

# Umbilical Line Insertion

## UVC Indications

- Neonatal/infant resuscitation: \* catheterization should be considered as a potential access site for infants up to 2 weeks of age
- \* **UVC 1<sup>st</sup> route for epinephrine administration - NRP update 2006**
- Patient acuity: respiratory compromise/failure
- Difficult venous access
- Medication/Fluid: \*hypertonic solutions should be administered via high UVC

## UAC Indications

- Frequent blood sampling required for acuity & management
- Central blood pressure monitoring
- Exchange transfusion

## Contraindications

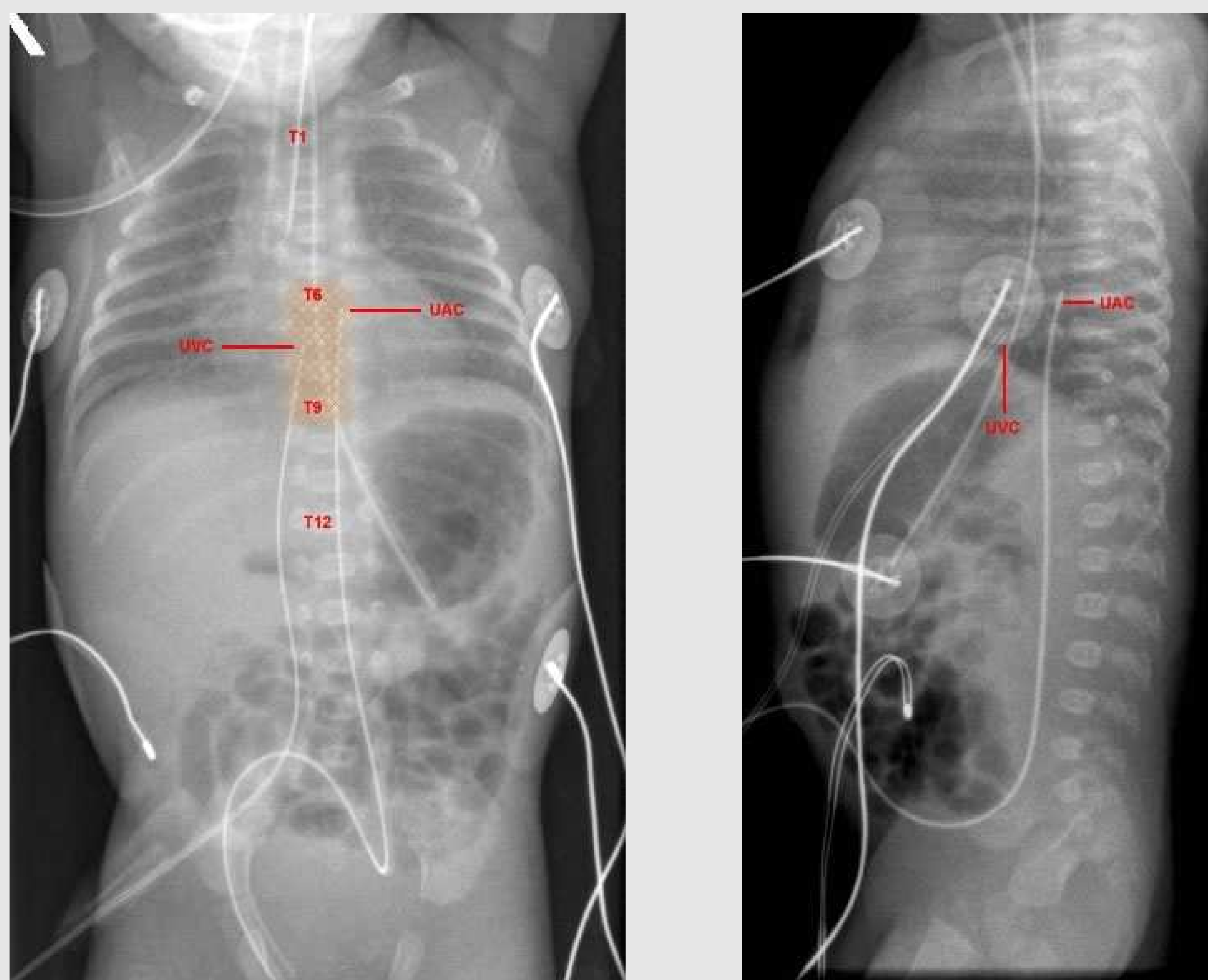
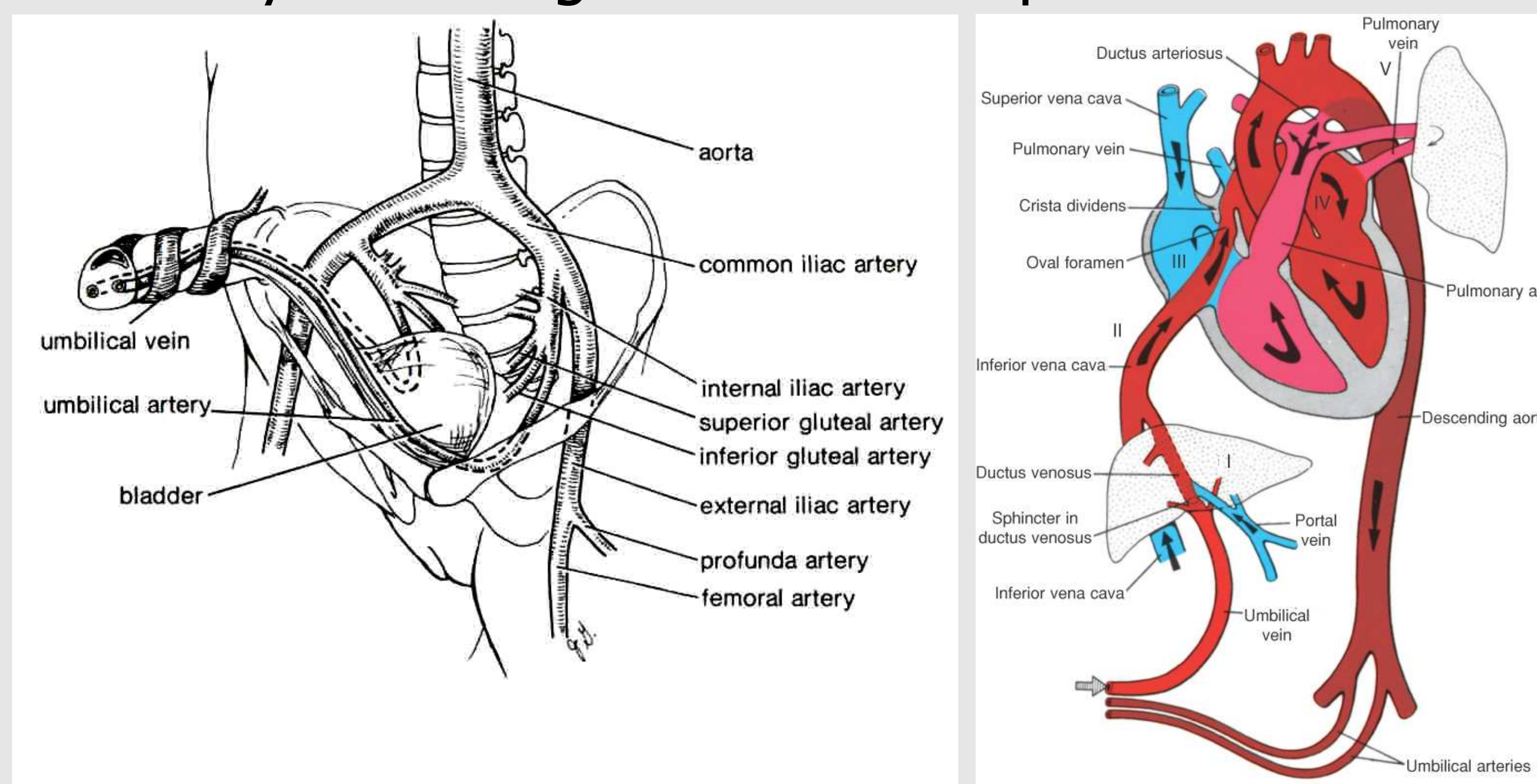
- Infection at site
- Necrotizing enterocolitis
- Omphalitis
- Abdominal wall defects (e.g. omphalocele)
- Peritonitis
- Vascular compromise of buttocks/lower limbs

### Umbilical Arterial Line (UAC)

- Loops down towards pelvis before entering the descending aorta
- Usually on the left side of the spine

### Umbilical Venous Line (UVC)

- Passes through the umbilical vein into the IVC
- Usually on the right side of the spine



American Academy of Pediatrics & American College of Emergency Physicians (2004). *The Pediatric Emergency Medicine Resource (APLS)* 4<sup>th</sup> ed. Jones & Bartlett: London.

Perlman, M., Kirpalani, A.M., & Moore, A.M. (1999). *Residents Handbook of Neonatology*. 2<sup>nd</sup> ed. B.C. Decker: Hamilton

Barrington KJ. Umbilical artery catheters: catheter position (Cochrane Review). In: The Cochrane Library, Issue 4, 2000: Update Software.

*Umbilical Arterial and Venous Catheterization: Acute Care Transport Services Learning Package (2005)*. The Hospital for Sick Children: Toronto

## Catheter Placement

### Placement Verification:

chest & abdominal x-ray 2 views (AP & lateral)

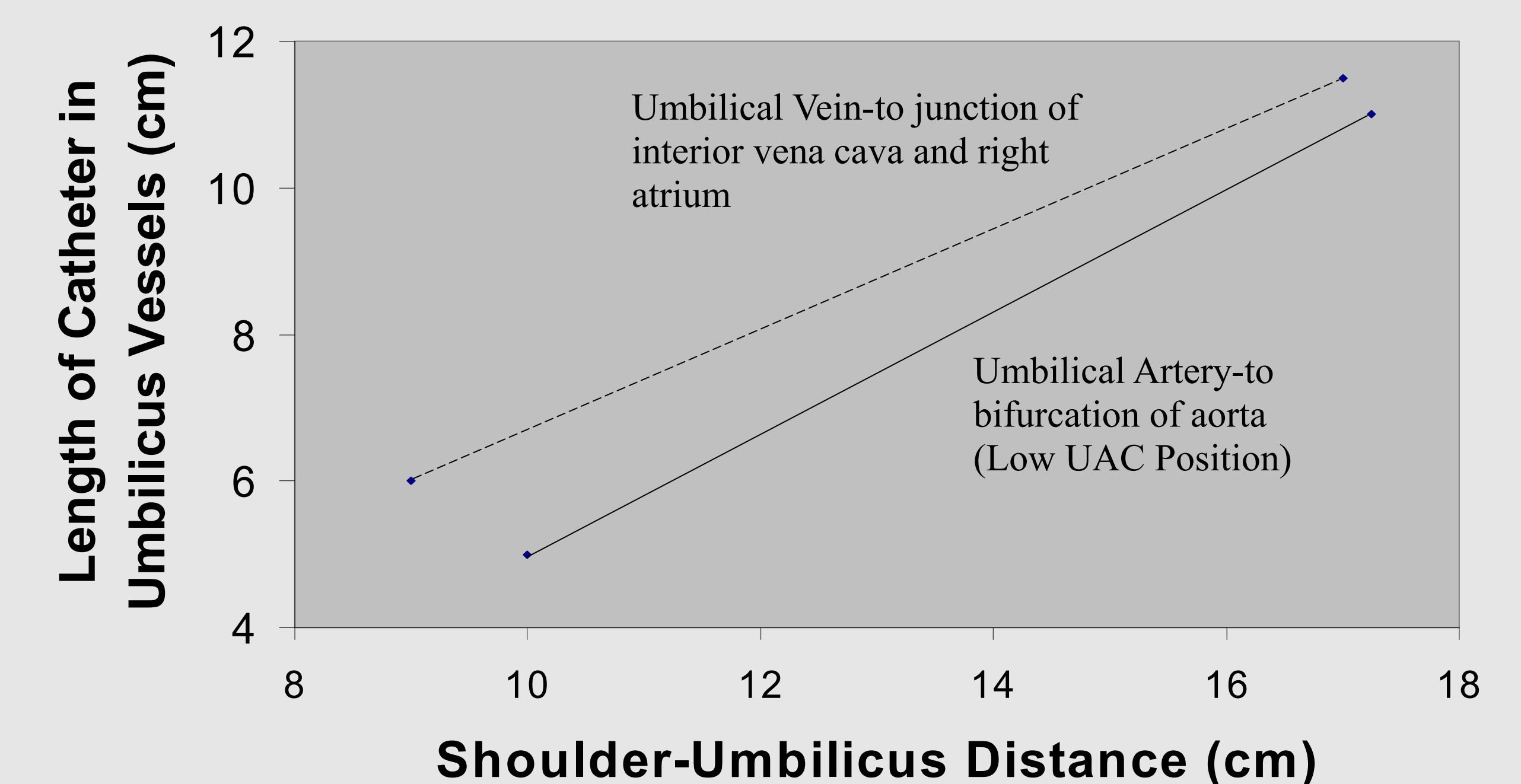
Catheter type	Placement/location on x-ray	Repositioning
UVC	<b>Catheter tip:</b> T <sub>6-9</sub> ; just above diaphragm  <b>During resuscitation:</b> Preterm → 2-3 cm insertion depth or until blood return is noted Term → 4 cm insertion depth	Placement is too high; or in the liver <b>* catheter is withdrawn never advanced</b>
UAC	<b>High line:</b> T <sub>6-9</sub> (preferred) <b>Low line:</b> L <sub>3-4</sub>	Placement is too high; or at T <sub>11-12</sub> <b>* catheter is withdrawn never advanced</b>

### Calculation Measurement for UVC

$$\frac{(3 \times \text{weight}) + 9}{2} + 1 = \text{insertion depth in cm}$$

### Calculation Measurement for UAC: High Line

$$(3 \times \text{weight}) + 9 = \text{insertion depth in cm}$$



### Catheter Diameter:

- ≤ 1500 grams # 3.5 Fr
- ≥ 1500 grams # 5.0 Fr