application of a warm, moist towel to the face may help loosen mucus in the nasal passages.
- **Nasal saline wash.** If symptoms are mild to moderate, a nasal saline solution may help clear nasal passages.
- **Oral fluids.** It is very important to stay fully hydrated.
- **Plenty of rest.** Allow for plenty of rest to recover more quickly.

What You Have Learned So Far...

- The common cold is caused by infection with a virus, usually a rhinovirus, although there are many other strains of virus that can also cause colds.
- The immune system response is activated for common colds and actually produces most of the symptoms such as coughing, runny nose, and sneezing.
- The common cold is diagnosed by its symptoms. If symptoms linger for more than 2 weeks, the underlying condition may be a more serious one, such as pneumonia.
- The common cold is best treated with nonmedicinal interventions such as rest, fluids, and humidification. Over-the-counter remedies such as cough medicines or decongestants may reduce the severity of symptoms but have adverse effects and are of questionable effectiveness. Many nutrients and supplements have been shown to also reduce symptoms, bolster the immune system, and reduce the risk of infection

Taking Aggressive Action to Defeat the Common Cold

After infection, viruses causing the common cold multiply rapidly. While most people wait until their symptoms become unbearable, then use an over-the-counter medication, the Life Extension Foundation believes that you should take aggressive action when the viral count is still relatively low and symptoms are mild. Numerous supplements have been shown to boost the immune system or have direct antiviral activity. Some supplements may offer additional help by interfering with the inflammatory cascade.

Vitamin C (ascorbic acid). Multiple studies have found that high doses of vitamin C alleviate common cold and flu symptoms, indicating that the vitamin does indeed have physiologic effects on colds (Hemila H 1997; Gorton HC et al 1999; Hemila H 2004). In a 5-year clinical trial using 50 milligrams (mg) or 500 mg of vitamin C daily, the high-dose group reported fewer colds than the low-

dose group (Sasazuki S et al 2005). From a meta-analysis of four double-blind, placebo-controlled trials, Dr Linus Pauling found a 45 percent decrease in the incidence of colds when 1000 mg of ascorbic acid (vitamin C) was used daily (Pauling L 1971).

Zinc. A number of published studies show that, if zinc lozenges are taken within 24 hours of the onset of common cold symptoms, the severity and duration of cold miseries are significantly diminished (Hulisz D 2004; Prasad AS et al 2000; Marshall S 1998; Mossad SB et al 1996).

Rhinoviruses attach to specific cell receptor sites in sinus and throat tissues, become lodged in the nose and throat, and then replicate out of control (Gwaltney JM 2002). By binding to the same cell receptor sites as do cold viruses, zinc inhibits the ability of rhinoviruses to take hold in the body.

A meta-analysis of all the published literature on zinc lozenges was conducted last year. The following was the conclusion of the report: "Clinical trial data support the value of zinc in reducing the duration and severity of symptoms of the common cold when administered within 24 hours of the onset of common cold symptoms. Additional clinical and laboratory evaluations are warranted to further define the role of ionic zinc for the prevention and treatment of the common cold and to elucidate the biochemical mechanisms through which zinc exerts its symptom-relieving effects" (Hulisz D 2004).

The key here is to suck on two 24-mg zinc lozenges at the very first symptom of a cold and continue doing this every 2 hours (while awake). Once rhinoviruses bind to their receptor sites in the nasal tissues and begin replicating, zinc lozenges lose their efficacy. Considering how inexpensive zinc lozenges are, it makes sense to keep them on hand so that they are immediately available if cold symptoms manifest.

One caveat to remember is that chronic use of zinc in doses over 100 mg/day may suppress immune function (Chandra RK 1984). Sucking on two zinc lozenges every 2 hours over the course of a day, the amount of total zinc intake could easily exceed 300 mg/day. This does not appear to be a problem in the short-term. If your cold symptoms do not subside after a few days of taking zinc lozenges, it would be best to stop taking them. Remember that less than 100 mg/day of zinc can improve immune function but taking more than 100 mg/day concerns some doctors.

N-acetylcysteine. N-acetylcysteine (NAC) is an acetylated ester of the amino acid L-cysteine. NAC raises glutathione levels, a potent internal antioxidant (Roes EM et al 2002). For many years, NAC has been used to treat bronchitis and other lung conditions as an expectorant or mucous thinner as well as an anti-inflammatory.

Cimetidine. Cimetidine is usually used to treat heartburn. A little-known side effect of cimetidine is that it inhibits the production of T-suppressor cells (Mitsuishi T et al 2003). In doing so, it boosts immune function by preventing the immune system from turning itself down.

Cimetidine has shown other immune-modulating effects such as increasing natural killer cell activity and boosting levels of the natural immune stimulants interleukin-2 (IL-2) and gamma interferon (Bourinbaier AS et al 1996; Kabuta H et al 1989; Kapinska-Mrowiecka M et al 1996). Human studies demonstrate cimetidine's efficacy against herpes and viral warts (Glass AT et al 1996; Goptu C et al 2000; Mitsuishi T et al 2003; Ronna T et al 1995; Shields CL et al 1999).

Since cimetidine is safe for most people, taking 800 to 1000 mg at night (or 200 mg three times a day and then 400 mg at night) seems like an effective therapy to temporarily turn up the immune system. Cimetidine in 200-mg tablets can be purchased over-the-counter at pharmacies. The directions in the over-the-counter package insert say that up to 800 mg/day is safe, but some published studies in which cimetidine was used as an antiviral agent have used up to 1000 mg/day (Choi YS et al 1993).

The Immune-Boosting Hormones DHEA and Melatonin

Dehydroepiandrosterone (DHEA) and its metabolites have demonstrated powerful immune-enhancing and antiviral effects (Ben-Yehuda A et al 1998; Corsini E et al 2002; Danenberg HD et al 1995; Danenberg HD et al 1997; Degelau J et al 1997; Padgett DA et al 1997; Padgett DA et al 2000). The administration of 50 mg a day of DHEA to elderly men resulted in the following immune enhancements compared to placebo:

- Increase of 35 percent in the number of monocyte immune cells
- Increase of 29 percent in the number of B immune cells
- Increase of 62 percent in B-cell activity
- Increase of 40 percent in T-cell activity
- Increase of 50 percent in IL-2
- Increase of 22 to 37 percent in natural killer cell number
- Increase of 45 percent in natural killer cell activity

One reason influenza can be so lethal to older people is that their immune systems are weak. A deficiency in DHEA appears to be partially responsible for the age-related decline in immune function (Fulop T Jr et al 1999; Khorram O et al 1997). One study showed that a metabolite of DHEA augmented activation of T-helper cells and protected mice from a lethal influenza virus infection (Padgett DA et al 1997).

Melatonin has broad-spectrum immune-enhancing effects and has been specifically shown to decrease viral load and prevent death in mice infected with certain viruses. The following was the conclusion of one melatonin study: "The immunomodulatory, antioxidant, and neuroprotective effects of melatonin suggest that this indole must be considered as an additional therapeutic alternative to fight viral diseases" (Maestroni GJ 1999).

Another study examined the immune function benefits of melatonin and found that melatonin activated IL-2 and gamma interferon, the body's natural hormonelike agents that facilitate T-helper cell production (Bonilla E et al 2004).

Taking higher doses (200 to 400 mg) of DHEA in the morning and higher doses of melatonin before bedtime (10 to 50 mg) would appear to be a logical approach to battling a viral infection.

The Best Possible Protection

The Life Extension Foundation and its founders have devoted themselves to pushing the knowledge of health beyond rigid, conventional boundaries. Although individual components of the information given here have been published in studies, there have been no clinical trials to support these recommendations in their entirety. In some cases, we are basing our recommendations on observations gleaned from decades of experience.

The following supplements, at the suggested dosages, represent a very aggressive approach to the common cold. Nevertheless, if taken at the first sign of symptoms, they may be able to ward off the viral infection and stop the cold before it can develop.

- **Cimetidine**—800 mg/day
- **Pure Gar garlic**—9000 mg once or twice a day (don't eat immediately after ingesting the garlic, and expect a strong sulfurous odor)
- **Kyolic aged garlic extract**—3600 mg/day
- **DHEA**—200 to 400 mg in the morning
- **Lactoferrin**—1200 mg/day
- **Zinc**—Two 24-mg lozenges every 2 hours (when awake) within 24 hours of the onset of symptoms (take only a few days to avoid toxic side effects)
- **Melatonin**—10 to 50 mg at bedtime

BOTANICAL AND OTHER NATURAL THERAPIES

Astragalus membranaceus. This root extract has been shown to have beneficial antioxidant, immune-modulating, and cardiovascular effects. It may improve lymphocyte function and increase IL-2 activity (Liu ZG et al 2003; Peng T et al 1995; Sun Y et al 1983; Wang DC 1989; Zhao XZ 1992). A preparation using *A. membranaceus* has been used to treat pneumonia in children. The authors believe it is beneficial because of its free radical-scavenging ability (Zong PP et al 1993).

Sambucus nigra. Also called black elderberry, *S. nigra* has been shown to have antiviral properties and is commonly used to treat colds or flu. Studies have shown that elderberry can increase production of inflammatory cytokines, which may stimulate the immune response and enable the immune system to work faster at destroying the viral load (Barak V et al 2001). A component of *S. nigra* has also been shown to bind to sialic acid receptors in the nasal mucosa, which is the same site used by the influenza virus for attachment (Ueno K et al 1997). Multiple studies have shown that people with influenza who supplemented with *S. nigra* experienced improvement in symptoms in 2 days, whereas recovery took at least 6 days in the control group (Zakay-Rones Z et al 1995; Zakay-Rones Z et al 2004). No adverse effects have been reported in clinical trials.

Garlic. With all the high-tech advances occurring in medicine, garlic would appear to be a relic of the past. Yet the scientific literature documents that garlic has powerful effects against certain viruses.

For instance, one recent study tested one capsule daily of an allicin-containing garlic supplement (like Pure Gar) from November through February on a group of 146 volunteers (Josling P 2001). Half the group received the garlic while the unfortunate other half got a placebo. The placebo group had 63 percent more common cold infections compared to the garlic group. Even more significant, those in the garlic group who did catch a cold had symptoms for an average of only 1.52 days compared to 5.01 days for the placebo group.

The doctors who conducted this garlic study concluded the following: "An allicin-containing supplement can prevent attack by the common cold virus." Considering the number of people afflicted with a cold each year, this should have been the lead news story of the day. The study was buried in a scientific journal while the medical establishment still states that there is no cure for the common cold.

Ribavirin is a prescription drug that has potent antiviral effects (Cattral MS et al 1996; Christie JM et al 1999; da Silva LC et al 2002; de Ledinghen V et al 2002; Di Bisceglie AM et al 1995; Fried MW et al 2002; Galban GE et al 2000; Kumada H 2002; Murphy ME et al 2000; Reichard O et al 1998; Schalm SW et al 1997a; Schalm SW et al 1997b; Schalm SW et al 1999; Schvarcz R et al 1995). Yet a Chinese study showed that (at least in the test tube), garlic is more effective than ribavirin in inhibiting viruses that attack the intestinal tract (Luo R et al 2001). The Life Extension Foundation has recommended ribavirin to treat various viral infections since 1983 but, in this particular study, garlic was shown to be superior.

A number of published studies indicate that both high-allicin garlic (such as Pure Gar) and aged garlic (such as Kyolic aged garlic) support healthy immune function while exerting antiviral effects (Guo NL et al 1993; Josling P 2001; Kyo E et al 2001; Liu ZF et al 2004; Moon DG et al 2000; Tsai Y et al 1985; Weber ND et al 1992). Garlic, a low-cost alternative, may be nature's most powerful weapon against certain viruses.

Andrographis paniculata. This herb is a traditional remedy used in India and Asia as a broad-spectrum natural antibiotic and immune system stimulator to treat bacterial, viral, and parasitic conditions. Multiple studies have shown the efficacy of *A. paniculata* against the common cold (Coon JT et al 2004; Poolsup N et al 2004). This herb has been shown to stimulate phagocytosis (antigen cell destruction) and increase proliferation of white blood cells (Puri A et al 1993). Studies indicate that *A. paniculata* decreases the duration and severity of cold symptoms, such as fatigue, sore throat, and nasal secretions (Caceres DD et al 1999).

Lactoferrin. It is well-known that infants obtain protection against certain infections from components contained in mother's milk. One such component is lactoferrin, which has well-documented immune-potentiating effects (Shin K et al 2005; Swart PJ et al 1998; Waarts BL et al 2005). Lactoferrin may boost natural killer cell activity and can kill certain viruses (Swart PJ et al 1998; Waarts BL et al 2005). Lactoferrin may stimulate macrophages, which in turn may help to induce cell-mediated immunity. Although many of the studies are on animals, lactoferrin is naturally present in many mucous membrane secretions in people, suggesting an innate human antimicrobial function (Nishiya K et al 1982; Zimecki M et al 2002).

A recent study showed that lactoferrin inhibits viral infection by interfering with the ability of certain viruses to bind to cell receptor sites (Waarts BL et al 2005).

Propolis. Before the discovery of antibiotics, honey was used in the fight against bacteria. The antibacterial effects of this folk remedy have since been confirmed by studies (Lusby PE et al 2005). In addition, *in vitro* and *in vivo* studies have shown that bee

propolis has an inhibitory effect on the growth and adherence of streptococci bacteria, and that propolis has antiviral and anti-inflammatory properties (Cohen HA et al 2004; Duarte S et al 2003; Mirzoeva OK et al 1996; Serkedjieva J et al 1992; Szmeja Z et al 1989). One study demonstrated that propolis decreased the duration of the common cold to just a few days. This study showed that the symptoms in the propolis treatment group improved 2.5 times faster than in the placebo group (Szmeja Z et al 1989).

Warning: Honey should NEVER be given to a child under 1 year of age; there is a significant risk of potentially fatal botulism. This risk vanishes in older children and adults.

LIFE EXTENSION FOUNDATION RECOMMENDATIONS

Although there is no cure for the common cold, patients should be proactive even before symptoms first appear to prevent infection, recover more quickly, reduce the severity of symptoms, and prevent the spread of the contagion. Frequent hand-washing and use of facial tissues with antiviral agents will help prevent the spread of the infection. In addition, take the following steps (especially during cold season):

- Eat properly.
- Get plenty of rest.
- Drink at least 8 to 10 glasses of fluids a day to avoid dehydration, keep mucous membranes moist, and loosen phlegm.
- Abstain from alcohol because it reduces the body's ability to fight infection.
- Avoid smoking and smoky places.
- Use mild pain relievers with anti-inflammatory properties, such as ibuprofen, to reduce aches and pains.
- Use saline-based, over-the-counter nose drops to relieve a stuffy nose.
- Use a cool-mist humidifier to keep nasal passages moist. Change the water daily to avoid buildup of molds.

A number of nutrients should also be considered, beginning when symptoms first appear, or when exposure to cold viruses is elevated (for example, when a member of the household is sick). These nutrients include:

- **Life Extension Mix**—Follow label directions.
- **Vitamin C**—1 to 10 grams (g) daily, in divided doses, up to bowel tolerance
- **Zinc gluconate**—one lozenge (5 to 15 mg) every 2 hours (while awake)
- **Astragalus membranaceus**—300 mg a day or 4 to 7 g in powder form
- **N-acetyl cysteine**—600 mg two times daily with vitamin C
- **S. nigra** (black elderberry)—15 milliliters (1 tablespoon) of elderberry juice—containing syrup four times a day for 3 to 5 days (adults only)
- **Melatonin**—10 mg/day 30 to 60 minutes before bed
- **Garlic extract**—600 to 1200 mg/day
- **Andrographis paniculata**—400 mg three times daily; for prevention, 200 mg/day 5 days a week
- **Lactoferrin**—300 to 900 mg/day
- **Propolis**—500 to 1500 mg/day
- **DHEA**—15 to 75 mg every morning (get blood tested after 3 to 6 weeks to ensure healthy maintenance levels)

For an alternative program, based on higher doses, please see the sidebar, The Best Possible Protection.

COMMON COLD SAFETY CAVEATS

An aggressive program of dietary supplementation should not be launched without the supervision of a qualified physician. Several of the nutrients suggested in this protocol may have adverse effects. These include:

DHEA

- Do not take DHEA if you could be pregnant, are breastfeeding, or could have prostate, breast, uterine, or ovarian cancer.

Garlic

- Garlic has blood-thinning, anticlotting properties.
- Discontinue using garlic before any surgical procedure.
- Garlic can cause headache, muscle pain, fatigue, vertigo, watery eyes, asthma, and gastrointestinal symptoms such as nausea and diarrhea.
- Ingesting large amounts of garlic can cause bad breath and body odor.

Melatonin

- Do not take melatonin if you are depressed.
- Do not take high doses of melatonin if you are trying to conceive. High doses of melatonin have been shown to inhibit ovulation.
- Melatonin can cause morning grogginess, a feeling of having a hangover or a “heavy head,” or gastrointestinal symptoms such as nausea and diarrhea.

NAC

- NAC clearance is reduced in people who have chronic liver disease.
- Do not take NAC if you have a history of kidney stones (particularly cystine stones).
- NAC can produce a false-positive result in the nitroprusside test for ketone bodies used to detect diabetes.
- Consult your doctor before taking NAC if you have a history of peptic ulcer disease. Mucolytic agents may disrupt the gastric mucosal barrier.
- NAC can cause headache (especially when used along with nitrates) and gastrointestinal symptoms such as nausea and diarrhea.

Vitamin C

- Do not take vitamin C if you have a history of kidney stones or of kidney insufficiency (defined as having a serum creatine level greater than 2 milligrams per deciliter and/or a creatinine clearance less than 30 milliliters per minute).
- Consult your doctor before taking large amounts of vitamin C if you have hemochromatosis, thalassemia, sideroblastic anemia, sickle cell anemia, or erythrocyte glucose-6-phosphate dehydrogenase (G6PD) deficiency. You can experience iron overload if you have one of these conditions and use large amounts of vitamin C.

Zinc

- High doses of zinc (above 30 milligrams daily) can cause adverse reactions.
- Zinc can cause a metallic taste, headache, drowsiness, and gastrointestinal symptoms such as nausea and diarrhea.
- High doses of zinc can lead to copper deficiency and hypochromic microcytic anemia secondary to zinc-induced copper deficiency.
- High doses of zinc may suppress the immune system.

For more information see the Safety Appendix

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