body (Table 28-5). The methodical use of one anatomic area and then movement to another (as described in the previous paragraph) minimizes variations in absorption rates. However, absorption is also altered by vigorous exercise, which enhances absorption from exercised muscles; therefore, it is recommended that a site be chosen other than the exercising extremity (e.g., avoiding legs and arms when playing in a tennis tournament).

TABLE 28-5

Onset and Duration of Action Related to Injection Site

	SITE OF INJECTION			
	Abdomen	**Arm**	**Leg**	**Buttock**
Rate	Very fast	Fast	Slow	Very slow
Duration	Very short	Short	Long	Very long

From Albisser AM, Sperlich M: Adjusting insulins, *Diabetes Educ* 18(3):211–218, 1992.

Injection sites for an entire month can be determined in advance on a simple chart. For example, a "paper doll" (body outline) can be constructed and insulin sites marked by the child. After injection, the child places the date on the appropriate site. To keep in practice, it is a good idea for the parent to give two or three injections a week in areas that are difficult for the child to reach. The same basic methodology is used when teaching children to give their own insulin injections (Fig. 28-3). They should practice first on an orange or a doll, building courage gradually. Other devices are available for insulin injection and may offer advantages to some children. Children who do not wish to give themselves injections can be taught to use a syringe-loaded injector (Inject-Ease). With the device, puncture is always automatic. Adolescents respond well to a self-contained and compact device resembling a fountain pen (NovoPen), which eliminates conventional vials and syringes. Preloaded pens may also cause less pain because the needle is not blunted by piercing the rubber top of the insulin vial (Rex, Jensen, and Lawton, 2006).