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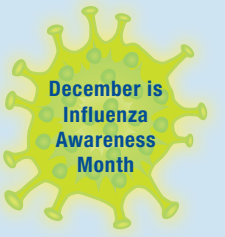

Influenza

Are you ready?

We give you the information you need to conquer the 2018–2019 flu season.

By Amanda Perkins, DNP, RN

Influenza, also known as the flu, is a respiratory illness caused by the influenza virus. According to the American Lung Association, influenza is a major public health problem, affecting 5% to 20% of the US population each year and resulting in approximately 200,000 hospitalizations and 3,000 to 49,000 deaths from related complications. In the US, the 2017–2018 influenza season was particularly harsh, with an increase in the severity of cases for every age group, visits to healthcare agencies, and hospitalizations. The number of influenza cases began to increase in November, peaked during January and February, and remained elevated through March, reaching the epidemic threshold for 16 weeks. This is the only time that all age groups have been classified as having increased severity in one influenza season, going back to the 2003–2004 season.

This article provides a description of influenza, including signs and symptoms, diagnosis, treatment, complications, vaccination, and the nurse's role in its prevention.

The basics

Influenza, a viral infection of the nose, throat, and lungs, can be mild to severe. In the worst cases, it can lead to death. The body's immune response to influenza causes inflammation, leading to signs and symptoms, such as a cough, sore throat, fever, and muscle and body aches (see *Flu symptoms*). Influenza can occur in all age groups and is seen most commonly in the fall, winter, and early spring. Typically, flu season lasts from October to March, peaking between December and February.

There are three different strains or types of influenza: types A, B, and C. Of the three types, A and B cause the most serious illness. Type A has three strains, two of which circulate among humans, causing moderate-to-severe illness and mutating easily. Type B is found only in humans and is more stable than type A. Out of the three types, type C, which isn't included in the seasonal flu vaccine, causes the mildest illness, in some cases producing no signs or symptoms.

The influenza virus is spread via tiny droplets when people who have the flu

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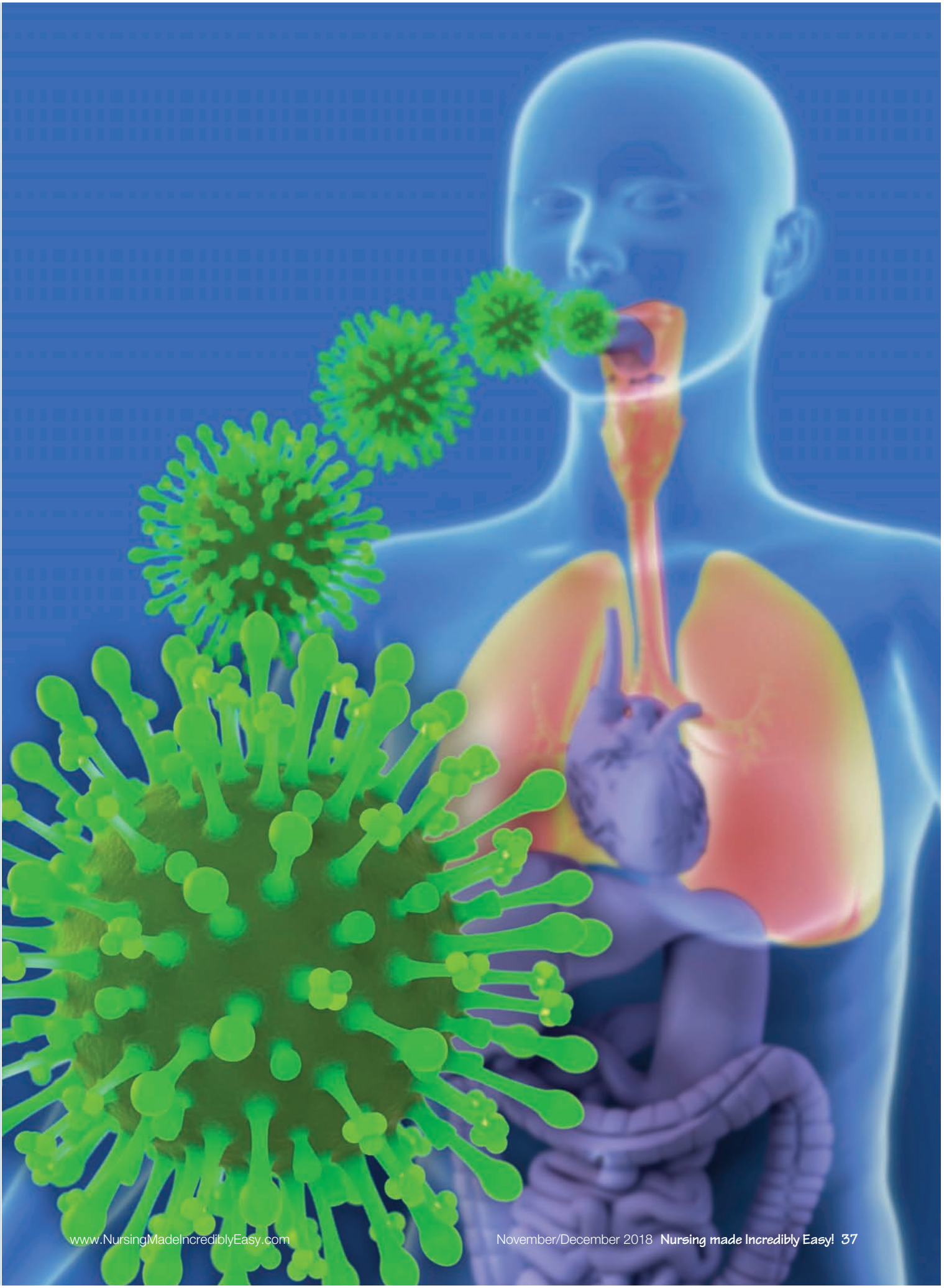


cough, sneeze, or talk. These droplets travel through the air and can enter an individual's body through the mucous membranes. People can also be infected after touching a surface with the influenza virus on it and then touching their mouth, nose, and/or eyes. In most cases, the time for symptom onset after exposure is 1 to 4 days. Influenza is most contagious within the first 3 to 4 days after the onset of symptoms. With that being said, it's possible to infect others approximately 1 day before the onset of symptoms and up to 1 week after symptom onset.

Signs and symptoms

Influenza is an acute illness that typically resolves in 7 to 10 days. The signs and symptoms of influenza typically start abruptly and include the following:

- fever
- chills
- cough
- sore throat
- runny nose
- stuffy nose
- muscle/body aches
- headaches
- fatigue
- anorexia
- eye pain and sensitivity to light.

Less commonly, patients may experience vomiting and diarrhea. This occurs more frequently in children, along with listlessness, irritability, nausea, and anorexia. The fever associated with influenza also tends to be higher in children than adults. Older patients may experience confusion in addition to the typical signs and symptoms. Cough and general malaise can last for 6 to 8 weeks. It's important to note that additional signs and symptoms may be present if the patient develops associated complications.

Diagnosis

Diagnosis is made with nasal swabs, nasal washes, throat swabs, and sputum analysis. Patients who present with signs and symptoms of influenza, especially those at high risk for complications, should be tested within the first 2 to 3 days of the illness. Early diagnosis leads to early treatment with antivirals and more appropriate and effective antibiotic use; decreases the number of diagnostic tests ordered and the incidence of hospitalizations; and improves infection control practices in the hospital setting.

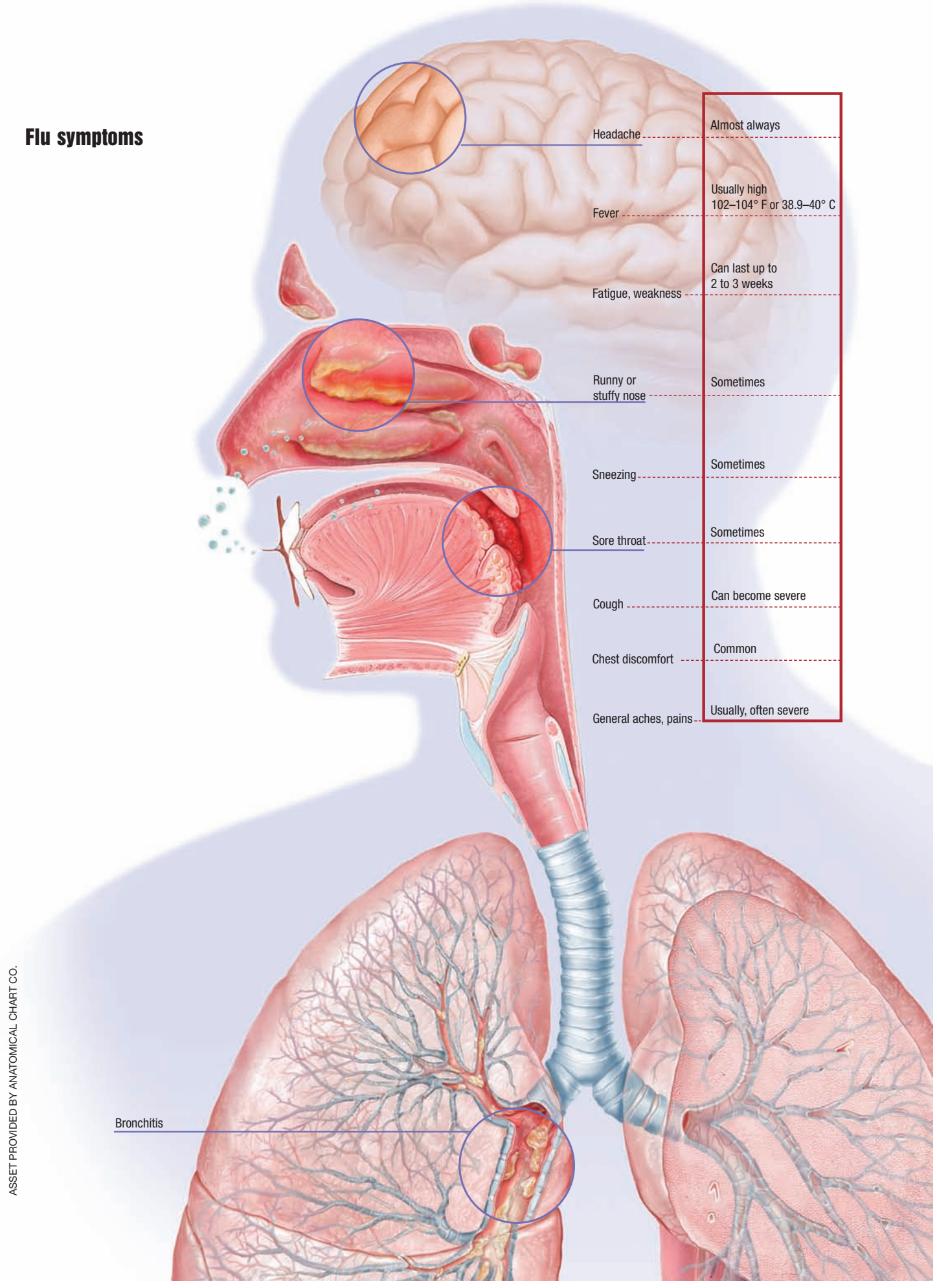
When testing for influenza, you need to know how to appropriately collect a sample because inappropriate sample collection can lead to false results, delaying treatment (see *How to collect a nasopharyngeal swab sample*). When collecting a sample, the following errors can occur: the specimen collected doesn't contain enough cells, the specimen collected is inappropriate (collected from the wrong site), the medium used is incorrect, and the specimen isn't stored properly. In most cases, the most appropriate site for specimen collection is the nasopharyngeal site.

The gold standard for influenza testing is the reverse transcriptase polymerase chain reaction (RT-PCR), which identifies influenza viral RNA. Drawbacks to this test include its cost and the need for a specialized lab, which may cause results to take up to 8 hours to be available. Another common test used for the diagnosis of influenza is the rapid influenza diagnostic

How to collect a nasopharyngeal swab sample

1. Collect the necessary supplies, including gloves, a mask, eye protection, and a swab with a flexible plastic handle.
2. Assess/observe the patient's nostrils, checking for swelling, wounds, deviated septum, and so on. If any wounds or deformities exist, avoid using the affected nostril. If both nostrils are affected, check with the healthcare provider.
3. Insert the swab into one nostril and straight back, ensuring that the swab reaches the nasopharynx.
4. Rotate the swab quickly, up to five times, ensuring that the swab remains in place for 5 to 10 seconds.
5. Remove the swab and insert it into a vial with the appropriate medium.
6. Break the swab at the handle, which will be scored.
7. Label the sample per your facility's protocol and transport it to the lab.

Flu symptoms



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did you know?

This year marks the 100th anniversary of the 1918 influenza pandemic. Known as the Spanish flu, it affected one-third of the Earth's population and was responsible for decreasing the average lifespan in the US by 10 years. Ending in the summer of 1919, the Spanish flu is believed to have caused tens of millions of deaths worldwide, more than World War I.

test (RIDT). A healthcare provider in an outpatient clinic can have the results of an RIDT before the end of a patient visit, typically within 15 minutes or less. A drawback to this test is that it can have more false-negative or false-positive results when compared with the RT-PCR. Ultimately, the test used will depend on provider preference.

Treatment

Antiviral medications can be used to treat patients with influenza. These medications may decrease symptoms and are recommended for patients with a high risk of complications. To be most effective, antiviral medications should be administered within the first 24 hours of symptom onset. After the patient has been ill for 48 hours, antiviral medications begin to lose their effectiveness. Although diagnosis of influenza is optimal when a patient presents with signs and symptoms, treatment can be started without lab confirmation. Commonly used medications include oseltamivir, zanamivir, and peramivir.

Oseltamivir is an oral medication, given as a capsule or suspension to individuals over 2 weeks old. The most common adverse reactions are nausea, vomiting, stomach pain, diarrhea, and headache. Zanamivir is an inhaled powder given to individuals over age 7. Adverse reactions include dizziness, irritation of the nose, and joint pain. When used to treat influenza, both of these medications are administered twice daily for 5 days. When used to prevent influenza, they're administered once daily for 10 days.

Peramivir is an I.V. medication, given as a one-time dose administered over 15 to 30 minutes to individuals over age 2. Common adverse reactions include constipation and difficulty falling asleep or staying asleep.

Treatment also involves supportive care and the management of symptoms. For example, if the patient has a fever, antipyretics may be recommended. It's important to maintain fluid and electrolyte balance and ensure adequate respiration. Patients should be encouraged to drink plenty of fluids while they're ill. If secondary bacterial pneumonia develops, treatment with antibiotics may be necessary.

Complications

Complications associated with influenza include:

- pneumonia
- myocarditis
- myositis
- sepsis
- respiratory failure
- kidney failure
- ear infections
- sinus infections
- dehydration
- encephalopathy
- worsening of chronic medical conditions, such as congestive heart failure, asthma, and diabetes mellitus.

Individuals with asthma or other chronic lung diseases are at a higher risk for influenza-related complications than other individuals. Overall, those with a higher risk of complications associated with influenza have one or more of the following:

- chronic lung disease(s)
- heart disease
- chronic kidney disease
- diabetes
- morbid obesity
- severe anemia
- condition(s) that suppress the immune system
- liver disorder
- long-term aspirin use (children and adolescents).

Additionally, children under age 2, adults age 65 or older, and pregnant women have a higher risk of complications associated with influenza.

Pneumonia is the most common complication associated with influenza. It can

be bacterial, viral, or both. The return of a fever during the second week of influenza may be a sign that pneumonia has developed. Additional signs that pneumonia has developed are symptoms that continue to worsen after 5 to 7 days, dyspnea, shortness of breath, crackles, rhonchi, and a dry cough that changes to a productive cough. Lung sounds will be clear in patients with influenza unless a respiratory complication, such as pneumonia, has developed. The patient may also report that he or she began to improve and then new symptoms developed.

Why vaccinate?

For healthcare workers, the prevention of influenza is key. The best way to prevent influenza is through vaccination. The CDC recommends that everyone age 6 or older receive the influenza vaccination each year to reduce the likelihood of severe outcomes and help the body develop antibodies to protect against different influenza strains. The number of antibodies developed is highest within the first few months of vaccination and then begins to slowly decline.

New influenza vaccines are developed each year, based on scientific research. There are a variety of vaccines that may be administered to prevent influenza, depending on the patient population. When determining which vaccine to administer, the healthcare provider will look at a variety of factors, including age, health, and allergies. At this time, the nasal spray flu vaccine isn't recommended due to decreased effectiveness.

The seasonal flu shot protects against three or four influenza viruses that are believed will be the most common during the influenza season. Trivalent vaccines have three components, protecting against two strains of type A and one strain of type B, whereas quadrivalent vaccines have four components, protecting against two strains of type A and B. Unless otherwise stated, the influenza vaccines described contain viruses that were grown in eggs.

Trivalent vaccines include standard-dose, high-dose, and recombinant. The standard-dose trivalent vaccine is the most commonly administered. The high-dose trivalent vaccine is recommended for individuals age 65 or older because of a diminished immune response. The recombinant trivalent vaccine is egg-free and approved for individuals age 18 or older, including those who are pregnant.

Quadrivalent vaccines include intradermal, standard, and recombinant. The intradermal quadrivalent vaccine is injected into the skin, as opposed to the muscle, and is approved for individuals between the ages of 18 and 64. The standard quadrivalent vaccine contains viruses grown in a cell culture and is approved for individuals over age 4. The recombinant quadrivalent vaccine is approved for individuals over age 18, including pregnant women.

When administering the influenza vaccine, ensure that patients understand they may have some adverse reactions for a few days, including:

- soreness, tenderness, redness, and swelling at the administration site
- low-grade fever
- headaches
- muscle aches
- allergic reaction (rarely).

Intradermal flu shots can cause toughness and itching at the administration site lasting for up to 2 days. For more information on intradermal flu shots, see *Jet injectors*.

Jet injectors

Jet injectors can be used to administer certain influenza vaccines to individuals ages 18 to 64. These devices don't use hypodermic needles; instead, they use a high-pressure, narrow stream of fluid to pierce the skin and administer the vaccine. Although not frequently used, jet injectors have been around since the 1960s. In the past, they were used for mass vaccination, often in military personnel.

In general, the influenza vaccine is most effective in individuals with a healthy immune system, particularly young adults and older children. Older patients and those with chronic health conditions often develop less immunity. Although these individuals may develop less immunity, it's still beneficial for them to obtain the vaccine because the immunity they do develop will help prevent influenza.

Although many of the influenza vaccines are made with eggs, individuals who have an egg allergy may still be able to receive the vaccine. Individuals who have hives after exposure to eggs, but no additional symptoms, are able to receive the influenza vaccine without any restrictions, whereas those who have additional symptoms, including respiratory symptoms, can receive the vaccine in a medical setting so they can be supervised by a healthcare provider. For additional information about who should use caution or avoid vaccines, see *When to avoid vaccination.*

In some instances, children may need two doses of the influenza vaccine, including those who are between ages 6 months old and 8, those who are being vaccinated for the first time, or those who've only received one vaccination in their lifetime. When administering two doses to a child, they should be spaced out by at least 28 days.

Children who are under 6 months old shouldn't be given the influenza vaccine. However, these children are at a high risk for complications associated with influenza, so prevention from those around them is essential. Individuals who will be spending time with a child under 6 months old should receive the influenza vaccine and be educated about prevention techniques, such as proper hand washing.

When to avoid vaccination

In some cases, it may be best for your patient to avoid receiving the influenza vaccine. Vaccination may need to be avoided or delayed if the patient has:

- acute respiratory infection
- history of Guillain-Barré syndrome
- latex allergy
- previous reaction to the influenza vaccine.

on the web

American Academy of Family Physicians: www.familydoctor.org/condition/colds-and-the-flu
American Lung Association: www.lung.org/lung-health-and-diseases/lung-disease-lookup/influenza
CDC: www.cdc.gov/flu
Mayo Foundation for Medical Education and Research: www.mayoclinic.org/diseases-conditions/flu/symptoms-causes/syc-20351719
Medline Plus: www.medlineplus.gov/flu.html

Your role

When it comes to influenza, it's essential to provide education to patients because there's a lot of misinformation about both influenza and vaccination. It's very important to educate patients that the influenza vaccine can't cause the flu, although patients who've received the influenza vaccine can still develop it. Patients should also be aware that it can take up to 2 weeks to develop immunity after the administration of the influenza vaccine. Education should include the importance of vaccination by the end of October, although vaccination at any point during the flu season is more beneficial than no vaccination at all. It's also important that both healthcare personnel and patients understand that outbreaks can occur at any time during the year, not just fall to spring. Parents and caregivers should understand that research has shown vaccination significantly decreases the risk of death in children.

Teach patients about prevention of influenza, including frequent hand washing, usage of masks, staying away from individuals who are ill, and staying home when sick with the flu. Instruct patients to cough/sneeze into tissues or their elbow,

never their hand. Also discuss the importance of adequate hydration with patients who are sick.

Keeping everyone safe

Influenza can lead to missed days from work or school and, in more severe cases, hospitalization or death. Nurses play an important role in the prevention and treatment of this public health problem. ■

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