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Contact Hours: **2**

# COVID-19 and Seasonal Flu 2022–2023

## What Healthcare Professionals Need to Know

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**LEARNING OUTCOME AND OBJECTIVES:** Upon completion of this course, you will be prepared to differentiate between COVID-19 and seasonal flu and discuss both treatment and vaccination for these two conditions. Specific learning objectives to address potential knowledge gaps include:

- Differentiate between the clinical presentation of COVID-19 and seasonal flu.
- Explain the incubation, period of contagion, transmission, and possible long-term effects of the COVID-19 and influenza viruses.
- Discuss infection prevention measures for influenza and COVID-19.
- Describe patient education considerations for influenza and COVID-19.
- Explain treatment and vaccination guidelines for seasonal flu and COVID-19.

## DIFFERENTIATING BETWEEN INFLUENZA AND COVID-19

Countries throughout the world are grappling with the effects of COVID-19, which is the worst pandemic since the Spanish Flu Pandemic in 1918–1919. While there is still a great deal not known about COVID-19 and the SARS-CoV-2 virus that causes it, some valuable information is available to guide healthcare professionals.

Concerns about COVID-19 in the context of the annual influenza (flu) season also raise questions for healthcare professionals, such as:

- How is the flu related to COVID-19?
- How can I tell the difference between the flu and COVID-19?
- What are the symptoms of COVID-19, and how long does it take for them to appear?
- How long is someone contagious after developing COVID-19 or the flu?
- How are COVID-19 and the flu transmitted?
- What steps can be taken to prevent COVID-19 and flu infection?
- What do I need to teach patients and families about COVID-19 and the flu?
- Should people get a flu shot during the pandemic?
- How can vaccines be safely administered during the pandemic?

## Signs and Symptoms of COVID-19 and Influenza

Some symptoms overlap between COVID-19 and influenza. It is important to know the clinical manifestations of each condition and how to differentiate between them.

Both the flu and COVID-19 are contagious respiratory illnesses, but they are caused by different viruses. COVID-19 is caused by infection with the coronavirus SARS-CoV-2, and the flu is caused by infection with a variety of influenza viruses. More recent strains of SARS-CoV-2 are known to spread more easily than the flu.

Since influenza and COVID-19 share a number of symptoms, differentiation between the two can be problematic. Both the flu and COVID-19 can cause mild to severe illness, including these **common signs/symptoms**:

- Fever
- Chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Sore throat
- Runny or stuffy nose
- Muscle pain
- Body aches
- Headache



- Vomiting and diarrhea (typically more common in children than in adults) (CDC, 2022a)

Loss of taste or smell is typically associated with COVID-19. Although such symptoms are more common with COVID-19, some patients with the flu may have alterations in taste and smell as well (CDC, 2021a; Mayo Clinic, 2022a).

Additional symptoms that are found in patients with COVID-19, but not typically in those with influenza, include red, swollen eyes and skin rashes (NYPMG, 2022).

Symptoms of COVID-19 can be mild at the beginning but become more intense over 5–7 days, with cough and shortness of breath becoming worse if pneumonia develops. The severity of illness can vary significantly from person to person. A person may have a cough or other symptoms but no fever (or a low-grade fever), particularly in the first few days of illness. It is also possible for a person infected by the SARS-CoV-2 virus to have minor or even no symptoms at all.

There is also evidence that COVID-19 vaccination may make illness less severe for those who are vaccinated and still become infected, known as “breakthrough infection” (see box below) (CDC, 2021a; Johns Hopkins Medicine, 2022).

#### **BREAKTHROUGH COVID-19 INFECTION**

No vaccine is 100% effective. A breakthrough infection occurs when someone who is vaccinated with either a primary series or a primary series plus booster(s) dose becomes infected with the SARS-CoV-2 virus. Fortunately, when people who are vaccinated develop a COVID-19 breakthrough infection, they are much less likely to experience severe symptoms, hospitalization, and death compared to people who are unvaccinated.

There are five factors that contribute to a higher risk for COVID-19 breakthrough infections:

- **Age.** Older adults are at highest risk for COVID-19. However, people ages 35–44 and 45–54 are more likely to have a breakthrough infection compared to those ages 75–84.
- **Location.** When filtered by zip code, the highest COVID breakthrough rates were found in northeastern states; southeastern states; and Michigan, Indiana, Ohio, and Kentucky.
- **Race.** Data show that COVID-19 hospitalizations and deaths are more frequent among Hispanic, non-Hispanic Black, and non-Hispanic American Indian or Alaska Native people than among non-Hispanic White people and Asians.
- **Underlying medical conditions.** Risk for breakthrough infections includes various chronic medical conditions such as anemia, coronary artery disease, depression, diabetes, chronic lung disease, and obesity.



- **Partial vaccination.** Partial vaccination is defined as receiving less than the recommended vaccinations/boosters. The CDC considers someone to be fully vaccinated only when all doses of vaccine in the primary series and all recommended boosters have been received.

(CDC, 2022b, 2022c; Dueck, 2022; University of Texas, 2021)

## COVID IN CHILDREN

Children of any age can get COVID-19 and experience its complications. Children are as likely to get COVID-19 as adults. However, they are less likely to become severely ill. Nearly 50% of children and adolescents with COVID-19 have no symptoms (Mayo Clinic, 2022b).

**Risk factors** for serious illness with COVID-19 in children include:

- Obesity
- Diabetes
- Asthma
- Congenital heart disease
- Genetic conditions
- Conditions affecting the nervous system or metabolism
- Babies who are less than 1 year old  
(Mayo Clinic, 2022b)

Children are at risk for a rare complication known as ***multisystem inflammatory syndrome in children (MIS-C)***, in which various body parts become inflamed, including the heart, lungs, kidneys, brain, skin, eyes, or gastrointestinal organs. Signs and symptoms of MIS-C include:

- Fever that lasts 24 hours or longer
- Vomiting
- Diarrhea
- Pain in the stomach
- Skin rash
- Fast heartbeat
- Rapid breathing
- Red eyes
- Redness or swelling of the lips and tongue
- Feeling unusually tired



- Redness or swelling of the hands or feet
- Headache, dizziness, or lightheadedness
- Enlarged lymph nodes

Emergency warning signs necessitating emergency care include the inability to breathe; inability to stay awake; new confusion; pale, gray, or blue-colored skin, lips, or nail beds; and severe stomach pain (Mayo Clinic, 2022b).

## Incubation Period

One or more days can pass between becoming infected and when symptoms start to appear in both the flu and COVID-19. With **influenza**, patients typically develop symptoms within 1–4 days. Severe symptoms of the flu may develop and end quite swiftly, usually within 5 days.

The typical time frame for symptom development with **COVID-19** is within 2–14 days after infection (CDC, 2022d). Research suggests that the median time for symptoms to appear from the omicron variant of COVID-19 is about 3 days. COVID-19 symptoms may develop more gradually, and severe symptoms may not appear for several days after exposure. During the recovery process, people with COVID-19 might have recurring symptoms alternating with periods of feeling better that persists for days or even weeks (Maragakis, 2022).

## Degree of Communicability

It is possible to spread the flu and COVID-19 for at least 1 day prior to experiencing any symptoms.

With **influenza**, the majority of people are contagious for about 1 day prior to showing symptoms. It appears that older children and adults are most contagious during the initial 3–4 days of their illness, but many remain contagious for about 7 days. Infants and people with weakened immune systems may be contagious for an even longer period of time.

The onset and duration of viral shedding and the period of infectiousness for **COVID-19** are not yet known with certainty. Research thus far indicates that on average, people can begin spreading the virus 2–3 three days before their symptoms begin, but infectiousness peaks 1 day before the beginning of symptoms (CDC, 2022d).

Emerging evidence suggests that persons who are vaccinated against COVID-19 but develop breakthrough infections are less likely to spread the virus because they shed it for shorter periods of time. However, the extent of this difference in contagion is unknown at this time (Rura, 2021).



## Communicability and the Omicron Variant

Viruses constantly change via mutation, which can result in a new variant of the virus. Some variants emerge and disappear, while others persist (Mayo Clinic, 2022c). People who are up to date on COVID-19 vaccines, including booster doses when eligible, are likely to have stronger protection against COVID-19 variants, including omicron, which became the most prevalent variant in 2022 (CDC, 2022e).

The **omicron variant** has been designated by the CDC and other public health organizations as a variant of concern (VOC). A VOC is one for which there is evidence of an increase in transmissibility; more severe disease (for example, increased hospitalizations or deaths); significant reduction in neutralization by antibodies generated during previous infection or vaccination; reduced effectiveness of treatments or vaccines; or diagnostic detection failures (CDC, 2022f).

**Characteristics** of the omicron variant include:

- Spreads more easily than the original virus that caused COVID-19 and the later delta variant
- Causes less severe disease
- Shows similar symptoms to previous variants
- Presence and severity of symptoms affected by vaccination status, presence of other health conditions, age, and history of prior infection

Current COVID-19 vaccines protect against severe disease, hospitalizations, and deaths due to omicron infection. Breakthrough infections may still occur.

Scientists are also investigating the effectiveness of current treatments. Some monoclonal antibody treatments are less effective against omicron's BA.2 lineage but continues to be effective against BA.1 and BA1.1 lineages. Other nonmonoclonal antibody treatments remain effective against omicron (CDC, 2022g).

## Modes of Transmission

Both influenza viruses and SARS-CoV-2 can spread from person to person between people who are in close contact with each other (within about six feet). Research indicates that in some types of situations, such as indoor settings with poor ventilation, small droplets may be spread farther than six feet.

Both viruses are spread primarily by droplets (large and small) made when people who are infected cough, sneeze, or talk. These droplets can enter the mouths or noses of other people and be inhaled into the lungs.



It may also be possible to acquire infection by physical contact with infected people (e.g., shaking hands) or by touching contaminated surfaces and then touching the mouth, nose, or, possibly, the eyes (CDC, 2022a).

Although the COVID-19 virus appears to spread mainly by droplets, it can occasionally spread via finer aerosols that remain suspended in the air. The largest droplets containing SARS-CoV-2 settle out of the air rapidly, within seconds to minutes. The smallest very fine droplets, and aerosol particles formed when these fine droplets rapidly dry, are small enough that they can remain suspended in the air for minutes to hours (CDC, 2021a). This enables one person to infect many others, and large transmission clusters seem to be associated with aerosol transmission.

Infectious exposure to COVID-19 occurs in three main ways, and these are not mutually exclusive:

- **Inhalation:** Small droplets and aerosol particles that contain the virus travel through the air and reach susceptible people.
- **Deposition:** The virus is transported in droplets and particles onto exposed mucous membranes.
- **Touching:** Hands that are soiled with contaminated fluids touch mucous membranes, or hands touch inanimate surfaces contaminated with the virus. (CDC, 2021a)

Even though SARS-CoV-2 and flu viruses are believed to spread in similar ways, COVID-19 has been observed to have more “**superspreading**” events than the flu. This means the virus that causes COVID-19 can quickly and easily spread to many people, resulting in continuous spread as time progresses (CDC, 2022a). There are no exact criteria for superspreader events. There may be large gatherings where very few, or none, contract the virus. On the other hand, a small gathering may spread the virus to all attendees. The general definition of a superspreader event is one in which there is a greater amount of transmission than would be expected (Cleveland Clinic, 2020).

### COVID-19 AND PETS

The risk of animals spreading COVID-19 to humans is considered low. Throughout the world, cats, dogs, and other animals have become infected with COVID-19. Infection typically occurs after close contact with people who have COVID-19. To **prevent** spreading the virus to pets, the CDC recommends:

- Limiting pet interactions with people outside of the household
- Keeping cats indoors when possible and not allowing them to roam outside
- Avoiding bringing pets to public places where a large number of people gather
- Avoiding putting masks on pets (since this could harm the pet)



There is no evidence that the virus can spread to people from the skin, fur, or hair of pets. Pets should **not** be wiped or bathed with chemical disinfectants, alcohol, hydrogen peroxide, or any other product not approved for animal use. If someone in the household has COVID-19, that person should avoid contact with the pet.

**Symptoms** of COVID-19 in pets include:

- Fever
- Coughing
- Respiratory distress
- Lethargy
- Sneezing
- Runny nose
- Eye discharge
- Vomiting
- Diarrhea

When caring for an infected pet, caretakers should follow the same precautions recommended for individuals caring for an infected person at home. Home isolation of pets can end if the pet has not shown symptoms for at least 72 hours without medical care and it has been at least 14 days since the pet's last positive test; or all follow-up tests for current infection are negative.

(CDC, 2022h)

## Complications

Although most people with **COVID-19** have mild to moderate symptoms, the disease can cause the following complications:

- Pneumonia
- Respiratory distress
- Organ failure
- Cardiac problems and heart failure
- Acute respiratory distress syndrome
- Blood clots
- Acute kidney injury



- Additional viral and bacterial infections  
(Mayo Clinic, 2022d)

Most people who get the **flu** recover in a few days to less than two weeks. However, some people develop severe complications, such as:

- Pneumonia
- Bronchitis
- Asthma exacerbations
- Sinus and ear infections
- Acute respiratory distress syndrome
- Myocarditis
- Encephalitis
- Muscle inflammation
- Multiorgan failure
- Extreme bodily inflammatory response
- Sepsis
- Worsening chronic heart disease  
(CDC, 2021b)

### **POST-COVID CONDITIONS (LONG COVID)**

Most people infected with COVID-19 recover within a few days to a few weeks. Thus, the start of post-COVID conditions is said to begin at least four weeks after infection. Post-COVID conditions are also referred to by various terms: long COVID, long-haul COVID, post-acute COVID-19, post-acute sequelae of SARS-CoV-2 infection (PASC), long-term effects of COVID, and chronic COVID.

Anyone who has been infected with COVID-19, even people with mild symptoms or no symptoms, can develop post-COVID conditions. Unvaccinated people may be at higher risk of developing post-COVID conditions compared to those who were vaccinated and had breakthrough infections. Additional higher-risk groups include those who experienced more severe symptoms, people who had an underlying health condition prior to COVID-19, and people who experience multisystem inflammatory syndrome (MIS) during or after COVID-19 illness (CDC, 2022i).



**SYMPTOMS OF “LONG COVID”**

There is no test to diagnose post-COVID conditions, and people present with a wide array of symptoms. A diagnosis of post-COVID conditions is made based on health history, symptoms, and whether a diagnosis of COVID-19 was made. The most commonly reported symptoms of post-COVID conditions include:

- Fatigue that interferes with daily life
- Symptoms that get worse after physical or mental effort
- Fever
- Respiratory distress
- Cough
- Chest pain
- Heart palpitations
- Difficulty thinking or concentrating
- Headache
- Sleep disturbances
- Dizziness upon standing
- “Pins and needles” sensations
- Change in smell or taste
- Depression or anxiety
- Diarrhea
- Stomach pain
- Joint or muscle pain
- Rash
- Changes in menstrual cycles

(CDC, 2022i)



## High-Risk Populations

### AGE FACTORS

Older adults are more likely to develop serious illness from **COVID-19** compared to younger adults. The risk increases for people in their 50s and increases further in the 60s, 70s, and 80s. The people who are most likely to get severely ill are those 85 years of age and older (CDC, 2021c).

It has been recognized for many years that people 65 years and older are also at high risk of developing serious complications from **influenza** when compared to young, healthy adults. In recent years, an estimated 70%–85% of seasonal flu–related deaths have occurred in people 65 years and older, and 50%–70% of seasonal flu–related hospitalizations have occurred among people in this age group (CDC, 2022j, 2022k).

Each year thousands of children are hospitalized and some children die from influenza. Children at higher flu risk include:

- Children younger than 6 months of age (who are too young to be vaccinated)
- Children ages 6 months to 5 years
- American Indian and Alaskan Native children
- Children ages 6 months to 18 years who have chronic health problems (CDC, 2021d)

### FEVER IN OLDER ADULTS

A single temperature reading higher than 100 °F (37.8 °C), multiple readings above 99 °F (37.2 °C), or a rise in temperature greater than 2 °F (1.1 °C) above the person's normal baseline temperature may be a sign of infection. Since normal body temperature in older adults can be lower than in younger adults, fever temperatures may also be lower (CDC, 2021c).

### HEALTH FACTORS

According to the CDC, many health conditions are known to increase a person's risk of serious complications from both the flu and COVID-19 (see table below).



HEALTH FACTORS INCREASING RISK OF . . .	
COVID-19	Influenza
<ul style="list-style-type: none"> <li>• Cancer</li> <li>• Cardiac conditions</li> <li>• Chronic renal disease</li> <li>• Chronic hepatic disease</li> <li>• Chronic respiratory disease</li> <li>• Cystic fibrosis</li> <li>• Dementia or other neurological conditions</li> <li>• Diabetes, type 1 or type 2</li> <li>• Disabilities that interfere with performing activities of daily living</li> <li>• HIV infection</li> <li>• Immunocompromised condition or weakened immune system</li> <li>• Mental health conditions</li> <li>• Overweight and obesity</li> <li>• Physical inactivity</li> <li>• Pregnancy</li> <li>• Sickle cell disease</li> <li>• Smoking (currently or formerly)</li> <li>• Solid organ or blood stem cell transplant</li> <li>• Stroke or cerebrovascular disease</li> <li>• Substance use disorders</li> <li>• Tuberculosis</li> </ul>	<ul style="list-style-type: none"> <li>• Age 65 years and older</li> <li>• Age younger than 2 years</li> <li>• Asthma</li> <li>• Neurologic and neurodevelopment conditions</li> <li>• Blood disorders (e.g., sickle cell disease)</li> <li>• Chronic lung disease (e.g., COPD, cystic fibrosis)</li> <li>• Endocrine disorders (e.g., diabetes)</li> <li>• Heart disease (e.g., congenital heart disease, congestive heart failure, coronary artery disease)</li> <li>• Kidney disease</li> <li>• Liver disorders</li> <li>• Metabolic disorders (e.g., inherited metabolic disorders, mitochondrial disorders)</li> <li>• Obesity (BMI 40 or higher)</li> <li>• People under age 19 years on long-term aspirin- or salicylate-containing medications</li> <li>• Immunocompromised state due to disease (e.g., HIV/AIDS, some cancers such as leukemia) or medications (e.g., chemotherapy/radiation treatment for cancer, chronic corticosteroids, other drugs that suppress the immune system)</li> <li>• Stroke</li> </ul> <p><b>Others at high risk:</b></p> <ul style="list-style-type: none"> <li>• Pregnant women and women up to two weeks after end of pregnancy</li> <li>• Nursing home and other long-term care facility residents</li> </ul>



	<ul style="list-style-type: none"><li>• Non-Hispanic Black persons, Hispanic or Latino persons, American Indian or Alaska Native persons</li></ul>
(CDC, 2022f, 2021e)	

## INFECTION PREVENTION MEASURES IN HEALTHCARE SETTINGS

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Both the annual influenza season and the COVID-19 pandemic create additional challenges in preventing infection, how healthcare is delivered, and the operations of healthcare facilities. The ways both diseases spread (droplets, close contact, etc.) may put healthcare professionals at higher risk since they work not only with patients who are known to be infected but with patients who may be asymptomatic as well.

### Prevention Strategies for Seasonal Influenza in Healthcare Settings

A summary of CDC recommendations for prevention of flu transmission in healthcare settings is provided below. (This list is not complete; see “Resources” at the end of this course for a link to the complete CDC recommendations.)

- Provide opportunities for all employees to receive the flu vaccine at work.
- Before patients and visitors arrive at a healthcare setting, instruct them to inform healthcare personnel if they have symptoms of any respiratory infection and to take appropriate prevention actions (e.g., wear a mask).
- During periods of influenza activity, limit elective visits by patients with suspected or confirmed influenza.
- Take steps to ensure all persons with symptoms of a respiratory infection adhere to respiratory hygiene, cough etiquette, hand hygiene, and triage procedures throughout the visit.
- Post visual alerts about the steps described above in strategic locations throughout the healthcare facility.
- Provide facemasks.
- Provide supplies to perform hand hygiene.
- Provide social distancing in common areas (e.g., waiting rooms).
- Instruct staff members not to report to work, or if at work, to stop patient-care activities, don a facemask, and notify their supervisor and infection control personnel before leaving work. (Staff members should not return to work until at least 24 hours after they no longer have a fever without the use of fever-reducing medicines.)
- Develop sick-leave policies for staff members that are nonpunitive.



- Develop employee procedures for tracking absences.
- Adhere to Standard Precautions.
- Adhere to Droplet Precautions.
- Use caution when performing aerosol-generating procedures.
- Manage visitor access and movement within the facility.
- Train and educate healthcare personnel on the prevention of infectious agents, including influenza.
- Develop an influenza strategy that can be applied across the entire spectrum of health settings.  
(CDC, 2021k)

## **Infection Prevention and Control (IPC) Recommendations during the COVID-19 Pandemic**

To avoid the spread of SARS-CoV-2 in the healthcare setting, the CDC provides guidance based on currently available information about COVID-19 and the current situation in the United States. Several of the IPC measures are influenced by levels of SARS-CoV-2 transmission in the community.

This guidance is applicable to all U.S. settings where healthcare is delivered (including home health). Employers should be aware that other local, state, and federal requirements may apply, including those promulgated by OSHA (CDC, 2022m).

A summary of CDC recommendations for prevention of COVID transmission in healthcare settings is provided below. (This list is not complete; see “Resources” at the end of this course for a link to the complete and most up-to-date CDC recommendations.)

### **RECOMMENDED ROUTINE IPC PRACTICES**

- Establish a process to identify and manage individuals entering the facility with suspected or confirmed SAR-CoV-2 infection regardless of vaccination status.
- Implement source control measures (i.e., use of respirators or well-fitting facemasks or cloth masks) and physical distancing for everyone in a healthcare setting regardless of their vaccination status.
- Implement universal use of personal protective equipment for healthcare providers (HCP).
- Encourage physical distancing.
- Optimize the use of engineering controls (e.g., physical barriers) and indoor air quality. Ensure everyone is aware of recommended IPC practices in the facility.



- Perform SARS-CoV-2 testing on anyone with even mild COVID-19 symptoms, regardless of vaccination status.
- Create a process to respond to SARS-CoV-2 exposures among HCPs and others. (CDC, 2022m)

### **SOURCE CONTROL OPTIONS**

*Source control* refers to use of respirators or well-fitting facemasks or cloth masks to cover a person's mouth and nose to prevent spread of respiratory secretions when they are breathing, talking, sneezing, or coughing. Source control options for HCP include:

- A NIOSH-approved N95 or equivalent or higher-level respirator, or
- A respirator approved under standards used in other countries that are similar to NIOSH-approved N95 filtering facepiece respirators (note: these should not be used instead of a NIOSH-approved respirator when respiratory protection is indicated), or
- A well-fitting facemask

When used solely for source control, any of the options listed above could be used for an entire shift unless they become soiled, damaged, or hard to breathe through. If they are used during the care of a patient for which a NIOSH-approved respirator or facemask is indicated for personal protective equipment (e.g., NIOSH-approved N95 or equivalent or higher-level respirator during the care of a patient with SARS-CoV-2 infection, facemask during a surgical procedure or during care of a patient on Droplet Precautions), they should be removed and discarded after the patient care encounter and a new one should be donned (CDC, 2022m).

### **RECOMMENDATIONS FOR FULLY VACCINATED INDIVIDUALS**

CDC recommendations for work restriction for healthcare providers who are up to date with all recommended COVID-19 vaccines doses or who have recovered from SARS-CoV-2 infection in the prior 90 days include:

- No work restrictions or testing
- Following all recommended infection prevention and control practices, including monitoring oneself for fever or symptoms consistent with COVID-19 and not reporting to work when ill
- In cases of fever or symptoms consistent with COVID-19, immediately self-isolating and contacting an established point of contact (e.g., occupational health program) to arrange for medical evaluation and testing

(CDC, 2022m)



## RECOMMENDED IPC PRACTICES WHEN CARING FOR PATIENTS WITH SUSPECTED OR CONFIRMED SARS-CoV-2 INFECTION

The CDC provides detailed guidance on infection control when caring for patients with suspected or confirmed COVID-19 infection. These recommendations apply to patients with COVID-19 symptoms as well as asymptomatic patients who have had close contact with someone who is infected. This guidance covers various aspects of patient care, including:

- Patient placement, transport, and movement in the facility
- Use of personal protective equipment and Standard Precautions
- Procedures that could generate infectious aerosols
- Visitation to patients' rooms and lower-risk alternatives
- Duration of transmission-based precautions
- Environmental infection control, including medical equipment, cleaning/disinfection, etc. (CDC, 2022n)

(See “Resources” at the end of this course for a link to the CDC’s detailed recommendations.)

## EDUCATION REGARDING PREVENTION, TESTING, AND TREATMENT

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It is important that patients receive accurate education regarding prevention, testing, and treatment of both influenza and COVID-19. Sharing such knowledge is intended to help reduce the number of infections, increase testing, and implement treatment initiatives.

### Influenza Education

There are steps that individuals can take to **prevent contracting the flu**. The most important step is to receive an annual flu vaccine (see also “2022–2023 Influenza Vaccine” later in this course). Children younger than 6 months are at risk but too young to be vaccinated. People who care for infants should be vaccinated instead.

Additional actions include:

- Avoid close contact with people who are sick.
- Stay at home when ill.
- Cover mouth and nose when sneezing or coughing.
- Avoid touching eyes, nose, or mouth.
- Perform frequent hand hygiene.



- Clean and disinfect surfaces and objects that may be contaminated.
- Stay at home for at least 24 hours after fever is gone except to obtain medical care or other necessities. (Fever should be gone without the need to use a fever-reducing medicine.)
- Take flu antiviral drugs if prescribed. (CDC, 2021g)

The most common **tests to detect influenza** viruses are rapid influenza diagnostic tests (RIDTs), which detect the virus antigens that cause an immune response. Results are available within about 10–15 minutes. RIDTs are not considered as accurate as other flu tests. Rapid molecular assays are more accurate than RIDTs and provide results in 15–20 minutes. Other more accurate and sensitive tests must be performed in specialized laboratories. These tests require a nose or back-of-throat swab, and obtaining results takes several hours (CDC, 2021h).

In a patient infected with influenza, antiviral drugs may be a **treatment** option. Antiviral drugs can lessen symptoms and shorten the time of illness by one or two days. Such drugs can also prevent serious flu complications such as pneumonia. Antiviral drugs work best when taken within 48 hours of the onset of symptoms, but they may still have some benefit even if taken later. U.S. Food and Drug Administration (FDA)–approved antiviral drugs include:

- Tamiflu (oseltamivir phosphate)
- Relenza (zanamivir)
- Rapivab (peramivir)
- Xofluza (baloxavir marboxil)

Other treatment measures are largely supportive in nature. These include taking acetaminophen for fever, staying hydrated, and getting plenty of rest (CDC, 2021i; NIH, 2021).

## COVID-19 Education

The CDC (2022o) offers the following recommendations on **how individuals can protect themselves** and others from becoming infected or sick with COVID-19:

- Get vaccinated and stay up to date on COVID-19 vaccines.
- For everyone ages 2 years and older, properly wear a well-fitting mask indoors and in public areas where the COVID-19 community level is high, regardless of vaccination status.
- For everyone ages 2 years and older (including passengers and workers), properly wear a well-fitting mask or respirator in indoor areas of public transportation (e.g., airplanes, trains, subways) and transportation hubs (e.g., airports, stations, seaports), especially in locations that are crowded or poorly ventilated, such as airport jetways.



- Inside the home, avoid close contact with sick people and, if possible, maintain six feet between the person who is sick and other members of the household. If taking care of someone who is sick, properly wear a well-fitting mask.
- Indoors in public, if not up to date on COVID-19 vaccines, stay at least six feet away from other people, especially if at higher risk of becoming very sick with COVID-19.
- Avoid poorly ventilated spaces and crowds.
- Test to prevent spread to others.
- Wash hands often with soap and water for at least 20 seconds (or use a hand sanitizer that contains at least 60% alcohol if soap and water are not available), especially:
  - Before eating or preparing food
  - Before touching one’s face
  - After using the restroom
  - After leaving a public place
  - After blowing one’s nose, coughing, or sneezing
  - After handling one’s mask
  - After changing a diaper
  - After caring for someone who is sick
  - After touching animals or pets
- If not wearing a mask, cover coughs and sneezes with a tissue; throw used tissues in the trash. Immediately wash hands with soap and water for at least 20 seconds (or use a hand sanitizer that contains at least 60% alcohol if soap and water are not available).
- If wearing a mask, cough or sneeze into the mask. Put on a new, clean mask as soon as possible and wash hands.
- Clean and disinfect high-touch surfaces regularly or as needed after having visitors in one’s home (i.e., tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks).
- If someone is sick or has tested positive for COVID-19, disinfect frequently touched surfaces.
- Monitor one’s health daily and be alert for symptoms such as fever, cough, and shortness of breath; take one’s temperature if symptoms develop.
- Avoid touching eyes, nose, and mouth with unwashed hands.

## DIAGNOSTIC TESTING FOR COVID-19

There are several FDA-approved tests for diagnosing COVID. Viral testing can be done in a laboratory, at a testing site, or at home or anywhere else. Viral tests do not detect antibodies and do not measure immunity level. Specimens from the nose or mouth are analyzed (CDC, 2022p).



## Testing Guidelines

The CDC offers the following guidelines for testing:

1. If symptoms of COVID-19 are present, get tested immediately and follow current quarantine guidance while waiting for results. If no symptoms are present, go to Step 2.
2. If exposed to someone with COVID-19, get tested at least five days after exposure. Follow quarantine guidance while waiting to test. If no such contact has occurred, go to Step 3.
3. If testing is needed for travel, follow destination requirements.

(CDC, 2022p)

## Types of Tests

The FDA has approved the following types of tests for diagnosing COVID-19:

- **RT-PCR test:** Also referred to as a *molecular test*, this test detects genetic material of the virus using a technique called *reverse transcription polymerase chain reaction (RT-PCR)*. A nasopharyngeal swab is inserted into the nostril, and fluid is obtained from the back of the nose. Shorter swabs may also be used. Results may be available in minutes if analyzed onsite and within 1–3 three days or longer if sent to an outside lab. RT-PCR tests are quite accurate when performed properly by a healthcare professional, but they can miss some cases of COVID-19 (i.e., false negative).
- **Antigen test:** This test detects particular proteins in the virus. A long nasal swab is used to obtain a fluid sample. Some antigen tests are able to produce results in minutes. A positive antigen test result is considered accurate when instructions are carefully followed. However, there is an increased chance of false-negative results. A RT-PCR test may be recommended to confirm a negative antigen test result.

**Antibody tests** (also known as *serology tests*) may be able to determine if someone has had a past infection with the COVID-19 virus, but antibody tests should not be used to diagnose a current infection. Their purpose is to detect past infections (CDC, 2022q).

A **self-test** for COVID-19 (also known as an *at-home test*, *home test*, or *over-the-counter [OTC] test*) gives rapid results and can be performed anywhere regardless of vaccination status or whether or not symptoms are present. Free COVID-19 at-home tests may be available at certain pharmacies or through local health departments (CDC, 2022r) (see “Resources” at the end of this course).

### COMBINED COVID-19 AND FLU TEST

A PCR test called the *Flu SC2 Multiplex Assay* has been developed to detect any of the following three viruses at the same time: SARS-CoV-2, influenza A, and influenza B.



However, a negative test does not rule out the possibility of any of these infections. Healthcare providers may take further steps such as additional testing and exposure information as part of the diagnostic process (Mayo Clinic, 2022e).

## COVID-19 TREATMENT

Medications used in the treatment of COVID-19 are available by prescription only. These medications must be started within days of symptom development. Medications include antiviral treatments and monoclonal antibodies, which are described in the table below.

COVID-19 PHARMACOLOGIC TREATMENTS			
Treatment	Who	When	How
Nirmatrelvir with ritonavir (Paxlovid) (antiviral)	Adults; children ages 12 years and older	Start as soon as possible; must begin within 5 days of when symptoms start	Taken at home by mouth
Remdesivir (Veklury) (antiviral)	Adults and children	Start as soon as possible; must begin within 7 days of when symptoms start	Intravenous (IV) infusions at a healthcare facility for 3 consecutive days
Molnupiravir (Lagevrio) (antiviral)	Adults	Start as soon as possible; must begin within 5 days of when symptoms start	Taken at home by mouth
(CDC, 2022s)			

In addition to medications, **supportive measures** include over-the-counter medications such as acetaminophen (Tylenol), rest, and adequate fluid intake.

## PREVENTIVE MEDICATION

The FDA has issued an emergency use authorization (EUA) for **tixagevimab plus cilgavimab (Evusheld)** in adults and children ages 12 years and older as a preventive measure against COVID-19. Evusheld consists of two monoclonal antibodies provided together to help prevent infection with the SARS-CoV-2 virus. A healthcare provider administers Evusheld as two separate consecutive intramuscular (IM) injections at a doctor's office or healthcare facility. If someone is moderately or severely immunocompromised or severely allergic to COVID-19 vaccines, that person may be eligible for Evusheld (CDC, 2022s).

COMPARING INFLUENZA AND COVID-19		
	Influenza (Flu)	COVID-19
Signs and Symptoms	<ul style="list-style-type: none"> <li>Fever</li> </ul>	<ul style="list-style-type: none"> <li>Fever</li> </ul>



	<ul style="list-style-type: none"> <li>• Chills</li> <li>• Cough</li> <li>• Fatigue</li> <li>• Sore throat</li> <li>• Runny or stuffy nose</li> <li>• Muscle pain</li> <li>• Body aches</li> <li>• Headache</li> <li>• Shortness of breath</li> <li>• Vomiting and diarrhea (more common in children than adults)</li> </ul>	<ul style="list-style-type: none"> <li>• Chills</li> <li>• Cough</li> <li>• Fatigue</li> <li>• Sore throat</li> <li>• Runny or stuffy nose</li> <li>• Muscle pain</li> <li>• Body aches</li> <li>• Headache</li> <li>• Shortness of breath</li> <li>• Vomiting and diarrhea (more common in children than adults)</li> <li>• Change in or loss of taste or smell (more frequent with COVID-19 but may occur with flu)</li> </ul>
<b>Incubation Period</b>	<ul style="list-style-type: none"> <li>• Symptoms typically develop within 1–4 days.</li> </ul>	<ul style="list-style-type: none"> <li>• Symptoms typically develop between 2–14 days after infection.</li> </ul>
<b>Transmission</b>	<ul style="list-style-type: none"> <li>• Droplet transmission</li> <li>• Possible airborne transmission</li> </ul>	<ul style="list-style-type: none"> <li>• Droplet transmission</li> <li>• Airborne transmission</li> </ul>
<b>Complications</b>	<ul style="list-style-type: none"> <li>• Pneumonia</li> <li>• Bronchitis</li> <li>• Asthma exacerbations</li> <li>• Ear infections</li> <li>• Acute respiratory distress syndrome</li> <li>• Myocarditis</li> <li>• Encephalitis</li> <li>• Muscle inflammation</li> <li>• Multi-organ failure</li> </ul>	<ul style="list-style-type: none"> <li>• Pneumonia</li> <li>• Respiratory distress</li> <li>• Multiorgan failure</li> <li>• Acute respiratory distress syndrome</li> <li>• Blood clots</li> <li>• Acute kidney injury</li> <li>• Additional viral and bacterial infections</li> </ul>
<b>Prevention</b>	<ul style="list-style-type: none"> <li>• Handwashing</li> <li>• Distancing</li> <li>• Flu vaccine</li> </ul>	<ul style="list-style-type: none"> <li>• COVID-19 vaccine</li> <li>• Mask wearing</li> <li>• Social distancing</li> </ul>



		<ul style="list-style-type: none"> <li>• Handwashing</li> </ul>
<b>Treatment</b>	<ul style="list-style-type: none"> <li>• Antiviral drugs</li> <li>• Supportive measures</li> </ul>	<ul style="list-style-type: none"> <li>• Supportive measures</li> <li>• Monoclonal antibodies and antivirals</li> <li>• Hospitalization (may include oxygen/ventilation and pharmacological management)</li> </ul>
(CDC, 2022a; 2022d)		

## INFLUENZA VACCINES DURING THE CORONAVIRUS PANDEMIC

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### 2022–2023 Influenza Vaccine Update

All persons aged 6 months of age and older are recommended for annual flu vaccination, with rare exceptions. It is important that everyone receive a flu vaccine that is appropriate for their age and health status (CDC, 2022t).

(For a link to more detailed information on approved flu vaccines for the 2022–2023 flu season, see “Resources” at the end of this course.)

### FLU VACCINE OPTIONS

In June 2022, the Advisory Committee on Immunization Practices (ACIP) approved the following recommendations, which were then approved and published by the CDC (2022u):

- ACIP recommends that adults ages  $\geq 65$  years preferentially receive one of the following influenza vaccines: quadrivalent high-dose inactivated influenza vaccine (HD-IIV4), quadrivalent recombinant influenza vaccine (RIV4), or quadrivalent adjuvanted inactivated influenza vaccine (aIIV4). If none of these three vaccines is available at an opportunity for vaccine administration, then any other age-appropriate influenza vaccine should be used.
- PCV15 (15-valent pneumococcal conjugate vaccine) may be used as an option to PCV13 (13-valent pneumococcal conjugate vaccine) for children ages  $< 19$  years according to currently recommended PCV13 dosing and schedules.
- MMR vaccine (Priorix, GSK) according to currently recommended schedules and off-label uses as an option to prevent measles, mumps, and rubella.

### WHO SHOULD AND SHOULD NOT GET A FLU SHOT

Flu shots are **appropriate** for most people.



- Different flu shots are approved for people of different ages. Everyone should get a vaccine that is appropriate for their age.
- Standard-dose inactivated flu vaccines are approved for people as young as 6 months of age.
- Some vaccines are only approved for adults. For example, the recombinant flu vaccine is approved for people ages 18 years and older, and the adjuvanted and high-dose inactivated vaccines are approved for people ages 65 years and older.
- Pregnant people and people with certain chronic health conditions can get a flu shot.
- People with egg allergy can get a flu shot.

People who **should not receive** a flu shot include:

- Children younger than 6 months of age
- People with severe, life-threatening allergies to any ingredient in that particular flu vaccine (other than egg proteins), such as gelatin, antibiotics, or other ingredients
- People who have previously had a severe allergic reaction to a dose of that particular influenza vaccine  
(CDC, 2022t)

Individuals with one of the following conditions **should consult their healthcare provider** to determine whether vaccination is right for them and to select the best vaccine for their situation:

- People with an allergy to eggs or any of the ingredients in the vaccine
- People who have ever had Guillain-Barré syndrome
- Those who have had a severe allergic reaction to a previous dose of any flu vaccine
- Anyone who is not currently feeling well  
(CDC, 2022t)

### **WHO SHOULD AND SHOULD NOT GET A NASAL SPRAY FLU VACCINE**

The nasal spray vaccine is **approved** for people ages 2–49 years. Many people in this age group can receive the nasal spray vaccine, including people with egg allergies (CDC, 2022t).

People who **should not receive** the nasal spray include:

- Children younger than 2 years
- Adults 50 years and older
- People with a history of severe or life-threatening allergic reaction to any ingredient of the nasal spray vaccine (other than egg proteins) or to a previous dose of any flu vaccine



- Children and adolescents ages 2–17 years who are receiving aspirin- or salicylate-containing medications
- Children ages 2–4 years who have asthma or a history of wheezing in the past 12 months
- Pregnant people
- People with weakened immune systems (immunosuppression) from any cause
- People who care for severely immunocompromised persons who require a protected environment (or otherwise avoid contact with those persons for 7 days after getting the nasal spray vaccine)
- People with cerebrospinal fluid (CSF) leaks (communication and leakage of fluid between the space surrounding the brain and the nose, throat, ear, or any other place in the head)
- People with cochlear implants
- People who have recently taken influenza antiviral drugs (depending on the specific influenza antiviral medication that was taken and how recently the last dose was taken) (CDC, 2022t)

People who **should consult their healthcare provider** about getting a nasal spray vaccine include:

- People with asthma who are ages 5 years and older
- People with underlying medical conditions that put them at higher risk of serious flu complications (e.g., lung disease, heart disease [except isolated hypertension], kidney or liver disorders, neurologic/neuromuscular disorders, blood disorders, or metabolic disorders [like diabetes])
- People with moderate or severe acute illness with or without fever
- People with Guillain-Barré syndrome after a previous dose of influenza vaccine (CDC, 2022t)

## FLU VACCINATION TIMING

September and October are generally good times to be vaccinated, and ideally, everyone should be vaccinated before the end of October. While flu activity may be low in the community early in the flu season, it could begin increasing at any time. After vaccination, the body takes about two weeks to develop antibodies that protect against flu (CDC, 2022v).

## FLU VACCINATION OF PERSONS WITH SUSPECTED OR CONFIRMED COVID-19

Persons currently infected with COVID-19 should wait to be vaccinated until after the isolation period is concluded. This also applies to people who have been vaccinated but contract COVID-



19 before receiving any additional or booster doses. People may, in consultation with their healthcare provider, consider delaying their next vaccine (primary dose or booster) by three months from when symptoms started or, if symptom-free, from when a positive test was recorded (CDC, 2022w).

## COVID-19 VACCINES

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A number of vaccines have been authorized and recommended to prevent COVID-19. They each require multiple doses (primary and booster) over varying time periods, depending on the product, and the individual's age and immune status. Approved vaccines include:

- Moderna (for ages 6 months and older)
  - Novavax (for ages 18 years and older)
  - Pfizer-BioNTech (for ages 6 months and older)
  - Janssen (Johnson & Johnson) (for ages 18 and older)
- (CDC, 2022y)

Detailed and up-to-date information on these vaccines, including vaccination schedules for children, adults, and immunocompromised individuals are available on the CDC website (see “Resources” at the end of this course).

### Who Should and Should Not Receive a COVID-19 Vaccine

The CDC (2022bb) recommends everyone stay up to date with COVID-19 vaccination, including all primary series doses and boosters for their age group:

- People ages **6 months through 4 years** should get all COVID-19 primary series doses.
- People ages **5 years and older** should get all primary series doses, and the booster dose recommended for them by CDC, if eligible.
  - People ages **5–11 years** are recommended to get the original (monovalent) booster.
  - People ages **12 years and older** are recommended to receive one updated Pfizer or Moderna (bivalent) booster.
    - This includes people who have received all primary series doses and people who have previously received one or more original (monovalent) boosters.
    - At this time, people ages **12–17 years** can only receive the updated Pfizer bivalent booster.



According to the World Health Organization (WHO, 2022), people who **should not receive** a COVID-19 vaccine include those with:

- A history of severe allergic reaction/anaphylaxis to any of the ingredients of the COVID-19 vaccine
- A fever over 101 °F (38.5 °C)
- Currently confirmed or suspected COVID-19 infection (in which case they should wait to obtain the vaccine until after the mandated isolation period is concluded and acute symptoms have subsided)

It typically takes several weeks after each dose of COVID-19 vaccine to develop maximum levels of immunity. The exact length of time a vaccine provides protection is unknown. However, most people have strong protection against serious illness and death for at least six months (WHO, 2022).

#### **VACCINATION SIDE EFFECTS**

Some people will experience mild side effects after vaccination. Common side effects include fever, head or body aches, and soreness at injection site. Symptoms generally subside within a day or two. Severe side effects are rare (WHO, 2022).

### **Coadministration of COVID-19 Vaccines with Other Vaccines**

According to the CDC, COVID vaccines may be administered without regard to timing of other vaccines. This includes simultaneous administration of the COVID-19 vaccine and other vaccines on the same day. However, administration of an orthopoxvirus vaccine with a COVID-19 vaccine requires additional considerations, which are detailed on the CDC website.

When administering multiple injections:

- Each syringe should be labeled with the name and dosage of the vaccine, lot number, initials of the preparer, and exact beyond-use time, if applicable.
- Each injection should be administered in a different injection site. These sites should be separated by one inch or more, if possible.
- When administering the COVID-19 vaccine and vaccines that may be more likely to cause a local reaction, injections should be given in different limbs, if possible.

(CDC, 2022z)

**“DO I NEED TO WAIT AFTER GETTING A FLU VACCINE OR ANOTHER VACCINE BEFORE GETTING A COVID-19 VACCINE?”**



According to the CDC (2022w), there is no recommended waiting period between getting a COVID-19 vaccine and other vaccines. An individual can get a COVID-19 vaccine and other vaccines, including a flu vaccine, at the same visit. Experience with other vaccines has shown that the way our bodies develop protection, known as an immune response, and possible side effects after getting vaccinated are generally the same when a vaccine is given alone or with other vaccines.

Any concerns should be discussed with a healthcare provider prior to vaccination.

### **V-SAFE**

The CDC offers a smartphone-based tool, v-safe after vaccination health checker, for individuals to report vaccine side effects and to identify any safety issues with new vaccines. This information helps the CDC to monitor the safety of COVID-19 vaccines in real time (CDC, 2022aa).

## **Safe Administration of Vaccines during the COVID-19 Pandemic**

The potential for asymptomatic transmission of the SARS-CoV-2 virus that causes COVID-19 requires meticulous attention to infection prevention practices during all patient encounters, including physical distancing, respiratory and hand hygiene, surface decontamination, and source control while in a healthcare facility (CDC, 2021j).

### **REDUCING EXPOSURE**

To help ensure the safe delivery of care during influenza vaccination visits, providers should minimize chances for exposures, including:

- Screening for symptoms of COVID-19 in persons with possible COVID-19, prior to and upon arrival at the facility
- Isolating symptomatic patients as soon as possible
- Limiting and monitoring points of entry to the facility and installing barriers, such as clear plastic sneeze guards, to limit physical contact with patients at triage
- Implementing policies for the use of a cloth face covering in persons over the age of 2 years (if tolerated)
- Ensuring adherence to respiratory hygiene, cough etiquette, and hand hygiene (CDC, 2021k)

### **INFECTION CONTROL**



All healthcare facility staff should adhere to recommended infection prevention and control procedures, including:

- Following Standard Precautions, which includes guidance for hand hygiene and cleaning the environment between patients
- Wearing a medical facemask at all times
- Using eye protection based on level of community transmission (CDC, 2021k)

## VACCINE ADMINISTRATION

When administering **all types** of vaccines:

- Reduce crowding in waiting areas by asking patients to remain outside (e.g., stay in their vehicles, if applicable) until they are called into the facility for their appointment.
- Ensure that physical-distancing measures, with separation of at least 6 feet between patients and visitors, are maintained during all aspects of the visit, including check-in, checkout, screening procedures, and postvaccination monitoring, using strategies such as physical barriers, signs, ropes, and floor markings.
- Utilize electronic communications as much as possible (e.g., filling out needed paperwork online in advance) to minimize time in the office as well as reuse of materials (e.g., clipboards, pens).

When administering **intranasal or oral vaccines**:

- Wear gloves when administering intranasal or oral vaccines.
- Change gloves between patients in addition to performing hand hygiene.
- Wear masks according to guidelines.

For **intramuscular or subcutaneous vaccines**:

- Change gloves between patients in addition to performing hand hygiene.

(CDC, 2022x)

## CONCLUSION

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Healthcare communities throughout the world are dealing not only with influenza but the compounding issues of the COVID-19 pandemic as well. There is a significant amount of research data about influenza. However, this is not necessarily the case for COVID-19. COVID-19 research is ongoing and new findings are published on an almost daily basis. Healthcare professionals must be able to differentiate between the two diseases and be prepared to deliver safe and appropriate patient care as well as encourage preventive measures in order to control disease outbreaks.



## RESOURCES

About List N: Disinfectants for coronavirus (COVID-19) (EPA)

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-coronavirus-covid-19>

Coronavirus resources (U.S. Department of Labor)

<https://www.dol.gov/coronavirus>

COVID-19 vaccination clinical resources (CDC)

<https://www.cdc.gov/vaccines/covid-19/>

COVID-19 vaccination schedules

<https://www.cdc.gov/vaccines/covid-19/images/COVID19-vaccination-schedule-most-people.png>

Free at-home COVID 19 tests

<https://www.covid.gov/tests>

Healthcare workers: information on COVID-19 (CDC)

<https://www.cdc.gov/coronavirus/2019-nCoV/hcp/>

Infection prevention control recommendations for COVID-19 (CDC)

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html>

Prevention strategies for seasonal influenza in healthcare settings (CDC)

<https://www.cdc.gov/flu/professionals/infectioncontrol/healthcaresettings.htm>

Standards for adult immunization practice (National Vaccine Advisory Committee)

<https://www.cdc.gov/vaccines/hcp/adults/for-practice/standards/>

Who should and should not get a flu vaccine (CDC)

<https://www.cdc.gov/flu/prevent/whoshouldvax.htm>

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## TEST

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1. Symptoms associated with COVID-19 but not typically associated with influenza include:
  - a. High fever and chills.
  - b. Red swollen eyes and rash.
  - c. Body aches.
  - d. Headache and fatigue.
  
2. When discussing COVID-19 and flu incubation and communicability, it is important to know that:
  - a. The omicron variant does not spread as quickly as the delta variant.
  - b. Flu symptoms typically develop 2–14 days after infection.
  - c. People can begin spreading COVID-19 2–3 three days before symptoms begin.
  - d. Severe symptoms of the flu develop and end very slowly.
  
3. Which is an **accurate** statement about SARS-CoV-2 or influenza virus transmission and incubation?
  - a. Both influenza and SARS-CoV-2 viruses are primarily spread by droplets.
  - b. SARS-CoV-2 is not as contagious as influenza viruses.
  - c. It is unlikely that SARS-CoV-2 and influenza virus transmission/exposure occurs via exposed mucous membranes.
  - d. Fine aerosol droplets contaminated with the COVID-19 and flu viruses can remain suspended only for a few minutes.
  
4. Which is a **correct** statement concerning infection prevention recommendations for COVID-19 in a healthcare setting?
  - a. Perform SARS-CoV-2 testing on people who display symptoms only if they are unvaccinated.
  - b. Implement universal use of personal protective equipment for healthcare providers.
  - c. SARS-CoV-2 testing is necessary only if severe COVID symptoms are present.
  - d. It is no longer necessary to adhere to Droplet Precautions.
  
5. A patient whose symptoms began six days ago may receive which one of the following treatments for COVID-19?
  - a. Nirmatrelvir with ritonavir
  - b. Molnupiravir
  - c. Remdesivir
  - d. Paxlovid



6. Recommendations for the influenza vaccine for the 2022–2023 season state that:
  - a. The nasal vaccine is approved for use in pregnant females.
  - b. The best time to receive the flu vaccine is January or February.
  - c. Children younger than 6 months of age should not receive the flu vaccine.
  - d. During a pandemic, persons over the age of 65 should not receive the flu vaccine.
  
7. Recommended immunization procedures during the COVID-19 pandemic state that:
  - a. Routine vaccination should be deferred for persons with suspected or confirmed COVID-19 until isolation is discontinued.
  - b. Maternal vaccines for pregnant women should be deferred during the pandemic.
  - c. Physical distancing measures can be reduced to 3 feet between patients during office visits.
  - d. Routine childhood immunizations should be deferred during the pandemic.

