

Umbilical Arterial Line Protocol
East Bay Newborn Specialists Guideline

Prepared by S Bennett

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Background:

Umbilical arterial catheters (UAC) are needed in critically ill neonates for continuous monitoring and frequent lab draws. They are known to have significant risk factors that need to be considered prior to placement and for the duration they are in place. 17-30% of patients with UACs have been shown to develop thrombi. 40% of these were found to have major organ infarcts at autopsy. UAC thrombi are associated with long term hypertension, abnormalities in renal function, leg growth abnormalities, abdominal aortic aneurysm and acquired aortic coarctation.

Cochrane review by Barrington in 8/09 reviewed 7 trials comparing High UAC's (T6-T9) vs Low lying UAC's (L3-L4). All showed significantly less ischemic phenomena with the high catheter position and there was no difference in death, IVH, or NEC. His conclusions were high umbilical artery positioning is supported in the literature. It will lead to fewer clinically obvious ischemic complications, probable reduced incidence of aortic thrombosis, longer duration of catheter usability.

Indications:

Critically ill neonates requiring mechanical ventilation for more than 24 hrs, need for continuous blood pressure monitoring, or frequent laboratory draws.

- Evaluate daily need to maintain catheter placement and remove immediately if no longer needed.
- If needed for >7 days consider peripheral arterial line placement
- Remove immediately if any signs of ischemia or thrombi
- Calculation for placement: $[3 \times \text{wt (kg)}] + 9$. For infants < 1500g consider using $[4 \times \text{BW (k)}] + 7$ as may be more accurate.

Goal: Above the diaphragm at T6-T9, below T9 and still needed consider moving to a low UAC (L3-L4)

Acronym (T6 needs a fix, T7 is heaven, T8 is great, T9 is fine, T 10 do it again.)

Diagnostic Evaluation:

CXR/KUB to confirm placement. Adjust as needed for correct position. If adjustments made confirm adequate position with follow up xray.

References:

- Symansky Journal of Peds: May 1972; Umbilical vessel catheterization: Indications, management, and evaluation of the technique.
- Barrington: Umbilical artery catheters in the Newborn: Effects of position on the catheter tip. Cochrane Database sys Rev 2009
- Ramasethu: Complications of Vascular Catheters in the Neonatal Intensive Care Unit: Clinics in Perinatology 35 2008 199-222