

Influenza

General Information

Influenza (the flu) is a highly transmissible respiratory illness caused by influenza viruses. It can cause mild to severe illness, and may lead to death. Older people, young children, and people with certain comorbidities† are at high risk for serious complications.

There are **three types of influenza** viruses: A, B and C. Human influenza A and B viruses cause seasonal epidemics of disease almost every winter. The emergence of new and very different influenza virus strains can infect higher than normal levels of people which may cause an influenza pandemic. Influenza type C infections cause a mild respiratory illness and are not thought to cause epidemics.

Influenza A viruses are divided into **subtypes** based on two proteins on the surface of the virus: the hemagglutinin (**H**) and the neuraminidase (**N**). There are 17 different **H** subtypes and 10 different **N** subtypes. **Influenza A** viruses can be further divided into different **strains**. Current subtypes of influenza A viruses found in people are influenza A (H1N1) and influenza A (H3N2) viruses.

In the spring of **2009**, a new influenza A (H1N1) virus emerged. This virus was very different from regular human influenza A (H1N1) viruses and the new virus caused the **first influenza pandemic** in more than 40 years. That virus “2009 H1N1” has now almost fully replaced the H1N1 virus that was previously circulating in humans.

Influenza B viruses are not divided into subtypes, but can be further broken down into different strains.

Naming convention for influenza viruses

The approach uses the following components:

1. The antigenic type (e.g., A, B, C)
2. The host of origin (e.g., swine, chicken, etc. For human-origin, no host of origin designation is given.)
3. Geographical origin (e.g., Denver, Taiwan, etc.)
4. Strain number (e.g., 15, 7, etc.),
5. Year of isolation (e.g., 57, 2009, etc.)



For influenza A viruses, the **H** and **N** antigen description in parentheses (e.g., (H1N1), (H5N1)). For example: A/duck/Alberta/35/76 (H1N1), A/Perth/16/2009 (H3N2)

How the Flu Virus Can Change: “Drift” and “Shift”

Influenza viruses can change in two different ways. One is called “**antigenic drift.**” These are small changes in the virus that happen continually over time. Antigenic drift produces new virus strains that may not be recognized by the body's immune system. This process works as follows:

A person infected with a particular flu virus strain develops antibodies against that virus. As newer virus strains appear, the antibodies against the older strains no longer recognize the “newer” virus, and reinfection can occur. This is one of the main reasons why people can get the flu more than one time. In most years, one or two of the three virus strains in the influenza vaccine are updated to keep up with the changes in the circulating flu viruses. So, people who want to be protected from the flu need to get a flu shot every year.

The other type of change is called “**antigenic shift.**” Antigenic shift is an abrupt, major change in the influenza A viruses, resulting in new H and/or new H and N proteins in influenza viruses that infect humans. Shift results in a new influenza A subtype or a virus with a H or a H and N combination that has emerged from an animal population that is so different from the same subtype in humans that most people do not have immunity to the new (e.g. novel) virus. Such a “shift” occurred in the spring of 2009, when a new H1N1 virus with a new combination of genes emerged to infect people and quickly spread, causing a pandemic. When shift happens, most people have little or no protection against the new virus. While influenza viruses are changing by antigenic drift all the time, antigenic shift happens only occasionally.

Influenza type A viruses undergo both kinds of changes; influenza type B viruses only change by the more gradual process of antigenic drift.

Transmission of Influenza Viruses from Animals to People

Influenza A viruses are found in many different animals, including ducks, chickens, pigs, whales, horses and seals. Influenza B viruses only circulate widely among humans.

All known subtypes of influenza A viruses have been found among birds, except subtype H17N10 which has only been found in bats. Wild birds are the primary natural reservoir for all subtypes of influenza A viruses and are thought to be the source of influenza A viruses in all other animals. Most influenza viruses cause asymptomatic or mild infection in birds; however, the range of symptoms in birds varies greatly depending on the strain of virus. Infection with



certain avian influenza A viruses (for example, some strains of H5 and H7 viruses) can cause widespread disease and death among some species of wild and especially domestic birds such as chickens and turkeys. Pigs can be infected with both human and avian influenza viruses in addition to swine influenza viruses. Infected pigs get symptoms similar to humans, such as cough, fever and runny nose. Because pigs are susceptible to avian, human and swine influenza viruses, they potentially may be infected with influenza viruses from different species (e.g., ducks and humans) at the same time. If this happens, it is possible for the genes of these viruses to mix and create a new virus. For example, if a pig were infected with a human influenza virus and an avian influenza virus at the same time, the viruses could mix (re-assort) and produce a new virus that has most of the genes from the human virus, but H and/or N from the avian virus. The resulting new virus would likely be able to infect humans and spread from person to person, but it would have surface proteins not previously seen in influenza viruses (antigenic shift) that infect humans. If this new virus causes illness in people and can be transmitted easily from person to person, an influenza pandemic can occur.

While it is unusual for people to get influenza infections directly from animals, sporadic human infections and outbreaks caused by certain avian influenza A viruses have been reported.

Symptoms

The main characteristic of this illness is “sudden onset”. People who have the flu often feel some or all of these symptoms: fever or feeling feverish/chills, cough, sore throat, runny or stuffy nose, muscle or body aches, headaches, fatigue, vomiting and diarrhea may occur in some cases, though this is more common in children than adults.

Complications

Most people who get influenza will recover in a few days to less than two weeks, but some people can develop complications, such as pneumonia, which can be life-threatening and possibly result in death. Pneumonia, bronchitis, and sinus and ear infections are three examples of complications from the flu. The flu can make chronic health problems worse. For example, people with asthma may experience asthma attacks while they have the flu, and people with chronic congestive heart failure may have worsening of this condition that is triggered by the flu. People 65 years and older, people with certain chronic medical conditions (such as asthma, diabetes, or heart disease), pregnant women, and young children are at a higher risk for complications.

Flu is **unpredictable** and how severe it is can vary widely from one season to the next depending on many things, including: what flu viruses are spreading, how much flu vaccine is



available, when the vaccine is available, how many people get vaccinated, and how well the flu vaccine is matched to flu viruses that are causing illness.

Flu-related deaths in the United States ranged from an estimated 17,000 during the mildest season to 52,000 during the most severe season (36,000 average). During a regular flu season, about 90 percent of deaths occur in people 65 years and older.

Transmission

People with the flu can spread it to others up to 6 feet away. Most experts think that flu viruses are spread mainly by **droplets** made when people with the flu cough, sneeze or talk. These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs. **Less often, a person might also get flu by touching a surface or object that has the flu virus on it and then touching his/her own mouth or nose.**

Most healthy adults may be able to infect others beginning 1 day **before** symptoms develop and up to 5 to 7 days **after** becoming sick. Children may pass the virus for more than 7 days after becoming sick.

Symptoms start 1 to 4 days after the virus enters the body. **That means that you may be able to pass on the flu to someone else before you know you are sick, as well as while you are sick for up to 7 days.** Some people can be infected with the flu virus but have no symptoms. During this time, those persons may still spread the virus to others.

Prevention

Vaccination

Influenza A (H1N1), A (H3N2), and influenza B viruses are included in each year's influenza vaccine. Getting a flu vaccine can protect against flu viruses that are the same or related to the viruses in the vaccine. The vaccine is not a live virus. The seasonal flu vaccine does not protect against influenza C viruses. Flu vaccines will **NOT** protect against infection and illness caused by other viruses that can also cause influenza-like symptoms. There are many other non-flu viruses that can result in influenza-like illness (ILI) that spread during the flu season. Once vaccinated, it takes about two (2) for your body to build immunity. Even if you have received the vaccine, it is still possible for you to get the flu.

General Hygiene

This includes, covering your mouth and nose with a tissue when coughing and sneezing or into your elbow and then doing proper hand hygiene after coughing, sneezing, or touching mucus



membranes. Ensuring that environmental surfaces are cleaned and disinfected on regular basis will help reduce transmission.

Infected persons should avoid contact with others in order to reduce the risk of transmission (home quarantine). This is important to keep infected children away from school/day care and adults should not go to work place during the illness period which can last up to seven (7) days. In healthcare, patients are usually placed on droplet precautions to protect healthcare personnel and other patient from this illness.

Treatment

In most cases, the flu resolves on its own with adequate rest, hydration, nutrition and antipyretics (fever reducer) medication, i.e., ASA (aspirin), Ibuprofen. The doctor may prescribe an anti-viral medical called Tamiflu which can help reduce the severity of the symptoms or the duration of illness.





















Cleaning and Disinfection

Diligent and frequent cleaning and disinfection of environmental surfaces is a key component in a comprehensive “respiratory illness” prevention strategy.

The EPA has established its perspective that if a disinfectant carries an influenza claim, it will allow companies to promote their product as effective against all strains of influenza. Disinfectants have not shown strain specificity. Thus there's no value in testing against a number of additional strains beyond the basic strains common on disinfectant labels already.



Influenza is susceptible to the following Diversey disinfectants:

Product	Oxivir® 1 RTU / Wipes	Oxivir® Tb RTU / Wipes	Oxivir® Five 16	Alpha® HP Multisurface Disinfectant Cleaner	Avert™ Sporicidal Disinfectant Cleaner/Wipes	Virex® II 256	Virex® Tb	Virex® Plus	Expose® II 256	MoonBeam®3 UV Disinfection
Contact Time (Min)	1	1	5	5	1	5	3	3	10	3
										
Product	Oxivir® Tb RTU / Wipes	Oxivir® Plus (Concentrate)	Virox® 5 Concentrate	Virox® 5 (RTU & Wipes)	Percept TM (Concentrate, RTU & Wipes)	Virex® II 256	Avert™ Disinfectant Cleaner	MoonBeam®3 UV Disinfection		
Contact Time (Min)	1	5	5	5	5	5	1	3		
										

Definitions:

† **Comorbidity:** Is a disease or condition that coexists with a primary disease but also stands on its own as a specific disease. For example, someone can have hypertension (high blood pressure) and not have diabetes. But on the other hand, someone with diabetes very often has hypertension too. So hypertension is a common comorbidity of diabetes. Other common comorbidities of diabetes are hyperlipidemia cardiovascular disease, kidney disease, and obesity.

£ **Epidemic:** epidemics occur when new cases of a certain disease, in a given human population, and during a given period, substantially exceed what is expected based on recent experience.

Epidemiologists often consider the term outbreak to be synonymous to epidemic, but the general public typically perceives outbreaks to be more local and less serious than epidemics.

! **Pandemic:** Is an epidemic of infectious disease that has spread through human populations across a large region; for instance multiple continents, or even worldwide. A widespread endemic disease that is stable in terms of how many people are getting sick from it is not a pandemic. Further, flu pandemics generally exclude recurrences of seasonal flu.

References:

1. <https://www.cdc.gov/flu/keyfacts.htm>
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