Insulin Injection “At-A-Glance”

Good insulin injection practices - injection technique, site rotation, and proper needle use - can be as important to glucose control as the type and dosage of insulin. Inappropriate insulin injection, on the other hand, can alter insulin absorption.

- **Injecting insulin in the right place**
  Insulin should be injected into the subcutaneous fat for most efficient absorption and utilization.

  - Injected too deeply, the insulin could be injected into the muscle, accelerating absorption and increasing the risk of hypoglycemia. If the injection is not deep enough, the insulin may leak out and reduce the effectiveness of the insulin.

  - The patient’s body mass index (BMI), along with the part of the body being injected and the needle length, determines the angle of injection. A 90° angle is appropriate for areas of the body with more fat -- and less than a 45° angle in areas of the body with less fat, thus avoiding the injection of insulin into muscle. Patients should pinch up a fold of skin to insert the needle at the appropriate angle to the skin fold – to avoid injecting insulin into the muscle. For patients using a 5mm mini-pen needle, no pinch up is necessary because the shorter needle cannot inject into the muscle.

*For more information about proper insulin injection technique:*

- **Site selection**
  Site selection is based on the different rates of insulin absorption. The most predictable area for injection is in the abdomen, followed by the outer back areas of arms, the outer thighs, and the buttocks.

  Places to avoid injecting insulin include: the skin in the two-inch radius around the umbilicus (navel); moles or scars, where absorption will not be as consistent; any part of the arm other than the outer back area where the highest concentration of fat is located; and the inner thighs, since thighs may rub together when walking and cause soreness at injection sites.

  Some clinicians recommend injecting in the same general area for one to two weeks, putting the needle in a different spot, and then moving to another area of the body. It also is important that patients not inject in areas that are going to be exercised, since increasing blood flow to the skin of a particular area increases the rate of absorption.

*For detailed information about proper injection site selection:*
Rotating injection sites
Site rotation is an important component of insulin therapy, especially for people with diabetes who inject three or more times a day. Proper site rotation may result in more consistent insulin absorption and minimize development of scar tissue.

To ensure proper site rotation:

- Inject the same general location at the same time each day - insulin is absorbed at different speeds depending on where it is injected and it is best to consistently use the same part of the body for each daily injection.
- Rotate within each injection site - to avoid developing hard lumps and fat deposits, it is important to inject in different spots within a general part of the body.

For detailed information about proper site rotation:

Proper needle use
Insulin injection syringes and pen needles are sterile products and guidelines issued by regulatory agencies call for all insulin injection syringes and pen needles to be labeled single-use only.

- Potential Risk of Infection. Guidance from the American Diabetes Association states that needle reuse may carry an increased risk of infection for some individuals. Patients with acute concurrent illness, poor personal hygiene, open wounds on the hands, or a weakened immune system should not reuse insulin needles.(1)

- Dose Accuracy. The American Diabetes Association’s Resource Guide recommends that patients using pen needles to always remove the needles immediately after use. When left in place, the pen needle creates an open passage to the insulin chamber and changes in temperature could impact insulin dosage.(2) Insulin can contract when taken from a warm to cool environment and consequently, studies show that up to two-thirds of the required insulin may not be delivered. Conversely, insulin can expand when taken from a cool to warm place. This can cause the insulin to leak out, changing the concentration and strength of insulin remaining in the cartridge.(3)

For detailed information about proper needle use:
References

1. American Diabetes Association, Insulin Administration
   [Link](http://care.diabetesjournals.org/content/26/suppl_1/s121.full)
