



# ASSIUT UNIVERSITY DRUG INFORMATION BULLETIN



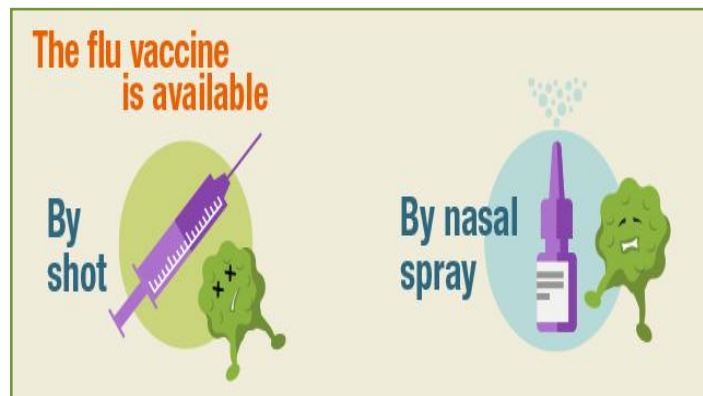
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كلية الصيدلة

## Influenza (Flu)

Influenza is infection of the lungs and airways with one of the influenza viruses. It causes fever, runny nose, sore throat, cough, headache, myalgias, and general malaise.

- The virus is spread by inhaling droplets coughed or sneezed out by an infected person or by having direct contact with an infected person's nasal secretions.
- People can often diagnose influenza themselves based on symptoms, but sometimes samples of blood or respiratory secretions must be analyzed to identify the virus.



- An annual influenza vaccination is the best way to prevent influenza.
- Resting, drinking plenty of fluids, and avoiding exertion can help, as can taking pain relievers, decongestants, and sometimes antiviral drugs.

Every year, throughout the world, widespread outbreaks of influenza occur during late fall or early winter. Influenza occurs in epidemics. Influenza epidemics may occur in two waves: first in schoolchildren and the people who live with them and, second, in people who are confined to home or live in long-term care facilities, mainly older people. In each epidemic, usually only one strain of influenza virus is responsible for the disease. The name of a strain often reflects where it was first found: a location (for example, Hong Kong flu) or an animal (for example, swine flu).

There are two types of influenza virus, type A and type B, and many different strains within each type. About 95% of influenza cases are caused by influenza virus type A. The illnesses produced by the different types and strains are similar. The strain of influenza virus causing outbreaks is always changing, so each year the influenza virus is a little different from the previous year's. It often changes enough that previously effective vaccines no longer work.

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► Influenza is distinctly different from the common cold. It is caused by a different virus and produces symptoms that are more severe. Also, influenza affects cells much deeper down in the respiratory tract.

### Symptoms and Diagnosis

Symptoms start 1 to 4 days after infection and can begin suddenly. Chills or a chilly sensation is often the first indication. Fever is common during the first few days, sometimes reaching about 39°C. Many people feel so ill, weak, and tired that they remain in bed for days. They have aches and pains throughout the body, particularly in the back and legs. Headache is often severe, with aching around and behind the eyes. Bright light may make the headache worse.

At first, respiratory symptoms may be relatively mild. They may include a scratchy sore throat, a burning sensation in the chest, a dry cough, and a runny nose. Later, the cough can become severe and bring up sputum. The skin may be warm and flushed, especially on the face. The mouth and throat may redden, the eyes may water, and the whites of the eyes may become bloodshot. People, especially children, may have nausea and vomiting. A few people lose their sense of smell for a few days or weeks. Rarely, the loss is permanent.

Most symptoms subside after 2 or 3 days. However, fever sometimes lasts up to 5 days. Cough, weakness, sweating, and fatigue may persist for several days or occasionally weeks. Mild airway irritation, which can result in a decrease in how long or hard a person can exercise, or slight wheezing may take 6 to 8 weeks to completely resolve.

The most common **complication** of influenza is pneumonia, which can be viral, bacterial, or both. In viral pneumonia, the influenza virus itself spreads into the lungs. In bacterial pneumonia, unrelated bacteria (such as pneumococci or staphylococci) attack the person's weakened defenses. With either, people may have a worsened cough, difficulty breathing, persistent or recurring fever, and sometimes blood or pus in the sputum. Pneumonia is more common among older people and among people with a heart or lung disorder. In long-term care facilities, as many as 7% of older people who develop influenza have to be hospitalized, and 1 to 4% die. Younger people with a chronic disorder are also at risk of developing severe complications.

### Prevention

Annual vaccination is the best way to avoid getting influenza. Influenza vaccines contain inactivated (killed) influenza virus or pieces of the virus and are given by injection. A newer vaccine, inhaled as a nasal spray, contains weakened live viruses. This vaccine is used only in healthy people aged 5 to 49 years. Influenza vaccines usually protect against three different strains of influenza virus. Different vaccines may be given every year to keep up with changes in the virus. Doctors try to predict the strain of virus that will attack each year based on the strain of virus that predominated during the previous influenza season and the strain causing disease in other parts of the world.

Flu vaccination should begin soon after vaccine becomes available, ideally by October. However, as long as flu viruses are circulating, vaccination should continue to be offered throughout the flu season, even in January or later. Since it takes about two weeks after vaccination for antibodies to develop in the body that protect against influenza virus infection, it is best that people get vaccinated so they are protected before influenza begins spreading in their community. Several antiviral drugs can be used to prevent infection with the influenza virus. They may be prescribed when people have had a clear, recent exposure to someone with influenza.

These drugs are also given to people who have conditions that make vaccination ineffective or dangerous. The drugs are used during epidemics of influenza to protect unvaccinated people who are at high risk of complications of influenza: older people and people with a chronic disorder.

**Amantadine** and **rimantadine** are older antiviral drugs that provide protection against influenza type A but not influenza type B. A drawback of both amantadine and rimantadine is that the influenza virus rapidly develops resistance to them. During the 2005 to 2006 influenza season, concerns about resistance prompted the Centers for Disease Control and Prevention to discourage the use of these drugs for prevention and treatment. Two newer drugs, **oseltamivir** and **zanamivir**, can prevent infection with influenza virus type A or type B. These drugs have minimal side effects.

### Treatment

The main treatment for influenza is to rest adequately, drink plenty of fluids, and avoid exertion. Normal activities may resume 24 to 48 hours after the body temperature returns to normal, but most people take several more days to recover. People may treat fever and aches with acetaminophen or NSAIDs, such as aspirin or ibuprofen. Because of the risk of Reye's syndrome, children should not be given aspirin. Acetaminophen and ibuprofen can be used in children if needed. Other measures as listed for the common cold, such as nasal decongestants and steam inhalation, may help relieve symptoms.

The same antiviral drugs that prevent infection (amantadine, rimantadine, oseltamivir, and zanamivir) are also helpful in treating people who have influenza. However, these drugs work only if taken in the first day or two after symptoms begin, and they shorten the duration of fever and respiratory symptoms only by a day or so. Nevertheless, these drugs are very effective in some people. If a bacterial infection develops, antibiotics are added.

### Bird Flu

Bird flu (avian influenza) is an infection with strains of influenza that normally occur in wild birds and sometimes pigs.

Bird flu is caused by several strains of influenza A that normally infect wild birds. The infection can be easily spread to domestic birds and sometimes pigs. However, it rarely spreads from animals to people. Most people who have been infected with bird flu have had close contact with an infected bird. Human infection with the avian flu strain H5N1

### Preventing Influenza With a Vaccine

- **Who should get the flu vaccine**

- Anyone 50 years of age or older
- Children 6 months to 5 years of age
- Residents of long-term care facilities
- Adults and children who are 6 months of age or older and who have diabetes, a chronic heart or lung disorder, kidney failure, certain blood disorders, or a weakened immune system
- Family members and caregivers of people in the above groups
- Family members and caregivers of children less than 6 months of age
- Doctors and health care workers
- All pregnant women
- Children who are younger than 18 years of age and regularly take aspirin (who are at risk of Reye's syndrome if they develop influenza)

- **Who should not get the flu vaccine**

- People with a severe allergy to eggs
- People who have had a severe reaction to an influenza vaccination in the past
- People who have had Guillain-Barré syndrome
- People who currently have a disorder that causes fever (other than a mild cold)

first occurred in Hong Kong, then in Vietnam, Indonesia, Cambodia, China, Thailand, Turkey, Azerbaijan, Djibouti, Egypt, and Iraq.

People infected with the current strain of bird flu (H5N1) cannot spread the infection to other people. Experts are concerned mainly that the genetic material of the virus could mutate and enable the virus to spread from person to person. Then, bird flu could spread rapidly and widely, causing a major worldwide epidemic (pandemic).

Symptoms vary depending on which strain of the virus is the cause. People may have extreme difficulty breathing and flu-like symptoms. Some people have conjunctivitis or pneumonia. The risk of death has been high: 30% in one outbreak and almost 80% in another.

Spread is contained by identifying and destroying infected flocks of domestic birds. Infected people are given **oseltamivir** or **zanamivir**, which are usually effective. **Amantadine** and **rimantadine** are ineffective against many strains of the bird flu virus. A vaccine for bird flu is being developed.

## H1N1 Swine Flu

H1N1 swine flu is a flu infection caused by a new strain of influenza A virus. Pigs (swine) can develop influenza. Most often, pigs are infected by strains of influenza that are slightly different from those that infect people. These strains very rarely spread to people, and when they do, they very rarely then spread from person to person. The H1N1 swine flu virus is a combination of swine, bird (avian), and human influenza viruses. H1N1 swine flu spreads easily from person to person, just like ordinary flu. People cannot get H1N1 swine flu from eating pork, and almost never get it from contact with pigs.

In 2009, H1N1 swine flu became a category 6 pandemic. This category indicates the widest spread of disease but does not indicate the severity of the disease. Because the H1N1 virus is new in people, some details about how it affects people are not yet clear. But symptoms are typically flu-like. They include fever, cough, sore throat, body aches, headache, chills, runny nose, fatigue, nausea, vomiting, and diarrhea.

In most people, symptoms seem to develop from 1 to 5 days after exposure to the virus and continue for up to another week. People can spread the infection for about 8 days, from the day before symptoms appear until symptoms are gone. Symptoms are usually mild but can become severe, leading to pneumonia or respiratory failure. The infection can make chronic disorders (such as heart and lung disorders and diabetes) worse and, during pregnancy, can cause complications (such as miscarriage or premature birth). Also at high risk are people with kidney or liver disorders or a weakened immune system due to drugs or disorders such as AIDS. Severe complications can develop and progress rapidly—in some countries, even in young, healthy people.

Samples of secretions from the nose and mouth are taken. A test that can confirm H1N1 infection can be done. There is a vaccine for swine flu.

People should be referred immediately if they have severe vomiting, shortness of breath, chest or abdominal pain, or sudden dizziness or confusion. Children should be taken to a doctor immediately if they have blue lips or skin, are not drinking enough fluids, are breathing rapidly or with difficulty, are unusually drowsy or irritable (including not wanting to be held), or have a fever with a rash. People at high risk of severe complications should contact a doctor if even mild symptoms develop, as should children under 5 years old and pregnant women. If a fever and a worse cough develop after flu-like symptoms disappear in any person, a doctor's attention is required.

Treatment focuses on relieving symptoms. The antiviral drugs oseltamivir or zanamivir may be used if people are at risk of complications or have severe symptoms. In the US,



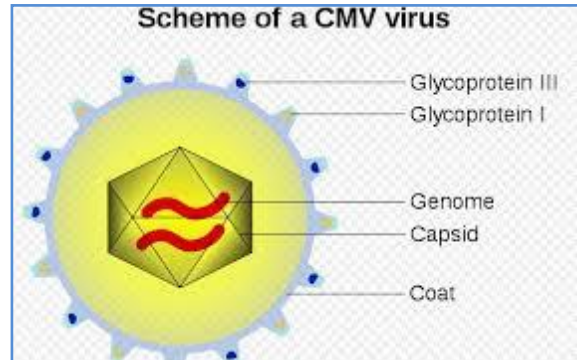
most people have recovered from H1N1 swine influenza fully without taking these drugs.

References: 1) [www.merckmanuals.com/home/infections/viral\\_infections/influenza.html](http://www.merckmanuals.com/home/infections/viral_infections/influenza.html)  
2) [www.cdc.gov/flu/protect/keyfacts.htm](http://www.cdc.gov/flu/protect/keyfacts.htm)

## Terminology

### Cytomegalovirus (CMV)

A commonly occurring virus of the herpes virus group the name derived from the swollen appearance of infected cells ('cytomegalo'=large cell). The infection is usually asymptomatic (or like mild influenza), but it can cause an illness similar to infectious MONONUCLEOSIS. Most people (80 per cent) will have had CMV infection by the time they are adults, but the virus can remain latent in the body and cause recurrent infections. During an acute infection the virus is excreted in saliva, breast milk and urine as well as from the vagina, and this may continue for years.



CMV is transmitted naturally by saliva or during sexual contact, but blood transfusions and organ transplantations are also infection routes. Although CMV rarely causes its host any problems, when it is passed from an infected mother to her fetus in utero or to an infant during birth (from vaginal secretions) or via breast milk postnatally, the virus causes a generalised severe infection in the infant. This can involve the central nervous system and liver, causing death of the fetus or neonate. If the infant survives it may be mentally retarded, with motor disabilities, deafness and chronic liver disease. If an adult is immunodeficient (because of HIV infection/AIDS or as a result of immunosuppressive treatment after an organ transplant, he or she may become seriously ill.

Source: Marcovitch H. 2005. *Black's Medical Dictionary*. 41<sup>th</sup> ed. London: A&C Black Publishers Limited. p 178

## Complementary Medicine

### Grape seed

#### *Vitis vinifera* (seed and leaf)

**Common use:** Chronic venous insufficiency

**Evidence:** A 12-week randomized controlled trial in 260 patients with chronic venous insufficiency using up to 720 mg daily of a specific grape leaf extract (AS 195), found edema of the legs decreased after six weeks. Patients also reported decreases in subjective symptoms such as tiredness or heavy legs, tension, and tingling and pain.

**Other reported uses:** Fluid retention, eye strain, gastric acidity, antioxidant for circulatory disorders, inflammatory conditions and varicose veins.

#### Notes

- There is some clinical evidence that the antioxidant activity in blood samples from healthy volunteers can be increased by supplementation of grape seed extracts.
- Cease use seven days prior to surgery.



**Pregnancy and breastfeeding-** Insufficient reliable data.

**Interactions**

**Anticoagulants** (e.g. warfarin), antiplatelet drugs (e.g. aspirin, clopidogrel) and NSAIDs (e.g. ibuprofen): Theoretically, the tocopherol content of grape seed oil may increase the anticoagulant effect of warfarin and the risk of bleeding.

Procynidin oligomers, an active constituent, are thought to inhibit platelet aggregation. Use with caution; monitor for bleeding and any INR changes.

**Cytochrome P450 substrates** Grape juice is thought to induce cytochrome CYP1A2 metabolism. Until more is known, patients taking drugs metabolised by P450 enzymes should be monitored for drug efficacy and adverse effects.

**Lactobacillus acidophilus** (bacteria that's found naturally in the intestines, mouth, or female genitals. It produces vitamin K as well as lactase, found in some fermented foods, such as yogurt, kefir, soy products, and pickles). Grape anthocyanins may inhibit the growth of Lactobacillus acidophilus. Concurrent use may theoretically prevent L.acidophilus colonization. Avoid concurrent use.



**Common dosage ranges**

**Tablets/capsules:** 360–720 mg (standardized red vine grape extract AS 195) daily for chronic venous insufficiency. 75–300 mg (grape seed extract) daily for three weeks, followed by a maintenance dose of 40–80 mg daily, or proanthocyanidin 150–300 mg daily have also been used.



## Test Your Knowledge

1. Which one of the following compounds is NOT adsorbed by activated charcoal?

- (A) acetaminophen
- (B) cyanide
- (C) phenothiazines
- (D) salicylates
- (E) tricyclic antidepressants

2. The main reason why methylcellulose and similar agents are included in ophthalmic solutions is to:

- (A) increase drop size
- (B) increase ocular contact time
- (C) reduce inflammation of the eye
- (D) reduce tearing during instillation of the drops
- (E) reduce drop size



3. Which of the following statements is (are) true of regular insulin?

- I. It is a suspension.
  - II. It may be administered either SC or IV.
  - III. It is longer acting than lispro insulin.
- (A) I only      (B) III only      (C) I and II only      (D) II and III only      (E) I, II, and III

# Real Enquiries

At the "Drug Information Center", we respond to enquiries from the professional health team as well as from others. Here's one of the enquiries received at the center!

**Enquiry received from:** Ph / Rania Gamal - Woman Health hospital. Assiut. Univ.

**Enquiry:** What is the equation used to convert mEq/mL to mg/mL?

**Summary of Answer:**

To convert milliequivalents per milliliter (mEq/mL) to milligrams per milliliter (mg/mL):

$$\text{mg /ml} = \frac{\text{mEq./ml.} \times \text{molecular weight}}{\text{valence}}$$

*Source: Ansel H.j. C.and Prince S (2004) Pharmaceutical Calculations The Pharmacist's Handbook. Philadelphia. A Wolters Kluwer company p.119*



## Ask the expert

### What is the role of diet in the cognitive decline of the older population?

Cognitive decline and dementia deeply affect the quality of life of older people and their caregivers. Therapeutic options for the treatment of Alzheimer's disease and dementia have been shown to be of limited efficacy, and prevention strategies are mandatory. There is cumulative evidence of the possible protective role of lifestyle and diet-related factors for the prevention of cognitive decline. At present, in older subjects, balanced diets, the prevention of nutritional deficiencies of antioxidants by nutritional supplements and moderate physical activity could be considered the first line of defence against the onset or progression of dementia.



Dietary models based on complex carbohydrates, fruits and vegetables and low in animal fat appear to protect against cognitive decline that is degenerative or vascular in origin, owing mainly to the high provision of antioxidants. Fish consumption has been associated with the lower risk of Alzheimer's disease in longitudinal cohort studies. Moreover, epidemiological data suggest a protective role of the B vitamins, especially vitamins B<sub>9</sub> and B<sub>12</sub>, on cognitive decline and dementia. Moreover, the higher consumption of polyunsaturated and monounsaturated fatty acids seems to have a significant protective effect. The Mediterranean diet could therefore be an interesting model to investigate the possible role of specific dietary patterns and cognitive decline. Conversely, vitamin deficiencies could have a negative impact on cognition in older people, while the aluminium content of foods and water may also affect the risk of developing Alzheimer's disease.

**Answers:**

1. **(B)** Chemicals that are not significantly adsorbed by activated charcoal include boric acid, cyanides, DDT, and ferrous sulfate.
2. **(B)** Increasing the contact time between a drug and the cornea will often increase the amount of drug absorption that will occur.
3. **(D)** Regular insulin is secreted by the beta cells of the pancreas. In its unmodified form, regular insulin is clear, has a short (0.5 to 1hr) onset of action, and a relatively short (6 to 8hrs) duration of action. Lispro insulin solution has a more rapid onset and shorter duration of action than regular insulin. Because regular insulin is a clear product, it can be administered either SC or IV.

## Pharmacology Mnemonics

SERIOUS COMPLICATIONS OF ORAL BIRTH CONTROL PILLS

**A** Abdominal Pain

**C** Chest Pain - Shortness of Breath

**H** Headaches (Sudden/Persistent) CVA or ↑BP.

**E** Eye Problems Vascular Accident or ↑BP

**S** Severe Leg Pain Thromboembolic Process.

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### Ca<sup>+</sup> CALCIUM CHANNEL BLOCKERS

**VERY NICE DRUGS**

Action: Blocks calcium access to cells causing: ↓ Contractility + ↓ Conductivity of the **heart**

↓ Demand for oxygen

Side Effects: ↓BP  
Bradycardia  
May precipitate AV block  
Headache  
Abdominal discomfort (constipation, nausea)  
Peripheral edema

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