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Contact Hours: **2**

COVID-19 and Seasonal Flu 2021–2022 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 seasonal flu and COVID-19 and discuss both treatment and vaccines. 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, and transmission for SARS-CoV-2 and influenza viruses.
- Discuss infection prevention measures.
- Describe patient education considerations for influenza and COVID-19.
- Explain concerns surrounding seasonal flu vaccine and routine immunizations during the COVID-19 pandemic.

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 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 flu?
- How are COVID-19 and flu transmitted?
- What steps can be taken to prevent infection?
- What do I need to teach patients and families about COVID-19 and 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 a new coronavirus (SARS-CoV-2), and the flu is caused by infection with a variety of influenza viruses.

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 (more common in children than adults)

According to the CDC, COVID-19 seems to cause more serious illnesses in some people. A **significant difference** between the flu and COVID-19 is that COVID-19 may cause a change in or loss of taste or smell (CDC, 2021a).



Symptoms of COVID-19 can be mild at the beginning but become more intense over five to seven 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).

BREAKTHROUGH COVID-19 INFECTION

No vaccine is 100% effective. A breakthrough infection is one “in which a person who has been fully vaccinated against a particular pathogen still becomes infected with it after being exposed.” In the case of COVID-19 in the United States, this means that a person becomes infected at some point more than two weeks after receiving the second dose of either the Pfizer or Moderna mRNA COVID-19 vaccines or the single-dose Johnson & Johnson / Janssen vaccine.

Some fully vaccinated people will become ill, and some people may even be hospitalized or die from COVID-19 breakthrough. Persons most at risk for breakthrough infections are older adults and those with compromised immune systems.

Up to 25% of individuals with breakthrough SAR-CoV-2 infections may have no symptoms and not even know that they have the virus. For those who do have symptoms, the symptoms are typically mild and last for a few days to one to two weeks in most patients. Symptoms generally include headache, cough, fever, and fatigue. There may be loss of sense of taste and smell. Serious symptoms are unusual in persons who are vaccinated.

(UT, 2021; CDC, 2021o; MSK Cancer Center, 2021; Maragakis, 2020)

Children generally have a milder form of COVID-19 and seldom require hospitalization. However, there have been reported cases of very young babies becoming seriously ill with pneumonia. Children are also 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 (GI) organs. Both children and adults with MIS experience:

- Stomach pain
- Bloodshot eyes
- Diarrhea
- Dizziness or lightheadedness
- Skin rash
- Vomiting

(CDC, 2021v)



Incubation Period

One or more days can pass between becoming infected and when symptoms start to appear in both flu and COVID-19. With flu, patients typically develop symptoms within one to four days. The typical time frame for symptom development with COVID-19 is five days after becoming infected. The incubation time range can vary, however, with symptoms of COVID-19 appearing as early as two days after infection or as late as 14 days after infection (CDC, 2021a).

Severe symptoms of flu may develop and end quite swiftly, usually within five 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, 2021).

Degree of Communicability

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

With **influenza**, the majority of people are contagious for about one day prior to showing symptoms. It appears that older children and adults are most contagious during the initial three to four days of their illness, but many remain contagious for about seven days. Infants and people with weakened immune systems may be contagious for an even longer period of time (CDC, 2021a).

The onset and duration of viral shedding and the period of infectiousness for **COVID-19** are not yet known with certainty. Based on current evidence, scientists believe that persons with mild to moderate COVID-19 may shed SARS-CoV-2 for up to 10 days following symptom onset, while a small fraction of persons with severe COVID-19 may shed the virus for up to 20 days. Based on existing literature, the incubation period (the time from exposure to development of symptoms) of SARS-CoV-2 ranges from 2–14 days (CDC, 2021z).

Emerging evidence suggests that persons who are vaccinated against COVID-19 may be less contagious because they have milder illness and shed the virus for shorter periods of time. However, the extent of this difference in contagion is unknown at this time. Until more research data are available, it is recommended that everyone follow infection control measures such as wearing masks (MSK Cancer Center, 2021).

The COVID-19 virus is constantly changing via mutation, and communicability of the virus also differs among **variants**. For instance:

- The Delta (B.1.617.2) variant has become the most common in the United States, is nearly two times as contagious as earlier variants, and may cause more severe illness. The greatest risk for transmission is to unvaccinated people. However, fully vaccinated people may experience breakthrough infections and may also transmit the variant to others.



- The Alpha (B.1.1.7) variant seems to spread more easily, with approximately a 50% increase in transmission compared to earlier circulating variants. This variant may also have an increased risk of hospitalizations and death.
- The Beta (B.1.351) variant seems to spread more easily, with about a 50% increase in transmission when compared to previous circulating variants. It also decreases the effectiveness of some monoclonal antibody medications and the antibodies generated by a previous COVID-19 infection or vaccine.

(Mayo Clinic, 2021a)

Modes of Transmission

The ease of transmission from person to person can vary. COVID-19 appears to spread more efficiently than influenza but not as efficiently as measles, which is among the most contagious viruses known to affect people.

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). Both are spread primarily by droplets made when people who are infected cough, sneeze, or talk. 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, 2021a).

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, 2021bb). This enables one person to infect many others, and large transmission clusters seem to be associated with aerosol transmission.

Even though SARS-CoV-2 and flu viruses are believed to spread in similar ways, SARS-CoV-2 is more contagious among certain populations than the flu virus. For example:

- Some people shed far more virus for longer periods of time than others. This may be due to differences in their immune systems or the distribution of virus receptors in their body.
- Some people breathe out many more particles than others when they talk. This may be due to the volume at which people speak.

(Kupferschmidt, 2020)

Also, COVID-19 has been observed to have more “superspreading” events than 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, 2021a). 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).

The CDC recommends staying at least six feet away from people who do not live within the same household. However, the virus may be able to travel a distance of six feet. Ultimately, people should stay as far away as possible from others who do not live in the same household (CDC, 2021w).

TRANSMISSION AND PETS

Based on limited information, the risk of animals spreading COVID-19 to humans is considered low. Infected pets might get sick or they might not have any symptoms. A small number of pets, including cats and dogs, worldwide have been reported to be infected with SARS-CoV-2, mostly after close contact with infected people. Of those pets who have been sick with COVID-19, most had only mild illness and fully recovered.

To protect 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 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 (CDC, 2021b).

The influenza virus can be transmitted from humans to pets. Such transmission can be especially serious when the flu virus moves between species because the receiving species typically has not built an immunity to the particular flu strain. Common pets at risk of such infection include dogs, cats, guinea pigs, hamsters, ferrets, and birds (Barber, 2020).

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, 2020)

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, 2021a)

Mortality

Influenza viruses and SARS-CoV-2 can both cause serious illness leading to hospitalization or death.

The World Health Organization (2021) estimates that 290,000 to 650,000 people die of flu-related causes every year worldwide. The COVID-19 pandemic is evolving rapidly, and doctors and scientists are working to estimate the mortality rate of the virus. Mortality is believed to be substantially higher—possibly 10 times more—than that of most strains of flu (Maragakis, 2021).



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, 2021x).

It is important to note that older unvaccinated adults are more likely to be hospitalized or die from COVID-19. People who are 65 and older and have received both doses of either the Pfizer or Moderna vaccines showed a 94% reduced risk of COVID-19 related hospitalization. Among older adults who are partially vaccinated, the reduced risk was 64% (CDC, 2021x).

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, 2021c).

Each year thousands of children are hospitalized and some children die from influenza. Although all children younger than 5 years old are considered at high risk for serious flu complications, the highest risk is for those younger than 2 years old, with the highest hospitalization and death rates among infants younger than 6 months old (CDC, 2020).

HEALTH FACTORS

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



HEALTH FACTORS INCREASING RISK OF . . .	
COVID-19	INFLUENZA
<p>Increased risk:</p> <ul style="list-style-type: none"> • Cancer • Chronic renal disease • COPD • Down syndrome • Serious heart conditions (e.g., heart failure, coronary artery disease, cardiomyopathies) • Immunocompromised state due to solid organ transplant • Obesity (BMI 30 or higher) • Pregnancy • Sickle cell disease • Type 2 diabetes <p>Possible increased risk:</p> <ul style="list-style-type: none"> • Asthma (moderate to severe) • Cerebrovascular disease • Cystic fibrosis • Hypertension • Immunocompromised state due to blood or bone marrow transplant, immune deficiencies, HIV, use of corticosteroids, or use of other immune-weakening medicines • Neurologic conditions (e.g., dementia) • Liver disease • Overweight (BMI >25 but <30) • Pulmonary fibrosis • Thalassemia • Type 1 diabetes 	<p>Increased risk:</p> <ul style="list-style-type: none"> • Asthma • Neurologic and neurodevelopment conditions • Blood disorders (e.g., sickle cell disease) • Chronic lung disease (e.g., COPD, cystic fibrosis) • Endocrine disorders (e.g., diabetes mellitus) • Heart disease (e.g., congenital heart disease, congestive heart failure, coronary artery disease) • Kidney disease • Liver disorders • Metabolic disorders (e.g., inherited metabolic disorders, mitochondrial disorders) • Obesity (BMI 40 or higher) • People under 19 years on long-term aspirin- or salicylate-containing medications • 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) • Stroke <p>Others at high risk:</p> <ul style="list-style-type: none"> • Pregnant women and women up to 2 weeks after end of pregnancy • Nursing home and other long-term care facility residents • Non-Hispanic Black persons, Hispanic or Latino persons, American Indian or Alaska Native persons
(CDC, 2021d, 2021e)	

INFECTION PREVENTION MEASURES IN HEALTHCARE SETTINGS

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 way 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 previous steps 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, 2021p)

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, 2021r).

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 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 their 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).
- 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.



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, 2021f).

ALLOWANCES FOR FULLY VACCINATED INDIVIDUALS

While it is generally safest to implement universal use of source control for everyone in a healthcare setting, some allowances could be considered for fully vaccinated individuals in healthcare facilities located in **counties with low to moderate community transmission**. For instance:

- Fully vaccinated HCP could choose not to wear source control or physically distance when they are in well-defined areas that are restricted from patient access (e.g., staff meeting rooms, kitchen).
- During patient visitation, patients and visitors who are fully vaccinated could choose not to wear source control and to have physical contact. (Visitors should wear source control when around other residents or HCP, regardless of vaccination status.)
(CDC, 2021f)



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, 2021f)

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

EDUCATION REGARDING PREVENTION, TESTING, AND TREATMENT

It is important that patients receive accurate education regarding prevention, testing, and treatment of both flu and COVID-19. The application of knowledge should help to 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 “2021–2022 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 get 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. 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).

COVID-19 Education

The CDC (2021j) offers the following recommendations on **how individuals can protect themselves** and others from getting sick with COVID-19:

- Get vaccinated as soon as you can; once you are fully vaccinated, you may be able to start doing some things that you had stopped doing because of the pandemic.
- Wear a mask in indoor public places; in general, you do not need to wear a mask in outdoor settings.
- Stay 6 feet away from anyone who is sick or who does not live in your household, especially if you are at higher risk of getting very sick.
- Avoid crowds and poorly ventilated spaces like restaurants, bars, fitness centers, or movie theaters.



- Wash your hands often with soap and water for at least 20 seconds (or use a hand sanitizer that contains at least 60% alcohol), especially:
 - Before eating or preparing food
 - Before touching your face
 - After using the restroom
 - After leaving a public place
 - After blowing your nose, coughing, or sneezing
 - After handling your mask
 - After changing a diaper
 - After caring for someone sick
 - After touching animals or pets
- Cover coughs and sneezes; throw used tissues in the trash.
- Clean and disinfect high-touch surfaces daily (i.e., tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, and sinks).
- Monitor your health daily and be alert for symptoms such as fever, cough, and shortness of breath, and take your temperature if symptoms develop.

Two kinds of tests are available for SARS-CoV-2 infection: viral and antibody.

Viral tests include the nucleic acid amplification test (NAAT) and the antigen test, and they are used to detect current infection. The PCR (polymerase chain reaction) test is the most commonly used NAAT technique for detecting genetic material of the SARS-CoV-2 virus and is considered the “gold standard.” A rapid antigen test, including an over-the-counter test, may also be used and is most accurate in symptomatic individuals, but false negatives or false positives are common, and it is recommended that a follow-up PCR test be conducted for further evaluation (Mayo Clinic, 2021b; Physician One Urgent Care, 2021; CDC, 2021y).

Antibody tests (also known as *serology tests*) detect viral proteins and indicate past infection. They are generally not as sensitive as viral tests, and antibody test results may need to be confirmed with an NAAT. Patients may consult with their state or local health department’s websites to find testing locations. If symptoms are present, healthcare providers should be consulted prior to going for a test (CDC, 2021y).

COMBINED COVID-19 AND FLU TEST

A PCR test called the Flu SC2 Multiplex Assay has been developed to detect any of these 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, 2021b).

Most people with the infection have mild illness and can recover without medical care. If someone is infected with SARS-CoV-2 but does not show signs of serious illness, then no immediate **treatment measures** are recommended. Supportive care such as acetaminophen, staying hydrated, and resting may mitigate symptoms until recovery.

To prevent further disease spread, patients with COVID-19 are advised to stay home, avoid public places, and separate themselves from other people, including those in the same household. Symptoms should be monitored and medical help immediately obtained if the patient develops trouble breathing, pain or pressure in the chest, new confusion, inability to wake or stay awake, and/or develops bluish lips or face (CDC, 2020dd).

COMPARING INFLUENZA AND COVID-19		
	INFLUENZA (Flu)	COVID-19
Signs and symptoms	<ul style="list-style-type: none"> • Fever • Chills • Cough • Fatigue • Sore throat • Runny or stuffy nose • Muscle pain • Body aches • Headache • Vomiting and diarrhea (more common in children than adults) 	<ul style="list-style-type: none"> • Fever • Chills • Cough • Fatigue • Sore throat • Runny or stuffy nose • Muscle pain • Body aches • Headache • Vomiting and diarrhea (more common in children than adults) • Change in or loss of taste or smell
Incubation period	<ul style="list-style-type: none"> • Symptoms typically develop within 1 to 4 days. 	<ul style="list-style-type: none"> • Symptoms typically develop 5 days after being infected, but symptoms may appear as early as 2 days or as late as 14 days after infection.
Transmission	<ul style="list-style-type: none"> • Droplet transmission 	<ul style="list-style-type: none"> • Droplet transmission • Airborne transmission



Complications	<ul style="list-style-type: none"> • Pneumonia • Bronchitis • Asthma exacerbations • Ear infections • Acute respiratory distress syndrome • Myocarditis • Encephalitis • Muscle inflammation • Multi-organ failure 	<ul style="list-style-type: none"> • Pneumonia • Respiratory distress • Multiorgan failure • Acute respiratory distress syndrome • Blood clots • Acute kidney injury • Additional viral and bacterial infections
Prevention	<ul style="list-style-type: none"> • Handwashing • Distancing • Flu vaccine 	<ul style="list-style-type: none"> • COVID-19 vaccine • Mask wearing • Social distancing • Handwashing
Treatment	<ul style="list-style-type: none"> • Antiviral drugs • Supportive measures 	<ul style="list-style-type: none"> • Supportive measures • Monoclonal antibodies (for outpatients with mild to moderate COVID-19 who are at high risk for disease progression) • Hospitalization (may include oxygen/ventilation and pharmacological management)
(CTCA, 2020; NIH, 2021)		

INFLUENZA VACCINES DURING THE CORONAVIRUS PANDEMIC

2021–2022 Influenza Vaccine Update

The CDC recommends that everyone 6 months of age and older get a flu vaccine for the 2021–2022 season, with rare exceptions. Flu shots are also recommended for use in pregnant women. Children younger than 6 months of age and people with severe, life-threatening allergies to flu vaccine (or its ingredients) should **not** receive the flu vaccine (CDC, 2021k, 2021i).



(For a link to more information on approved flu vaccines for the 2021–2022 flu season, see “Resources” at the end of this course.)

FLU VACCINE OPTIONS

All flu vaccines in the United States for the 2021–2022 season are quadrivalent vaccines. Different vaccines are approved for different age groups. For 2021–2022, recommendations are for egg-based, cell-based, and recombinant flu vaccines.

Egg-based vaccine composition recommendations include:

- A/Victoria/2570/2019 (H1N1) pdm09-like virus
- A/Cambodia/e0826360/2020 (H3N2)-like virus
- B/Washington/02/2019- like virus (B/Victoria lineage)
- B/Phuket/3073/2013-like virus (B/Yamagata lineage)

Cell- or recombinant-based vaccine composition recommendations include:

- A/Wisconsin/588/2019 (H1N1) pdm09-like virus
- A/Cambodia/e0826360/2020 (H3N2)-like virus
- B/Washington/02/2019- like virus (B/Victoria lineage)
- B/Phuket/3073/2013-like virus (B/Yamagata lineage)

These recommendations include **two changes** compared to the 2020–2021 U.S. flu vaccines: both the influenza A (H1N1) and the influenza A (H3N2) vaccine virus components were updated. Compared to the Southern Hemisphere flu vaccine recommendation, this recommendation represents an update to the influenza A (H3N2) component (CDC, 2021m).

WHO SHOULD AND SHOULD NOT GET A FLU SHOT

All persons aged 6 months of age and older are recommended to receive the annual flu vaccination, with rare exception. Flu shots are appropriate for most people.

People Who Should Not Receive a Flu Shot

- 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, 2021k)



People Who Should Talk to Their Healthcare Provider

Individuals with one of the following conditions should consult with 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, 2021m)

WHO SHOULD AND SHOULD NOT GET A NASAL SPRAY VACCINE

The quadrivalent nasal spray vaccine is approved for use in nonpregnant individuals, ages 2 years through 49 years. People with certain medical conditions should not receive the nasal spray influenza vaccine (CDC, 2021m).

People Who Should Not Receive the Nasal Spray

- Children younger than 2 years old
- 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 2 through 17 years old who are receiving aspirin- or salicylate-containing medications
- Children 2 through 4 years old who have asthma or a history of wheezing in the past 12 months
- 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 without a spleen or with a nonfunctioning spleen
- Pregnant people



- People with an active leak between the cerebrospinal fluid and the mouth, nose, ear, or other place within the skull
- People with cochlear implants
- People who have taken flu antiviral drugs within a certain amount of time (48 hours for oseltamivir and zanamivir, 5 days for peramivir, and 17 days for baloxavir)

People Who Should Talk to Their Healthcare Provider

- People with asthma 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 within 6 weeks following a previous dose of flu vaccine (CDC, 2021k)

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, 2021m).

Flu Vaccination of Persons with Suspected or Confirmed COVID-19

Routine influenza vaccination should be deferred for persons with suspected or confirmed COVID-19, regardless of symptoms, until criteria have been met for them to discontinue isolation. While mild illness with COVID-19 is not a contraindication to vaccination, vaccination visits for these individuals should be postponed to avoid exposing healthcare personnel and other patients to the virus that causes COVID-19. When scheduling or confirming appointments for vaccination, patients should be instructed to notify the provider's office in advance if they currently have or develop any symptoms of COVID-19 (CDC, 2021m).

Safe Administration of Vaccines during a 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, 2021m).

REDUCING EXPOSURE

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

- Screen for symptoms of COVID-19 in persons with possible COVID-19 prior to and upon arrival at the facility.
- Isolate symptomatic patients as soon as possible.
- Limit and monitor points of entry to the facility and install barriers, such as clear plastic sneeze guards, to limit physical contact with patients at triage.
- Implement policies for the use of a cloth face covering in persons over the age of 2 years (if tolerated).
- Ensure adherence to respiratory hygiene, cough etiquette, and hand hygiene. (CDC, 2021p)

INFECTION CONTROL

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

- Follow Standard Precautions, which includes guidance for hand hygiene and cleaning the environment between patients.
- Wear a medical facemask at all times.
- Use eye protection based on level of community transmission. (CDC, 2021p)

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.
- Administration of vaccines is not considered an aerosol-generating procedure, and the use of an N95 or higher-level respirator is not recommended.

For **intramuscular or subcutaneous vaccines**:

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

(CDC, 2021s)

COVID-19 VACCINES

A number of vaccines have been authorized and recommended to prevent COVID-19, and other vaccines remain in the trial phase. As of September 2021, three vaccines have been authorized and recommended in the United States. These are:

COVID VACCINES IN THE UNITED STATES	
Brand Name	Shots Required
Pfizer-BioNTech	2 shots (given 21 days apart)
Moderna	2 shots (given 28 days apart)
Johnson & Johnson / Janssen	1 shot
(CDC, 2021t)	

Since receiving approval, COVID-19 vaccines have been received by the majority of the U.S. population. Based on assessment of data and evidence from vaccinated individuals, the U.S. Advisory Committee on Immunization Practices has estimated that benefits (prevention of COVID-19 disease and associated hospitalizations, ICU admissions, and deaths) outweigh any risks associated with the vaccines (Rosenblum et al., 2021).

Vaccine effectiveness against COVID-19 hospitalization for Moderna and Pfizer-BioNTech vaccines was 93% and 88%, respectively, whereas the single-dose Janssen vaccine had somewhat lower effectiveness at 71% (Self et al., 2021).



Who Should Get a COVID-19 Vaccine

The FDA and CDC recommend vaccination of **all eligible persons** with one of the approved vaccines, without preference for any specific vaccine. COVID-19 vaccines are also recommended for and can be administered to people with:

- Underlying medical conditions
- A history of allergic reactions **not** related to vaccines
- Pregnancy or breastfeeding
- Children ages 12–15 (Pfizer-BioNTech vaccine only)

People who should **not** receive a COVID-19 vaccine include:

- Any age groups not yet approved
- People with severe, life-threatening allergies to any component of the vaccine

People with a severe allergic reaction (anaphylaxis) to any vaccine or injectable (intramuscular or intravenous) medication should consult with their healthcare provider to assess risk prior to receiving the COVID-19 vaccine.

Vaccine Boosters

COVID-19 vaccine **booster shots** are available for Pfizer-BioNTech vaccine recipients who completed their initial series at least 6 months ago. The CDC recommends the booster shot for people 65 years and older, residents 18 years and older in long-term care settings, and people 50–64 years with underlying medical conditions. Other groups—such as people 18–49 with underlying medical conditions or at increased risk because of occupational or institutional settings—may receive a Pfizer-BioNTech booster shot based on their individual risk and benefit (CDC, 2021aa). (Booster shots of the Moderna and Johnson & Johnson / Jansen vaccines are not approved or recommended as of September 2021.)

Coadministration of COVID-19 Vaccines with Other Vaccines

Although data are not available for COVID-19 vaccines administered simultaneously with other vaccines, extensive experience with non-COVID-19 vaccines has demonstrated that immunogenicity and adverse event profiles are generally similar when vaccines are administered simultaneously as when they are administered alone.

COVID-19 vaccines were previously recommended to be administered alone, with a minimum interval of 14 days before or after administration of any other vaccines. This was out of an abundance of caution during a period when these vaccines were new and not due to any known safety or immunogenicity concerns. However, substantial data have now been collected regarding the safety of COVID-19 vaccines currently approved or authorized by FDA.



COVID-19 vaccines may now be administered without regard to timing of other vaccines.

This includes simultaneous administration of COVID-19 vaccine and other vaccines on the same day, as well as coadministration within 14 days.

It is unknown whether reactogenicity of COVID-19 vaccine is increased with coadministration, including with other vaccines known to be more reactogenic, such as adjuvanted vaccines or live vaccines. When deciding whether to coadminister an(other) vaccine(s) with a COVID-19 vaccine, vaccination providers should consider whether the patient is behind or at risk of becoming behind on recommended vaccines, their risk of vaccine-preventable disease (e.g., during an outbreak or occupational exposures), and the reactogenicity profile of the vaccines.

If multiple vaccines are administered at a single visit, administer each injection in a different injection site. For adolescents and adults, the deltoid muscle can be used for more than one intramuscular injection administered at different sites in the muscle (CDC, 2021q).

The CDC is continually updating vaccine information during the pandemic, and healthcare professionals should visit the CDC COVID-19 vaccination webpage often for the latest information (see “Resources” below) (CDC, 2021n).

V-SAFE

The CDC has developed a new 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. The government is also working toward making vaccines widely available for everyone at no cost. Some vaccination providers, however, may bill the patient’s insurance company, Medicaid, or Medicare for an administration fee (CDC, 2021u).

CONCLUSION

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/>

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/>

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1. A symptom associated with COVID-19 but **not** with influenza is:
 - a. High fever and chills.
 - b. Complaints of loss of taste and smell.
 - c. Body aches.
 - d. Complaints of headache and fatigue.

2. When discussing COVID-19 “breakthrough” cases, it is important to know that:
 - a. Symptoms of COVID-19 infection and breakthrough infection are distinctly different.
 - b. Persons who are fully vaccinated cannot die of a breakthrough case of COVID-19.
 - c. Up to 25% of individuals who have breakthrough COVID-19 may have no symptoms.
 - d. Breakthrough COVID-19 infections are very common.

3. Which is an **accurate** statement about SARS-CoV-2 and influenza virus transmission and incubation?
 - a. Both influenza and SARS-CoV-2 viruses are primarily spread by droplets.
 - b. SARS-CoV-2 does not spread as efficiently as influenza viruses.
 - c. Unlike SARS-CoV-2, influenza viruses cannot spread until symptoms have developed.
 - d. Symptoms of both flu and COVID-19 typically develop from one to four days after infection.

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. Visitors do not need to wear masks anywhere in the facility if they are vaccinated.
 - d. Physical distancing is not required for vaccinated individuals in patient areas.

5. The clinician correctly educates a patient infected with COVID-19 to:
 - a. Quarantine for 5 days and then resume your normal activities.
 - b. Immediately visit your doctor to begin aggressive treatment measures.
 - c. Stay at home and monitor your symptoms.
 - d. Continue to share physical spaces with others in your same household.



6. Recommendations for the influenza vaccine for the 2021–2022 season include:
 - 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 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 current 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 current pandemic.

