Antivirals available for the current influenza season:

There are 2 commonly prescribed antivirals:

1) **Tamiflu®** (oseltamivir), available as capsules, tablets, and oral suspension for use in all age groups including pregnant women;

2) **Relenza®** (zanamivir), available as an orally inhaled powder delivered by Diskhaler in adults and children over 7 years of age.

A third antiviral **Peramivir**, administered IV (200 mg/20 mL), is available through an Emergency Use Authorization (EUA). It is used to treat severe, complicated flu in the hospital setting for adults and children who do not show favorable response to oseltamivir or zanamivir. Peramivir is diluted with 0.9% or 0.45% sodium chloride for injection and should be stored under refrigeration and used within 24 hours. Peramivir should not be administered to patients who have a known allergy to other antivirals. For additional information on peramivir contact the CDC at 1-800-232-4636.

The pharmacology of antivirals:

Antivirals inhibit an enzyme called neuraminidase from binding to the surface of the infected cell which prevents the release and dissemination of the influenza virus. Antivirals shorten the duration of the influenza infection by 1 to 2 days and may decrease the severity of infection and the risk for complications. Antivirals are best administered within the first 48 hours of symptom onset. Use of antivirals is reserved for individuals in select groups as identified by the CDC. Most healthy people not in the high risk groups will tolerate the flu without significant complications. Overuse of antivirals may lead to resistant strains of the virus. While there have been CDC-confirmed cases of oseltamivir resistant virus in the US; it is important to note that all tested virus retained sensitivity to zanamivir.

Safe administration of **Tamiflu®** in children less than 1 year of age:

When indicated, infants should be prescribed Tamiflu® oral suspension (12 mg/mL). Infants younger than 3 months receive 12 mg twice daily for 5 days (chemoprophylaxis is only indicated when the situation is deemed critical); infants aged 3 to 5 months receive 20 mg twice daily for 5 days (chemoprophylaxis is 20 mg once daily for 10 days); and infants aged 6 to 11 months receive 25 mg twice daily for 5 days (chemoprophylaxis 25 mg once daily for 10 days).

Report side effects of antivirals to FDA MedWatch at [www.fda.gov/medwatch](http://www.fda.gov/medwatch) or call 1-800-FDA-1088.
Emergency compounding of oral suspension from Tamiflu® capsules:

Emergency compounding of oral suspension may be necessary when supplies of oral suspension or tablets are exhausted. Please note that the final concentration of emergency compounded suspension is 15 mg/mL. This differs from the commercially available suspension which is 12 mg/mL. Emergency compounding employs the use of Tamiflu® capsules (75 mg) which are mixed with either Cherry Syrup (Humco®) or Ora-Sweet SF (sugar free) from Paddock Laboratories. Compounded oral suspension remains stable for 35 days when refrigerated at 36° to 46°F; and for 5 days at room temperature of 77°F. Complete details for emergency compounding of Tamiflu® oral suspension can be found at: www.cdc.gov/H1N1flu/pharmacist/. Additionally, for adults and children at least one year of age who are unable to swallow Tamiflu® capsules, the capsule may be opened and the contents mixed with a thick sweetened liquid such as regular or sugar-free chocolate syrup to mask the flavor of the powder.

Drug interactions with antivirals:

Tamiflu® and Relenza® do not interact with amoxicillin, acetaminophen, ibuprofen, cimetidine, antacids, or other commonly prescribed drugs for treatment of flu.

Inactivated flu vaccines may be administered at anytime before, during, or after Tamiflu® or Relenza® dosing. Live attenuated intranasal vaccine (LAIV), however, should not be administered until 48 hours after antiviral dosing due to the risk of interference with immunity from inhibition of replication of live vaccine virus. Accordingly, Tamiflu® and Relenza® should not be administered for 2 weeks after receiving LAIV unless deemed medically necessary, as this may interfere with the development of immunity.

Tips on dosing and use of antivirals past the expiration date:

Relenza® is administered by inhalation every 12 hours for 5 days. On the first day of treatment it is advisable to take 2 doses if they can be given at least 2 hours apart. If the patient is currently taking another inhaled bronchodilator, it should be administered prior to the Relenza® dose. Each blister of Relenza® contains 5 mg of zanamivir and 20 mg of lactose powder which is found in milk proteins. Patients with severe allergy to milk proteins should not be prescribed Relenza®.

Missed doses of antivirals should be taken as soon as possible if within at least 2 hours of the next scheduled dose.

FDA extension dates for specific lot numbers of expired or near expired antivirals can be verified at: www.fda.gov/NewsEvents/PublicHealthFocus/ucm154962.htm.

Pregnancy and lactation risks of antivirals:

Antivirals are listed as Pregnancy Risk Category C due to the lack of clinical studies in humans to assess the safety of use in pregnancy. Tamiflu® is the preferred antiviral for use in pregnancy due to its systemic activity. Zanamivir (Relenza®) studies using IV dosing in pregnant rats and rabbits did not show any fetal malformation, maternal toxicity, or embryotoxicity. These studies also demonstrated that zanamivir crossed the placenta but blood concentrations were significantly lower in fetal blood. Zanamivir is excreted in milk in rat studies, though it is unknown if it is excreted in human milk.

Antivirals are an essential part of influenza treatment in many instances. Being armed with knowledge for the safe and proper use of antiviral medications is essential for health care providers this flu season. Please contact the Missouri Regional Poison Center for further information regarding antiviral drugs.
HAND SANITIZERS

We certainly are using more hand sanitizers as a result of all the information about H1N1, seasonal flu, and basic germ control. Hand sanitizers are found in schools, daycares, offices and in most people’s homes, purses, and pockets. The Missouri Poison Center receives calls about hand sanitizers because people are aware of their potential poison risk, but are not sure ‘how much’ could be a problem. Media coverage and health information has drawn attention to the high concentration of alcohol in hand sanitizers. While hand sanitizers can be dangerous if swallowed, actual symptoms from their misuse are extremely rare.

Important notes about Hand Sanitizers:

- Hand sanitizers are effective in killing germs and reducing illnesses when used according to the directions.
- Some manufacturers are coming out with brightly colored and scented hand sanitizers. These attractive qualities could make the hand sanitizer more appealing to small children.
- A lick or a taste of a hand sanitizer gel causes only mild symptoms, if any, at all.
- Hand sanitizers taste bad and can result in a burning sensation, so most children will not swallow a large amount.
- Hand sanitizers are often left on tables or counters, easily reached by children. Remember that the dispensers are not child-resistant and usually have an easy to use pump handle. Keep hand sanitizers out of reach of small children.
- Supervise the use of hand sanitizers.
- It is not true that children may get drunk from licking their hands after application.
- In a normal healthy toddler, it would take 1-2 teaspoons, swallowed, to cause a problem.
- Children are especially prone to the symptoms of alcohol poisoning, which may include drowsiness, coma, slowed breathing, and low blood sugar.
- Common hand sanitizers contain 62 - 65% ethanol, which is the same type of alcohol found in alcoholic beverages.
- Older children or adults may attempt to abuse products containing ethanol – be watchful.
- Call the Missouri Poison Center at 1-800-222-1222 if a hand sanitizer is swallowed (or splashed in the eyes), or if you have any concerns.

Proper use of a Hand Sanitizers

- Apply a dime-sized amount to dry hands.
- Rub hands together until completely dry.
- Always monitor use by children.
PoisonAlert
A quarterly publication of the Missouri Regional Poison Center

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The Missouri Regional Poison Center website is at:
http://www.cardinalglennon.com and click on the Poison Center logo at the bottom.

Public Education Materials
If you would like to provide your patients with public education materials including: brochures, telephone stickers, emergency action cards, quarterly public newsletters and more, call for a complete list and order form.

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