

Sometimes a patient needs medications or electrolytes several times per day over short periods of time. In such cases, a piggyback solution is used. A piggyback solution consists of a separate IV bag and tubing connected to the primary IV tubing. The piggyback may contain, for example, an antibiotic or potassium that is given every 4 hours in 100 mL of fluid. Vitamins can be added to IV solutions, especially when patients are unable to process vitamins in their gastrointestinal system.

An IV push refers to quick delivery of a small amount of medication in a syringe. An IV push cannot be used for drugs that can potentially irritate the vein, for drugs that may be fatal if given too quickly, or for a large amount of medication. Only a licensed health-care professional can administer IV push medication.

TPN is given when the patient's digestive system needs a complete rest. This treatment is also known as hyperalimentation. TPN is a nutritional solution infused (flowed) directly into the veins to give the patient complete nutrition. The solution is placed directly into a large vein because of the risk of damage to the vein or tissues surrounding a peripheral vein. TPN provides the patient with a well-rounded supply of fluid and electrolytes, in addition to calories from fats, protein, and vitamins. TPN fluids require the use of special long-term IV catheters placed by a physician, usually in the subclavian vein. The end of the catheter lies in the superior vena cava.

### A CLOSER LOOK 10.3: Types of IV Lines

Peripheral lines are IV lines placed in veins in the arms, hands, or sometimes the feet or scalp of a small child. Central lines are IV lines inserted in large veins such as the subclavian vein or internal jugular vein. These catheters terminate in the superior vena cava; that is, the tip of the catheter lies in the superior vena cava, just above the heart, to allow the medication and fluids to mix with a larger amount of blood. Central lines are used to give additives that irritate small veins, such as total parenteral nutrition. Peripherally inserted central catheter (PICC) lines are similar to central lines in that they terminate in a large vein close to the heart, but they are inserted from a peripheral site such as the lower arm.

Lipids, or fats, may also be added to IV solutions. Commercial lipid solutions contain substances such as soybean or safflower oil, which is added to water, glycerin, and egg yolks. These lipids increase the caloric source for patients who need it. Lipids, like TPN, usually require a special line.

Blood and blood products can be administered through an IV line. A licensed health-care professional administers blood, but everyone on the team must understand the types of blood products. Whole blood provides complete correction of blood loss in that it restores not only the fluid volume lost, but also the components, such as platelets and white blood cells, that were depleted. One unit of whole blood is 500 mL. Blood products provide various portions of whole blood based on a patient's needs. Patients with hemophilia, for example, require only clotting factors and platelets, not whole blood.

Before blood or a blood product is given, the patient's blood type must be checked against what is to be administered. This process, called "type and cross," ensures that patients do not have a transfusion reaction to blood that does not match their own.

A transfusion reaction is a serious negative response to the administration of blood or blood products. Signs and symptoms of a reaction include a rapid change in vital signs, dyspnea, restlessness, fever, chills, blood in the urine (hematuria), and pain in the chest, back, or flank. To discontinue a blood transfusion, the health-care worker first clamps the line infusing the blood and opens the line infusing NSS that is hung like a "Y" with the blood (Fig. 10-18). You should closely watch the patient's vital signs, including pulse, temperature, respiratory rate, and blood pressure, when transfusing blood products.

### Injectable Medication Supplies

Ampules, vials, needles, and syringes, as well as IV-related items, including bags or bottles of solutions, tubing, needles, and catheters, comprise some of the equipment you will need to know how to use if you are preparing an injection for administration or will be administering one.