

PROCEDURE

ORIGINAL DATE: 06/99

Revised Date: 09/02

Home Health Foundation, Inc.

SUBJECT: MIDLINE CATHETER INSERTION

PURPOSE: To create more permanent IV access for patients undergoing long term IV therapy.

Policy

A midline catheter is a peripheral catheter which is longer than traditional peripheral catheters, but is shorter than catheters designed for central venous placement. Midline catheters are considered when the duration of IV therapy is expected to exceed 6 days. Only clinicians certified in midline placement may place a midline catheter. A MD order must be obtained and the patient must sign the Home Health VNA Consent for IV Therapy form, as well as the Consent for Midline Placement.

The length of a midline catheter is greater than 3 inches with the tip residing below the axilla and insertion site is no more than 1.5 inches above or below the antecubital fossa. Manufacturer's guidelines will be adhered to for cannula placement. No more than 2 attempts at cannulation by any one practitioner are recommended because multiple unsuccessful attempts cause unnecessary trauma to the patient and limit vascular access. There is no optimal time interval for removal and replacement of midlines. Therefore, ongoing and frequent monitoring by the professional IV nurse is indicated.

Procedure

1. Verify the physician's order for midline placement.
2. Assess patient's understanding of procedure and potential complications.
3. Using a tourniquet, assess the antecubital vasculature of both extremities to determine the most appropriate insertion site. Following vein selection, release the tourniquet, but leave it under the arm.
4. Place the patient supine with the selected arm at a 45 degree angle to the body. Support patient for comfort as necessary.
5. Wash hands and remove midline catheter insertion tray from package.
6. Using provided tape measure, measure from 1cm below the insertion site to determine catheter length remaining outside the patient.
7. Place moisture-proof underpad beneath the patient's arm.

8. Don mask, goggles and sterile gloves.
9. Open tray and establish sterile field.
10. Observe sterile technique while preparing insertion site:
 - a) Use three alcohol swabsticks to cleanse the arm beginning at the insertion site and moving out in concentric circles to encompass an area from mid-forearm to mid-upper arm. Allow 2-3 minutes to dry.
 - b) Repeat step (a) using three iodine swabsticks.
11. Position the fenestrated drape over the arm leaving the proposed insertion site exposed.
12. Establish a larger sterile field using two sterile drapes connecting the tray with the draped arm.
13. Prepare equipment:
 - a) Fill two 10cc syringes with NS.
 - b) Fill 5cc syringe with Heparin (100U/cc).
 - c) Attach injection cap to the extension set and prime with NS.
 - d) Stretch out sterile tape measure and cut it at its predetermined desired length.
 - e) Using the forceps, remove the catheter from the tray and lay it flat on the top of the sterile tape measure.
14. Prepare catheter:
 - a) Attach prefilled syringe to the catheter and gently flush with approximately 1cc of NS leaving syringe attached.
 - b) If trimming the catheter, slowly and gently retract the guidewire until its tip is approximately 1cm from the desired new catheter tip (pre-measured with tape measure).
 - c) Trim catheter using the sterile surgical scissors included in the insertion tray. Insure that **ONLY** the catheter is trimmed. **NEVER TRIM THE GUIDEWIRE.**
 - d) Reposition the guidewire to approximately 1cm from the newly formed catheter tip. Crimp the excessive portion of guidewire at a 90 degree angle at the catheter hub to prevent accidental advancement of the guidewire out of the newly formed tip.
15. Position the prepared items needed for the insertion close to the insertion site for ease of accessibility: *introducer, catheter, forceps, etc.*
16. Observing caution to prevent compromising the sterile field, firmly reapply the tourniquet. **THE FIRST PAIR OF GLOVES ARE NOW CONTAMINATED.** Remove and replace with the second pair of sterile gloves.
17. Use non-dominate extremity to apply reverse pressure below the intended site in order to stabilize the vein for insertion of the introducer. **INSERTION TECHNIQUE IS SPECIFIC TO THE PARTICULAR CATHETER USED: (a) THE SAFE-T-PEEL SHEATH INTRODUCER OR (b) THE BREAKAWAY NEEDLE INTRODUCER TECHNIQUE STEPS FOR EACH METHOD ARE EXPLAINED IN #18 AND #19 RESPECTIVELY.**

18. Safe-T-Peelaway Sheath Introducer Technique

- a) Gently twist cover off the introducer to decrease any incidence of premature peeling of sheath.
- b) Use non-dominant hand to apply traction to the skin distal to the targeted entry site.
- c) Enter the skin with needle bevel up approximately 1.0 cm back from the desired point of entry into the vein at a 15 to 30 degree angle. Hold the flashback chamber near the rear and sides of the chamber.
- d) While maintaining a firm grip on the flashback chamber, advance the entire unit slightly farther into the vein. Such action assures that the catheter sheath has entered the lumen of the vein.
- e) Continue to stabilize the flashback chamber with non-dominant hand and use dominant hand to gently grasp one wing and advance another 1/3 of the sheath into the vein. **DO NOT RETRACT THE NEEDLE.** Release tourniquet in a manner that will not compromise sterility of gloves or established sterile field.
- f) Position your fingers as a "V", placing your index finger over the wings and your middle finger just above the sheath tip in the vein, while not yet applying pressure. This procedure will stabilize the sheath in place.
- g) Slowly withdraw the needle, as this occurs downward pressure should be applied just over the sheath tip in the vein to minimize blood return.
- h) Using the forceps, grip the silicone catheter 1/2" from the tip and thread through the introducer sheath. Advance the catheter slowly into the vein until approximately 8cm (3") is outdwelling. You may flush intermittently while threading to float the catheter tip past any venous valves or other obstructions.
- i) Before withdrawing the introducer sheath, place pressure on skin just proximal to the introducer sheath tip to hold the silicone catheter stationary in the vein. Withdraw the introducer sheath until it is free from the insertion site. Grip the wings of the introducer, one wing between each thumb and index finger and carefully pull outward. This action will cause the sheath to begin splitting. Then, peel the sheath apart.
- j) Continue to advance the catheter through the insertion site until desired length is indwelling.
- k) Starting with step 20, continue with procedure as described in the general insertion procedure.

19. Breakaway Needle Introducer Technique

- a) Using the breakaway introducer needle with flashback chamber, enter the skin approximately 1.0cm back from the desired point of entry into the vein. **HOLD THE NEEDLE BY THE FLASHBACK CHAMBER OR BY ONE WING TO PREVENT BREAKING OF THE NEEDLE DURING INSERTION.** Advance the needle into the vessel and look for blood return in the flashback chamber.
- b) Once blood return is visualized in the flashback chamber, carefully advance the needle just slightly farther into the vein to assure appropriate intravascular access. **DO NOT ADVANCE THE ENTIRE LENGTH OF THE NEEDLE INTO THE VEIN.**
- c) Release the tourniquet in a manner that avoids contamination of sterile gloved hands.

- d) Grasp one wing of the needle to stabilize it and grasp the flashback chamber. Use a gently twisting and pulling motion to remove the flashback chamber from the luer connector of the breakaway needle introducer.
- e) Using the forceps, grip the catheter 1/2' from the tip and thread through the luer connector of the introducer needle. **NEVER PULL THE CATHETER BACK WHILE THE NEEDLE IS IN THE VESSEL.**
- f) If the catheter has been advanced too far, remove the needle before pulling back on the catheter. Advance the catheter slowly into the vein until approximately 8cm (3") is outdwelling. You may flush intermittently while threading to float the catheter tip past any venous valves or obstructions.
- g) Carefully withdraw the breakaway needle from the puncture site towards the hub of the catheter, placing pressure on the skin just proximal to the needle tip to hold the catheter stationary in the vein.
- h) Stabilize the catheter at the insertion site with a tape strip.
- i) Lift the catheter with forceps and allow the needle to rotate 180 degrees around the catheter so that the wings are facing downward.
- j) With the wings facing downward, grasp each wing between thumb and index finger. **SNAP** the needle upward until plastic portion is completely separated. This action will cause the needle wings to split and the cannula to begin splitting.
- k) Peel away from catheter allowing the catheter to fall down. In order to minimize the needle insertion force, the needle is not designed to break completely. Discard the needle according to established agency protocol.
- l) Continue to advance the catheter through the insertion site until desired length is indwelling.
- m) Before withdrawing the breakaway needle, establish proper placement of the catheter by measuring the catheter remaining outside the patient with sterile tape measure provided in the tray or by using the markings on the catheter. Aspirate to check for blood return and flush to assure patency.
- n) Start with step 20, continue with procedure as previously described in the general insertion guidelines.

20. Removing the guidewire

- a) Straighten portion of catheter distal to the insertion site.
- b) Grasp cap attached to the guidewire and connector and gently pull back with a slow but constant motion until the guidewire is removed. The catheter should be positioned straight out of the exit site. Do not pull vigorously as this may cause the catheter to "bunch". **DO NOT USE THE HUB OF THE CATHETER FOR STABILIZATION DURING THE REMOVAL.**
- c) If difficulty is encountered, further flushing the catheter with attached syringe may be helpful in freeing the guidewire. If "bunching" occurs at the hub, refrain from further pulling. Attempt to straighten the catheter back to its normal shape. Catheter malposition may prevent guidewire removal and it may be necessary to remove catheter and guidewire completely.

21. Using the attached syringe, aspirate blood and flush the catheter to determine continued placement and patency.
22. Heparinize according to agency protocol.
23. Remove the syringe and add the previously primed extension set with injection cap.
24. Cleanse the insertion site area as necessary and secure the catheter per agency protocol.
25. See agency protocol for midline catheter care and maintenance.

Reference: INS (Intravenous Nurse Society) Standards of Practice (2000)