

LAC+USC MEDICAL CENTER

DEPARTMENT OF NURSING SERVICES AND EDUCATION

MIDLINE CATHETER INSERTION AND REMOVAL PROCEDURE

PURPOSE:

To outline nursing responsibility in midline catheter insertion and removal.

SUPPORTIVE DATA:

Midline catheters are inserted by Peripherally Inserted Central Catheter (PICC) certified Registered Nurses (RNs) who are approved by the PICC service at LAC +USC Medical Center (LAC+USC).

Midline catheter insertion sites include the following peripheral veins: Basilic, Brachial, Median and Cephalic.

No chest X-ray is required after midline placement and may be used immediately after PICC nurse confirms placement.

EQUIPMENT LIST:

- Midline tray
- Sterile ultrasound probe sheath
- 1 Chlorhexidine scrubs with wings
- 1 bag 150 mL Sodium Chloride 0.9% 1 secondary intravenous (IV) tubing)
- 1 positive reflux valve
- 1 Biopatch™
- 1 Statlock™
- 1 ampule lidocaine 1% (50 mg/5 mL)
- 1 Filter needle
- 1 pair of sterile gloves
- Tourniquet
- Tape measure
- Facemask
- Bouffant hat
- Eye protection
- Electric clippers with disposable heads (if required)

CONTENT:

PROCEDURE STEPS

1. Wash hands prior to / upon entering room
2. Check expiration of the midline tray.
3. Conduct a **Time-Out** procedure.

KEY POINTS

Observe appropriate isolation policy, if applicable

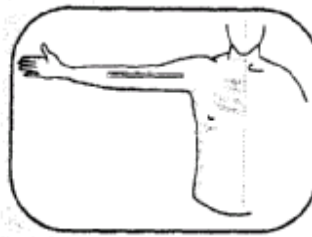
PROCEDURE STEPS

4. Check for allergy history.
5. Don clean gloves.
6. Clean bedside table with approved cleaning agent.
7. Doff gloves and perform hand hygiene.
8. Don a clean pair of gloves.
9. Obtain Vital Signs (VS) in the ICUs.
10. Place patient supine with selected arm extended 60 - 90 degrees from the body.
11. Measure circumference of the mid upper arm in centimeters (cm).
12. Use ultrasound machine to assess veins.
13. Locate brachial artery using the ultrasound machine.
14. Mark selected vessel between 3 inches below the axilla and 2 inches above the axilla.
15. Unfasten tourniquet and leave in place under arm near axilla.
16. Remove excess hair from insertion site using electric clippers with single use disposable heads. **Do Not use a razor.**
17. Determine catheter length to be inserted:

KEY POINTS

Pay particular attention to Lidocaine and latex materials. They have the highest allergy risk of the items used to insert the catheter.

Optimum arm positioning for Midline-insertion is 90 degrees. 60 degrees is acceptable for patients who are unable to maintain arm at 90 degrees



Establish a baseline measurement in centimeters in case complications arise.

Selected vein should be two times the diameter of the catheter.

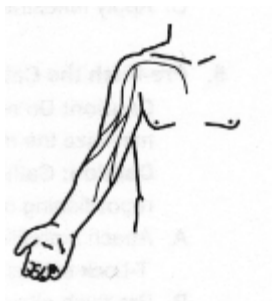
Prevents arterial puncture. Placement of catheter within noted parameters prevents trauma due to arm movement and decreases risk of infection.

Removal of hair decreases risk of infection. Micro-abrasions from razors increase risk of infection.

Measure to the desired tip location in the proximal portion of the extremity, just distal of the shoulder

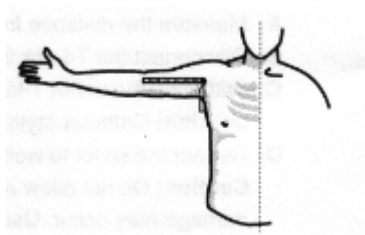
PROCEDURE STEPS

- Midline catheter tip length should be at or below the axillary line.



KEY POINTS

deltoid muscle



18. Doff gloves and perform hand hygiene.

19. Post STOP sign outside door / curtain.

20. Don facemask, bouffant hat, eye protection (optional) and wash hands per hospital protocol. All other staff in room should abide by this protocol.

21. Place Midline tray on bedside table and remove packet of sterile gloves in outer wrapping and place aside.

22. Don sterile gloves from outer wrapping.

23. Have patient raise arm, grasp drape from outer wrapping and place under patient's arm (glossy side down).

24. Activate chlorhexidine scrub (3 mL) from outer wrapping by pinching wing while holding sponge in a downward position and allowing sponge to become saturated.

25. Scrub arm insertion site using a chlorhexidine applicator x 3:

- Use vigorous back-and-forth motion for 30 seconds
- Include 5 inches above and 5 inches below insertion site
- Allow to air dry for 30 seconds.

Alerts staff to sterile procedure being performed.

This step applies to ALL staff in the room.

Sterile gloves to be used for prepping patient.

Creates a clean area between the patient's arm and the patient's bed/gurney.

If patient is hypersensitive to chlorhexidine use povidone-iodine swabs. See # 26

PROCEDURE STEPS

KEY POINTS

If hypersensitive to chlorhexidine:

26. Scrub arm with a povidone-iodine swab x 3:

- Use circular motion. Begin in the center and move outward to 5 inches above and 5 inches below insertion site.
- Allow area to dry for 30 seconds.

27. Doff gloves and discard.

28. Perform hand hygiene.

29. Open inner wrapping of tray using sterile technique and ensure sterile field completely covers procedure table.

Completely covering table with sterile drape ensures sterility of contents.

30. Count all sharps and syringes on the Midline tray.

A count is performed at the beginning and end of the procedure to ensure no sharps or syringes are lost.

31. Place the following supplies on to the sterile field using sterile technique:

- Sterile ultrasound probe sheath
- 1 chlorhexidine scrubs
- 1 - 2 positive pressure reflux valves
- 1 Biopatch™
- 1 ampule 1% Lidocaine (50 mg/5 mL)
- 1 pair of sterile gloves

32. Don clean gloves.

33. Fasten tourniquet on patient.

34. Remove gloves and perform hand hygiene.

35. Connect secondary tubing to bag of 150 mL 0.9% Sodium Chloride (NS).

36. Empty contents into syringe bin within the tray.

37. Clearly label bin containing NS.

PROCEDURE STEPS

KEY POINTS

38. Remove sterile gown from tray and don using sterile technique.

39. Don 2nd pair of sterile gloves in tray using over the gown sterile technique.

40. Using a filter needle aspirate 1% lidocaine (50 mg/5 mL) into a 5 mL Syringe.

41. Detach filter and connect a 25 gauge – 16 mm needle to syringe and remove air.

42. Place lidocaine label on syringe.

43. Fill remaining 10mL syringe with NS.

44. Attach a pre-filled 10 mL NS syringe in tray to a positive pressure valve. Then connect the positive pressure valve to lumen of the Midline catheter and prime to remove all air.

45. Place maximal sterile barrier drape contained in tray over patient.

46. Measure the distance from the zero mark to the desired tip location (refer to step) and note cm marking.

47. Disconnect the -lock from the catheter leuc connector and withdraw connector stylet as one unit well above the point the catheter is to be cut.

48. Using sterile scissors contained in the tray carefully cut the catheter and inspect cut surface to ensure there is no loose material.

49. Re-advance the T-lock connector/stylet

Using the cloth part of the sterile gown to handle the sterile gloves helps ensure that the fingers only touch the inside of the sterile gown.

If available, the 2nd staff member can assist in tying back of sterile gown. This will help with maintaining sterility of gloves.

Clearly identifies lidocaine syringe.

Prevents air emboli from entering patient.

Provides sterile field for procedure.

Prevents accidental cutting of the stylet.

NEVER cut the stylet.

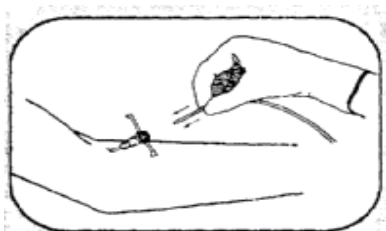
PROCEDURE STEPS

KEY POINTS

- assembly and assure the stylet tip is intact.
- | | |
|--|--|
| 50. Lock the T-lock connector to the catheter hub and gently retract the stylet until the stylet tip is inside the catheter. | Prevents trauma to vessel wall from exposed stylet. |
| 51. Open sterile ultrasound probe sheath and place on probe using sterile technique and secure with sterile tape from tray. | Sleeve maintains sterility of procedure and tape prevents sleeve from migrating off sterile field. |
| 52. Place 4x4 gauzes on exposed area of skin near insertion site. | Minimizes contact of sterile items with skin. |
| 53. Administer topical or local anesthetic 1% intradermal to insertion site and wait 1-2 minutes. | Minimizes pain during procedure. |
| 54. Perform ultrasound guided venipuncture using the safety needle contained in tray and check for blood return (use caution not to double puncture vessel wall). | Ecchymosis and hematoma may occur with double puncture. |
| 55. Remove guidewire from spool and inspect end to ensure it is intact. | |
| 56. Insert flexible end through safety Needle and into the vein. (Maintain sufficient Guidewire exposed for micro-introducer insertion). | <u>CAUTION:</u> The stiff end of the guidewire may cause vessel damage. Inspect flexible end of guidewire to ensure it is intact. |
| Note: If resistance encountered in the first 12-14 cm remove guidewire and try alternate vessel. | |
| 57. Remove safety needle over the guidewire and activate safety lock on needle. | Prevents needle stick to staff and patient. |
| 58. Release tourniquet by using the sterile drape to keep hands sterile. | Maintains sterility of procedure. |
| 59. Administer additional local anesthetic if necessary | Minimizes pain during insertion of micro-introducer. |

PROCEDURE STEPS

60. If needed, using the flat side of a # 11 scalpel make a small, no greater than 0.3 cm, incision in the skin directly over the guidewire.
61. Insert micro-introducer (dilator and introducer sheath) over the guidewire using slight rotational motion. Keep the guidewire visible at all times.
62. Remove guidewire (ensure it is intact and measures 50 cm) and insert into spool, then place clear cap on micro-introducer.
63. Remove dilator with cap on it and insert catheter through introducer.



(Insert catheter and advance)

64. Partially split but Do Not remove the introducer to facilitate insertion of catheter.
65. Advance catheter slowly in increments of 2-3 centimeters with patient's head turned towards insertion site.
66. Continue inserting catheter until pre-procedure measurement length is reached.
67. Withdraw the introducer sheath from the vein and away from the site.
68. Split the introducer sheath and peel it away from the catheter.
69. Disconnect the T-lock from the catheter

KEY POINTS

- Allows for easier insertion of micro-introducer.
- Resistance during insertion of micro-introducer should be minimal.
- Ensures guidewire is removed intact.
Prevents air embolus and reduces blood loss.
- Helps guide catheter and prevents vessel wall trauma.
- CAUTION: Midline tip position should be at or below the axillary line.
- Tear the sheath only a few cm at a time.
- CAUTION: Never use force to remove the stylet.

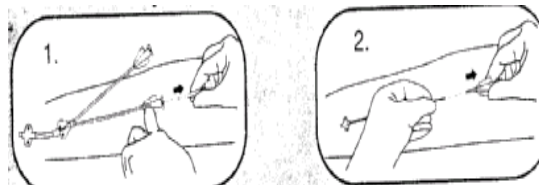
PROCEDURE STEPS

luer lock connector and slowly remove the T-lock and stylet.

KEY POINTS

Resistance can damage the catheter or cause bunching of the catheter.

(Remove the Stylet/Assembly)



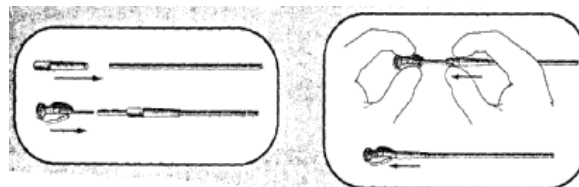
70. Check stylet to ensure it is intact.

Ensures no fragment of stylet remains inside patient.

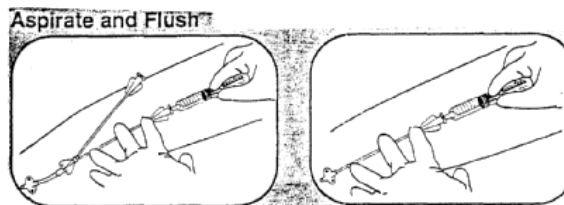
71. Attach NS primed positive pressure reflux valve, that is no smaller than 10 mL.

CAUTION: To reduce the potential for backflow into the catheter tip, always remove syringes slowly while injecting the last 1 mL of sterile saline.

(Attach connector to single lumen catheter)



72. Aspirate and flush with at least 10 mL NS.



73. Flush Midline with 10 ml NS every shift and/or after each use. Flush with 20 ml NS after blood transfusion and/ or blood withdrawal.

Warning: The fluid level in the catheter will drop if the connector is held above the level of the patient's heart and open to air. To prevent this, hold the connector below the level of the patient's heart before removing the positive pressure valve.

PROCEDURE STEPS

74. Clean insertion site using chlorhexidine applicator:
- Use vigorous back-and- forth motion for 30 seconds
 - Allow to air dry for 30 seconds.

- 75. If hypersensitive to chlorhexidine:**
Clean insertion site with 3 alcohol pads using one pad at a time:
- Use a circular motion. Begin in the center and move outward to 5 inches above and 5 inches below insertion site.
 - Allow to dry for 30 seconds after each application.

76. Clean insertion site with 3 povidone iodine swabs using one swab at a time:
- Use a circular motion. Begin in the center and move outward to 5 inches above and 5 inches below insertion site.
 - Allow to dry for 30 seconds after each application.

77. Wipe area around insertion site with skin prep.

78. Secure hub of catheter with Statlock^{1M}.

79. Apply Biopatch^{1M} (shiny side away from patient) by aligning the slit in the patch with the catheter.

80. Place transparent dressing over insertion site covering BiopatchTM and StatlockTM

KEY POINTS

Cleans site of blood.

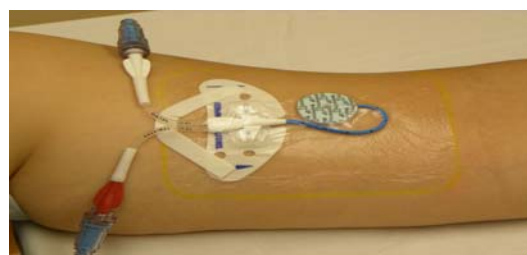
If hypersensitive to chlorhexidine use 3 alcohol pads and 3 betadine swabs. See #75 and 76.

Cleans site of blood.

Helps secure Statlock^{1M} and transparent dressing in place.

Aligning the slit of the Biopatch^{1M} with the catheter allows for easier removal during dressing change.

Insertion site with Biopatch^{1M} and Statlock^{1M} should be treated as one unit covered with the transparent dressing.



PROCEDURE STEPS

KEY POINTS

- | | |
|---|---|
| 81. Count to ensure all sharps and syringes are discarded. | Prevents needle sticks to patient and staff, and ensures all sharps and syringes have been removed. |
| 82. Remove gloves and discard. | |
| 83. Perform hand hygiene. | |
| 84. Date and initial dressing, and apply the sticker with the removal date. | |
| 85. Place lot number label on work-up sheet and on patient's ID card. Give information booklet and ID card to patient/family. | Provides patient/family with information regarding care and maintenance of the Midline catheter. |
| 86. Don clean gloves. | |
| 87. Clean ultrasound machine with approved cleaning agent. | |
| 88. Doff gloves and perform hand hygiene. | |

STEPS

KEY POINTS

REMOVAL OF MIDLINE CATHETER:

1. Perform hand hygiene.
2. Don clean gloves.
3. Remove dressing and StatLock™ catheter stabilization device or tape securement strips.
4. Use alcohol to dissolve adhesive on Statlock™ while peeling it away from the skin.
5. Grasp catheter near insertion site and

Do not use excessive force!

PROCEDURE STEPS

remove slowly by pulling back.

6. Apply digital pressure with sterile gauze for 5 minutes.
7. Apply occlusive dressing.
8. Discard catheter to biohazardous waste container (red).
9. Doff gloves and perform hand hygiene.
10. Document removal information in electronic health record

KEY POINTS

If resistance is felt, stop removal. Apply warm compress and wait 20-30 minutes. Then, resume removal procedure beginning at step 5.

Initial date: 09/18	Reviewed and approved by: Procedure Committee Professional Practice Committee Nurse Executive Council Attending Staff Association Executive Committee	Revision date: 09/18
------------------------	---	-------------------------