

UMBILICAL VENOUS CATHETERISATION

Do not attempt to carry out this procedure unless you have been trained to do so and have demonstrated your competence [under appropriate supervision](#)

INDICATIONS

- Infants <1000 g
- Larger sick infants (a double lumen catheter may be indicated if infant requires significant support)
- [Other ventilated infants](#)
- Exchange transfusion
- Central venous pressure monitoring
- Administration of hypertonic solutions [e.g. glucose 12.5%, or vasopressors (e.g. dopamine)]

CONTRAINDICATIONS

- Umbilical sepsis
- Necrotising enterocolitis (NEC)
- Exomphalos

EQUIPMENT

- Umbilical vein catheterisation pack
- Sterile mask, gown and gloves
- Sterile drape
- Infusion pump
- Sodium chloride 0.9% infusion containing heparin 1 unit/mL
- Umbilical tape

PROCEDURE

Non-sterile preparation

- Monitor SpO₂ during procedure
- Estimate length of catheter to be inserted:
 - measure from shoulder tip to umbilicus
 - high catheter placement preferred: tip above diaphragm but not in heart
 - use graph in pack to determine catheter placement

OR

- in the absence of graph use formula (weight in kg × 1.5) + 5.5 cm
- Whichever calculation used, remember to add length of cord stump to give final distance catheter needs to be advanced
- Tie umbilical tape loosely around base of cord

Sterile preparation

- Scrub up, and put on mask and gown
- Use sterile technique
- Clean cord stump and surrounding skin with non-alcohol antiseptic solution
- Attach 3-way tap to catheter and flush all parts with sodium chloride 0.9%. Leave syringe attached
- Put sterile towels into incubator
- Place all equipment to be used on sterile towel covering sterile trolley
- Drape umbilical stump with sterile towels
- Place sterile sheet with a hole in the centre over the cord. Pull the cord through the hole

Cut cord

- Clamp across cord with artery forceps at 3 cm
- Apply gentle upward traction
- Cut along underside of forceps with scalpel blade
- Cut cord cleanly to leave 2-3 cm stump or, [if also placing a UAC and you have been trained in this procedure, consider using side-on technique \(see \[Umbilical arterial catheterisation guideline\]\(#\)\)](#)

Remember to measure length of cord stump and add to calculated placement distance to give final length catheter needs to be advanced

Insert catheter

- Identify vessels:
 - single thin walled vein
 - two small thick-walled arteries that can protrude from cut surface
- Support cord with artery forceps placed near to vein
- Dilate lumen using either a dilator or fine forceps
- Insert catheter with 3-way tap closed to catheter; if resistance felt, apply gentle steady pressure for 30-60 sec
- Advance catheter to desired distance, and open 3-way tap to check for easy withdrawal of blood

If catheter will not advance beyond 4-5 cm and blood cannot be withdrawn, it is likely that a false passage has been created. Remove catheter and seek advice from a more experienced senior person

Securing catheter

- If an Umbilical Artery Catheter (UAC) is also to be inserted, site both catheters before securing either. secure each catheter separately to allow independent removal
- To secure catheter:
 - place purse string suture around UVC
 - knot suture round umbilicus three or four times
 - place two sutures into cord, one on either side of the catheters, allowing suture ends to be at least 3 cm long beyond cut surface of cord
 - sandwich catheter and ends of the two sutures between zinc oxide tape as close to cord as possible without touching cord. Sutures should be separate from the catheter on either side as this allows easy adjustment of catheter length (should this be necessary). It is not necessary to stitch suture to zinc oxide tape
 - if catheter requires adjustment, cut zinc oxide tape between catheter and two suture ends, pull back catheter to desired length and retape; **never** advance once tape has been applied as it is not sterile
- Connect catheter to infusion
- Confirm position of catheter in IVC by X-ray
- If catheter found to be in right atrium, withdraw it to avoid risks of cardiac tamponade or cardiac arrhythmia
- if catheter in liver, withdraw it so that it lies in IVC, or remove it and insert replacement

DOCUMENTATION

- Record in notes details of procedure, including catheter position on X-ray and whether any adjustments were made

AFTERCARE

- Monitor circulation in lower limbs and buttocks whilst catheter is in situ
- Leave cord stump exposed to air
- The catheter may remain in place for up to 7-10 days (*longer at consultant request*)
- *Any infusions must be connected to UVC in sterile manner using hand hygiene and sterile gloves*

COMPLICATIONS

- Air embolism
- Bleeding resulting from accidental disconnection
- Refractory hypoglycaemia due to malpositioning of catheter
- Infection: prophylactic antibiotics not required

Cardiac tamponade

- Suspect in presence of:
 - tachycardia
 - poor perfusion
 - soft heart sounds

UVC PM 11.07.09

- increasing cardiomegaly
- decreasing oxygen saturation
- arrhythmias
- Confirm diagnosis by:
 - chest X ray: widened mediastinum and enlarged cardiac shadow
 - echocardiogram (if available)
- Consider drainage if there is cardiovascular compromise (see **Pericardiocentesis** guideline)