Medical or Clinical Guideline MUHC

☐ Medication included ☒ No Medication included

THIS IS NOT A MEDICAL ORDER

Title:	Central Venous Lines (CVL) Tip Position Guidelines Including Peripherally Inserted Central Catheter (PICC) – Recommendations for Term babies less than 28 days of life, (or 40 weeks and 28 days postmenstrual age for ex-premature babies (born less 37 weeks)).
This guideline is attached to:	Interprofessional Protocol - Care of Central Venous Access Device (CVAD) in the Pediatric and Adult Population – Accessing Connections and Injection Ports

1. PURPOSE

The purpose of these guidelines is to obtain a reliable radiological confirmation of the distal tip position of a central venous catheter (CVL) in order to ensure adequate and safe tip position for the patient.

GUIDELINE APPICABLE IN THE FOLLOWING SETTING:

All clinical areas involved in the care of preemies and neonates including medical wards, surgical wards, medical imaging, hemato-oncology service, Neonatal Intensive Care Unit (NICU) and, Pediatric Intensive Care Unit (PICU).

GUIDELINE HAS BEEN APPROVED BY: Vascular Access Committee, which has representatives from all clinical areas including NICU, PICU, medical imaging and surgery.

2. PROFESSIONALS AND PATIENT POPULATION

Professionals:

- Physicians who are inserting central venous lines, who have read this protocol and understand the standards there in.
- Radiology Technicians who have read this protocol and who have reviewed the practice during orientation.

Population: All NICU babies and all term babies less than 28 days of life, (or 40 weeks and 28 days postmenstrual age for ex-premature babies) who have a central venous access device in place.

3. ELEMENTS OF CLINICAL ACTIVITY

Professionals are responsible to know the limits and extent of their practice as related to the particular protocol.

Procedure:

The main goal is to obtain a reliable and replicable radiological confirmation of the catheter distal tip position.

Tip location must be determined in the following circumstances:

1) Immediately following insertion, if fluoroscopy was not used to guide the insertion.
2) In the presence of signs and symptoms of catheter malfunction, or when a pleural or pericardial effusion are suspected
3) When migration of the catheter is suspected.

Any additional radiological exam to determine the position of the catheter or its function is at discretion of the treating doctor and/or the radiologist responsible.

4. INTERPRETATION – POST TIP PLACEMENT REVIEW:

- When the tip of the catheter is located at the brachiocephalic (or innominate) vein, subclavian or axillary vein, it must be used ONLY as peripheral line and the catheter must be replaced as soon as possible, if still necessary. This must be documented by the clinician reading the X-Rays, and the treating team must be notified.

- If the catheter is inside the heart, it must be pulled back immediately to a central venous position at the Superior Vena Cava (SVC) between T5 and T6 and **MUST be outside the right atrium** (the right tracheobronchial angle or carina are also acceptable anatomical references). Documentation of readjustment is required. This readjustment must be done by the team who inserted the CVL; for PICCs, by the PICC Line bedside nurse certified under physician supervision, or by the physician.

- If the catheter is inside the jugular vein, it has to be pulled back immediately to the subclavian vein; and the catheter must be used as peripheral and be replaced as soon as possible if still necessary. Documentation of readjustment is required.

- If the CVL is no longer considered central, i.e.: located in a peripheral vein, the axillary or the subclavian vein, (as opposed to the Superior vena cava or the inferior vena cava) the decision to continue to use the catheter as a peripheral line is the responsibility of the physician in charge of the patient. A discussion must occur between the physician in charge of the patient and the physician who inserted the CVL. The treating team including pharmacist must be notified.

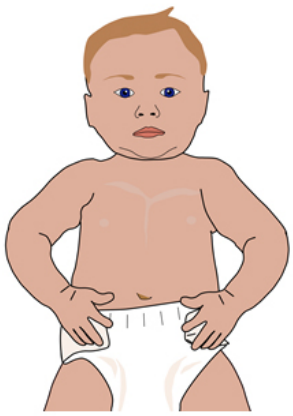
Site of insertion: Arm	**Rationale**
Radiography Specifications for arm: Specify in the window “raison” of OACIS request that the X-Ray is ordered to verify catheter tip placement and that the central venous line is placed in the arm. The post menstrual age of the patient must be indicated in this box. Reminder: If the X-Ray is done at the bedside, the plate must be put directly under the patient and not in the incubator tray in order to avoid measurement artifact. If the patient is unstable, the plate will be placed in the drawer. Ensure that the humeral head is visible on the radiography for interpretation (see below x-Ray image, arm and forearm position during the X-ray).	
Ideal Tip Location (see X-ray below): Under fluoroscopic guidance or at the bedside (see arms and forearm position below at the time of the X-Ray or the image took at the end of the procedure during fluoroscopy), the tip of the catheter must be placed at the level of: - right tracheobronchial angle level - Carina level - T5 level - T6 level **And** **The tip of the central venous line MUST be outside of the right atrium**.	Regular Chest X-Ray position requires arms to be placed above the head. This position is not a natural position for the baby. The tip of the central catheter will vary depending on the position of the arm. Thus, to properly determine tip placement, the x-ray must be taken with the arms as illustrated below.

The baby must be in the natural physiologic position at the time of the Chest X-ray,

the two arm positions are acceptable during the control

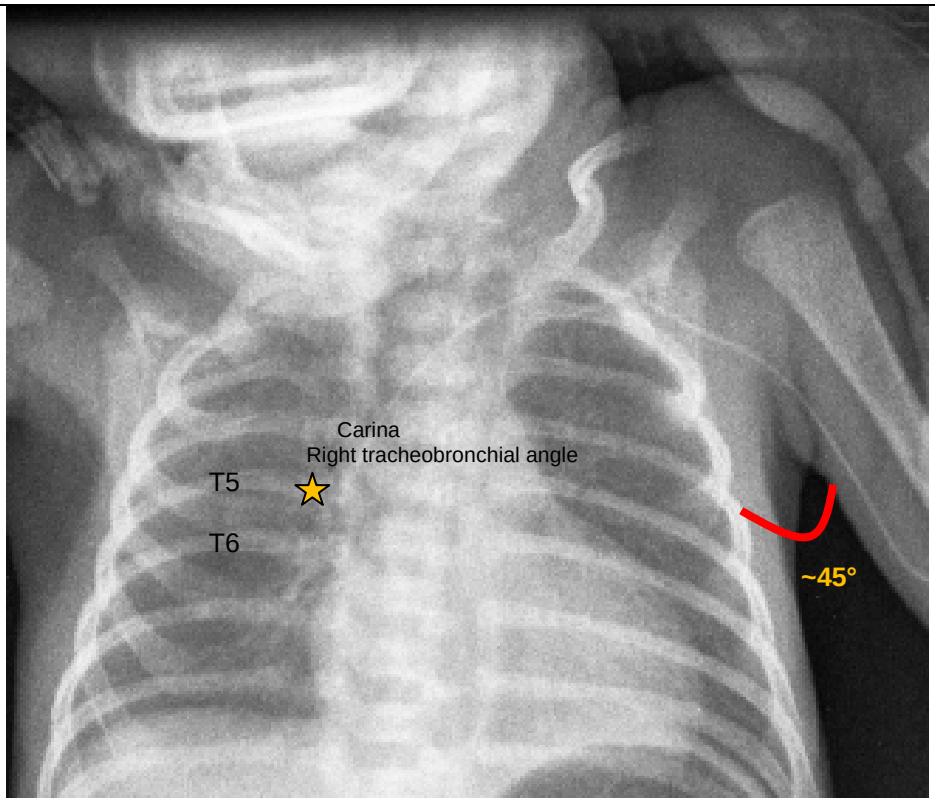
(See below with Ballard JL reference).

ADEQUATE POSITION

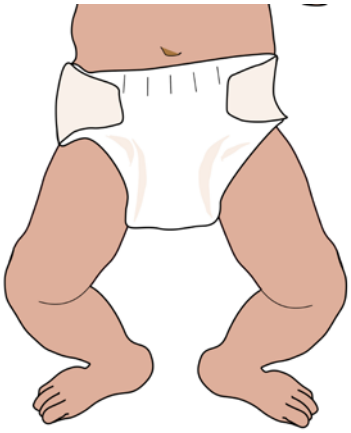


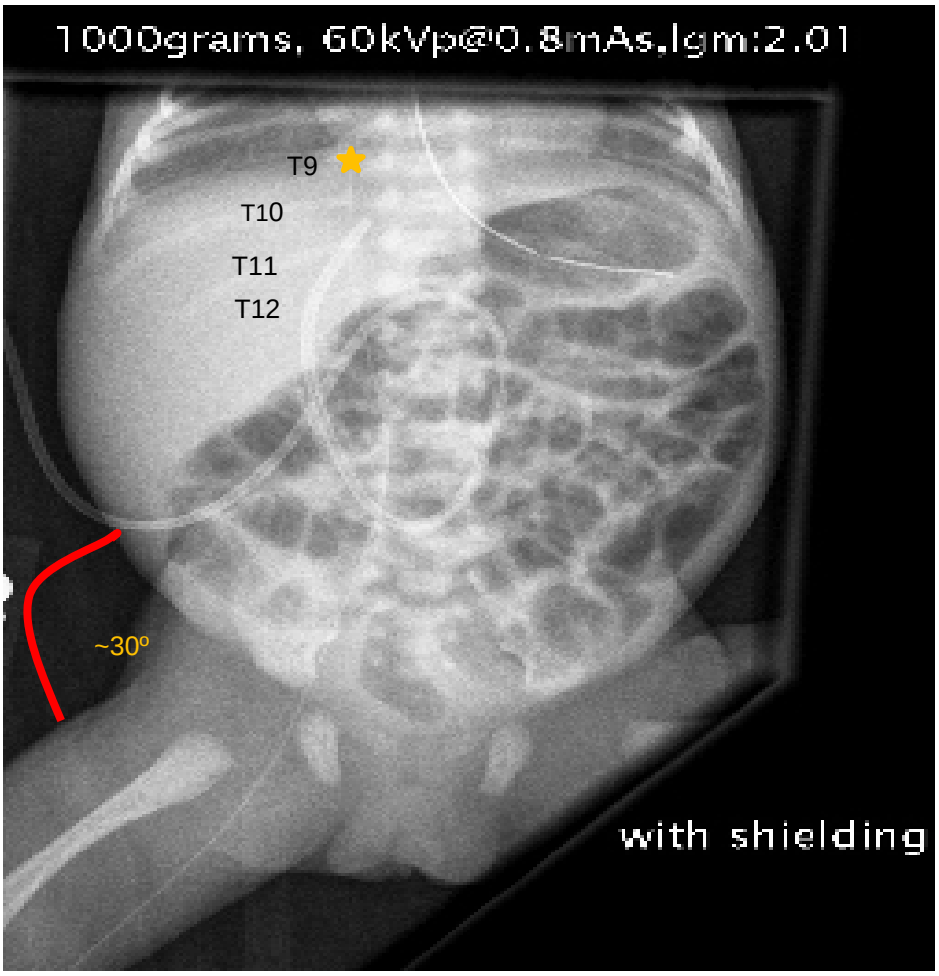
ADEQUATE POSITION

WRONG POSITION



Site of insertion: Leg	Rationale
Ideal Tip Location for the leg see draft and x-ray below Radiography Specifications: Specify in the window "raison" of OACIS request that the X-Ray is ordered to verify tip placement and that the central venous line is placed in the leg. The post menstrual age of the patient must be notified in this box. **An Antero posterior (AP) view is requested for all insertion in the leg. If the CVL insertion is done at the bedside without fluoroscopy, a lateral view (shoot through) is also required.** Reminder: If the X-Ray is done at the bedside, the plate must be put directly under the patient and not in the incubator tray in order to avoid measurement artifact. If the patient is unstable, the plate will be placed in the drawer. Ensure that the femoral head is visible on the radiography for interpretation The baby must be in the natural physiologic position – refer to the image below During insertion, the tip of the catheter must be placed at the level of: -**T9** **-T10** **-T11** **-T12** **AND** **The tip of the central venous line MUST be outside of the right atrium.**	To confirm that the tip is not in a paravertebral vein. Placing the plate in the incubator tray causes artifacts and makes the radiography harder to interpret especially when you take measure in order to pull back the CVL.




1000grams, 60kVp@0.8mAs,lgm:2.01
T9
T10
T11
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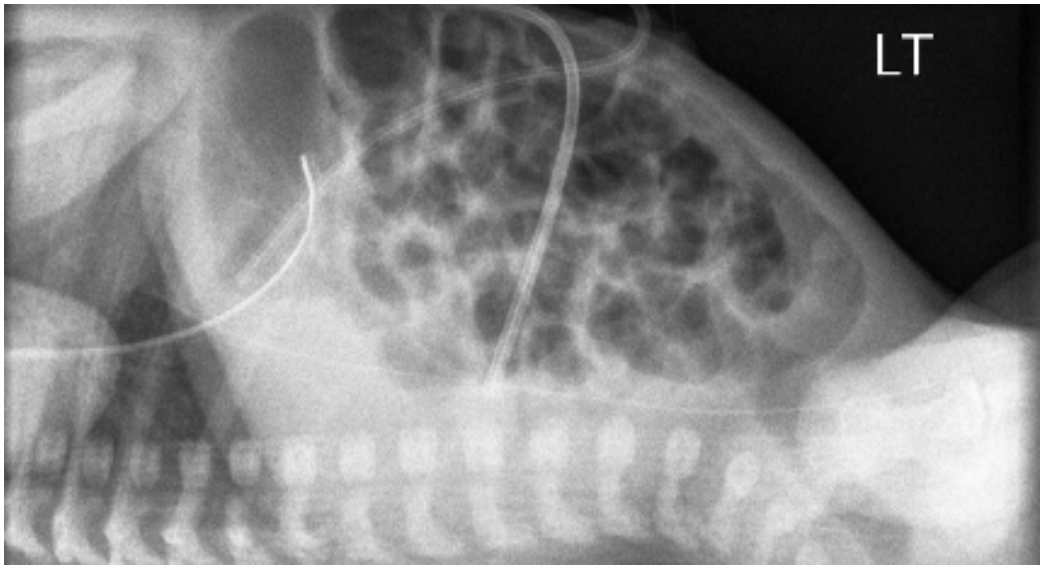
~30°
with shielding



Rationale: A lateral view is recommended for bedside insertion to avoid the misplacement of the tip at renal or lumbar veins. This lateral view is not necessary if the CVL is placed under fluoroscopy because the wire is put at the right atrium during the procedure and it's visualized directly.

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5. APPROVAL PROCESS

Institutional and professional approval

Committees	**Date** [yyyy-mm-dd]
☐ Pharmacy and Therapeutics Pediatrics (if applicable)	N/A
☐ Adult Pharmacy and Therapeutics (if applicable)	N/A
☐ MUHC Adult Site Medication Administration Policy (MASMAP) (if applicable)	N/A
☐ MUHC Pediatric Medication Administration Policy (PMAP) (if applicable)	N/A
☒ Clinical Practice Review Committee (if applicable)	2014-05-06
☐ Nursing Executive Committee and Council of Nurses (NEC and CN) (if applicable)	N/A
☐ Multidisciplinary Council (if applicable)	N/A
☐ MUHC Central Executive Committee of Council of Physicians Dentists and Pharmacists Committee (ECPDP) (Obligatory if attached to a collective order) — Final approval Signature of Chairperson: _____	N/A

6. REVIEW DATE

To be updated in maximum of 5 years (2019) or sooner if presence of new evidence or need for practice change.

7. REFERENCES

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