that are accessed by blunted plastic cannulas or systems that use valves that open and close a fluid path when activated by insertion of a syringe.

Blunt plastic cannulas and pre-slit injection port sites (Fig. 20-15) eliminate the need for steel needles and conventional injection port sites but remain accessible via hypodermic needles, a drawback except in emergent situations. Systems that do not permit needled access enhance safety by preventing health care workers from attempting to use needles. A syringe with a blue spike is available to access a single-dose vial (see Fig. 20-15, *A*). The pre-slit injection port sites are identified by a white ring surrounding the port; this ring alerts users that the system is needleless (see Fig. 20-15, *B*). Syringes are available with the blunt plastic cannula for accessing these sites (see Fig. 20-15, *C*). A lever lock (see Fig. 20-15, *D*) or threaded lock cannula (see Fig. 20-15, *E*) attaches to an IV line, IV Y site, or peripheral intermittent infusion device. A pre-slit universal vial adapter (not pictured) provides access to standard multiple-dose vials, and syringe cannulas are then used to access the adapter. Valve technology allows syringes and IV tubing to connect directly in-line without the use of an adapter.

Nursing Alert

Misconnections of tubing have occurred, resulting in patient deaths. Many needleless IV systems allow other types of tubing such as blood pressure and oxygen tubing to connect and instill air directly into the IV line. Before tubing is connected or reconnected to a patient, trace it completely from the patient to the point of origin for verification.