Complications of peripheral I.V. therapy

IF YOUR PATIENT is receiving peripheral I.V. therapy, you’ll need to watch for signs and symptoms of complications, such as:
- hypersensitivity
- infiltration
- extravasation
- phlebitis
- infection.

We’ll fill you in on how to recognize these complications and walk you through how to treat them, with an eye on prevention.

You’re so sensitive

Before you administer an I.V. medication, take steps to find out if your patient may be prone to hypersensitivity:
- Ask him if he has any allergies, including allergies to food or pollen.
- Ask if he has a family history of allergies; if he does, he’s more likely to develop a drug hypersensitivity.
- If your patient is an infant less than age 3 months, ask the mother about her allergy history because maternal antibodies may still be present.

After giving an I.V. medication, follow through with these precautions:
- Stay with your patient for 5 to 10 minutes to detect early signs and symptoms of hypersensitivity, such as sudden fever, joint swelling, rash, urticaria (hives), bronchospasm, and wheezing.
- If he’s receiving the drug for the first or second time, check him every 5 to 10 minutes or according to your facility’s policy. An immediate, severe reaction is life-threatening, so prompt recognition and treatment are imperative.
- At the first sign of hypersensitivity:
  - Discontinue the infusion and notify the

Running down the infiltration scale

Use these classifications when documenting instances of infiltration.

<table>
<thead>
<tr>
<th>Degree</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No symptoms</td>
</tr>
<tr>
<td>1+</td>
<td>Skin blanched</td>
</tr>
<tr>
<td></td>
<td>Edema less than 1 inch (2.5 cm) in any direction</td>
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<tr>
<td></td>
<td>Cool to touch</td>
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<tr>
<td></td>
<td>With or without pain</td>
</tr>
<tr>
<td>2+</td>
<td>Skin blanched</td>
</tr>
<tr>
<td></td>
<td>Edema 1 to 6 inches (2.5 to 15 cm) in any direction</td>
</tr>
<tr>
<td></td>
<td>Cool to touch</td>
</tr>
<tr>
<td></td>
<td>With or without pain</td>
</tr>
<tr>
<td>3+</td>
<td>Skin blanched, translucent</td>
</tr>
<tr>
<td></td>
<td>Gross edema more than 6 inches in any direction</td>
</tr>
<tr>
<td></td>
<td>Cool to touch</td>
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<tr>
<td></td>
<td>Mild to moderate pain</td>
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<tr>
<td></td>
<td>Possible numbness</td>
</tr>
<tr>
<td>4+</td>
<td>Skin blanched, translucent, tight, leaking, discolored, bruised, swollen</td>
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<tr>
<td></td>
<td>Gross edema more than 6 inches in any direction</td>
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<tr>
<td></td>
<td>Deep, pitted tissue edema</td>
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<tr>
<td></td>
<td>Circulatory impairment</td>
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<tr>
<td></td>
<td>Moderate to severe pain</td>
</tr>
<tr>
<td></td>
<td>Infiltration of any blood product, irritant, or vesicant</td>
</tr>
</tbody>
</table>

health care provider immediately.
- Administer medications as ordered.
- Monitor the patient’s vital signs and provide emotional support.

**Just say no to infiltration**

Infiltration occurs when I.V. fluid leaks into surrounding tissue. It’s commonly caused by improper placement or dislodgment of the catheter. When the tip of the catheter is positioned near a flexion area, patient movement may cause the catheter to slip out or through the lumen of the vessel. The risk of infiltration increases in older patients because their veins are thin and fragile.

Signs and symptoms of infiltration include:
- swelling
- discomfort
- burning
- tightness
- cool skin
- blanching.

If only a small amount of an isotonic solution or nonirritating drug infiltrates, the patient usually experiences only mild discomfort. Here’s what you need to do:
- Stop the infusion and remove the device (unless the medication is a vesicant; consult the health care provider and pharmacy).
- Elevate the limb to increase patient comfort.
- Check the patient’s pulse and capillary refill time.
- Counteract the effects of the drug as ordered.
- Perform venipuncture in a different location and restart the infusion.
- Check the site frequently.
- Document your findings using the infiltration scale (see Running down the infiltration scale).

**Memory jogger**

As soon as you spot infiltration, think of the three C’s:
- Cut off (the infusion)
- Counteract (the effects of the drug)
- Contain (the affected area).

Extra! Extra! Extravasation suspected!

Extravasation, the leaking of vesicant drugs (such as antineoplastics) into surrounding tissue, can cause severe local tissue damage, resulting in delayed healing, infection, tissue necrosis, disfigurement, loss of function, and even amputation.

To help prevent extravasation when giving vesicants:
- Strictly adhere to proper administration techniques.
- Avoid using the back of the hand where tendon and nerve damage is more likely.
- Avoid using the wrist and fingers because they’re hard to immobilize and areas with previous damage or poor circulation.
- Give vesicants last when multiple drugs are ordered.

Signs and symptoms of extravasation include:
- blanching, burning, or discomfort at the I.V. site
- cool skin around the I.V. site
- swelling at or above the I.V. site.

If you suspect extravasation, follow your facility’s protocol. Take these essential steps:
- Stop the I.V. flow and remove the I.V. line, unless the catheter should remain in place to administer the antidote.
- Estimate the amount of extravasated solution and notify the health care provider.
- Instill the appropriate antidote according to your facility’s protocol.
- Elevate the extremity.
- Record the extravasation site, your patient’s symptoms, the estimated amount of extravasated solution, and the treatment.

*Follow the manufacturer’s recommendations to apply either ice packs or warm compresses to the affected areas.*

**Fighting phlebitis**

Phlebitis, or inflammation of a vein, is a common complication of peripheral I.V. therapy that’s associated with acidic or alkaline solutions or those that have a high osmolarity. Other factors include:
- vein trauma during insertion
- using a vein that’s too small
- using a vascular access device that’s too large
- prolonged use of the same I.V. site.

Phlebitis can follow any infusion, but it’s
most common after continuous infusions, developing 2 to 3 days after the vein is exposed to the drug or solution. It develops more rapidly in distal veins than in veins close to the heart. Phenytoin and diazepam can produce phlebitis after one or more injections at the same I.V. site. Large doses of potassium chloride, amino acids, dextrose solutions, and multivitamins can cause phlebitis as well. Certain irritating I.V. drugs are also likely to cause phlebitis when piggybacked, including:

- erythromycin
- tetracycline
- nafcillin
- vancomycin
- amphotericin B.

Take these steps to prevent phlebitis:
- Use proper venipuncture technique.
- If necessary, dilute drugs correctly.
- Monitor administration rates.
- Observe the I.V. site frequently.
- Change the infusion site regularly according to your facility’s policy.

Signs and symptoms of phlebitis include:
- redness or tenderness at the tip of the catheter
- puffy area over the vein
- elevated temperature.

To detect phlebitis, inspect the I.V. site several times a day (see Classifying phlebitis).

Infection detection
A patient receiving I.V. therapy may develop a local or systemic infection. Monitor your patient for signs and symptoms of infection, such as redness and discharge at the I.V. site or an elevated temperature. If the infection is systemic:
- Stop the infusion.
- Notify the health care provider.
- Remove the device.
- Culture the site and device as ordered.
- Administer medications as prescribed.
- Monitor the patient’s vital signs.

Let’s not get too complicated
Complications of peripheral I.V. therapy can be serious, but with your careful attention and eye on prevention, you can help your patient avoid these pitfalls.

Learn more about it
Infusion Nurses Society. Infusion Nursing Standards of Practice. Journal of Infusion Nursing. 29(1, Suppl.):S1-S92, January/February 2006.