



**FIGURE 15-3:** Insulin pens (Credit: Ondrej83/Shutterstock)

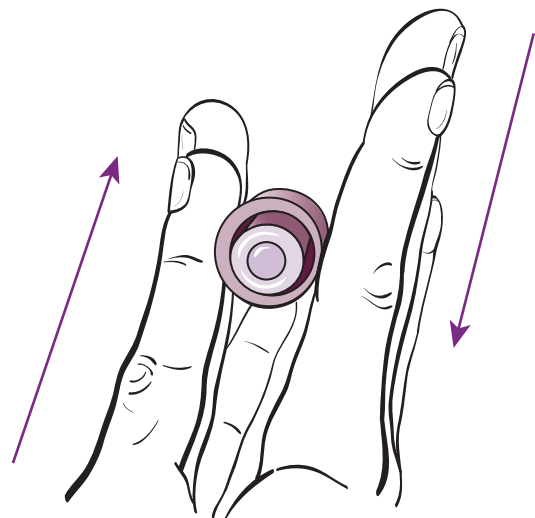
temperature extremes (freezing or very hot) because they will severely damage the insulin. Always label a container with the time and date that it was opened. After you have opened an insulin vial, gently roll it between your fingers (Fig. 15-4). Do not shake it.

### Injecting Insulin

Rotate insulin injection sites on the patient's body. This is necessary for several reasons: (1) if a site is used too frequently, the body may develop scar tissue that thickens, thus preventing insulin absorption; (2) abscesses may form; and, most important, (3) rotating sites allows insulin to be evenly absorbed and thereby helps to maintain steady glucose levels and delay or minimize the complications of diabetes such as neuropathy, eye and kidney damage, and cardiovascular disease. If the patient is self-injecting, you may need to help the patient develop a chart of site rotation, such as that shown in Figure 15-5. A good rule of thumb to teach patients is that each site should only be used once a month, and each injection site should be 1 inch away from other sites.

The patient is spared discomfort and cost if you draw up regular and longer-acting insulin into one syringe before injection. Follow your agency protocol, but typically, the ordered amount of the clear, regular insulin is drawn up first, followed by the cloudy, longer-acting insulin. Following these directions ensures that you do not inadvertently put some of the cloudy, longer-acting insulin into the clear, regular insulin vial.

Another method of delivering insulin to patients with type 1 diabetes is the insulin pump (Fig. 15-6). This method uses a small needle, small-bore tubing, and a small pager-sized pump that delivers a steady dose of insulin to the patient 24 hours a day, 7 days a week. The pump also delivers a bolus (rapid injection) at mealtimes to help with the size of each meal eaten. In addition, some pumps monitor the blood



**FIGURE 15-4:** Proper insulin handling. Be sure to roll the insulin vial between your fingers before drawing up the injection; do not shake the vial.