UNDERSTANDING INFLUENZA

INTRODUCTION

Influenza (commonly called the flu) is one of the most common infectious diseases. Influenza is not a reportable disease, so the exact number of cases that occur in any year is not known but according to the World Health Organization, tens of millions of people are infected with influenza every winter and most of us have had a flu infection. Fortunately, serious complications caused by influenza are very uncommon. However, each year in the United States there are a few thousand deaths caused by influenza, several hundred thousand people are hospitalized because of an influenza infection, and even mild cases of the flu account for many lost work days and countless visits to emergency rooms and physicians’ offices.

OBJECTIVES

When the learner has finished this module, she/he will be able to

1. Identify the microorganism that causes the flu.
2. Explain how the influenza virus is transmitted.
3. Identify common signs and symptoms of an influenza infection.
4. Identify the differences between the cold and the flu.
5. Identify possible complications of an influenza infection.
6. Identify signs and symptoms that indicate the need to see a physician
7. Identify people who are at risk for complications of an influenza infection.
8. Explain how transmission of influenza can be avoided.
9. Identify basic care measures for someone who has influenza.
10. Identify medications that are used to treat influenza.

THE INFLUENZA VIRUS

Influenza is caused by a virus. Viruses are primitive, microscopic organisms that are everywhere in the environment, and they infect plants, animals, bacteria, and humans. Some viruses such as the influenza virus are relatively harmless, and other viruses such the human immunodeficiency virus (commonly known as HIV) are quite deadly. There are many different types of viruses, but they do share some characteristics and the influenza virus is, in many ways, a typical virus.

- The influenza virus is infectious. It can be spread from one person to another. This type of transmission of a virus is called horizontal transmission. If the virus is transmitted from mother to an unborn child that is called vertical transmission.

- The influenza virus is always mutating. Mutation happens when a virus undergoes a spontaneous change in its form and a new strain of the virus appears. These mutations are a survival mechanism that allows viruses to avoid the immune system of our bodies and to be resistant to drugs. These mutations are one of the
reasons why the flu vaccine changes every year (This will be discussed in a later section).

- The influenza virus is usually relatively harmless but it can be deadly. This variation in the virus’s effects depends on who is infected - the host - and on the virus itself. For the elderly, the very young, people who have a compromised immune system, people who have certain medical conditions, or people who do not have access to good medical care an infection with influenza can be serious. And although most strains of the influenza virus are not highly potent, the influenza virus can mutate and produce a strain that is very dangerous. The Spanish flu epidemic in 1918 has been described as one of the worst plagues in history and an estimated 100 million people were killed.

- There is no highly effective cure for influenza. Viruses cannot be treated with antibiotics, and although there are anti-viral drugs available these drugs have limitations and they are typically given only to high-risk people.

- The influenza virus is everywhere. There are millions of different types of viruses and all of us, at all times, have viruses on our skins, in our gastrointestinal tracts, our lungs, etc. The influenza virus is no different; it is very common and every year millions of people “get the flu.”

TRANSMISSION OF INFLUENZA

The influenza virus lives in the passages of the respiratory tract, e.g., the nose, throat, and lungs. When someone who has been infected coughs, sneezes, or talks, tiny droplets of moisture that are saturated with the virus are spread in the air: the primary mode of transmission is respiratory.

These droplets may simply fall to the ground, but some will be inhaled by anyone who is nearby, and others may land on objects such as a computer keyboard, door handles, telephone receivers, etc., and if someone touches these objects and there is hand to mouth contact, influenza can be spread.

Learning Break: The flu can be spread to someone who is standing about six feet from the infected person.

Unfortunately, someone who has been infected with the influenza virus does not begin to have the signs and symptoms of the flu for several days, and that person can be infectious during that time. Because of that “lag time” between when the virus infects someone and the appearance of the coughing, sneezing, etc., that characterize a case of the flu, the person who has been infected with influenza can easily spread the virus to others. In addition, the influenza virus is contagious for approximately 5-7 days after it is obvious that someone is sick. Children who have the flu and people who have the flu and also have a weakened immune system may be contagious for a longer period of time, but regardless of who has an influenza infection, the flu is highly contagious.
**Learning Break:** In most cases the influenza virus only survives outside the body for 1-2 days. But if there is a high concentration of the virus on an object that is handled very frequently - paper money, for example - the virus can survive for much longer.

**SIGNS AND SYMPTOMS OF AN INFLUENZA INFECTION**

Influenza infections usually start quickly, and the signs and symptoms rapidly become debilitating. Each case of influenza infection is a bit different than another, but the following are common signs and symptoms of influenza. Influenza is a disease that primarily affects the respiratory tract, but people often have signs and symptoms that involve other body systems, as well.

- Chills
- Cough
- Fatigue
- Fever over 102°
- Headache
- Muscle aches
- Nasal congestion
- Sore throat

Most people who have the flu are sick for one or two weeks, but the course of the illness may be shorter or longer than that. In either case, it is not unusual for someone who has influenza to feel so sick that they need to stay in bed for several days.

Most cases of influenza happen during the winter months. There are several possible reason for this: people spend more time indoors during the winter and are in closer proximity to each other; the virus survives for a longer time in colder temperatures; there is less humidity in the air when it is cold and this allows the virus to be more easily transmitted, and people get less sunlight, and as sunlight is a major source of vitamin D their immune systems are a bit weaker in the winter.

**IS IT A COLD OR IS IT THE FLU?**

A cold and the flu are both illnesses that are caused by viruses, they both affect the respiratory tract, they produce many of the same signs and symptoms, and they both tend to be more common during the winter months. Because of these similarities, it can be difficult to know if someone has a cold or the flu, yet there are some differences between the illnesses.
• A cold begins gradually. A case of the flu usually begins more quickly and dramatically.

• Someone with the flu will have a fever and the fever can be as high as 102\(^\circ\) while a person who has a cold may not have a fever at all or a very mild one. Someone with a cold will tend to have nasal congestion and/or excess nasal secretions (a runny nose) and mild fatigue, while a person who has the flu will have chills, muscle aches, and feel very, very tired.

• The signs and symptoms of the flu are more intense than those of a cold.

• A cold does not last as long as a case of the flu.

• The flu is much more likely to cause serious complications than a cold.

The most important differences between a cold and the flu are a) there are medications that can be used to prevent and treat the flu, and b) if someone has the flu medical professionals will be more alert for possible serious complications, especially if the patient has certain risk factors.

**WHAT ARE THE COMPLICATIONS OF INFLUENZA?**

For most people, a case of the flu is a miserable experience. They will feel terrible for 5-7 days and then recover. But for some people influenza can potentially be very serious, and a case of the flu can develop into bronchitis, pneumonia, or a sinus infection. Influenza can also aggravate medical conditions such as asthma, congestive heart failure, diabetes, and emphysema. Someone who has one of these medical conditions and develops an influenza infection could easily develop a dangerous change in blood sugar or respiratory distress. The following groups of people should take preventative measures to avoid contracting influenza and they should be closely monitored if they have the flu.

• Pregnant women

• The elderly

• Children less than 1 year of age.

• People with a compromised immune system. This would include people who have a pre-existing infection such as HIV, people who are undergoing chemotherapy, or people who are or will be having a transplant procedure.

• People who have asthma, congestive heart failure, diabetes, emphysema, or heart disease.
Learning Break: Asthma, congestive heart failure, emphysema, and heart disease can affect oxygen delivery. Influenza is a disease of the respiratory tract, so the flu can be especially dangerous for people who have these cardiac or pulmonary diseases. For people with diabetes, the dehydration, fever, and stress associated with the flu can cause hyperglycemia or hypoglycemia.

WHEN SHOULD YOU SEE A PHYSICIAN?

A routine case of the flu does not require the attention of a physician and can be managed at home with rest, supportive care, and time to recover. However, if flu-like signs and symptoms are present a physician should be consulted if any of the following apply.

• There is a high risk for developing complications. Remember what the high risk groups are: the elderly, pregnant women, the very young, people with a compromised immune system, and people with a serious pre-existing medical disease.

• The patient has a fever greater than 103°, fever with a rash, difficulty breathing, rapid breathing, or extreme fatigue, if the patient cannot eat or drink, or if the patient seems confused.

• The patient is a child one year of age or younger and has a fever greater than 100°, fever with a rash, difficulty breathing, rapid breathing, persistent vomiting, cannot eat or drink, or has a cough that produces a “whooping” sound.

It is also sensible to see a physician if the patient appears to have the flu, but has some signs and symptoms that are not typical of the illness.

PREVENTION TECHNIQUES

Influenza is highly contagious, but there is no need to isolate people who have the flu. People who have an active case of the flu should certainly limit their social contacts until they have recovered, and they should strictly avoid contact with people who have a high risk of developing complications. But by understanding how the flu is spread and using some basic hygiene techniques, transmission of the flu can be greatly reduced. In order to limit the spread of influenza, during the flu season everyone should:

• Practice hand washing: Hand washing is one of the most effective infection control techniques to prevent transmission of the flu. Soap and water or an alcohol-based hand sanitizer can be used. Wash your hands if you need to cover your face or mouth when you cough or sneeze, or if you touch your eyes, mouth, or nose.
• Try and avoid touching your eyes, mouth, or nose if you have the flu or during flu season. The influenza virus can be spread with from these areas to your hand and fingers and then to the environment.

• Cover your nose and mouth with a tissue when you cough or sneeze. Make sure you dispose of the tissue properly (put it in the trash immediately) and wash your hands after discarding the tissue.

• Stay home. This was discussed before, but one of the most effective methods of preventing the spread of influenza is to limit your social contacts. You should avoid contacting other people until at least 24 hours after your fever has gone and/or if you are still clearly sick.

• Flu vaccine. The flu vaccine is one of the best ways to prevent contracting the flu: it is 70-90% effective. The vaccine can be given by injection or given as a nasal preparation that is squirted in the nose. It takes approximately 2 weeks for the vaccine to work, and the vaccine must be given before the flu season starts so most people receive it in October or November. People who are at high risk for developing complications, people who work with high-risk patients, people who live in close proximity to large groups of others (e.g., nursing home residents, college students living in dormitories), and anyone 50 years of age or older should receive the flu vaccine. The side effects of the vaccine are usually mild and include soreness at the injection site, a slight fever, and muscle aches. The flu vaccine will not cause an infection with influenza: you cannot get the flu from the flu vaccine.

Learning Break: Because the influenza virus mutates, flu vaccines must be developed that are specifically designed to prevent infection with the strain of influenza that is, or will be the one that will be the most common; that is why the flu vaccine changes each year and there can be delays in its production and delivery.
TREATING THE FLU

In most cases, physicians do not perform specific tests to diagnose the flu. The physician will interview and examine the patient and the typical signs and symptoms of the flu are sufficient evidence to make the diagnosis. If the physician is not sure that the patient has the flu, she/he may order a throat culture, and blood tests or x-rays may be ordered if the patient has atypical signs and symptoms or has a high risk of developing complications.

If the patient clearly has a case of influenza and is not high risk, she/he can be treated with simple supportive care. These “home remedies” and allowing time to recover are usually all that is needed.

• Rest, no strenuous physical activity. Limit social contacts.

• Fluids. It is not particularly important what the patient drinks, it is important that the patient does drink so whatever fluid he/she likes and can tolerate is the best choice.

• Fever and muscle aches can be treated with the over-the-counter analgesics acetaminophen and ibuprofen. Do not use aspirin. Cough can be treated with over-the-counter cough suppressants.

Learning Break: Check with a physician before taking any medication. Most over-the-counter medications can be taken safely by most people who have the flu, but these drugs could be contraindicated for people with certain medical conditions or they could interact with prescription medications.

• Follow the guidelines for prevention.

There are medications that can be used to treat influenza. Antiviral drugs, e.g., amantadine, rimnataadine, can reduce the duration of a case of the flu and decrease the fever if they are given within 48 hours after the onset of symptoms. The antiviral drugs are usually given only to people who have very severe signs and symptoms, people who are hospitalized, or people who have a high risk of developing complications.

Learning Break: Antibiotics cannot be used to treat influenza. Influenza is an infection caused by a virus, and antibiotics are only effective for treating infections caused by bacteria.