BaylorScott&White – Central TX

Department of Anesthesiology Guidelines

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***From the American Society of Anesthesiologist Task Force on Central Venous Access***

**Practice Guidelines for Central Venous Access**

The purposes of these Guidelines are to (1) provide guidance regarding placement and management of central venous catheters, (2) reduce infectious, mechanical, thrombotic, and other adverse outcomes associated with central venous catheterization, and (3) improve management of arterial trauma or injury arising from central venous catheterization.1

***Resource Preparation***

* Central venous catheterization should be performed in an environment that permits use of aseptic techniques.
* A standardized equipment set should be available for central venous access which can be located in the storage area outside of ORs 24 and 25. These kits are pre-packaged to contain almost everything needed for central line insertion, including mask, hat, gown, gloves, drape, sterile prep solution and the actual central line kit.
* A checklist or protocol should be used for placement and maintenance of central venous catheters. This can be found on share point at [http://vmwss/anesthesia/Anesthesia%20Quality/Central%20Line%20Insertion%20Checklist%20rev%20%205%2028%2013.pdf](http://vmwss/anesthesia/Anesthesia%20Quality/Central%20Line%20Insertion%20Checklist%20rev%20%205%2028%2013.pdf%20). This should be completed and submitted by the circulating OR nurse.
* An assistant, when available, should be used during placement of a central venous catheter.

***Prevention of Infectious Complications***

* In preparation for the placement of central venous catheters, use aseptic techniques (*e.g.*, hand washing) and maximal barrier precautions (*e.g.*, sterile gowns, sterile gloves, caps, masks covering both mouth and nose, and full-body patient drapes).
* A chlorhexidine-containing solution should be used for skin preparation in adults, infants, and children.
* For neonates, the use of a chlorhexidine-containing solution for skin preparation should be based on clinical judgment and institutional protocol.
* If there is a contraindication to chlorhexidine, povidone-iodine or alcohol may be used as alternatives. Unless contraindicated, skin preparation solutions should contain alcohol.
* If there is a contraindication to chlorhexidine, povidone-iodine or alcohol may be used. Unless contraindicated, skin preparation solutions should contain alcohol.
* Catheters coated with antibiotics or a combination of chlorhexidine and silver sulfadiazine should be used for selected patients based on infectious risk, cost, and anticipated duration of catheter use.
* Catheters containing antimicrobial agents are not a substitute for additional infection precautions.
* For immunocompromised patients and high-risk neonates, administer intravenous antibiotic prophylaxis on a case-by case basis.
* Intravenous antibiotic prophylaxis should not be administered routinely.
* Catheter insertion site selection should be based on clinical need.
* An insertion site should be selected that is not contaminated or potentially contaminated (*e.g.*, burned or infected skin, inguinal area, adjacent to tracheostomy or open surgical wound).
* In adults, selection of an upper body insertion site should be considered to minimize the risk of infection.
* The use of sutures, staples, or tape for catheter fixation should be determined on a local or institutional basis.
* Transparent bio-occlusive dressings should be used to protect the site of central venous catheter insertion from infection.
* Unless contraindicated, dressings containing chlorhexidine may be used in adults, infants, and children.
* The duration of catheterization should be based on clinical need.
* The clinical need for keeping the catheter in place should be assessed daily.
* Catheters should be removed promptly when no longer deemed clinically necessary.
* The catheter insertion site should be inspected daily for signs of infection. The catheter should be changed or removed when catheter insertion site infection is suspected.
* When a catheter-related infection is suspected, replacing the catheter using a new insertion site is preferable to changing the catheter over a guidewire.
* Catheter access ports should be wiped with an appropriate antiseptic before each access when using an existing central venous catheter for injection or aspiration.
* Central venous catheter stopcocks or access ports should be capped when not in use.
* Needleless catheter access ports may be used on a case-by-case basis.

***Prevention of Mechanical Trauma or Injury***

* Catheter insertion site selection should be based on clinical need and practitioner judgment, experience, and skill.
* In adults, selection of an upper body insertion site should be considered to minimize the risk of thrombotic complications.
* When clinically appropriate and feasible, central venous access in the neck or chest should be performed with the patient in the Trendelenburg position.
* Selection of catheter size (i.e., outside diameter) and type should be based on the clinical situation and skill/experience of the operator.
* Selection of the smallest size catheter appropriate for the clinical situation should be considered.
* Selection of a thin-wall needle (a wire-through-thin-wall-needle, or Seldinger) technique versus a catheter-over-the-needle (a catheter- over-the-needle-then-wire-through-the-catheter, or Modified Seldinger) technique should be based on the clinical situation and the skill/experience of the operator.
* The decision to use a thin-wall needle technique or a catheter-over-the-needle technique should be based at least in part on the method used to confirm that the wire resides in the vein before a dilator or large-bore catheter is threaded.
* The catheter-over-the-needle technique may provide more stable venous access if manometry is used for venous confirmation.
* The number of insertion attempts should be based on clinical judgment.
* The decision to place two catheters in a single vein should be made on a case-by-case basis.
* Use static ultrasound imaging in elective situations before prepping and draping for prepuncture identification of anatomy to determine vessel localization and patency when the internal jugular vein is selected for cannulation.
* Static ultrasound may be used when the subclavian or femoral vein is selected.
* Use real-time ultrasound guidance for vessel localization and venipuncture when the internal jugular vein is selected for cannulation. Real-time ultrasound may be used when the subclavian or femoral vein is selected.
* Real-time ultrasound may not be feasible in emergency circumstances or in the presence of other clinical constraints.
* After insertion of a catheter that went over the needle or a thin-wall needle, confirm venous access.
* Methods for confirming that the catheter or thin-wall needle resides in the vein include, but are not limited to: ultrasound, manometry, pressure-waveform analysis, or venous blood gas measurement.
* Blood color or absence of pulsatile flow should not be relied upon for confirming that the catheter or thin-wall needle resides in the vein.
* When using the thin-wall needle technique, confirm venous residence of the wire after the wire is threaded.
* When using the catheter-over-the-needle technique, confirmation that the wire resides in the vein may not be needed (1) when the catheter enters the vein easily and manometry or pressure waveform measurement provides unambiguous confirmation of venous location of the catheter, and (2) when the wire passes through the catheter and enters the vein without difficulty.
* If there is any uncertainty that the catheter or wire resides in the vein, confirm venous residence of the wire after the wire is threaded. Insertion of a dilator or large-bore catheter may then proceed.
* Methods for confirming that the wire resides in the vein include, but are not limited to surface ultrasound (identification of the wire in the vein) or transesophageal echocardiography (identification of the wire in the superior vena cava or right atrium), continuous electrocardiography (identification of narrow-complex ectopy), or fluoroscopy.
* After final catheterization and before use, confirm residence of the catheter in the venous system as soon as clinically appropriate.
* Methods for confirming that the catheter is still in the venous system after catheterization and before use include waveform manometry or pressure measurement.
* Confirm the final position of the catheter tip as soon as clinically appropriate.
* Methods for confirming the position of the catheter tip include chest radiography, fluoroscopy, or continuous electrocardiography.
* For central venous catheters placed in the operating room, perform the chest radiograph no later than the early postoperative period to confirm the position of the catheter tip.

***Management of Arterial Trauma or Injury Arising from Central Venous Catheterization***

* When unintended cannulation of an arterial vessel with a dilator or large-bore catheter occurs, the dilator or catheter should be left in place and a general surgeon, a vascular surgeon, or an interventional radiologist should be immediately consulted regarding surgical or nonsurgical catheter removal for adults.
* After the injury has been evaluated and a treatment plan has been executed, the anesthesiologist and surgeon should confer regarding relative risks and benefits of proceeding with the elective surgery versus deferring surgery for a period of patient observation.

***References***

1. Practice Guidelines for Central Venous Access: *A Report by the American Society of Anesthesiologists Task Force on Central Venous Access.* Anesthesiology 2012; 116:539–73