

## Bronchitis (Acute)

Acute bronchitis is one of the most common reasons people in the United States seek medical care. It is important to distinguish episodes of acute bronchitis from the chronic bronchitis that is associated with chronic obstructive pulmonary disease (COPD), which is discussed elsewhere in this book.

During an episode of acute bronchitis, the tissue lining the bronchi becomes irritated and inflamed, causing increased secretion of mucus and a narrowing of the airways. This produces the characteristic cough (Treanor JJ et al 2000). For many people, the cough itself becomes an aggravating factor and worsens their condition.

Up to 95 percent of cases of acute bronchitis are caused by viral infection, with most of the rest caused by environmental irritants. The most common viral causes are influenza, parainfluenza, and the common cold viruses. Unfortunately, in many cases (up to 70 percent), antibiotics are prescribed for acute viral bronchitis, making it one of the leading situations in which antibiotics are misused. Accordingly, the American College of Physicians and the U.S. Centers for Disease Control have issued guidelines aimed at stopping physicians from automatically prescribing antibiotics to patients with acute bronchitis. According to these two organizations, the only form of bronchitis that should be treated with antibiotics is pertussis (whooping cough). However, because of the risk that acute bronchitis can also be caused by certain bacteria, some physicians will also prescribe antibiotics to certain patients to prevent further infection.

Unfortunately, there is little that can be done to stop an episode of acute bronchitis once it begins. The most common recommendation for treatment is to wait for the inflammation to subside naturally, which will relieve the coughing and other symptoms. In very severe cases, a physician might recommend medications that limit coughing, reduce mucus production, and open airways. However, many of these medications have unpleasant side effects.

Life Extension's approach to acute bronchitis is based on two simple ideas:

1. The best defense is a good offense. Since acute bronchitis is usually caused by viral infection, every effort should be made to prevent exposure to these viruses from progressing to a full-blown infection. Life Extension has developed an aggressive program to help people avoid infections by these common viruses. To read about this program in detail, please see the chapters Influenza and Common Cold or refer to the section at the end of this chapter. It is important that people act quickly if they suspect they are coming down with a viral infection.
2. Although no medication or dietary supplement has been shown to specifically inhibit acute bronchitis, it may be possible to reduce symptoms by attacking the underlying cause of the condition, namely inflammation and its associated free radical damage and mucus production. Many nutrients have been shown to possess powerful anti-inflammatory and antioxidant capabilities.

### DIAGNOSING AND TREATING ACUTE BRONCHITIS

The diagnosis of acute bronchitis can be somewhat complicated because of the many conditions it resembles. Patients with acute bronchitis typically show up at the physician's office with a productive cough and signs of bronchial obstruction, including wheezing and breathlessness. Other symptoms may include chest pain and hoarseness. Fever is rarely associated with acute bronchitis, so if a fever is present in addition to a cough, the diagnosis is likely to be influenza or pneumonia. Other conditions that may be accompanied by a chronic cough and are sometimes mistaken for acute bronchitis include postnasal drip syndrome, asthma, and gastroesophageal reflux disease (GERD).

It is important to note that in nonsmokers, acute bronchitis should generally not be treated with antibiotics. These drugs are ineffective against the viruses that typically cause acute bronchitis, and their overuse leads to antibiotic-resistant pathogens. If therapy is warranted, physicians will likely suggest medications that control symptoms of acute bronchitis, such as coughing and mucus production. Pain relievers such as aspirin or nonsteroidal anti-inflammatories may be used, along with over-the-counter nasal decongestants. Cough suppression is not considered a primary treatment goal; the cough will resolve as the inflammation subsides and the bronchi heal.

People with acute bronchitis are also advised to drink plenty of fluids to help thin the mucus and hydrate the body. Expectorants, or medications that thin mucus, may also be recommended. The only antiviral drugs of value are those that specifically treat influenza virus in patients whose bronchitis is caused by this virus. There is some evidence that anti-influenza drugs can reduce the unnecessary use of antibiotics. Bronchodilators, which open airways, are rarely prescribed except to adults who are wheezing and have evidence of restrictive airway disease (Smucny J et al 2004).

Whether it is treated or not, acute bronchitis will typically resolve on its own as the inflammation of the bronchi gradually subsides and the airways open again. Nevertheless, the condition is aggravating and painful while it persists, so early intervention—at the first sign of symptoms of viral infection—is important to prevent acute bronchitis. More information on Life Extension's aggressive early intervention programs for the common cold and influenza can be found elsewhere in this book. Life Extension also advocates that people practice good “viral hygiene” by washing their hands as frequently as possible and avoiding coming into close contact with infected people.

## ANTIOXIDANT THERAPY

Antioxidants, which combat free radicals and reduce oxidative stress, are important weapons in the fight against respiratory infections. During an infection, the immune system is activated into producing inflammatory cytokines and increasing free radical production (Biesalski HK et al 1995). The oxidative stress caused by increased free radical production enhances the inflammation already present, leading to a self-reinforcing cycle of inflammation and free radical production.

**Vitamin C.** Although few clinical trials have addressed antioxidants and acute bronchitis, it is logical that people suffering from inflammation of the bronchi and elevated free radical damage would benefit from a strong antioxidant defense. There is also good evidence that large doses of vitamin C can interfere with viral infections at the first sign of symptoms (Gorton HC et al 1999), thus reducing one's risk of developing acute bronchitis.

- In one study, investigators examined cold and flu symptoms in two groups of students. Individuals in the control group were given conventional pain relievers and decongestants, whereas those in the test group were treated with hourly doses of 1000 mg vitamin C for the first six hours and then three times a day thereafter. Flu and cold symptoms in the test group decreased 85 percent compared with the control group (Gorton HC et al 1999).
- In a randomized, double-blind study, older patients hospitalized with acute respiratory infections (bronchitis and bronchopneumonia) were given 200 mg vitamin C daily. On evaluation two and four weeks after admission, significant increases in vitamin C concentration in plasma and white cells were noted, even in the presence of acute respiratory infection. Patients were further evaluated by a clinical scoring system based on primary symptoms of their respiratory illness. Those receiving vitamin C fared significantly better than those who received placebo (Hunt C et al 1994).

**Vitamin E.** Evidence from animal and human studies also shows that vitamin E, a powerful antioxidant, plays an important role in the maintenance of the immune system. Even marginal deficiencies in vitamin E may predispose individuals to viral infections by reducing the immune response. Therefore, supplying the body with additional antioxidants could reduce oxidative stress and enhance immune function (Beharka A et al 1997). A recent review has proposed that supplementation with antioxidants may improve or exert a protective effect on lung health (Romieu I 2005).

**N-acetylcysteine.** N-acetylcysteine (NAC) is a precursor of glutathione, an important internal antioxidant. NAC has been in clinical use for more than 30 years as a mucolytic drug. NAC is routinely used to boost antioxidant levels and dissolve mucus in people suffering from respiratory ailments (Kupczyk M et al 2002).

In a randomized study of 24 bronchitis patients with an average age of 66, the addition of 600 mg NAC twice daily to standard therapy improved symptoms and quality of life (Reichenberger F et al 2002). Other investigators have shown that administration of NAC reduces episodes of influenza and influenza-like illnesses, especially in older high-risk individuals (De Flora A et al 1997).

## INFLAMMATION AND ADDITIONAL NUTRIENT SUPPORT

**Omega-3 fatty acids.** The defining feature of acute bronchitis is inflammation that produces symptoms. Fortunately, many nutrients have been shown to reduce inflammation by interfering with the cascade of chemical reactions that causes inflammation. Among the best known are the omega-3 fatty acids. These essential fatty acids have been shown to decrease the production of bronchorestrictive leukotrienes by reducing the production of arachidonic acid. Some researchers believe that this effect explains why Eskimos, who eat a lot of these fatty acids in a diet rich in cold-water fish, experience less lung disease than other populations (Schwartz J 2000).

**Curcumin.** Curcumin, which is derived from the common spice turmeric, is also a natural anti-inflammatory. This supplement is a natural inhibitor of nuclear factor kappa beta, which mediates most inflammatory processes in the body. Curcumin has shown promise in protecting lung tissue against inflammation induced by chemical and infectious agents in the laboratory (Venkatesan N 2000). Although there are no human trials examining curcumin in acute bronchitis, its antioxidant and anti-inflammatory properties make it a logical therapy.

**Bromelain.** Bromelain, an extract of the pineapple plant, has also demonstrated anti-inflammatory and mucolytic properties (Maurer HR 2001). Bromelain is a collective term for enzymes found in pineapple fruit, stem, and leaves. These enzymes are

proteolytic, meaning they break down protein into its constituent peptides and amino acids. Bromelain has been found to be a mucolytic, or a compound that breaks down mucus (Bernkop-Schnurch A et al 2000). A recent review also noted that bromelain may offer therapeutic benefits to individuals who have bronchitis and sinusitis (Maurer HR 2001).

## LIFE EXTENSION'S FLU AND COMMON COLD PROGRAM

Because acute bronchitis is so often caused by the flu virus and the common cold, a summary of Life Extension's flu and common cold prevention program is presented here. For a more complete description, please see the appropriate chapters. At the first sign of infection, consider taking the following supplements. This program is not meant for long-term consumption because of the high doses. Follow these recommendations for only a few days.

**Vitamin C.** Megadoses of vitamin C (1000 mg every hour for the first 6 hours and three times daily thereafter) administered during or after influenza infection decreased influenza symptoms in a large group of students (Gorton HC et al 1999).

**Vitamin E.** Both human and animal studies have shown that vitamin E can help fight influenza infection by boosting the immune system (Hara M et al 2005; Gay R et al 2004). Animal studies have shown that vitamin E, in conjunction with other antioxidants, can help protect against the flu by reducing the oxidative damage associated with the virus:

- After being infected with the influenza virus, aged mice fed a diet supplemented with vitamin E had significantly lower pulmonary viral levels and maintained their body weight, unlike control mice or mice fed with other antioxidants. Levels of pro-inflammatory cytokines, including interleukin-6 and tumor necrosis factor-alpha, were lowest in the group supplemented with vitamin E (Han SN et al 2000).
- Vitamin E was shown to reduce the viral activity in the lungs of middle-aged mice after exposure to influenza (Meydani M 1999).
- Supplementation with vitamin E before infection helped protect the lungs of the mice against lipid peroxidation (Mileva M et al 2002).

**Selenium and zinc.** A combination supplement containing selenium and zinc can reduce the severity of flu infection.

- In one study, seniors who received an experimental formula of zinc, selenium, fermentable oligosaccharides (a kind of sugar that enhances beneficial bacteria), and structured triacylglycerides for 183 days showed signs of enhanced immune function and had fewer days of upper respiratory symptoms (Langkamp-Henken B et al 2004).
- A two-year supplementation program of vitamins and micronutrients showed that selenium and zinc significantly reduced infections in elderly residents of nursing homes (Girodon F et al 1997) and enhanced the residents' immune response to influenza vaccination (Girodon F et al 1999).

Mice that are deficient in selenium are more susceptible to influenza infection (Beck MA 2001). In selenium-deficient mice, the pro-inflammatory response is stronger and the immune response is weaker than in mice that have an adequate level of selenium (Beck MA et al 2003). Moreover, the genome of viruses in selenium-deficient mice shifts toward more virulent, resistant strains (Beck MA et al 2004).

Zinc has also been studied extensively for its ability to inhibit the viruses (such as the rhinovirus) that cause the common cold (Hulisz D 2004; Prasad AS et al 2000; Marshall S 1998; Mossad SB et al 1996).

**Lactoferrin.** Lactoferrin is a subfraction of whey and has antiviral, antimicrobial, anticancer, and immune-enhancing effects. Lactoferrin is concentrated in the saliva, where it comes into direct contact with pathogens and kills or suppresses them through a variety of mechanisms (Kawasaki Y et al 1993; Schoen P et al 1997). Lactoferrin may stimulate macrophages, which in turn may help induce cell-mediated immunity (Zimecki M et al 2002). Lactoferrin is present naturally in many mucous membrane secretions, suggesting an innate antimicrobial function (Zimecki M et al 2002; Nishiya K et al 1982). 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).

**Elderberry extract.** Studies show that a black elderberry extract (Sambucol) has antiviral properties against 10 strains of influenza virus. In a double-blind, placebo-controlled, randomized study, elderberry extract reduced the duration of influenza symptoms by one to two days (Barak V et al 2001; Zakay-Rones Z et al 1995).

**Tea.** Green tea has been shown to inhibit bacteria and viruses and stimulate the immune system. Black tea and extracted components, such as catechin and saponins (Hayashi K et al 2000), inhibit influenza virus growth, infectivity, and symptoms (Iwata M et al 1997a,b). In a cell culture study, the active ingredients in green tea were found to be powerful inhibitors of all varieties of influenza virus (Song JM et al 2005).

**Garlic.** Garlic has been valued for centuries for its medicinal properties. Garlic, and its active component, allicin, have a wide

spectrum of antifungal, antibacterial, and antiviral action. It benefits the immune system by increasing the number of natural killer cells and the killer activities of spleen cells (Harris JC et al 2001; Kyo E et al 2001). One recent study tested an allicin-containing garlic supplement on a group of 146 volunteers for four months. Half the group took one garlic capsule daily while the other half received a placebo. The placebo group had 63 percent more infections than the group that took the garlic capsule. Even more significant, those who took garlic capsules and who did catch a cold experienced symptoms for an average of only 1.52 days, compared with 5.01 days for the placebo group (Josling P 2001). Aged garlic has also been shown to have antiviral properties, particularly against influenza B (Tsai Y et al 1985) and to have immunomodulatory effects (Kyo E et al 2001).

**Dehydroepiandrosterone and melatonin.** In addition, the hormones dehydroepiandrosterone (DHEA) and melatonin have been shown to bolster the body's immune response (Maestroni GJ 1993, 1999; Padgett DA et al 1997, 2000). Taking higher-than-usual doses (200 to 400 mg) of DHEA in the morning and higher-than-usual doses (10 to 50 mg) of melatonin before bedtime would appear to be logical approaches to battling a viral infection.

**Cimetidine.** The antiviral drug cimetidine (Tagamet®) is an over-the-counter drug used to treat heartburn. It also has potent immune system-boosting effects that can drastically reduce the duration of certain viral infections. Because cimetidine is safe for most people to take, 800 to 1000 mg taken at night (or 200 mg three times a day and 400 mg at night) can help boost the immune system in the event of exposure to influenza. Cimetidine in 200-mg tablets can be purchased over the counter. The directions in over-the-counter package inserts indicate that it is safe to take as much as 800 mg cimetidine a day. Some published studies state that up to 1000 mg cimetidine daily is safe (Choi YS et al 1993).

## LIFE EXTENSION FOUNDATION RECOMMENDATIONS

By staying healthy and avoiding viral infection and environmental pollutants whenever possible, your chances of contracting acute bronchitis will be greatly reduced. Acute bronchitis is more common during the winter months, the flu and cold season, than at other times. Common-sense strategies to prevent acute bronchitis include ensuring appropriate and thorough hand washing to avoid exposure to viruses and reducing exposure to such irritants as air pollution, tobacco, and smoke (Hueston WJ et al 1998).

If exposure to a potential virus has already occurred, Life Extension's aggressive anticold and antifu program may help reduce the risk of infection. At the first sign of infection, the following supplements may help ward off more serious illness:

- **Cimetidine**—800 to 1000 milligrams (mg) daily
- **Pure Gar brand garlic**—9000 mg once or twice daily (consume food after ingesting this amount of garlic to reduce esophageal burning)
- **Kyolic aged garlic extract**—3600 mg daily
- **DHEA**—200 to 400 mg daily in the morning
- **Lactoferrin**—1200 mg daily
- **Zinc**—two 24-mg lozenges every two hours while awake. This is a very high dosage of zinc and is toxic if taken for long periods. Take this much zinc only for a few days.
- **Melatonin**—10 to 50 mg at bedtime
- **Vitamin C**—6000 mg daily (1000 mg every hour for the first six hours), then 3000 mg daily (1000 mg several hours apart).
- **Vitamin E**—400 international units (IU) daily
- **Green tea**—725 mg daily. A decaffeinated form is available for people who are sensitive to caffeine.
- **Selenium**—200 micrograms (mcg) daily
- **Elderberry extract**—30 mg, three times daily

Once acute bronchitis has developed, the following nutrients might help reduce inflammation and provide your body with valuable antioxidant support:

- **Vitamin C**—2000 to 3000 mg daily
- **Vitamin E**—400 IU daily, with at least 200 mg gamma tocopherol
- **NAC**—600 to 1800 mg daily
- **EPA/DHA**—1400 mg EPA and 1000 mg DHA daily
- **GLA**—900 to 1800 mg daily
- **Curcumin**—800 to 1600 mg daily
- **Bromelain**—500 mg several times daily on an empty stomach

## PRODUCT AVAILABILITY

All the nutrients and supplements discussed in this section are available through the Life Extension Foundation Buyers Club, Inc. For ordering information, call anytime toll-free 1-800-544-4440, or visit us online at [www.LifeExtension.com](http://www.LifeExtension.com).

The blood tests discussed in this section are available through Life Extension National Diagnostics, Inc. For ordering information, call anytime toll-free 1-800-208-3444, or visit us online at [www.LifeExtension.com](http://www.LifeExtension.com).

## **BRONCHITIS 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:

### **Bromelain**

- Consult your doctor before taking bromelain if you are taking anticoagulants or antithrombotic agents. Bromelain can thin the blood.
- Bromelain can cause gastrointestinal symptoms such as nausea and diarrhea.
- Bromelain can cause bleeding from the uterus between menstrual periods (metrorrhagia) and excessive uterine bleeding during menstruation (menorrhagia).

### **Curcumin**

- Do not take curcumin if you have a bile duct obstruction or a history of gallstones. Taking curcumin can stimulate bile production.
- Consult your doctor before taking curcumin if you have gastroesophageal reflux disease (GERD) or a history of peptic ulcer disease.
- Consult your doctor before taking curcumin if you take warfarin or antiplatelet drugs. Curcumin can have antithrombotic activity.
- Always take curcumin with food. Curcumin may cause gastric irritation, ulceration, gastritis, and peptic ulcer disease if taken on an empty stomach.
- Curcumin can cause gastrointestinal symptoms such as nausea and diarrhea.

### **DHEA**

- Do not take DHEA if you could be pregnant, are breastfeeding, or could have prostate, breast, uterine, or ovarian cancer.
- DHEA can cause androgenic effects in woman such as acne, deepening of the voice, facial hair growth and hair loss.

### **EPA/DHA**

- Consult your doctor before taking EPA/DHA if you take warfarin (Coumadin). Taking EPA/DHA with warfarin may increase the risk of bleeding.
- Discontinue using EPA/DHA 2 weeks before any surgical procedure.

### **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.

### **GLA**

- Consult your doctor before taking GLA if you take warfarin (Coumadin). Taking GLA with warfarin may increase the risk of bleeding.
- Discontinue using GLA 2 weeks before any surgical procedure.
- GLA can cause gastrointestinal symptoms such as nausea and diarrhea.

### **Green Tea**

- Consult your doctor before taking green tea extract if you take aspirin or warfarin (Coumadin). Taking green tea extract and aspirin or warfarin can increase the risk of bleeding.
- Discontinue using green tea extract 2 weeks before any surgical procedure. Green tea extract may decrease platelet aggregation.
- Green tea extract contains caffeine, which may produce a variety of symptoms including restlessness, nausea, headache, muscle tension, sleep disturbances, and rapid heartbeat.

## 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.

## Selenium

- High doses of selenium (1000 micrograms or more daily) for prolonged periods may cause adverse reactions.
- High doses of selenium taken for prolonged periods may cause chronic selenium poisoning. Symptoms include loss of hair and nails or brittle hair and nails.
- Selenium can cause rash, breath that smells like garlic, fatigue, irritability, and nausea and vomiting.

## 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.

## Vitamin E

- Consult your doctor before taking vitamin E if you take warfarin (Coumadin).
- Consult your doctor before taking high doses of vitamin E if you have a vitamin K deficiency or a history of liver failure.
- Consult your doctor before taking vitamin E if you have a history of any bleeding disorder such as peptic ulcers, hemorrhagic stroke, or hemophilia.
- Discontinue using vitamin E 1 month before any surgical procedure.

## 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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