

## INS Position Paper

### Recommendations for Frequency of Assessment of the Short Peripheral Catheter Site

#### Background

As many organizations choose to follow the Infusion Nurses Society (INS) recommendations for peripheral intravenous (IV) site rotation based on clinical indications rather than a specific time frame, INS recognizes the critical importance of site assessment to identify any signs of complications. The risks of peripheral IV catheters are well known, including phlebitis, infiltration/extravasation, and infection. Nerve damage is also a risk both during insertion and as a result of major infiltrations/extravasations. Minimizing the complications associated with these risks demands regular assessment for signs and symptoms and prompt removal when evident. Peripheral IV sites should be assessed for redness, tenderness, swelling, drainage, and/or the presence of paresthesias, numbness, or tingling.<sup>1,2</sup> In addition to site-related changes, the possibility of catheter-associated bloodstream infection must also be considered in any patient with a peripheral IV catheter who has an elevated temperature, even in the absence of site redness, tenderness, swelling, or drainage. There are limited evidence-based guidelines addressing how *often* to assess the peripheral IV site. Much of the general nursing literature addresses the need for “frequent” assessment of the IV site and the 2011 *Infusion Nursing Standards of Practice* recommends “routine” assessment for signs and symptoms of phlebitis and infiltration.<sup>2</sup>

In the winter of 2012, INS convened a national task force of infusion therapy experts representing the varying areas of infusion practice based on population (neonatal, pediatric, geriatric, oncology) and settings (acute care, outpatient, home care, long-term care) to examine current practices and to develop specific recommendations for the frequency of peripheral IV assessment.

## Discussion

Historically, routine peripheral IV site rotation for adults was based upon a time frame. In the 2006 version of the *Infusion Nursing Standards of Practice*, the recommendation was to rotate the site at least every 72 hours.<sup>3</sup> In the 2011 *INS Standards*, the recommended frequency for site rotation of the “short” peripheral catheter (as differentiated from a midline peripheral catheter in the *Standards*) is now based on clinical indications, rather than a specific time frame. Clinical indications include assessment of the patient’s condition and access site, skin and vein integrity, length and type of prescribed therapy, venue of care, and integrity and patency of the catheter.<sup>2</sup> The primary reference used to support site rotation based on clinical indications was a Cochrane systematic review of the literature.<sup>4</sup> Five randomized, controlled trials that compared routine peripheral IV catheter removal with removal only when clinically indicated were included in the analysis of 3408 trial participants that found no conclusive evidence of benefit for routine peripheral IV catheter site rotation. The impact of clinically indicated site rotation will continue to be a research priority for INS.

It is recognized that a variety of factors may influence the frequency of peripheral IV site assessment, including risk factors such as age and cognition, types of infusate (eg, irritant, vesicant), type of infusion (eg, intermittent vs continuous), catheter location (eg, area of flexion, high-risk location such as external jugular), and health care setting (eg, acute care, home care).

A review of the literature and community practice provided some guidance in formulating this INS Position Paper. Young patients (neonates [ $<4$  weeks old] and pediatric) and older adult patients ( $>65$  years old) are addressed as specialty populations in the 2011 *INS Standards*. In the older adult, even small infiltrates can lead to severe complications, and nursing practice policy “may recommend observing the area every 1 to 2 hours.”<sup>5</sup> The National Association of Neonatal Nurses (NANN)<sup>6</sup> provides specific guidelines for peripheral IV assessment in the neonatal patient recommending hourly assessment, including observation for any signs of redness, edema, pain with flushing, or increased resistance when flushing the catheter. NANN also cites increasing pump pressure readings; however, infusion pumps *should not* be relied on to detect

infiltrations/extravasations as they occur at much lower pressures than occlusion alarms are set to recognize. When an IV catheter has infiltrated, the fluid or medication will continue to infuse and worsen the problem.<sup>7</sup> In a survey of 12 pediatric hospitals by this INS Task Force, 10 hospitals reported policies recommending hourly assessment for pediatric patients receiving infusions. Two organizations identified every 2 hours for general pediatrics. Pediatric textbook references recommend a frequency of either hourly or every 1 to 2 hour site assessment.<sup>8,9</sup>

The Oncology Nursing Society (ONS)<sup>10</sup> provides very specific recommendations in relation to intermittent infusions of vesicant medications, recommending that the site be monitored for signs of extravasation every 5 to 10 minutes, including a check to verify blood return. Continuous infusions should not be administered via a peripheral IV in either adults or in pediatrics.<sup>10,11</sup> Intermittent vesicant infusions (eg, 30-60 minutes) must be administered via a peripheral IV catheter with caution. Some confusion exists whether a medication is considered a vesicant or an irritant. Although some medications may not be recognized as vesicants, the package insert does caution the nurse to monitor for extravasation. As identified in the INS *Standards*, the nurse administering parenteral medications should have knowledge of potential adverse reactions and appropriate interventions.<sup>2</sup> In addition, vasoconstrictor agents can cause severe tissue necrosis with infiltration and should be given via a central vascular access device whenever possible.<sup>12</sup>

An experienced infusion nurse who has served as an expert witness in over 100 infusion-related malpractice cases, Masoorli recommends assessment of the peripheral IV site at least every 4 hours.<sup>13</sup> She further states that the lack of specific guidelines for site assessment is a problem and that there is great variation in practice. Frequent assessment of the site allows for rapid action and less risk for serious tissue damage, a risk associated with the common complication of infiltration. In a nursing skills manual, patient observation of the insertion site is recommended at a frequency of every 1 to 2 hours.<sup>14</sup> The Centers for Disease Control and Prevention (CDC) recommends at least daily evaluation of the insertion site by palpation through the dressing to discern tenderness and by inspection if a transparent dressing is used; removal of an opaque dressing for visual assessment is recommended if tenderness is present. It is noted that the CDC's recommendations are in the context of the risk for vascular-related infections/phlebitis and does not address other peripheral IV risks.<sup>15</sup>

The patient who is receiving infusions via a peripheral IV catheter in the home setting presents a unique situation as the nurse is in the home only intermittently. While continuous infusions via a central vascular access device are common, continuous infusions via a peripheral IV catheter are not. Should they be administered in the home setting, patient safety must be addressed. The patient and caregiver(s) should be motivated, willing, and able to participate in the care and monitoring of the infusion. While the nurse assesses the site with each home visit, patient education is critical and must address the importance of regular site assessment and what to report.

Patient education related to peripheral IV catheters and site assessment is equally important in institutional settings. The alert and oriented patient, and/or family members/caregivers, should be provided with information about the peripheral IV catheter, potential risks, and instruction to promptly report signs or symptoms such as swelling, redness, pain, and/or paresthesias/numbness or tingling in the extremity.

## **Definitions**

*Extravasation:* Inadvertent infiltration of a vesicant solution/medication into surrounding tissue.

*Infiltration:* Inadvertent administration of a nonvesicant solution/medication into surrounding tissue.

*Irritant:* An agent capable of producing discomfort or pain along the internal lumen of the vein.

*Vesicant:* An agent capable of causing blistering, tissue sloughing, or necrosis when it escapes from the intended vascular pathway into surrounding tissue.

## **Statement of Position**

It is the position of the Infusion Nurses Society that:

1. When an infusion is running (whether continuous or intermittent\*), peripheral IV catheter sites should be routinely assessed for redness, tenderness, swelling, drainage,

and/or the presence of paresthesias, numbness, or tingling at the specified frequency listed below. Assessment should minimally include visual assessment, palpation, and subjective information from the patient. If there is tenderness at the site, the dressing may be removed to more carefully visualize the site:

- a. At least every 4 hours
  - i. Patients who are receiving nonirritant/nonvesicant infusions *and* who are alert and oriented *and* who are able to notify the nurse of any signs of problems such as pain, swelling, or redness at the site.
- b. At least every 1 to 2 hours
  - i. Critically ill patients
  - ii. Adult patients who have cognitive/sensory deficits or who are receiving sedative-type medications and are unable to notify the nurse of any symptoms
  - iii. Catheters placed in a high-risk location (eg, external jugular, area of flexion)
- c. At least every hour
  - i. Neonatal patients
  - ii. Pediatric patients
- d. More frequently: every 5 to 10 minutes
  - i. Patients receiving intermittent infusions of vesicants
    - The nurse should advocate for central vascular access administration of vesicant medications whenever possible. The peripheral infusion of vesicant agents should be limited to less than 30 to 60 minutes.<sup>10,11</sup>
    - In addition to visual assessment of the site, a blood return should be verified every 5 to 10 minutes during the infusion.  
<sup>10,11</sup>
  - ii. Patients receiving infusions of vasoconstrictor agents
    - The nurse should advocate for central vascular access administration of vasoconstrictor agents whenever possible as

these agents can cause severe tissue necrosis with extravasation.<sup>12</sup>

- e. With every home/outpatient visit
  - i. For patients receiving peripheral infusions at home as overseen by home care or outpatient nurses
  - ii. Patient and family education should include:
    - What to look for: redness, tenderness, swelling, or site drainage
    - To check the site at least every 4 hours during waking hours
    - Ways to protect the site during sleep and activities
    - How to stop the infusion if signs/symptoms occur
    - To promptly report to the nurse
    - The organization's 24-hour contact telephone numbers
2. For all patients who have a locked peripheral IV catheter for intermittent infusions, the site should be assessed with every catheter access/infusion or at a minimum of twice per day.
3. Temperature should be checked at a frequency according to organizational policy/procedure and more often based on nursing judgment. The possibility of catheter-associated bloodstream infection should be considered when there is fever in any patient with a peripheral IV catheter even in the absence of site redness, tenderness, swelling, or drainage.

\*Note that these guidelines are applicable to intermittent or continuous infusions. IV push administration is not addressed as the nurse is present during the entire infusion administration.

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