Central Venous Access: A Protocol For Academic Medical Centers

B Phillips

Citation

B Phillips. *Central Venous Access: A Protocol For Academic Medical Centers*. The Internet Journal of Surgery. 2004 Volume 6 Number 1.

Abstract

This article is reviewing some guidelines in regard to changing central venous catheters.

CENTRAL VENOUS ACCESS PROTOCOL

Line Sepsis is extremely serious and can be life threatening. All reasonable precautions must be followed in order to minimize sepsis rate. The following protocol is an inexpensive, effective system for placing and changing lines.

NEW LINE

1. All equipment must be at hand, transducers calibrated and the monitors functional prior to starting. It is the residents' responsibility to be sure this is done prior to beginning. Do not open kit until you are ready to perform procedure and you are certain you have the correct catheter.
2. Position the patient including placing EKG leads, supplemental oxygen and a pulse oximeter.
3. Lower the side rail.
4. Prep the primary site and alternative site, usually the IJ and subclavian using a 4x4 pack and Betadine.
5. Wash hands. Put on a cap, mask, gown, and gloves.
6. Open kit. Do a final prep with the prep sticks contained in the introducer or central access kit.
7. Apply the small fenestrated sheet directly over the site.
8. Apply the large fenestrated sheet contained in the universal access kit or a fenestrated utility sheet directly over the site. The field must be larger in all directions than the length of the wire. There should be no intravenous tubing hanging near the procedure site.
9. Infiltrate Lidocaine.
10. Place the patient in Trendelenburg position. In general maximum Trendelenburg is used, but in some situations such as CHF, none is used.
11. Gain access to the vein and using the Seldinger technique, dilate the track and place the catheter or introducer. Usual insertion distance is 15cm.
12. Use a sterile extension tubing to attach the side arm of the introducer or the central venous catheter to the intravenous solution after anchoring the catheter in place. A needleless anchoring device is effective, available and may decrease needle injuries.
13. Keep skin site sterile until final dressing is applied.
14. An x-ray is required to confirm placement, and absence of pneumothorax

LINE CHANGE OVER A WIRE

Steps 1 through 14 are the same, with three (3) exceptions.

In Step 2: be sure you confirm which lumen is the distal lumen of the catheter prior to prepping and draping. This is especially important on a double lumen catheter as the drape covers the printed identification on the catheter tubing.

In Step 11: cut the distal lumen tubing just distal to the catheter hub and introduce the wire. Then cut the other lumens and remove and place aside the old catheter for

culturing after completion of the line change.

In Step 14: If the line change goes well and the patient is to remain in the Intensive Care Unit for greater than 24 hours an x-ray is not essential. If the patient is to be transferred from the Intensive Care Unit within a few hours of the line change, an x-ray may be obtained.

- If both a pulmonary artery catheter and an arterial line are to be started, it is advisable to place the arterial line first.
- Full draping, gown, and gloving is required for initial placement of the central line as well as for any line change.
- There must be no sign of infection if a line is to be changed over a wire.
- If there is a major break in technique, the drape should be removed and the prep begun from the beginning.
- There can be no compromise on sterile technique.

GUIDELINES FOR ROUTINE LINE CHANGES (CENTRAL & ARTERIAL)

Line sepsis rates vary depending on patient population. In the past, some lines were routinely changed every 72 hours. In other cases, lines were left in place as long as necessary - provided the skin demonstrated no signs of infection and there was no evidence of unexplained systemic sepsis. More recent literature indicates a longer interval between routine changes does not lead to increased infection rates. The following guidelines are intended only to assist the House Officer. Obviously, a Critical Care Attending may deviate from these guidelines in certain clinical situations.

TIPS OF LINES EXCHANGED OVER A WIRE ARE CULTURED

1. Emergency Room Lines: Lines placed in the ER will be changed, preferably to a new site, as soon as the patient is stabilized, and usually within 6 hours.
2. Transferred Patient Lines: Lines placed in other hospitals will be treated as ER Lines.
3. Code Lines: Code lines will be treated as ER Lines.
4. Arterial Lines: Elective arterial lines may be left in place as long as they are clinically needed, provided neither the site nor the patient have signs of sepsis. Arterial lines will not be left in place only for “routine” blood drawing. Indications for arterial line removal include erythema or pus at insertion site, documented positive blood cultures, or unexplained temperature or WBC elevations.
5. Central Venous Line - Single, Double or Triple Lumen: Single, double and triple lumen lines will be changed at seven day intervals, usually over a wire provided neither the patient nor the site appear septic. The minimum number of ports necessary for patient care will be used. Routine blood drawing is not an indication for a multi-lumen catheter. Routine site inspection and dressing changes are mandatory.
6. TPN Line - Single Lumen: Dedicated TPN lines may be left in place as long as there is no TPN line protocol violation, and neither the site nor the patient appear septic. This includes tunneled and non-tunneled lines.
7. TPN Line - Double or Triple Lumen: Double or triple lumen lines used for TPN will be changed at six day intervals. It is preferable to have a single lumen dedicated line for TPN.
8. Pulmonary Artery Catheters: PA lines, including the introducer, should be changed at seven day intervals. Lines will be removed as soon as they are not clinically indicated and if there is any sign of infection at the insertion site, positive blood cultures or unexplained fever or WBC elevation.
9. Quinton Dialysis Catheters: Dialysis catheters may be left in place for up to six days provided there are no signs of sepsis.
10. Cutdown Lines: Lines placed by cutdown should be totally removed at 72 hours. On occasion, this may be extended if other sites do not exist.
11. Radiology Lines: Lines placed by the Radiology Department will be removed as soon as possible, i.e. as soon as the infusion is no longer needed.

LINE CHANGES

Lines may be changed over a wire provided the lines are indeed still required, the skin site looks good, the original

access was not by cutdown, and the line was not placed in the ER or during a code. All lines removed during a change over wire will be cultured, including the introducer sheaths. The actual PA line is not routinely cultured. If the line or sheath cultures later become positive, the new line must be totally removed and cultured.

LINE CULTURES

1. Routine cultures are not done upon routine removal of perioperative lines in asymptomatic patients.
2. Routine cultures are done on any line changed over a wire.
3. Routine cultures are done on any line being removed from a patient with any indication of sepsis such as unexplained fever, erythema of the site, or positive blood cultures. If a patient has suspected sepsis and a PA line is being removed, both the PA and the introducer sheath should be cultured and appropriately labeled, otherwise only the sheath is cultured.

METHOD OF CULTURING LINES

1. The skin will be prepped with Betadine. After line removal, the distal 2 centimeters will be cut with sterile scissors and placed in a dry sterile container. The microbiology slip and container must be labeled with;line type, i.e. PA line, CVP, introducer;site of insertion, i.e. right subclavian, L. internal jugular, right radial; the date.
2. The distal 2 centimeters of PA line introducers will be cultured. The actual PA line will not be cultured unless the patient has signs of sepsis.
3. Blood cultures are not to be drawn from lines. Interpretation of such cultures is impossible.

SUPERVISION

Line placements and changes, including arterial, CVP, TPN, Arterial, and PA lines should be approved in advance by the Trauma-Critical Care Attending.

DOCUMENTATION

A brief note, dated and timed including indications, is placed in the progress section with all line placements and removals. Be sure to note that the line was removed with the tip intact.

CORRESPONDENCE TO

Bradley J. Phillips, MD Critical Care Medicine CCM 2707 88 E. Newton St. Boston Medical Center Boston, MA 02118 Tel: (617) 638-6406 Fax: (617) 638-6452 Email: bjpmd2@aol.com

References

Author Information

Bradley J. Phillips, M.D.
Critical Care Medicine, Boston Medical Center, Boston University School of Medicine