Influenza

Summary

Influenza is an acute viral disease of the respiratory tract characterized by the sudden onset of fever, often accompanied by sore throat, chills, headache, myalgias, rhinitis, nasal congestion and/or a dry cough. Conjunctival infection, abdominal pain, nausea, vomiting, and diarrhea are less commonly associated with influenza illness. Some children can display an atypical presentation of influenza as upper respiratory tract infection(s) or fever with few other respiratory tract symptoms. In infants, influenza can sometimes produce a sepsis-like picture and can cause other infections like pneumonia.

Infections are acquired primarily by droplet spread from other infected people through coughing, sneezing, or direct contact with contaminated surfaces leading to autoinoculation. Laboratory diagnosis is made by antigen testing and/or polymerase chain reaction (PCR) of nasal, nasopharyngeal or throat swabs, or nasal washings. Serology and viral culture are no longer used for clinical diagnosis of influenza though they still may be used in research and public health settings.

Antiviral treatment is most commonly prescribed for high-risk patients (e.g., individuals with chronic cardiac, pulmonary, renal, or endocrine disorders; patients on immunosuppression; children under two years; adults ≥65 years old; pregnant women; persons <19 years old on chronic aspirin therapy; Native Americans; persons with morbid obesity; and, residents of nursing homes and other chronic care facilities), hospitalized patients with influenza, and any person presenting with severe, progressive illness. Antivirals as prophylaxis should be considered for non-immunized people in special situations or groups at high risk of complications from influenza.

Antiviral administration should not depend solely on lab confirmation and should be initiated as soon as possible after illness onset as clinical benefit is greatest when administered early. However, antiviral treatment may still be beneficial in patients with severe, complicated, or progressive illness, in hospitalized patients, and in high-risk outpatients when started up to 48 hours after of illness onset, as indicated by clinical and observational studies. Annual influenza vaccination is considered to be the most effective way to prevent disease, serious illness or complications.

Agent

Four types of influenza virus are currently recognized: A, B, C, and D. Influenza A, B, and C are the only types known to infect humans and cause illness. Influenza A and B are the only types that are tied to seasonal epidemics and outbreaks. Influenza A is the only type currently capable of causing pandemics.

Influenza A viruses are subclassified by two surface antigens: hemagglutinin (H, H1-H18) and neuraminidase (N, N1-N11). Minor antigenic variations within the circulating strains occur continuously and cause seasonal epidemics; this is a process referred to as antigenic “drift”. Antigenic “shift” is a major change in the circulating influenza virus that results in a new subtype and can lead to a pandemic under sustained human-to-human transmission. The implications of these genetic mutations are explained in more detail below.

Transmission

Reservoir:

Humans are the primary reservoir for influenza A viruses. Other newly-identified reservoirs such as swine and birds may be potential sources of new influenza A subtypes which can be pathogenic to humans and emerge through genetic reassortment.

Mode of transmission:

Influenza viruses are primarily spread via droplets from infected persons who are coughing and/or sneezing, talking or by direct contact with virus-contaminated surfaces.

Period of communicability:

- Generally, adults can be infectious from one day prior to symptom onset up to seven days after onset.

Clinical Disease

Incubation period:

Usually 1-4 days (about 2 days, on average).

Illness:

The illness is characterized by the sudden onset of fever, with any or all of the following: sore throat, headache, myalgias, coryza (inflammation of the mucus membrane in the nose), and non-productive cough. Influenza may be indistinguishable from many other upper respiratory viral illnesses and should be confirmed with laboratory tests. The clinical picture may range from the common cold, croup, bronchiolitis, COVID-19, or viral pneumonia, to undifferentiated acute respiratory disease. Gastrointestinal manifestations (nausea, vomiting, or diarrhea) are uncommon, but may accompany the respiratory phase, particularly in children. Though uncommon, rash has also been identified as a symptom in several studies, particularly in children.

Laboratory Diagnosis

The diagnosis of influenza is often made on clinical grounds, especially during influenza season, which runs approximately from October through May. Ideally, testing should be performed within 72 hours of initial symptom onset.

Diagnosis can be confirmed by:

- Reverse transcriptase-polymerase chain reaction (RT-PCR) testing of nasal or throat swabs available at NMDOH Scientific Laboratory Division (SLD) and commercial labs. RT-PCR testing offers improved sensitivity and specificity, and test results are available to the submitter usually within 2-3 business days.
- Rapid Influenza Diagnostic Test (RIDTs) provides more immediate results and can be done at the point of care. The sensitivity (45-90%) and specificity (60-90%) of these tests varies depending on the prevalence of influenza in the community and the specific tests used.
- Viral culture of nasopharyngeal swab, nasal, or throat washings is considered the “gold standard” testing method. Turnaround time for results is usually 2-6 days.

- Immunofluorescence or direct fluorescent antibody (DFA) staining results are available within 2-4 hours and done in a lab setting. This testing method has acceptable sensitivity and specificity standards but requires specifically trained laboratory staff for interpretation.
- Serological testing is rarely useful for patient management as two titers collected 10-14 days apart are required.

Treatment

Individuals sick with influenza are advised to stay home and avoid contact with other people. Influenza is typically treated with rest, liquids, and antipyretic medications. Salicylates (i.e., aspirin) should be avoided due to the risk of Reye's syndrome.

Antiviral medications are usually reserved for treatment of high-risk patients. Other situations (e.g., non-immunized exposed persons or groups at high-risk for complications) may also warrant antiviral medical use for prophylaxis.

- Neuraminidase inhibitors (zanamivir and oseltamivir) have been shown to be effective for treatment of both influenza A and B. Due to high resistance among circulating influenza A viruses, amantanes (amantadine and rimantadine) are not recommended for treatment or prophylaxis.
- Oseltamivir is FDA-approved for treatment in persons aged two weeks of age and older.
- Zanamivir is approved for treatment in persons 7 years and older.
- Baloxavir marboxil is approved for treatment in persons 5 years and older against both influenza A and B. It is not recommended for hospitalized, pregnant, or breastfeeding people due to lack of data.
- Treatment started within 48 hours of onset of illness and given for 5 days reduces symptoms by one day and may reduce viral shedding.

Secondary bacterial infections causing bronchitis, pneumonia, or other invasive secondary bacterial infections may complicate influenza illness leading to severe disease or death, especially in high-risk populations. These secondary bacterial infections require specific antibiotic therapy as directed by the patient's health care provider.

Surveillance

Case Definition:

A formal case definition has not been established for influenza. However, for surveillance purposes, influenza-like illness (ILI) is defined as fever (temperature of 100°F or more [37.8°C] or more), a cough, and/or a sore throat regardless of a known cause.

Reporting:

Report **immediately** all 1) human infection with novel strain not included in seasonal diagnostic strains (e.g., avian/swine/or other novel influenza strains) confirmed by laboratory testing, 2) pediatric influenza-related deaths, 3) influenza outbreaks (two or more confirmed influenza cases within 72 hours of each other) in congregate living settings, and 4) ILI involving large number of people in the same geographic area (outbreaks) to the Center for Health Protection

(CHP) at 1-833-796-8773 (1-833-SWNURSE). Hospitalized flu cases are reportable but are not considered an emergent condition.

Control Measures

1. **Case management**
    a. Isolation: Patients with influenza should be cared for at home when possible, unless hospitalization is warranted. In addition to standard precautions, droplet precautions are required for people hospitalized with influenza or an ILI for the duration of illness.
2. **Contact management**
    a. Isolation: None required.
    b. Prophylaxis:
        i. Antiviral medications are useful adjuncts to influenza vaccine for the prevention of influenza A or B in: high-risk patients, non-immunized persons, or groups at high risk for complications including residents of institutions, nursing homes, or correctional facilities. Antiviral medications must be continued until full immunologic response to the vaccine has been achieved (i.e., two weeks), or throughout the epidemic for unimmunized or immunodeficient persons.
    c. Oseltamavir, zanamivir, and baloxavir can be used for prophylaxis against both influenza type A and B. Oseltamavir is approved for prophylactic use in persons ≥1 year; zanamivir and baloxavir for use in persons aged ≥5 years.

Guidelines on the indications for, and the dosing of, antiviral therapy for treatment and chemoprophylaxis are updated periodically. Current guidelines are available at:

https://www.cdc.gov/flu/hcp/antivirals/summary-clinicians.html

3. **Prevention**

1.1. Immunization: Vaccination is the most beneficial means of reducing influenza burden in those who are at the greatest risk of serious complications from influenza. The vaccine is available as an inactivated trivalent injection. Routine annual administration of influenza vaccine is a universal recommendation for all persons six months of age and older; high-risk persons and health care personnel are especially targeted groups. Recommendations for the administration of live attenuated nasal spray vaccinations should be checked annually due to low effectiveness during certain flu seasons. This information can be accessed here: https://www.cdc.gov/flu/hcp/acip/index.html. Currently, there is no evidence to support the administration of a second dose of influenza vaccine to adults who have already received their annual seasonal vaccination.

1.2. Influenza vaccination for special populations: Persons ≥65 years of age should preferentially receive a higher dose or adjuvanted influenza vaccine (e.g., Fluzone); these are intended to provide older individuals a better immune response following vaccination. Some children ages 6 months through 8 years require two doses of influenza vaccine. The first should be given as soon as the vaccine becomes available and the second at least 28 days later.

Management of Influenza in Child Care Centers

1. All children 6 months of age and older, especially children at high risk for serious disease from influenza, should be vaccinated.
2. If a child or staff person develops fever and chills, sore throat, headache, or muscle aches suggestive of influenza, s/he should be sent home until 24 hours after cessation of fever without use of antipyretics.

Management of Influenza in Long-term Care Facilities or other Institutional Settings

Please consult with the New Mexico Department of Health epidemiologist on call 1-833-796-8773) for suspected influenza outbreaks at semi-enclosed institutional settings (nursing homes, rehabilitation centers, or correctional institutions) to assist with testing, confirm influenza, prevention recommendations, and control of further illness.

Annually updated guidelines for the management of influenza in child care, schools, outpatient, acute care and long-term care settings can be accessed at the New Mexico Department of Health Influenza Website: https://nmhealth.org/about/erd/ideb/isp/

Pandemic Control Measures

Influenza viruses mutate on a regular basis, referring back to the term “antigenic drift” describing potential annual mutations within the same influenza B or influenza A subtypes. This phenomena is the reason why influenza vaccine must be reformulated and administered every year.

As previously mentioned, major antigenic changes in influenza A subtypes referred to as “antigenic shift,” carry the potential to cause a pandemic when they demonstrate the ability to cause human illness and show efficient human-to-human transmission, in the background of little or no pre-existing immunity among the general population. Such novel influenza viruses can result in global pandemics with morbidity and mortality exceeding baseline seasonal influenza levels. The most recent example was the 2009 Influenza A H1N1 pandemic that first appeared in April 2009 and caused increased morbidity and mortality worldwide throughout the 2009-2010 influenza season. Since 2024, human cases of highly pathogenic avian influenza (H5N1) have been detected in the United States, primarily among individuals with animal exposures (e.g., poultry and dairy farm workers). As of March 2025, the CDC assesses the risk of H5N1 to be low for the general public and remains closely monitored for changes in the virus’s potential to spread.

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See Influenza Fact Sheets (English) (Spanish).