

# I.V.

## THERAPY

### REDUCING THE RISK OF INFECTION

**Keep I.V. complications under control by following this practical advice.**

**T**hrombophlebitis, cellulitis, and septicemia are three potential complications of intravenous (I.V.) therapy that can extend your patients' hospital stays. These complications not only cause discomfort and inconvenience for patients, but they also add to the cost of hospital care and increase your work load, spreading nursing resources thinner. But nosocomial infections, a leading cause of

I.V. complications, can often be prevented.

If your hospital has an I.V. team skilled in venipuncture technique, infections can be reduced significantly. But your hospital may not have that luxury. And even if it does, you're the one who's likely to be caring for the

patient around the clock—changing I.V. tubing, checking dressings, and administering medications. With as many as 75% of hospitalized patients receiving I.V. therapy, you can't afford not to follow strict aseptic technique. And you don't want to overlook any potential source of contamination.

The following guidelines will help you avoid I.V. therapy complications that contribute to nosocomial infections.

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### Choosing the insertion site

Be careful when you select an I.V. insertion site. Sites that are close to joints—the hands, wrists, and elbows, for example—don't provide the stability needed for continuous infusions. These sites limit the patient's mobility and increase the risk of extravasation. They should be used only when other sites aren't available.

### Preparing the site

Before inserting an I.V. cannula, clean the patient's skin according to hospital protocol. Preparing the skin properly reduces the number of microorganisms present at the time of venipuncture, decreasing the risk of microbes being pushed into the bloodstream by the cannula. Migration of bacteria from the skin is a leading cause of catheter sepsis.

You can use various antiseptic solutions to clean the skin, such as alcohol and povidone-iodine. A relatively new product that you may want to consider is called I.V. Prep. It contains 85.3% alcohol, Irgasan DP300 (a bacteriostatic agent), and Citroflex and Gantrez (two film-forming agents designed to protect the skin and help transparent dressings adhere to the skin).

### I.V. site dressings:

#### Transparent or gauze?

Select a dressing that you won't have to constantly manipulate to check the site—such handling can lead to contamination. Your choices include traditional gauze dressings and transparent dressings.

Several studies have shown that transparent dressings tend to keep the I.V. device more stable and, in the long run, cost less to maintain than gauze dressings. Because you can see the insertion site through a transparent dressing, you'll save time checking it, too.

Although all dressings should be changed at least every 24 hours, one study suggests that transparent dressings can be worn for a longer time than gauze dressings without increasing the risk of contamination. The study found that transparent dressings worn up to 7 days compared with gauze dressings worn an average of 2.4 days in terms of the incidence of infections and phlebitis.

Besides choosing the right type of dressing, consider how the dressings and starter kits are packaged. To avoid cross-contamination from materials

being carried from room to room, your best choice may be a prepackaged starter kit that includes site preparation materials, gloves, tape, a tourniquet, and a dry sterile dressing for the previous I.V. site. Hospitals can purchase prepackaged kits or, if the cost is prohibitive, design and bundle their own.

### Preventing contamination of I.V. tubing

Constant manipulation of the I.V. device may cause contamination as well as separation of the I.V. tubing from the cannula hub. Multiple medication pushes and tubing changes increase the risk of in-line contamination. You can reduce that risk by following these guidelines:

- Use strict aseptic technique when changing I.V. tubing—particularly when connecting (or disconnecting) the tubing to the solution container or cannula hub. Because the cannula can easily be shifted during this procedure, extravasation often occurs.
- Change the cannula and primary tubing simultaneously whenever possible.
- When piggybacking solutions into the injection port, rub the port with alcohol swabs before inserting the needle.
- When a piggyback solution is discontinued (and before starting a new infusion), take precautions in removing the I.V. needle and extension set, which may harbor contaminants. Dispose of them properly to protect other personnel and equipment from contact with solutions or contaminated blood.
- As recommended by the Centers for Disease Control, tubing should be changed every 72 hours. This procedure is often neglected because of rotating staffing practices, use of agency nurses, random accountability for performing this task, and failure to label tubing.
- Never leave a contaminated needle or I.V. dressing attached to I.V. tubing not being used; doing so may cause upward contamination of the entire tubing and solution.
- Never let I.V. tubing touch the floor; contamination may occur through microscopic pores in the tubing.

### I.V. filters—another safeguard

When outbreaks of gram-negative nosocomial infections in the 1970s were traced to contaminated fluids, I.V. filters were developed to prevent such infections. Today, stringent protocols in fluid preparation and manufacture vir-

tually guarantee fluid sterility. Are filters still necessary? Considering the growing number of patients at high risk for nosocomial infections—for example, patients who are elderly or debilitated—filters *can* be an added safeguard. Keep in mind, too, that contamination may not produce any specific local or systemic effects but may further weaken a site of lowered resistance, such as a surgical wound, and increase the risk of infection.


For instance, consider the potential for infection by particulate matter found in large-volume parenteral solutions. The U.S. standard for large-volume parenterals is 50 particles (each measuring not more than 10 microns) per milliliter and not more than 5 particles (of 25 or fewer microns) per milliliter. However, these particles are still large enough to occlude a pulmonary capillary, which measures about 8 microns in diameter.

A 0.22-micron end-line filter not only protects against particulate contamination but can also protect against air embolism, excessive pressures from bolus delivery pumps, and rapid recovery from a dry I.V. line. A filter equipped with Luer-Lok connectors provides additional protection from separations.

### Keeping patients free of complications

By practicing these few safeguards, you can significantly reduce the risk of I.V.-related nosocomial infections and decrease your patients' lengths of stay. Remember to:

- use care in selecting an insertion site
- follow aseptic techniques in skin preparation and venipuncture
- choose a transparent dressing
- limit cannula and tubing manipulation
- change I.V. tubing regularly
- use a 0.22-micron end-line filter as an extra safeguard.

Finally, encourage your facility to provide ongoing staff education programs on venipuncture instruction and I.V. infection control. 

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