

January 2, 2018

CLINICAL PRACTICE ALERT - INFLUENZA

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Etiology/ pathophysiology	<ul style="list-style-type: none"> The flu is a contagious respiratory illness caused by influenza viruses that infect the nose, throat, and sometimes the lungs that ranges from mild to severe and can lead to death. Proteins on the surface of the different viruses determine the strain they belong to. In the US, influenza activity has increased significantly over recent weeks with influenza A(H3N2) viruses predominating so far this season. Influenza seasons with this virus as predominant have been associated with more hospitalizations and deaths in persons ≥ 65 years and young children compared to other age groups. When the flu virus comes in contact with the epithelial cells lining the upper and lower airways, it attaches to, penetrates, and replicates in these cells. This leads to destruction and loss of these cells which will eventually be replaced. As a result, the airways become irritated, resulting in cough and breathing difficulties. The damaged airways may also become susceptible to secondary infections, such as bacterial pneumonia.
Epidemiology/ incidence	<ul style="list-style-type: none"> In US, peak incidence occurs between December and March. Estimated to affect ~10% of adults and, depending on age, up to 20-30% of children each year. During seasonal outbreaks, the highest rates of hospitalization are in young children, but most flu-related deaths (>85-90%) occur in those ≥ 65 years. Globally, 291,000 - 646,000 people die from seasonal influenza-related respiratory illnesses each year.
Routes of Transmission	<ul style="list-style-type: none"> Primary route: airborne droplets generated by people when they sneeze, cough, or talk. The virus then enters the mouth and nose of people within 6 feet of an infected person, or is inhaled into the lungs. Less common means: person touches a fomite (contaminated inanimate object) and then touches their mouth or nose. Flu viruses capable of infecting humans and animals (zoonotic infection) can be transmitted after contact with infected animals, their excretions, or ingestion of contaminated undercooked food or water (avian H5N1). Protecting against airborne droplets and good hand hygiene reduce the risk of transmission. Viral infectivity is lost rapidly on porous surfaces and hands but may be retained for days on nonporous surfaces. The virus can remain infectious for ≥ 24 hrs after aerosolization under conditions of low (25%) or high humidity (80%) but is less stable at intermediate humidity.
Incubation/ communicable periods	<p>Most adults harboring flu virus may infect others beginning 1 day before symptom onset up to 5-7 days after becoming sick. Children may pass the virus for >7 days. Some can be infected with flu virus but have no symptoms. Healthy carriers may still spread the virus to others.</p> <p>Onset of symptoms: Time from exposure to symptoms onset is 1 to 4 days; average ~2 days.</p>
Diagnosing flu	<p>Difficult to distinguish flu from other viral or bacterial causes of respiratory illnesses based on S&S alone. A number of tests can detect flu viruses in respiratory specimens. Most common are "rapid influenza diagnostic tests (RIDTs)" that detect the viral antigens that stimulate an immune response. Results available within ~10-15 min but are not as accurate as "rapid molecular assays" that detect genetic material of the virus in 15-20 min. More-accurate and sensitive flu tests require a health care provider to swab the inside of the nose or the back of the throat and then send the swab for lab testing. Results may take one to several hours.</p>
Clinical features (S&S)	<ul style="list-style-type: none"> Uncomplicated flu: fever (100° to 103°F - not all have a fever), chills, cough, sore throat, muscle aches, runny or stuffy nose, headache, malaise and fatigue. Vomiting and diarrhea more common in young children. Most recover within a week, although fatigue may last for several more days. More severe S&S include high fever, shaking chills, pleuritic chest pain, and productive cough of thick yellow-green mucus. Complications: bacterial pneumonia, ear or sinus infections, dehydration.
Prevention strategies	<p>Routine annual flu vaccination with a licensed, recommended, and age-appropriate vaccine is recommended for all persons aged ≥ 6 months without contraindications. CDC also recommends preventive actions like staying away from people who are sick, covering coughs and sneezes and frequent handwashing to help slow the spread of germs.</p>
Treatment	<ul style="list-style-type: none"> Mild illness/low risk for complications: Supportive care. Encourage patient to rest, drink plenty of fluids, and take non-aspirin pain relievers and fever reducers. Cough suppressants, decongestants, and antihistamines may be taken to alleviate flu symptoms.

	<ul style="list-style-type: none"> • Ventilatory support: Respiratory failure with severe hypoxemia and hypercarbia may occur in pts with flu-associated pneumonia or exacerbation of underlying airway disease. Give O₂ and bronchodilators as indicated and assist ventilations prn for viral pneumonia progressing to acute lung injury or ARDS. Consider need for CPAP or use of BVM. Extracorporeal membrane oxygenation (ECMO) may be life-saving at the hospitals in pts with ARDS. • Flu vaccine effectiveness (VE) has been lower against A(H3N2) (32%) viruses than against influenza A(H1N1)pdm09 or influenza B viruses. For this reason, in addition to flu vaccination for prevention, the use of antiviral medications for treatment becomes even more important. Three prescription neuraminidase inhibitors (NAIs) are approved by the U.S. Food and Drug Administration (FDA) and are recommended during the 2017–2018 flu season: oseltamivir (available as a generic version or under the trade name Tamiflu®), zanamivir (Relenza®), and peramivir (Rapivab®) (pills, liquid, an inhaled powder, or an intravenous solution). Antiviral treatment is usually most effective if started within 1-2 days of symptom onset. However, for those prone to flu complications it is still helpful if started two days beyond onset of illness.
PPE/BSI for EMS See System Policy I2 Infection Control Measures pp. 4 & 5	<p>For close contact (within 6 feet of an influenza pt): Standard Precautions and BSI:</p> <ul style="list-style-type: none"> • Nonsterile gloves for any contact with potentially infectious material followed by hand hygiene immediately after glove removal • If patient has a fever and is coughing: Droplet precautions: Surgical mask on them and mask on you which includes the use of surgical masks or NIOSH-approved N95 or higher respirator masks by EMS personnel when appropriate. • May consider wearing disposable isolation gowns and face shield including eye protection when splashes or sprays of respiratory secretions or other infectious material are possible.
Cleaning/ disinfection of EMS equipment/ vehicles after transport	<ul style="list-style-type: none"> • Stethoscope heads and other frequently-handled items should be disinfected after each patient. After thoroughly cleaning all planes and crevices, spray all planes of equipment with System-approved disinfectant registered by the EPA with label claims for viruses (such as, norovirus, rotavirus, adenovirus, poliovirus) and TB. The System prefers CaviWipes Bleach disinfectant towelettes (Metrex™), CaviCide1, or a freshly constituted (mixed the same day) 1:10 solution of bleach to water. Follow manufacturer's instructions. • General recommendation: If using a spray, hold cleaning agent dispenser 10" from surface and atomize with quick short strokes, spraying evenly on (potentially) contaminated areas of equipment and affected interior patient compartment or other affected portions of vehicle until wet. Mainstream products on the markets usually have a contact or wet dwell time ≤3 minutes to meet the practical needs in clinical settings. Wipe down with a clean towel dampened with clean water then dry thoroughly. Avoid streaking and unsightly residue that may be left behind from disinfectant.
Citations	<p>CDC. (2018). Prevention and control of seasonal Influenza with vaccines, 2017-18 https://www.cdc.gov/flu/professionals/acip/index.htm</p> <p>CDC. (2018). Seasonal influenza A(H3N2) activity and antiviral treatment of patients with influenza, https://emergency.cdc.gov/han/han00409.asp</p> <p>Illinois Department of Public Health – Influenza (Flu). (n.d.). Retrieved from http://dph.illinois.gov/topics-services/diseases-and-conditions/influenza</p> <p>Interim Guidance on Environmental Management of Pandemic Influenza Virus --Summary: Environmental Management. (n.d.). Retrieved from http://www.flu.gov/planning-preparedness/hospital/influenzaguidance.html</p>

Health & age factors known to increase a person's risk of getting serious complications from the flu:

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| <ul style="list-style-type: none"> • Asthma; Chronic lung disease (COPD; cystic fibrosis) • Endocrine disorders (such as diabetes mellitus) • Heart disease (such as congenital heart disease, heart failure and coronary artery disease) • Kidney disorders • Liver disorders • Metabolic disorders (such as inherited metabolic disorders and mitochondrial disorders) • Neurological and neurodevelopmental conditions • Blood disorders (such as sickle cell disease) • People who are obese with a BMI of 40 or higher | <ul style="list-style-type: none"> • People <19 years of age on long-term aspirin therapy • People with a weakened immune system due to disease or medication (such as people with HIV or AIDS, or cancer, or those on chronic steroids) <p>Other people at high risk from the flu:</p> <ul style="list-style-type: none"> • Adults 65 years and older • Children <5 years old, but especially those <2 years • Pregnant women and those up to 2 weeks post-partum • American Indians and Alaska Natives • People who live in nursing homes and other long-term care facilities |
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