Influenza

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PURPOSE: This course segment is necessary for all healthcare workers to update them with the latest information on influenza.

OBJECTIVES: When completing this course, you will be able to:

1. Define the symptoms of influenza and what makes influenza different than other illnesses like the common cold and stomach viruses.
2. Define the different types of influenza and how it spreads
3. Explain which individuals are at highest risk for contracting influenza
4. Explain how to prevent influenza from spreading

OVERVIEW

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 Centers for Disease Control and Prevention (CDC) estimates that 5 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 200,000 people are hospitalized and about 36,000 people die from the flu and its complications every year.

Flu outbreaks

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.

Importance of flu

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.

Types of flu viruses

The first flu virus was identified in the 1930s. Since then, scientists have classified influenza 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.

TRANSMISSION

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.

SYMPTOMS

If you get infected by the flu virus, you will usually feel symptoms 1 to 4 days later. You can spread the flu to others before your symptoms start and for another 3 to 4 days after your symptoms appear. The symptoms start very quickly and may include

- Body aches
- Chills
- Dry cough
- Fever
- Headache
- Sore throat
- Stuffy nose

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 call "stomach flu" is not influenza.

DIAGNOSIS

Usually, health care providers diagnose the flu on the basis of whether it is epidemic in the community and whether the person'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.

PREVENTION Flu Vaccine

The main way to keep from getting flu is to get a yearly flu vaccine. You can get the vaccine at your doctor'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.

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 have been killed, they cannot cause infection. 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 doctor's offices 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 will still give you some protection.

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 that you can get from your health care provider. The 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 kidney dysfunction
- You have an immunodeficiency disease 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.

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.

Possible side effects

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, CDC recommends that you consult with your health care provider before getting vaccinated.

Vaccine recommendations

If you are in any of the following groups or live in a household with someone who is, 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
- You are in close contact with children 0 to 23 months of age

In response to vaccine shortages in previous flu seasons, CDC, in coordination with its Advisory Committee for Immunization Practices (ACIP), issued recommendations for prioritization of influenza vaccination. Go to this Web site for the 2005-2006 recommendations: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5434a4.htm. In addition, ACIP has recommended that the U.S. government's Vaccines for Children program expand its distribution of FluMist to children and adolescents aged 5 to 18 for the 2005-2006 season.

CDC recommends that children 6 months to 23 months of age get the flu vaccine.

Children and teenagers (6 months to 18 years of age) 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 people in any of the above groups.

Medicine for Prevention

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

- Tamiflu (oseltamivir)
- Flumadine (rimantadine) (See text box below.)
- Symmetrel (amantadine) (See text box below.)
- Relenza (zanamivir)

Tamiflu, Flumadine, and Symmetrel may be used by children who are 1 year of age and older and adults. For adults and children 5 years of age and older, Relenza is used for prevention of flu.

- 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 them immediately following flu vaccination during a flu epidemic to protect you during the 2- to 4-week period before antibodies develop or when a flu epidemic is caused by virus strains other than those covered by the vaccine. (Antibodies are proteins from your immune system that protect you from the flu virus.)

Your health care provider can help you decide which medicine is best for you. You should discuss the flu vaccine and medicines with your health care provider before the flu season begins.

Because of influenza A virus resistance to rimantadine and amantadine, CDC recommends that you not take these drugs to prevent flu during the 2005-2006 flu season.

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) is for treating influenza A and B virus infections in adults and children 1 year and older.
- Relenza (zanamivir) is for treating influenza A and B virus infections in children 7 years and older and adults who have an uncomplicated flu infection and who have had symptoms for no more than 2 days. Relenza is not used to prevent flu infection.
- Flumadine (rimantadine) is for treating adults who have influenza type A virus infections. It has no effect on influenza type B virus infections. (See text box below.)
- Symmetrel (amantadine) is for treating adults and children who are 1 year of age and older to prevent and treat type A influenza virus infections but has no effect on influenza B virus infections. Symmetrel, however, is more likely to cause side effects such as lightheadedness and inability to sleep more often than is Flumadine. (See text box below.)

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 more quickly return to your daily routine.

Because of influenza A virus resistance to rimantadine and amantadine, CDC recommends that you not take these drugs to treat flu during the 2005-2006 flu season.

COMPLICATIONS

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 these 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 to get the appropriate treatment.

Flu complications in children and teenagers

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 connected with Reye's syndrome.

Other complications of the flu that can 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.

IMPORTANT FLU OUTBREAKS SINCE 1918

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 influenza virus called H5N1. 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 an influenza virus called H9N2 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, one flu strain, labeled H5N1, caused two Hong Kong family members to be hospitalized after a visit to China, killing one of them, a 33-year-old man. (A third family member died while in China of an undiagnosed respiratory illness.)

As of November 29, 2005, H5N1 has caused illness in 133 people, 68 of whom have died. H5N1 infections have been confirmed in Thailand, Vietnam, Indonesia, Cambodia, and China. Researchers are especially concerned because this flu strain, which is transmitted by birds and is quite deadly, is becoming endemic in Asia and has infected humans in an unprecedented number of countries.

In addition, from 2003 to the present, several other strains of bird flu have caused illness in Egypt, Canada, and the Netherlands.

RESEARCH

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

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.

MORE INFORMATION

Visit PandemicFlu.gov for one-stop access to U.S. Government avian and pandemic flu information. The U.S. Department of Health and Human Services is responsible for Pandemic Influenza Planning.