

## I-230 Responding to Complications of PICC Lines

### Purpose

Identify possible complications.

Assure that the line will be maintained safely.

Provide for client/caregiver education.

### Applies To

Registered Nurses

Licensed Practical/Vocational Nurses

Other (*Identify*): \_\_\_\_\_

### Special Considerations

#### *Bleeding*

Bleeding is frequently associated with any non-tunneled catheter insertion. More frequent dressing changes and/or a mild pressure dressing may be required. Excessive bleeding or bleeding that persists for more than 24 hours is not normal. Excessive bleeding may be caused by coagulation disorders, vigorous physical activity, or a traumatic insertion procedure.

Response: Develop a plan with the physician for the management of excessive bleeding.

#### *Phlebitis*

Sterile Mechanical Phlebitis is the most common complication seen with the PICC line. It is not an infectious process; it is the body's response to a foreign material in the blood vessel. This phlebitis is predictable in that:

It usually occurs in the first 48 to 72 hours after insertion.

It occurs more often in women than in men.

It occurs more often on left-sided insertions.

It occurs more often when large-gauge catheters are used.

Phlebitis should be reported using this scale:

1 + pain at the site, erythema, and/or edema; no streak; no palpable cord.

2 + pain at the site, erythema, and/or edema; streak formation; no palpable cord.

3 + pain at site, erythema, and/or edema; streak formation; palpable cord.

Response: Conservative measures to be taken for a 1+ or 2+ phlebitis:

Warm, moist compresses applied to the upper arm between the insertion site and shoulder for 20 minutes, 4 times a day.

Elevation of the extremity.

Mild exercise.

If phlebitis does not resolve in 24-48 hours, if it progresses to a grade 3+, or if the client experiences severe pain or discomfort, the physician must be notified. Removal of the catheter is indicated.

### *Cellulitis*

This infection may exhibit itself as pain, tenderness, and redness at the catheter exit site. Cellulitis does not follow the course of the vein. It tends to spread in a circular pattern into the surrounding subcutaneous tissue.

Cellulitis is most often caused by Staph epidermis or Staph aureus. Contamination at the site is the most common route of infection.

Response: Oral antibiotics are usually quite effective and may not require removal of the catheter.

### *Pain During Infusion*

If pain is present only during the infusion, it may be caused by the chemical properties of the solution or medication being infused. Infusions with high osmolality or low PH may cause chemical irritation, vasospasms, and phlebitis. The rate and frequency of administration are found to be factors in chemical phlebitis caused by antibiotics.

Response: Slowing the administration rate will often help. Warm compresses applied during the infusion may decrease pain by increasing the hemodilution around the catheter.

### *Drainage from Catheter Exit Site*

Any fluid from the site should be cultured to rule out catheter sepsis or exit-site infection. Chemical phlebitis downstream from the catheter tip could cause a narrowing of the lumen of the vein. A rapid infusion could cause increased pressure in the venous system and lead to reflux of the infusion solution at the exit site.

Response: Action is determined by identifying the type of drainage. If a leak is determined in the external portion of the catheter, a catheter repair is indicated.

### *Catheter Sepsis*

While infection rates with PICC lines have been low compared to other central lines, the potential for catheter-related sepsis is present with any type of vascular access.

Documented catheter sepsis requires:

A client who is exhibiting signs of sepsis.

A specific organism cultured from the blood.

A specific organism cultured from the catheter tip.

No other source for that organism.

Resolution of the septic picture when the catheter is removed.

Response: This presents an area of much controversy. Some say many cases of sepsis can be resolved with the catheter in place; while others say that the catheter must be removed, the infection resolved and then another line can be placed. Others maintain the decision to remove the catheter depends on the causative organism, type of catheter, and condition of the patient. Consult the client's physician for specific orders.

### *Air Embolism*

The potential for air embolism exists whenever a venipuncture is performed. If the pressure of the air is greater than that of the column of blood, air will enter the system when it is open. Keeping the catheter exit site below the level of the heart will help to maintain adequate pressure within the system.

Early signs of air embolism include:

- Chest pain.
- Dyspnea and hypoxia.
- Apnea.
- Tachycardia.
- Hypotension.
- Nausea.
- Substernal pain.
- Confusion.

Response: Immediately position the client on his/her left side with feet elevated. Activate the emergency response system. Monitor vital signs and start peripheral IV if possible.

### *Catheter Tip Migration*

It is possible for any type of central venous catheter to migrate to another location while in the body. Certain types of clients are more susceptible to catheter tip migration.

Oncology clients who experience frequent nausea and vomiting are likely to experience migration due to the physical position often assumed during vomiting and the change in the interthoracic pressure that occurs.

Respiratory clients who have bouts of severe coughing.

Clients who are very active.

Symptoms may include referred pain in the jaw, ear, or teeth. Distended veins on the malpositioned side may be evident. Flushing or a sense of fullness in the head may occur during rapid infusions.

Response: Measure and document the external length of the catheter with each dressing change. This will assist in early detection. Periodic catheter tip verification by x-ray study should be performed on all long-term, centrally placed catheters.

**Related Procedures**

Central Line Management

**Policy History**

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