NEONATAL RESUSCITATION – QUICK REFERENCE

Accessing the Umbilical Vein in an Emergency

Epinephrine is the primary medication used in neonatal resuscitation. It is given when the infant’s heart rate remains less than 60 bpm after 30 seconds of effective ventilation followed by another 30 seconds of cardiac compressions combined with effective ventilation. Epinephrine acts as a positive inotropic and chronotropic agent to improve systemic and pulmonary perfusion. The recommended dose is 0.01 mg/kg delivered by intravenous route.

Effective IV access through the umbilical vein can be secured with a 3.5 or 5.0 mm umbilical venous catheter. A number 5 Fr feeding tube may also be used. For safety, a leuer lock connection is recommended. A stop-cock must be used to prevent air emboli.

**Recommended equipment (sterile kit)**
- Clamps (recommended: 1 Addison, 1 Iris forcep, 1 curved hemostat)
- Umbilical tape
- Safety scalpel
- 3.5Fr or 5Fr UV catheter (or 5Fr feeding tube)
- 10, 30 or 60 mL syringes
- 3-way stop-cock
- Chlorhexidine swab or stick
- 2X2 and 4X4 Gauze

**Solutions and medications**
- 10 mL 0.9% NaCl
- Epinephrine 1:10,000 (dose 0.01mg/kg)
- 1 mL syringe
- 0.9% NaCl for volume

**Minimum required equipment:**
- syringes (for epinephrine),
- 3-way stop-cock
- UV catheter or #5 Fr sterile feeding tube
- (safety scalpel highly recommended)

**Procedure**
1. In an emergency, there may be no time for preparing a sterile field for full aseptic technique. Work as cleanly and quickly as possible and observe universal precautions.
2. Clamp the cord 7 -10 cm from the infant’s abdomen.
3. Tie tape loosely around the base of the cord. (The arteries are unlikely to bleed when resuscitation is needed but arterial bleeding may occur with recovery.)
4. Fill a 10 mL syringe with 0.9% NaCl.
5. Attach a 3-way stop-cock to the catheter. Flush the catheter and the ports of the stop-cock. Close the stop cock to prevent air entry.
6. Clean the umbilicus with Chlorhexidine.
7. Make a clean cut through the cord approx 2.5 cm from the abdomen to expose the vein.
8. Insert the catheter in the vein (larger vessel) in the direction of the infant’s head to approx 2- 3 cm beyond the abdominal surface, stabilizing the cord by holding it at the base, (fingers or artery forceps may be used for stabilization and/or insertion).
9. Apply gentle pressure when resistance is felt at the umbilical ring just below the skin.
10. Once inserted just below the skin, open the stop-cock between infant and syringe. Gently aspirate for blood return. If no blood is seen, insert the catheter a little further or draw it back slightly and try again. Advance no more than 3-4 cm beyond the transition point between the mucous membrane and the skin to prevent over-insertion.
11. Re-aspirate for blood return.
12. Administer medication or fluid as per neonatal resuscitation protocol.
13. Flush catheter with 2 – 5 mL of 0.9% NaCl to deliver remaining medication and avoid clotting.
14. Tape distal portion of catheter to abdomen.
15. Continue with resuscitation and stabilization.
16. If removing catheter, tighten suture or tape and apply pressure to umbilicus.

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1 The UV catheter may be inserted via the original cut end of the cord if the umbilical vein is easily visible, but if the catheter does not insert easily, the cord must be re-cut with a scalpel. Ensure catheter remains sterile.
References:

Neonatal Resuscitation Performance Checklists, Canadian Pediatric Society, December 2006

Addendum to the 2006 Provider Textbook, Canadian Pediatric Society, Revised March 2007

Newborn Life Support Provider Course, Vascular Access Skill Station (NLS), Resuscitation Council (UK), July 2008

Guidelines for Umbilical Venous Catheterization (emergency procedure); NHS Neonatal Transfer Service, August 2008

Umbilical Vessel Cannulation, Regional Emergency Medical Services Authority, Reno, Nevada, August 2007

Neonatal Resuscitation, presentation by Karen Ailsworth MD, MS, FAAP, for ALSO, August 15, 2008

Procedure of Umbilical Vein Catheterization, First Responders Manual (Michigan), Glenda Dolehanty RN

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