



## From the Front Lines

AlixRx Clinical Pharmacists Address Everyday Challenges in Long-Term Care

### What You Need to Know About Zika Virus

If you have watched the news recently, you have definitely heard about Zika virus. Zika virus has actually been around since 1947, when it was discovered in the forests of Uganda. The virus is common in Africa and Asia, but was not seen in the Western Hemisphere until May of 2015, when cases were reported in Brazil. It is carried and spread by a certain type of mosquito. The virus is spreading rapidly in the Western Hemisphere because we do not have any immunity to the virus.

The incubation period for the virus is 2-12 days after being bitten and symptoms usually appear 3-7 days post exposure. Only 1 in 5 persons infected with Zika virus will become symptomatic. The symptoms are usually mild and can include fever, joint pain, macropapular rash, myalgia, headache and conjunctivitis. Symptoms usually only last a few days to a week and severe illness requiring hospitalization is rare.

There is no specific treatment recommended for Zika virus infection. Supportive care including rest, fluids and analgesics/antipyretics is recommended. It is recommended to avoid aspirin until Dengue infection can be ruled out.

There are tests for Zika virus, however are not widely available and are only accurate within the first week or so after infection. After this time period, tests for Zika antibodies can be performed. The virus is closely related to the viruses that cause Dengue and Yellow Fever, so it may cross-react with antibody tests for these viruses. The virus does not appear to linger in the body and those exposed to the virus are immune. Humans can transmit the virus to mosquitoes for up to 20 days after infection.

Evidence shows that Zika virus can be transmitted sexually through semen. The virus persists longer in semen than it does in the blood, but the actual length of time that the virus remains in the semen is unknown. At this time, there is no evidence that women can transmit the Zika virus to men.

The link between Zika virus and microcephaly has not yet been proven, but a strong correlation has been observed. Zika virus has also been linked to causing Guillain-Barre syndrome.

There currently is no vaccine for Zika virus, but development is underway. It is predicted that a vaccine may be developed within 2 years, however it may take 10 -12 years before the vaccine would be approved and available for use in the general public.

#### In this issue:

**What You Need to Know About Zika Virus**

**Alternatives to Potentially Inappropriate Medications in the Elderly**

**Challenges of Switching to Insulin Pens**

**Which Vitamin K Dosage Form is Preferred in LTC?**

## Alternatives to Potentially Inappropriate Medications in the Elderly

In 2015, the American Geriatrics Society released an update to the Beer's Criteria for Potentially Inappropriate Medications in the Elderly. An article appearing in the November 2015 edition of JAGS, highlights possible alternatives to some of the medications included in the 2015 update. This article focuses on two areas: High-Risk Medications and Harmful Drug-Disease Interactions in the Elderly. Specific drug classes discussed include drugs with high anticholinergic activity, non-steroidal anti-inflammatory drugs (NSAIDs), and drugs with significant CNS activity.

First generation antihistamines such as diphenhydramine (Benadryl, Tylenol-PM) are both highly anticholinergic and sedating. Safer alternatives include intranasal saline flushes, intranasal corticosteroids such as fluticasone (Flonase), and second-generation or less sedating antihistamines such as loratadine (Claritin).

Chronic use of oral NSAIDs such as ibuprofen or naproxen increases the risk of gastric bleeding, and acute kidney injury especially in older adults with a history of peptic ulcer disease, chronic kidney disease, hypertension, or heart failure. Possible alternatives may include topical NSAIDs such as diclofenac (Voltaren gel and Flector patch) and topical lidocaine (lidocaine gel).

Medication classes with significant CNS activity in older adults include antipsychotics and benzodiazepines especially at higher doses for longer duration. Risks include falls, cognitive impairment, and sedation. It is important to limit the dose and duration of antipsychotics when used for delirium or for the behavioral complications of dementia.

### Alternatives for High-Risk Medications in the Elderly

1. First-generation antihistamines (Benadryl, ChlorTrimeton). Avoid using for sleep. For allergic symptoms, consider second-generation antihistamines (Claritin, Zyrtec) or nasal corticosteroids (Flonase) or saline flushes.
2. Long-acting antidiabetics (glyburide, chlorpropamide). Consider glipizide, metformin.

### Alternatives for Harmful Drug-Disease Interactions in the Elderly

#### Falls/Dementia

1. Avoid benzodiazepines (Valium, Ativan, Xanax) and nonbenzodiazepine hypnotics (Ambien, Sonata). Consider Buspar or an antidepressant such as Cymbalta, Effexor, or Remeron especially if anxiety, insomnia, or symptoms of depression.
2. Antipsychotics. Avoid drugs with significant anticholinergic activity such as chlorpromazine, loxapine, olanzapine, and trifluoperazine. Consider haloperidol, risperidone, or quetiapine, but only for short duration at the lowest effective dose.

#### Chronic Kidney Disease or Chronic Renal Failure (eGFR < 30 mL/min)

1. Avoid all NSAIDs including ibuprofen, naproxen, and celecoxib (Celebrex). Consider acetaminophen, Cymbalta (arthritis, neuropathic pain), topical NSAIDs (Flector patch, Voltaren gel), Lidocaine gel and patch

## Challenges of Switching to Insulin Pens



Figure 1.

What's wrong with this insulin pen? The large air bubble at the top is an indicator that the cartridge was incorrectly used as a vial to withdraw insulin. Insulin pen devices are preferred to the traditional vial and syringe delivery by patients, physicians, and nurses across most settings.<sup>1</sup> Pen devices have several advantages over insulin vials, including ease of use, dosing accuracy, increased safety via less risk for needle sticks, and potential cost savings.<sup>2</sup> Due to these benefits, insulin pen use in the senior care setting has increased.

Most insulin is available in both a vial and pen, however, newer formulations such as Toujeo® are only available via a pen device. Although insulin pens are marketed as easier to use and more accurate than traditional syringe/vial administration, education and training is still required. Your AlixaRx Clinical Pharmacist is a great resource to educate patients and other health care providers on the proper use of insulin pens. Often this includes education about key concepts that are commonly missed or forgotten.

Listed below are some common errors in administration noted at skilled nursing facilities:

1. Failing to prime the pen or perform a test dose
2. Not holding down the button or plunger for the appropriate time (refer to individual package inserts for complete administration details)
3. Not swabbing the pen with alcohol prior to needle attachment
4. Safety needles must be properly attached to the pen prior to administration. If not, the needle will not puncture the pen device and nursing may report the pen is “stuck” or “isn’t working”.
5. Using the pen device as a vial and withdrawing insulin with an insulin syringe (Figure 1)

Your AlixaRx Clinical Pharmacist can provide in-servicing and education to help prepare nursing staff. All pen manufacturers have training aids and brochures available for additional education. Scheduled follow up training is essential to educate new staff and remind current staff of the proper technique. Failing to prime the pen, removing insulin from the pen device, or not realizing the safety needle has engaged can result in dosing errors and significant risk for patients. Failing to use aseptic technique or entering the pen via a syringe for insulin removal can result in infection control issues. Any potential error in administration resulting in the pen device being damaged, or the incorrect dose being administered, can hamper the clinician's ability to make appropriate dosage adjustments. This is an opportunity for collaboration with facility staff, prescribers, and your AlixaRx Clinical Pharmacist to improve patient outcomes.

The insulin pen in Figure 1 was one of several noted at a skilled nursing facility. During a follow up in-service, it was discovered that a nurse was afraid patients were not getting the proper dose of insulin when using the insulin pen. In an effort to ensure patients received the correct dose of insulin, this nurse was utilizing the insulin pen as a vial. What the nurse did not realize was this practice resulted in dosing errors, increased infection risk, and damage to the pen device.

Challenge yourself at the next opportunity you have with a resident or other healthcare provider utilizing insulin pens. Become an expert on insulin pen technique and your residents can experience positive outcomes and enhanced diabetic control.

## Which Vitamin K Dosage Form is Preferred in LTC?

**Background** | A skilled-stay rehab patient on Coumadin recently had a supratherapeutic INR of 5.2. The patient had no evidence of abnormal bleeding. The provider was called and the patient was ordered 5 mg vitamin K (also called phytonadione), intramuscularly.

**Discussion** | There is a lot of misunderstanding about the use of vitamin K to reverse the effects of warfarin. Two issues stand out in the case above: First, the use of vitamin K was not needed in this instance because the patient had no evidence of bleeding and the INR was only slightly higher than 5. Holding warfarin with simple daily INR monitoring may suffice in this case. Second, the IM route of administration is not recommended.

### Vitamin K dosage form comparison

**Intramuscular (IM) vitamin K – NOT RECOMMENDED.** Avoid intramuscular vitamin K due to the risk of hematoma.

**Subcutaneous (SC, SQ) vitamin K – NOT RECOMMENDED.** Avoid subcutaneous vitamin K due to unpredictability and delayed efficacy.

**Oral (PO) vitamin K. RECOMMENDED.** Oral vitamin K is the safest route of administration and is therefore the recommended route of administration when vitamin K use is indicated.

**A note about intravenous (IV) vitamin K** | IV vitamin K is indicated for emergency situations and should be diluted in 50 mL of compatible solution and administered over at least 20 minutes. Because of the risk of anaphylactic reactions, IV vitamin K is typically not administered in a LTC living center situation.

References: 1. Guyatt GH, Akl EA, Crowther M, et al, "Executive Summary: Antithrombotic Therapy and Prevention of Thrombosis", 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines, "Chest 2012, 141(2 suppl); 7-47. 2.Patriquin C, Crowther M. "Treatment of warfarin-associated coagulopathy with vitamin K" Expert Rev Hematol. 2011 Dec;4(6):657-65. 3. Lexi-Comp® version 2.1.0, Lexi-Comp, Inc., 2014.

### Contributing authors

**Matt Palmer, PharmD, CGP** – AlixaRx Clinical Pharmacist

**Jenny Rowley-Funk, RPh, CGP** – AlixaRx Clinical Pharmacist

**Tom Richards, PharmD, CGP** – AlixaRx Clinical Pharmacist

**Al Barber, PharmD,CGP** – Director of Pharmacy

**Victor Alves PharmD, CGP, FASCP** – Director of Clinical Services

**Blake Griese, PharmD, JD** – Editor