SAFE Medicine®
Protect Yourself from Medication Errors
The Institute for Safe Medication Practices
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PEN injectors: Technology has some risks

Many injectable medicines are now available in devices that look like pens (see Figure 1). Pen injectors offer consumers a reliable way to give themselves injectable medicines. In some pen styles, the cap is removed and a small needle is attached. The pens are already filled with medicine. Measuring the right dose can be as easy as turning a dial on the pen.

Figure 1. Examples of several pen devices.

Pen injectors are sophisticated syringes that are designed for multiple injections of medicines until their medicine cartridges are empty. Some pen devices are called "auto-injectors" because they automatically insert a needle on the end before the injection. Auto-injectors are used most often for emergency medicines like those used to treat severe allergic responses or migraine headaches. Other pen devices are "self-injection devices," which require the user to insert the needles. These pen devices are used most often to inject hormones, like insulin, human growth hormone, and fertility drugs. They are also used for medicines to treat autoimmune diseases such as rheumatoid arthritis and psoriasis.

Pen injectors can be used in the home, in hospitals, and in other healthcare settings. As their use increases, they are becoming safer and easier to use. However, as with any medicine or new technology, errors have happened. Below we offer a glimpse of problems that have been reported with pen devices.

Misread digital numbers

With many insulin pens, the dose to be injected is displayed on the pen. On the Lantus Opticlik (insulin glargine) and Apidra (insulin glulisine) pens, the dose is displayed in a small window using digital numbers. Unfortunately, the numbers displayed in the window may be read incorrectly if the pen is held upside down, as a left-handed person might do. For instance, if the pen is held incorrectly, a dose that looks like "25" units is actually "52" units (see Figure 2), and a dose that looks like "21" units is actually "12" units. Similar displays of doses on other pen devices might cause the same problem.

Figure 2. If held upside down when dialing a dose of 25 units (top), the actual dose selected is 52 units (bottom).

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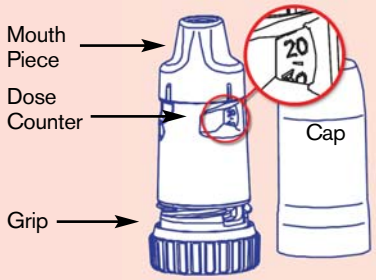
60 second safety tip

■ **Slow dose countdown.** A woman with asthma stopped by a pharmacy to talk with a pharmacist about her Pulmicort Flexhaler (budesonide inhalation powder). After trying many times to take her medicine, the woman said it felt like the inhaler was not working. The inhaler keeps track of how many doses are left (see photo). But the number on the dose counter did not seem to be moving.



The woman was unable to see or feel anything when she used the inhaler, so she did not think that she was getting the medicine. The pharmacist checked to make sure the inhaler was working correctly. In doing so, he called the company that makes the inhaler, AstraZeneca, and was told that the dose counter moves very slowly. The dose counter is labeled in multiples of 20 (i.e., 60-40-20-0) (see photo), so actual movement of the counter is hard to see. An exact countdown of each dose does not occur. AstraZeneca recently changed its patient information leaflet to let consumers know that it is unlikely that the inhaler's dose indicator will move with each dose. Ask your pharmacist if you have any questions about how many doses are left in your inhaler.

Brand name medicines appear in green; generic medicines appear in red.

Pen devices continued from page 1

Receiving the wrong drug or strength

Some brand names of insulin products look and sound very much alike. As a result, pharmacists have occasionally filled prescriptions with the wrong insulin pen device. This has caused poor blood sugar control in consumers. For example, a Novolog Mix 70/30 FlexPen (70% insulin aspart protamine suspension, 30% insulin aspart) was dispensed instead of a Novolog FlexPen (human insulin aspart). The consumer's blood sugar levels unexpectedly changed from high to low until the error was noticed.

Adult and junior (for children) strengths of EpiPen (epinephrine) have been mixed-up. Consumers who got the wrong strength of this emergency medicine did not get relief when they had a serious allergic reaction.

Getting the full pen as a single dose

Consumers and healthcare providers have injected the entire contents of a pen injector that was intended to deliver multiple doses. For example, a nurse gave the full contents of a pen device that held 750 mcg of Forteo (teriparatide) to a hospitalized patient with osteoporosis. The patient was supposed to receive 20 mcg. This is the usual daily dose. The pen actually holds 750 mcg, enough to last a month. Printed on the label was "750 mcg." Thus, the patient thought each injection contained 750 mcg of Forteo. Based on this, she told her nurse and doctor that she was taking 750 mcg each day. She told them that she prepared the pen by turning the pen dial once until it clicked. But at home, the patient was really receiving 20 mcg with each daily dose. Unfortunately, her doctor did not question this and prescribed 750 mcg of Forteo daily, while she was in the hospital. The nurse did not know how to give the full contents of the pen. So, she withdrew all of the medicine from the pen into a regular syringe and gave it to the patient.

Not enough education

Nurses will often teach patients how to use a newly prescribed pen device before leaving the hospital. But, some insurance companies may not cover the cost of pen injectors. If a patient cannot afford to buy the prescribed pen, the pharmacist may dispense a vial of medicine and syringes. Patients may not know how to withdraw the medicine from a vial into a syringe and self-inject the medicine, because they were taught to only use the pen device. Also, the pen used in the hospital to teach the patient, may not be the same one used at home. There is a wide variety of pens on the market, and hospitals may not stock all of the demonstration pens. Each pen may work in a slightly different way.

Many consumers do not tip and roll their insulin pen injectors adequately to assure proper mixing. This may cause large clumps of insulin flowing from the pen injector during the first injection. This can lead to very low blood sugar levels.

Learning how to use your pen device is critical to your safety. When you pick up the pen device from the pharmacy, ask the pharmacist how to use it. Bring someone with you and ask for written information that you can bring home. Ask your pharmacist if a demonstration pen is available to help you learn how to use the pen device. If so, your pharmacist can request a prescription for a "trainer" pen from your provider or get it from the drug manufacturer. If you have questions about your pen device, contact your pharmacist or provider.

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In The News!

Withdrawn cough and cold medicines. The US Food and Drug Administration (FDA) has raised concerns about the effectiveness and safety of over-the-counter (OTC) cough and cold medicines for young children. An FDA advisory panel met in October and recommended banning OTC cough and cold products for children under the age of 6. The panel found that there was no proof that the medicines help cold symptoms in young children. Further, there have been several reports of serious harm when these medicines have been given to young children. Before the panel met, many drug manufacturers had voluntarily removed more than a dozen cold products labeled for use in children under the age of 2. Drug companies have taken no action yet on cold products for children 2-6 years. Without cough and cold medicines available for young children, the panel members were concerned that some parents may use medicines approved for older children or adults, believing that "smaller" doses are safe. But medicines intended for older children and adults may be harmful if given to young children—even in exact "smaller" doses. Saline nose drops and a cool-mist humidifier can be used to help ease cold symptoms and loosen nasal secretions. Visit the American Academy of Pediatrics, for a list of medicines that were withdrawn from the market, at: http://www.aap.org/new/kidcolds.htm.

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