

diabetes and children during the adolescent growth spurt.

**Methods of administration.**

Daily insulin is administered subcutaneously by twice-daily injections, by multiple-dose injections, or by means of an insulin infusion pump. The insulin pump is an electromechanical device designed to deliver fixed amounts of regular or lispro insulin continuously (basal rate), thereby more closely imitating the release of the hormone by the islet cells ([Phillip, Battelino, Rodriguez, et al, 2007](#)). Although the pump delivers a programmed amount of basal insulin, the child or parent must program a dose for the pump to deliver before each meal.

The system consists of a syringe to hold the insulin, a plunger, and a computerized mechanism to drive the plunger. The insulin flows from the syringe through a catheter to a needle inserted into subcutaneous tissue (the abdomen or thigh), and the lightweight device is worn on a belt or a shoulder holster. The needle and catheter are changed every 48 to 72 hours by the child or parent using aseptic technique and then taped in place.

Although the pump provides more consistent insulin delivery, it has certain disadvantages. Pump therapy is expensive and requires commitment from the parent and child. A certain level of math skills is required to calculate infusion rates. It should also not be removed for more than 1 hour at a time, which may limit some activities. Skin infections are common, and as with any other mechanical device, it is subject to malfunction. However, the pumps are equipped with alarms that signal problems, such as a depleted battery, an occluded needle or tubing, or a microprocessor malfunction.

**Monitoring**

Daily monitoring of blood glucose levels is an essential aspect of appropriate DM management. Plasma blood glucose and hemoglobin A1C goal ranges are found in [Table 28-3](#).

**TABLE 28-3**

**Plasma Blood Glucose and Hemoglobin A1C Goals for Type 1 Diabetes Mellitus by Age Group**

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