In the rare event that a hub or connector failure, connector life and could lead to potential bacteremia, or septicemia is known or suspected, the needleless access port must be replaced.

Place biohazard according to facility policy. Never leave stylet in place after catheter insertion; injury may occur. Remove both stylet and adapter after insertion.

14. Remove dilator and extension lines. Blood should aspirate easily. If excessive resistance to blood aspiration is experienced, the dilator should be reinserted. Use the sheath until shunt/dilator is fully inserted.

Caution: Never leave shunt in place as an indwelling catheter. Damage to the vein will occur.

13. Loosen locking collar of sideport. Remove sideport adapter and replace with sterile end cap should be applied to the needleless access port and completely flush catheter lumen.

Caution: Never leave shunt in place as an indwelling catheter. Damage to the vein will occur.

15. Once adequate aspiration has been achieved, lumen(s) should be irrigated with saline and needleless access port(s) should be replaced.

16. Remove sheath and dilator. A few centimeters (approximately 5 cm) above the shunt/dilator close to the tip. Place a protective dressing from the skin surface. To progress the shunt/dilatation catheter, the shunt/dilator should be inserted into the vein. A few centimeters (approximately 5 cm) above the shunt/dilator close to the tip. Place a protective dressing from the skin surface. To progress the shunt/dilatation catheter, the shunt/dilator should be inserted into the vein. Never leave stylet in place after catheter insertion; injury may occur. Remove both stylet and adapter after insertion.

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Caution: Never leave shunt in place as an indwelling catheter. Damage to the vein will occur.
DIRECTIONS FOR SELDINGER INSERTION

1. Follow directions for Modified Seldinger Insertion, up to step 5.
2. Remove needle, leaving guiderewire in the targeted vessel. Advance the guiderewire until it reaches the caval atrial junction. Once the guiderewire is in place, measure a depth of the guiderewire by reading the markings on the wire.
3. Cut catheter to length determined by marked guiderewire.
4. Insert proximal end of wire into distal tip of catheter lumen. Feed catheter lumen into the vessel following the guidewire. Advance catheter lumen along the guidewire until the distal tip is correctly positioned in the target vein. The distal tip should be positioned at the level of the caval atrial junction.

Caution: A skin knick may be required to feed the catheter smoothly into the vessel.
5. Make any adjustments to catheter under fluoroscopy. The distal tip should be positioned at the level of the caval atrial junction.

Caution: Do not clump the lumen portion of the catheter.
6. Remove the wire from the catheter. Remove by applying gentle pressure with one hand above the insertion site while grasping the 130cm wire with the other hand and pulling slowly back with a constant motion.
7. Follow Directions for Modified Seldinger Insertion, from step #14 on.

POWER INJECTION PROCEDURE

1. Remove the injection/needleless cap from the PRO-PPCC® catheter.
2. Using a 10cc or larger syringe(s), aspirate catheter lumen(s) to assure patency and remove locking solution. Discard syringe(s).
3. Attach a 10cc or larger syringe filled with sterile normal saline and vigorously flush the catheter with the full 10cc of sterile normal saline.

Warning: Failure to ensure patency of the catheter prior to power injection studies may result in catheter failure.
4. Detach syringe.
5. Attach the power injection device to the PRO-PPCC® catheter manufacturer’s recommendations.

Warning: Always use connector tubing between power injector syringe and catheter. Do not attempt to connect power injector syringe directly to the catheter. Damage may result.
6. Complete power injection study taking care not to exceed the flow rate limits.

Warning: Exceeding the maximum indicated flow rate may result in catheter failure and/or catheter tip displacement.
7. Disconnect the power injection device.
8. Flush the PRO-PPCC® catheter with 10cc of sterile normal saline, using a 10cc or larger syringe. For multi-lumen catheters, flush all lumens after power injection.
9. Replace the injection/needleless cap on the PRO-PPCC® catheter.

INFUSION

- Before infusion begins all connections should be examined carefully.
- Frequent visual inspection should be conducted to detect leaks to prevent blood loss or air embolism.
- If a leak is found, the catheter should be clamped immediately and replaced.
- Necessary remedial action must be taken prior to the continuation of the treatment.

Note: Excessive blood loss may lead to patient shock.

CENTRAL VENOUS PRESSURE MONITORING

- For central venous pressure monitoring it is recommended that a catheter lumen of 20 gauge or larger be used.
- Prior to conducting central venous pressure (CVP) monitoring:
  - Ensure proper positioning of the catheter tip.
  - Flush catheter vigorously with normal saline.
  - Ensure pressure transducer is at the level of the right atrium.
- It is recommended that a continuous infusion of saline (1 ml/hr) is maintained through the catheter while measuring CVP to improve the accuracy of the results.
- Use your institution’s protocols for central venous pressure monitoring procedures.

Warning: CVP monitoring should always be used in consultation with other patient assessment metrics when evaluating cardiac function.

CATHETER MAINTENANCE

- Dressing Changes – A dressing should cover the insertion site at all times. The dressing should be changed per institutional policy or any time the dressing becomes soiled, wet, or non-occlusive.

Note: During all dressing changes the external length of the catheter should be measured to determine if catheter migration has occurred. Periodically confirm catheter placement and tip locations by imaging method.
- Flushing/Maintenance: The catheter should be maintained according to your institutional policy. Recommended catheter flushing/main- tenance is as follows:
  - The valve is not a barrier to infection. Strict aseptic technique must be utilized during all actuations and cap changes.
  - Flush the catheter after every use, or at least weekly when not in use. Use a 10cc or larger syringe.
  - The catheter should be flushed with normal saline prior to drug administration to verify patency.
- After drug administration each lumen should be flushed with a minimum of 10cc of normal saline, using a “pulse” or “stop/start” technique to maintain patency. Use of heparinized saline to lock each lumen of the catheter is optional.
- Always remove syringes slowly while injecting the last 0.5 ml of saline.
- Apply a sterile end cap on the catheter hub to prevent contamination when not in use.
- To help prevent a drop in the fluid volume (allowing air entry) while changing injection caps, hold the connector below the level of the patient’s heart before removing the injection cap.

Note: When maintained in accordance with these instructions, the PRO-PPCC® with valve technology does not require the use of heparinized saline to lock the catheter lumen. However, use of heparinized saline will not adversely affect the catheter and may be necessary based on patient status or use of alternative flushing and locking techniques.
- Injection Caps – Injection cap(s) or needleless access port(s) should be change per institutional policy. If using the supplied needless access port(s), do not exceed 150 actuations.

CATHETER PERFORMANCE

- Occluded/Partially Occluded Catheter – If resistance is encountered to aspirating or flushing, the lumen may be partially or completely occluded.

Warning: Do not flush against resistance.
- If the lumen will neither aspirate nor flush, and it has been determined that the catheter is occluded with blood, follow institutional declotting procedure.

INFECTION

Caution: Due to risk of exposure to HIV or other blood borne pathogens, healthcare professionals should always use Universal Blood and Body Fluid Precautions in the care of all patients.
- Sterile technique should always be strictly adhered to.
- Clinically recognized infection should be treated promptly per institutional policy.

CATHETER REMOVAL

Warning: Only a clinician familiar with the appropriate techniques should attempt the following procedures.

Caution: Always review facility protocol, potential complications and their treatment, warnings, and precautions prior to catheter removal.
1. Wash hands, gather equipment.
2. Remove old dressing and inspect insertion site for redness, tenderness, and drainage.
3. Grasp catheter near insertion site and using a slow steady motion, remove catheter from vein.
4. If resistance is felt – STOP. Retape the catheter and apply a warm compress to the extremity for 20-30 minutes.
5. Resume removal procedure. If further difficulty is encountered, follow institutional policy for further intervention.
6. Apply pressure, if necessary, until bleeding stops and dress siteaccordingly.

WARRANTY

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