

Healthy Steps to Cold and Flu Care and Prevention

Sneezing, scratchy throat, runny nose - everyone knows the first signs of a cold, probably the most common illness known. Although the common cold is usually mild, with symptoms lasting one to two weeks, it is a leading cause of doctor visits and of school and job absenteeism.

The Problem

In the course of a year, individuals in the United States suffer 1 billion colds, according to some estimates. Colds are most prevalent among children, and seem to be related to youngsters' relative lack of resistance to infection and to contacts with other children in day-care centers and schools. Children have about six to ten colds a year. In families with children in school, the number of colds per child can be as high as 12 a year. Adults average about two to four colds a year, although the range varies widely. Women, especially those aged 20 to 30 years, have more colds than men, possibly because of their closer contact with children. On average, individuals older than 60 have fewer than one cold a year.

The economic impact of the common cold is enormous. The National Center for Health Statistics (NCHS) estimates that, in 1996, 62 million cases of the common cold in the United States required medical attention or resulted in restricted activity. In 1996, colds caused 45 million days of restricted activity and 22 million days lost from school, according to NCHS.

The Causes

The Viruses - More than 200 different viruses are known to cause the symptoms of the common cold. Some, such as the rhinoviruses, seldom produce serious illnesses. Others, such as parainfluenza and respiratory syncytial virus, produce mild infections in adults but can precipitate severe lower respiratory infections in young children.

Rhinoviruses (from the Greek rhin, meaning "nose") cause an estimated 30 to 35 percent of all adult colds, and are most active in early fall, spring and summer. More than 110 distinct rhinovirus types have been identified. These agents grow best at temperatures of 33 degrees Celsius [about 91 degrees Fahrenheit (F)], the temperature of the human nasal mucosa.

Coronaviruses are believed to cause a large percentage of all adult colds. They induce colds primarily in the winter and early spring. Of the more than 30 isolated strains, three or four infect humans. The importance of coronaviruses as causative agents is hard to assess because, unlike rhinoviruses, they are difficult to grow in the laboratory.

Approximately 10 to 15 percent of adult colds are caused by viruses also responsible for other, more severe illnesses: adenoviruses, coxsackieviruses, echoviruses, orthomyxoviruses (including influenza A and B viruses), paramyxoviruses (including several parainfluenza viruses), respiratory syncytial virus and enteroviruses.

The causes of 30 to 50 percent of adult colds, presumed to be viral, remain unidentified. The same viruses that produce colds in adults appear to cause colds in children. The relative importance of various viruses in pediatric colds, however, is unclear because of the difficulty in isolating the precise cause of symptoms in studies of children with colds.

Does Cold Weather Cause A Cold?

Although many people are convinced that a cold results from exposure to cold weather, or from getting chilled or overheated, researchers have found that these conditions have little or no effect on the development or severity of a cold. Nor is susceptibility apparently related to factors such as exercise, diet, or enlarged tonsils or adenoids. On the other hand, research suggests that psychological stress, allergic disorders affecting the nasal passages or pharynx (throat), and menstrual cycles may have an impact on a person's susceptibility to colds.

The Cold Season

In the United States, most colds occur during the fall and winter. Beginning in late August or early September, the incidence of colds increases slowly for a few weeks and remains high until March or April, when it declines. The seasonal variation may relate to the opening of schools and to cold weather, which prompt people to spend more time indoors and increase the chances that viruses will spread from person to person.

Seasonal changes in relative humidity also may affect the prevalence of colds. The most common cold-causing viruses survive better when humidity is low—the colder months of the year. Cold weather also may make the nasal passages' lining drier and more vulnerable to viral infection.

Cold Symptoms

Symptoms of the common cold usually begin two to three days after infection and often include nasal discharge, obstruction of nasal breathing, swelling of the sinus membranes, sneezing, sore throat, cough, and headache. Fever is usually slight but can climb to 102° F in infants and young children. Cold symptoms can last from two to 14 days, but two-thirds of people recover in a week. If symptoms occur often or last much longer than two weeks, they may be the result of an allergy rather than a cold.

Colds occasionally can lead to secondary bacterial infections of the middle ear or sinuses, requiring treatment with antibiotics. High fever, significantly swollen glands, severe facial pain in the sinuses, and a cough that produces mucus, may indicate a complication or more serious illness requiring a doctor's attention.

How Cold Viruses Cause Disease

Viruses cause infection by overcoming the body's complex defense system. The body's first line of defense is mucus, produced by the membranes in the nose and throat. Mucus traps the material we inhale: pollen, dust, bacteria and viruses. When a virus penetrates the mucus and enters a cell, it commandeers the protein-making machinery to manufacture new viruses which, in turn, attack surrounding cells.

Cold symptoms: the body fights back. Cold symptoms are probably the result of the body's immune response to the viral invasion. Virus-infected cells in the nose send out signals that recruit specialized white blood cells to the site of the infection. In turn, these cells emit a range of immune system chemicals such as kinins. These chemicals probably lead to the symptoms of the common cold by causing swelling and inflammation of the nasal membranes, leakage of proteins and fluid from capillaries and lymph vessels, and the increased production of mucus.

How Colds Are Spread

Depending on the virus type, any or all of the following routes of transmission may be common:

- Touching infectious respiratory secretions on skin and on environmental surfaces and then touching the eyes or nose.
- Inhaling relatively large particles of respiratory secretions transported briefly in the air.
- Inhaling droplet nuclei: smaller infectious particles suspended in the air for long periods of time.

Much of the research on the transmission of the common cold has been done with rhinoviruses, which are shed in the highest concentration in nasal secretions.

Studies suggest a person is most likely to transmit rhinoviruses in the second to fourth day of infection, when the amount of virus in nasal secretions is highest. Researchers also have shown that using aspirin to treat colds increases the amount of virus shed in nasal secretions, possibly making the cold sufferer more of a hazard to others.

Prevention

Hand washing is the simplest and most effective way to keep from getting rhinovirus colds. Not touching the nose or eyes is another. Individuals with colds should always sneeze or cough into a facial tissue, and promptly throw it away. If possible, one should avoid close, prolonged exposure to persons who have colds.

Because rhinoviruses can survive up to three hours outside the nasal passages on inanimate objects and skin, cleaning environmental surfaces with a virus-killing disinfectant might help prevent spread of infection.

Treatment

Only symptomatic treatment is available for uncomplicated cases of the common cold: bed rest, plenty of fluids, gargling with warm salt water, petroleum jelly for a raw nose, and aspirin or acetaminophen to relieve headache or fever.

A word of caution: several studies have linked the use of aspirin to the development of Reye's syndrome in children recovering from influenza or chickenpox. Reye's syndrome is a rare but serious illness that usually occurs in children between the ages of three and twelve years. It can affect all organs of the body, but most often injures the brain and liver. While most children who survive an episode of Reye's syndrome do not suffer any lasting consequences, the illness can lead to permanent brain damage or death. The American Academy of Pediatrics recommends children and teenagers not be given aspirin or any medications containing aspirin when they have any viral illness, particularly chickenpox or influenza. Many doctors recommend these

medications be used for colds in adults only when headache or fever is present. Researchers, however, have found that aspirin and acetaminophen can suppress certain immune responses and increase nasal stuffiness in adults.

Nonprescription cold remedies, including decongestants and cough suppressants, may relieve some cold symptoms but will not prevent, cure, or even shorten the duration of illness. Moreover, most have some side effects, such as drowsiness, dizziness, insomnia, or upset stomach, and should be taken with care.

Nonprescription antihistamines may have some effect in relieving inflammatory responses such as runny nose and watery eyes that are commonly associated with colds.

Antibiotics do not kill viruses. These prescription drugs should be used only for rare bacterial complications, such as sinusitis or ear infections, that can develop as secondary infections. The use of antibiotics “just in case” will not prevent secondary bacterial infections.

Does vitamin C have a role? Many people are convinced that taking large quantities of vitamin C will prevent colds or relieve symptoms. To test this theory, several large-scale, controlled studies involving children and adults have been conducted. To date, no conclusive data has shown that large doses of vitamin C prevent colds. The vitamin may reduce the severity or duration of symptoms, but there is no definitive evidence.

Taking vitamin C over long periods of time in large amounts may be harmful. Too much vitamin C can cause severe diarrhea, a particular danger for elderly people and small children. In addition, too much vitamin C distorts results of tests commonly used to measure the amount of glucose in urine and blood. Combining oral anticoagulant drugs and excessive amounts of vitamin C can produce abnormal results in blood-clotting tests.

Inhaling steam also has been proposed as a treatment of colds on the assumption that increasing the temperature inside the nose inhibits rhinovirus replication. Recent studies found that this approach had no effect on the symptoms or amount of viral shedding in individuals with rhinovirus colds. But steam may temporarily relieve symptoms of congestion associated with colds.

Interferon-alpha has been studied extensively for the treatment of the common cold. Investigators have shown interferon, given in daily doses by nasal spray, can prevent infection and illness. Interferon, however, causes unacceptable side effects such as nosebleeds and does not appear useful in treating established colds.

Flu

Influenza, or flu, is a respiratory infection caused by a variety of flu viruses. The most familiar aspect of the flu is the way it can “knock you off your feet” as it sweeps through entire communities.

The flu differs in several ways from the common cold, a respiratory infection also caused by viruses. For example, people with colds rarely get fevers or headaches or suffer from the extreme exhaustion that flu viruses cause.

The U.S. Centers for Disease Control and Prevention (CDC) estimates that 10 to 20 percent of Americans come down with the flu during each flu season, which typically lasts from November to March. Children are two to three times more likely than adults to get sick with the flu, and children frequently spread the virus to others. Although most people recover from the illness, CDC estimates that in the United States more than 100,000 people are hospitalized and about 36,000 people die from the flu and its complications every year.

When And Where Do People Usually Get The Flu?

Flu outbreaks usually begin suddenly and occur mainly in the late fall and winter. The disease spreads through communities creating an epidemic. During the epidemic, the number of cases peaks in about 3 weeks and subsides after another 3 or 4 weeks. Half of the population of a community may be affected. Because schools are an excellent place for flu viruses to attack and spread, families with school-age children have more infections than other families, with an average of one-third of the family members infected each year.

Is The Flu An Important Disease?

Besides the rapid start of the outbreaks and the large numbers of people affected, the flu is an important disease because it can cause serious complications. Most people who get the flu get better within a week (although they may have a lingering cough and tire easily for a while longer). For elderly people, newborn babies, and people with certain chronic illnesses, however, the flu and its complications can be life-threatening.

How Is The Flu Transmitted?

You can get the flu if someone around you who has the flu coughs or sneezes. You can get the flu simply by touching a surface like a telephone or door knob that has been contaminated by a touch from someone who has the flu. The viruses can pass through the air and enter your body through your nose or mouth. If you've touched a contaminated surface, they can pass from your hand to your nose or mouth.

You are at greatest risk of getting infected in highly populated areas, such as in crowded living conditions and in schools.

What Are Flu Symptoms?

If you get infected by the flu virus, you will usually feel symptoms one to four days later. You can spread the flu to others before your symptoms start and for another three to four days after your symptoms appear.

The symptoms start very quickly and may include

- Headache
- Chills
- Dry cough
- Body aches

- Fever
- Stuffy nose
- Sore throat

Typically, the fever begins to decline on the second or third day of the illness. The flu almost never causes symptoms in the stomach and intestines. The illness that some people often call “stomach flu” is not influenza.

How Does A Health Care Provider Diagnose The Flu?

Usually, health care providers diagnose the flu on the basis of whether it is epidemic in the community and whether the patient's complaints fit the current pattern of symptoms. Health care providers rarely use laboratory tests to identify the virus during an epidemic. Health officials, however, monitor certain U.S. health clinics and do laboratory tests to determine which type of flu virus is responsible for the epidemic.

How Can I Keep From Getting The Flu?

Flu Vaccine

The main way to keep from getting flu is to get a yearly flu vaccine. You can get the vaccine at your health care provider's office or a local clinic, and in many communities at workplaces, supermarkets, and drugstores. You must get the vaccine every year because it changes.

Until recently, you could get the flu vaccine only as an injection (shot). In 2003, however, the Food and Drug Administration (FDA) approved a nasal spray flu vaccine called FluMist, which you can get from your health care provider. FDA approved it for use in healthy people aged 5 to 49 years.

You should not use FluMist if

- You have certain lung conditions, including asthma, or heart conditions
- You have metabolic disorders such as diabetes or renal dysfunction
- You have an immunodeficiency diseases or are on immunosuppressive treatment
- You have had Guillain-Barré syndrome
- You are pregnant
- You have a history of allergy or hypersensitivity, including anaphylaxis, to any of the parts of FluMist or to eggs

Children or teenagers who regularly take aspirin or products containing aspirin also should not take FluMist.

Scientists make a different vaccine every year because the strains of flu viruses change from year to year. Nine to 10 months before the flu season begins, they prepare a new vaccine made from inactivated (killed) flu viruses. Because the viruses are killed, they cannot cause infections. The vaccine preparation is based on the strains of the flu viruses that are in circulation at the time. It includes those A and B viruses (see section below on types of flu viruses) expected to circulate the following winter.

Sometimes, an unpredicted new strain may appear after the vaccine has been made and distributed to health care providers and clinics. Because of this, even if you do get the flu vaccine, you still may get infected. If you do get infected, however, the disease usually is milder because the vaccine still will give you some protection.

Your immune system takes time to respond to the flu vaccine. Therefore, you should get vaccinated 6 to 8 weeks before flu season begins in November to prevent getting infected or reduce the severity of flu if you do get it. Because the flu season usually lasts until March, however, it's not too late to get it after the season has begun. The vaccine itself cannot cause the flu, but you could become exposed to the virus by someone else and get infected soon after you are vaccinated.

Are There Possible Side Effects From The Flu Vaccine?

You should be aware that the flu vaccine can cause side effects. The most common side effect in children and adults is soreness at the site of the vaccination. Other side effects, especially in children who previously have not been exposed to the flu virus, include fever, tiredness, and sore muscles. These side effects may begin 6 to 12 hours after vaccination and may last for up to 2 days.

Viruses for producing the vaccine are grown in chicken eggs and then killed with a chemical so that they can no longer cause an infection. The flu vaccine may contain some egg protein, which can cause an allergic reaction. Therefore, if you are allergic to eggs or have ever had a serious allergic reaction to the flu vaccine, the CDC recommends that you consult with your health care provider before getting vaccinated.

Who should get the flu vaccine?

If you are in any of the following groups or live in a household with someone who is, the CDC recommends that you get the flu vaccine.

- You are 50 years of age or older
- You have chronic diseases of your heart, lungs, or kidneys
- You have diabetes
- Your immune system does not function properly
- You have a severe form of anemia
- You will be more than 3 months pregnant during the flu season
- You live in a nursing home or other chronic-care housing facility

In 2004, the CDC added the recommendation that children 6 months to 23 months of age get the flu vaccine every year. The CDC also recommends that you get a flu shot if you are in close contact with children in this age group.

Children and teenagers (aged 6 months to 18 years) should get the flu vaccine if they are taking long-term aspirin treatment as they may be at risk of developing Reye's syndrome following a flu infection (see section on complications in children). They should also get the flu vaccine if they live in a household with someone in the above groups.

Health care providers and volunteers should get the flu vaccine if they work with patients in any of the above groups.

Medicine For Prevention

Although the flu vaccine is the best way to prevent getting the flu, three antiviral medicines also are available by prescription that will help prevent flu infection.

- Tamiflu (oseltamivir)
- Flumadine (rimantadine)
- Symmetrel (amantadine)

Tamiflu is for use in adults and teenagers 13 years and older. Rimantadine and amantadine may be used by adults and children who are 1 year of age and older.

Rimantadine and amantadine have unpleasant side effects. Your health care provider can help you decide which medicine is best for you.

- These medicines help prevent the flu if you take them for at least 2 weeks during the outbreak of flu in your community.
- You may use these medicines if you are in close contact with family members or others who have the flu.
- You may use them if you are in close contact with people who have been vaccinated but whom you want to give added protection from getting the flu.
- You may use either medicine immediately following flu vaccination during a flu epidemic to protect you during the 2- to 4-week period before antibodies (proteins from your immune system that protect you from the flu virus) develop or when a flu epidemic is caused by virus strains other than those covered by the vaccine.

You should discuss the flu vaccine and medicines with your health care provider before the flu season begins.

How Is Flu Treated?

Many people treat their flu infections by simply

- Resting in bed
- Drinking plenty of fluids
- Taking over-the-counter medicine such as aspirin or acetaminophen (Tylenol, for example)

Do not give aspirin to children and adolescents who have the flu.

Do not take antibiotics to treat the flu because they do not work on viruses. Antibiotics only work against some infections caused by bacteria.

Medicine for Treatment

If you do get the flu and want to take medicine to treat it, your health care provider may prescribe one of four available antiviral medicines.

- **Tamiflu** (oseltamivir) helps adults 18 years and older and **Relenza** (zanamivir) helps adults and children 7 years and older who have an uncomplicated flu infection and who have had symptoms for no more than two days. FDA also has approved Tamiflu for use in children 1 year of age and older who have had symptoms for no more than 2 days. Both treat influenza type A and type B infections.
- **Flumadine** (rimantadine) helps adults who have influenza type A virus infections. It has no effect on influenza type B virus infections.
- **Symmetrel** (amantadine) may be taken by adults and children who are 1 year of age and older to prevent and treat type A influenza virus infections. Amantadine, however, is more likely to cause side effects such as lightheadedness and inability to sleep more often than is rimantadine.

To work well, you must take these medicines within 48 hours after the flu begins. They reduce the length or time fever and other symptoms last and allow you to return to your daily routine quicker.

What Are Possible Complications From The Flu?

You can have flu complications if you get a bacterial infection, which can cause pneumonia in your weakened lungs. Pneumonia also can be caused by the flu virus itself.

Complications usually appear after you start feeling better. After a brief period of improvement, you may suddenly get symptoms.

- High fever
- Shaking chills
- Chest pain with each breath
- Coughing that produces thick, yellow-greenish-colored mucus

Pneumonia can be a very serious and sometimes life-threatening condition. If you have any of these symptoms, you should contact your health care provider immediately so that you can get the appropriate treatment.

Are There Other Flu Complications That Affect Only Children?

Reye's syndrome, a condition that affects the nerves, sometimes develops in children and teenagers who are recovering from the flu. Reye's syndrome begins with nausea and vomiting, but the progressive mental changes (such as confusion or delirium) cause the greatest concern.

The syndrome often begins in young people after they take aspirin to get rid of fever or pain. Although very few children develop Reye's syndrome, you should consult a health care provider before giving aspirin or products that contain aspirin to children. Acetaminophen does not seem to be associated with Reye's syndrome.

Other complications of the flu that affect children are

- Convulsions caused by fever
- Croup
- Ear infections, such as otitis media

Newborn babies recently out of intensive care units are particularly vulnerable to suffering from flu complications.

Are There Different Types Of Flu Viruses?

The first flu virus was identified in the 1930s. Since then, scientists have classified flu viruses into types A, B, and C.

Type A is the most common and usually causes the most serious epidemics. Type B outbreaks also can cause epidemics, but the disease it produces generally is milder than that caused by type A. Type C viruses, on the other hand, never have been connected with a large epidemic.

Flu Pandemics In The 20th Century

If a flu virus emerges that is either new or has not circulated in many years, and if it is able to spread easily from person to person, it could quickly travel around the world and cause serious illness and death for millions of people. This is called a flu pandemic.

The 1918 Spanish flu pandemic is the catastrophe against which all modern pandemics are measured. More than 20 million people were killed worldwide; 500,000 died in the United States alone. This virus was especially quick to kill. So far, the world has not seen a virus that severe again.

In 1957 and 1968, the Asian flu and Hong Kong flu, respectively, invaded the United States. Although hundreds of thousands of people in the United States died, the death toll for each pandemic was not as high as that for the Spanish flu.

In 1976, the United States experienced a swine flu scare. When a new flu virus was first identified at Fort Dix, New Jersey, it was labeled the "killer flu," and health experts were afraid that it would infect people around the world. In fact, swine flu never left the Fort Dix area. Research on the virus later showed that if it had spread, it would probably have been much less deadly than the Spanish flu.

In 1997, another "near miss" pandemic occurred when 18 people in Hong Kong became ill from a new flu virus. Six of the infected people subsequently died. Usually, flu viruses move first from chickens to pigs, and then from pigs to humans. This virus was different because it moved directly from chickens to people. The avian flu never became a pandemic, however, because it didn't easily spread from person to person. In addition, public health authorities ordered the slaughter of all live chickens in Hong Kong.

In 1999, two children in Hong Kong were infected with a flu virus that usually infects birds. They were the first confirmed human infections by this virus, and both children recovered. Although other infections from this virus were reported from China, there have been no cases since April 1999.

In 2003, there have been three avian flu outbreaks.

- In February, three people in Hong Kong were infected with an avian influenza virus related to the 1997 virus; two died.

- In March, an influenza outbreak in poultry workers in the Netherlands infected about 80 workers; one died.
- In November, one child in Hong Kong was infected but recovered.

The U.S. 2003 flu season began early, and as of December 6, 47 states reported cases of human-to-human flu transmission to the CDC. Twenty-four states reported widespread infections. Several children have died in this outbreak.

What Research Is Going On?

Although flu epidemics pop up in the fall and winter seasons in communities throughout the world every year, there has not been a pandemic since 1968. Scientists are worried that a new flu virus will emerge in this century and cause a severe pandemic again. For this reason, research institutions and health departments around the world are cooperating to track flu outbreaks in humans and animals, and to determine what types and strains of flu viruses are the causes.

To prevent another flu pandemic and reduce the numbers of flu epidemics, the National Institute of Allergy and Infectious Diseases (NIAID) supports research to find out how influenza viruses work, and to develop better vaccines to prevent and treat influenza virus infections.

From the National Institute of Allergies and Infectious Diseases

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