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Assessing and Flushing a Peripheral Intravenous Line

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Overview

Source: Madeline Lassche, MSNEd, RN and Katie Baraki, MSN, RN, College of Nursing, University of Utah, UT

After peripheral intravenous (IV) access is initiated, it is important to assess and maintain the IV catheter according to institutional policies and nursing standards of practice. The regular assessment of the insertion site and the surrounding areas for signs of complications is necessary to prevent IV catheter complications, including infiltration, phlebitis, infection, extravasation, or catheter dislodgement. Routine IV maintenance is equally important to preserve line patency and to reduce the risk of occlusion, thrombosis, and thrombophlebitis. According to the CDC, peripheral IV catheters (PIV) may be kept in place for as long as 96 h, with proper care and maintenance. In addition, according to the Infusion Nurses Society (INS), a pediatric patient IV catheter may be kept in place until the IV line is no longer patent or it demonstrates complications. Routine rotation every 96 h is not indicated in the pediatric population due to increased anxiety caused by needle sticks.

This video demonstrates the assessment and maintenance of peripheral IV lines, including general considerations before initiating the procedure, assessing the injection site for associated complications, and maintaining catheter patency by flushing it with the normal saline solution.

Procedure

1. General procedure considerations (review in the room, with the patient).

1. As always, before the patient encounter, wash your hands thoroughly with soap and warm water. Use hand sanitizer, applying vigorous friction, if the hands are not visibly soiled.
2. At the bedside computer, review the patient's medical history and confirm that the patient continues to require IV access.
3. Review the maintenance IV fluid orders in the Medication Administration Record (MAR).
    1. If the patient currently receives maintenance fluid via the IV line, confirm that the patient needs to continue the IV fluid therapy. This is accomplished by reviewing the patient's intake and output balance; assessing vital signs, skin turgor, and mucus membranes; and reviewing serum laboratory results.
4. Wash hands as described above (step 1.1) upon leaving the patient's room.

2. In the medication preparation area, obtain a 10-mL normal saline flush and alcohol wipes.

3. Assessing and flushing the patient's IV line. Upon first entering the patient's room, set the supplies down on the counter and wash your hands, as described in step 1.1.

1. Assess the peripheral IV insertion site.
    1. Inspect the IV catheter insertion site for redness, swelling, or bruising. Redness can indicate irritation, inflammation, infection, or thrombus formation. Bruising may indicate that a hematoma has developed and may cause damage to surrounding tissues.
    2. Assess the condition of the transparent catheter dressing. The dressing should be clean, dry, and adhere securely to the skin around the IV catheter insertion site. Loose, wet, or soiled dressings should be changed using aseptic technique.
    3. Assess for tenderness and swelling.
        1. Gently palpate the area around the IV catheter insertion site and ask the patient if the area is tender or painful. Tenderness may indicate that the insertion site has become inflamed or infected.
        2. With one hand, gently palpate the area around the IV catheter insertion site and, with the other hand, simultaneously palpate the same area on the other limb. Compare both sides.
        3. As you are palpating, assess to the temperature (*i.e.,* increased or decreased), skin texture (*i.e.,* soft, boggy, or tight), and swelling (*i.e.,* whether there are differences in size between the two limbs). Increased temperature may indicate inflammation or infection, while decreased temperature and bogginess may indicate infiltration. Both conditions indicate that the PIV must be discontinued.
2. Flush the PIV.
    1. Before proceeding to the next step, wash your hands, as described in step 1.1, and put on clean gloves.
    2. Prepare 0.9% saline flush.
        1. Open the package of a 0.9% saline syringe. Holding the syringe with your dominant hand, unscrew and remove the syringe cap with your non-dominant hand. Place the cap upright on a table/counter, taking care not to contaminate the end of the cap. Gently turn the plunger to break the seal.

2. Holding the syringe upright with your non-dominant hand, gently push the plunger with your dominant hand to expel the air. Pick up the syringe cap with your dominant hand, taking care not to contaminate the end of the cap, and gently screw the cap onto the 0.9% saline syringe. Place the 0.9% syringe on the table.

3. Cleanse the PIV needleless injection site.
    1. Open an alcohol wipe pack and hold it with your dominant hand.
    2. Holding the PIV needleless injection site with your non-dominant hand, wrap the alcohol wipe around the PIV needleless injection site and scrub the site with friction and intent (*i.e.,* as if you were juicing an orange) for at least 15 s. Allow the needleless injection site to dry while continuing to hold it with your non-dominant hand, taking care not touch the site.

3. Flush the catheter with normal saline.
    1. While continuing to hold the PIV needleless injection site between the thumb and forefinger of your non-dominant hand, pick up the 0.9% saline syringe with the other hand, place the syringe cap between the middle and ring finger of your non-dominant hand, and unscrew the cap.
    2. Attach the syringe to the needleless port by pushing gently to insert the tip of the syringe into the center portion of the needless injection site. Turn it clockwise.
    3. Unclamp the PIV clamp by gently pushing the plastic clamp open. Holding the 0.9% saline syringe between the middle and forefinger of your dominant hand, use the thumb of your dominant hand to gently push the plunger to flush the PIV line.
    4. While pushing the plunger, assess the PIV insertion site for leaking, swelling at the insertion site, and ease of administration. Ask the patient if he/she is experiencing any pain as the 0.9% saline is being pushed into the line. If any of these conditions occur, or if it is difficult to push the 0.9% saline fluid into the line, the IV site is no longer appropriate for use and should be replaced.
    5. Continue to hold the needleless injection site between your forefinger and the thumb of your non-dominant hand and gently unscrew the 0.9% syringe from the needless injection port.
    Discard the used alcohol wipe and the 0.9% saline syringe in the garbage.

4. Document the peripheral IV site assessment in the patient's electronic health record.

1. In the patient's electronic health record, record the date, time, and location/site of peripheral IV site assessment. Record the assessment findings.
    1. If the site is free of complications, document that the peripheral IV site is free of signs and symptoms of redness, swelling, and irritation. Document that the dressing is clean, dry, and intact, and that the peripheral IV line is patent and flushes easily.
    2. If the site has complications, document the findings and patient responses. The peripheral IV line should be discontinued and replaced. The patient's primary care provider should be notified and appropriate actions taken to prevent further complications.

5. Leave the patient room and wash your hands upon exiting.

Applications and Summary

Routine assessment and line maintenance will ensure that IV therapy can continue. It also prevents avoidable complications and patient injury. If complications are noted when assessing the injection site, it is important to stop the IV fluid infusion, contact the primary care provider, and take measures to prevent further injury. If phlebitis or infiltration is suspected, the peripheral IV catheter should be promptly removed, and this should be documented in the patient's electronic health record. If the site is infiltrated, the patient's limb should be elevated; ice or heat should be applied, depending upon the type of fluid being infused and according to physician and/or pharmacy instructions. In some cases, an additional subcutaneous neutralizing medication should be administered around the insertion site. Lastly, the circulation, pulse and capillary refill should be assessed periodically to ensure that perfusion is maintained. If phlebitis is suspected, a warm pack should be applied to the site. Lastly, if extravasation or thrombophlebitis is suspected, stop the IV fluid infusion and follow institutional policy. Do not remove the IV catheter until instructed to do so, because the catheter may be necessary to deliver an antidote, if available, in some chemotherapeutic extravasations.

References

1. Grady, N. *et al.* Guidelines for the prevention of intravascular catheter-related infections. Centers for Disease Control and Prevention. (2011).
2. Policies and procedures for infusion nursing, Fourth Edition. Chapter 6: Site care and maintenance. Infusion Nurses Society. (2011).

