
Safe at School®: Overview of Insulin Concentration for School Nurses

The concentration of insulin is the number of units of insulin in 1 milliliter (mL). Insulin vials and pens commonly have a concentration of 100 units in 1 mL (100 units/mL), which is called U-100. However, some insulin products come in a higher concentration. U-200 means that there are 200 units of insulin in 1 mL (200 units/mL), U-300 means that there are 300 units of insulin in 1 mL (300 units/mL), and U-500 means that there are 500 units of insulin in 1 mL (500 units/mL). Given that a brand of insulin may come in different concentrations, it is important to look at the insulin pen or vial for the concentration. Currently available insulin pens (with their concentrations) can be found in the **Consumer Guide** from the **American Diabetes Association®**.

There are many reasons why a health care provider chooses to prescribe a concentrated insulin to a person with diabetes, although the primary reason is often to decrease the volume given with an injection. For the safety of the person with diabetes, insulin pens should only be used according to instructions on the package insert to avoid administration errors. When insulin pens are used according to instructions on the package insert, the insulin pen device displays the number of insulin units to be delivered and no conversion is needed. Concentrated insulin should not be transferred to a different device (such as from an insulin pen to a syringe or pump), as this can result in over dosage and severe hypoglycemia.

When using insulin via a vial and syringe, make sure the insulin concentration on the vial and syringe match (such as when using a vial with an insulin concentration of U-100, only use syringes that are for U-100 insulin). There is currently one concentrated insulin available in a vial (HUMULIN R U-500 vial), and there is a corresponding U-500 syringe. HUMULIN R U-500 should only be used with the U-500 insulin syringe to avoid administration errors.

In summary—because insulin comes in different concentrations—insulin should only be administered according to instructions on the package insert for the safety of the person with diabetes.