

Ethanol Lock for Central IV Catheter Guidelines

Patient Candidate Criteria:

- Patients who have experienced multiple bacterial infections of their central venous catheter within a short period of time.

OR

- Patients in whom replacement of infected central venous catheter is not feasible.

Patient Inclusion Criteria:

- Must be more than or equal to 6 months old, **OR** if less than or equal to 6 months old, must be more than or equal to 6 kg.
- Must be an uncomplicated intra-luminal infection and all other likely sources for persistent bacteremia have been ruled out.
- Must have another line or lumen for necessary infusions (medications, intravenous fluids) available for use during the ethanol lock period if required.
- Must have an ethanol compatible central catheter hardware composed of silicone rubber, not polyurethane.
- Must have the ability to aspirate the volume to be infused into the line.

Patient Exclusion Criteria:

- Less than 6 months old or weighs less than 6 kg.
- Known allergy, sensitivity or genetic inability to metabolize ethanol (e.g. aldehyde dehydrogenase deficiency).
- Received the following medications (PO/IV) within the designated time (days/hours)
 - Heparin, including in TPN (currently)
 - Metronidazole (48 hours)
 - Disulfuram (7 days)
 - Isoniazid (24 hours)
- Use with caution in patients with liver disease/dysfunction
- Objections due to social or religious reasons.

Catheter Exclusion Criteria:

- Catheter tip not located in central vein.
- Catheter manufactured from material other than silicone.
- Catheter material impregnated with antibiotic or other chemical.

Procedure:

- Authorized prescriber will place order containing the following information (Patients on the Pediatric service require a pediatric infectious disease consultation)
 - Type of catheter
 - Volume of ethanol 70% lock solution needed (Table 1)
 - Line(s) to be locked; must be compatible with ethanol
 - Dwell time (average 4 hours, but at least 2 hours, and as long as 12 hours)
 - Total days of therapy
- Determining the volume of the catheter lumen
 - Table 1 - Types of Central Venous Catheters can be used to determine the fill volume.
 - If the volume is not known, estimate the volume using the following steps
 1. Prepare the catheter cap per hospital policy
 2. Flush the lumen with 5 mL of NS in a 10 mL syringe to establish patency
 3. Obtain a 3 mL syringe of NS
 4. Discard any additional NS in the 3 mL syringe until the syringe contains only 1 mL of NS
 5. Attach the syringe to the injection cap of the lumen
 6. Draw back on the syringe plunger until the first drop of blood appears in the syringe
 7. The volume in the syringe minus 1 mL (the initial volume in the syringe) is the volume of the lumen
 8. Flush the lumen with 5 mL of NS in a 10 mL syringe
 9. Repeat the process for additional lumens to be used.

Note: 0.1 mL will be added to the catheter volume for patients less than 15 kg, while 0.2 mL will be added to the catheter volume for patients greater than or equal to 15 kg.

TABLE 1 - Types of Central Venous Catheters	
Catheter Type	Dose (Volume)
Port-a-cath Small Port 6.6 Fr	1.2 mL
Port-a-cath Dual Port 6.6 Fr	1.7 mL
Broviac 2.7 Fr (single lumen)	0.15 mL
Broviac 4.2 Fr (single lumen)	0.3 mL
Broviac 6.6 Fr (single lumen)	0.6 mL
Hickman Double Lumen 7 Fr Proximal	0.6 mL
Hickman Double Lumen 7 Fr Distal	0.8 mL
Hickman Triple Lumen 10 Fr Proximal	1.3 mL
Hickman Triple Lumen 10 Fr Medial	0.3 mL
Hickman Triple Lumen 10 Fr Distal	0.3 mL
Hickman Triple Lumen 12.5 Fr Proximal	1.5 mL
Hickman Triple Lumen 12.5 Fr Medial	0.4 mL
Hickman Triple Lumen 12.5 Fr Distal	0.4 mL

Ethanol Lock Administration Procedure

- **Ethanol is NOT compatible with heparin or citrate anticoagulant.** Flush line with 10 mL of normal saline (pediatrics, per standards) before and after administration of other medications and TPN; as well as before instillation and after aspiration of ethanol.
- Ethanol-lock is instilled in all lumens of the catheter once a day during the longest period of time the patient is off IV medications and/or parenteral nutrition.
- Review physician order: % ethanol, line(s) to be locked, volume to be instilled, length of dwell time, and days of therapy.
- Obtain all supplies: gloves, normal saline flush (10 mL syringes), syringe with the ordered volume of 70% ethanol flush, and alcohol pads to clean hub prior to instillation of ethanol.
- Explain procedure to patient and/or family. Inform patient and/or family of the possibility of systemic exposure to small amounts of ethanol with this procedure. **Do not proceed if patient and/or family have objections.**
- Place sign at head of bed stating, "Ethanol-lock in use, do not mix with heparin"
- Label the port(s) of the line being instilled with ethanol by placing sticker on the port(s).
- Use aseptic technique throughout procedure.
- If line is not being used, unclamp line, check for blood return, then flush with 5-10 mL normal saline to ensure patency. If line has fluid infusing, stop infusion, check for blood return, then flush with 5-10 mL normal saline (pediatric, per protocol).
- Instill ethanol (volume determined by physician order) into the catheter lumen.
- Re-clamp line and allow to dwell (time determined by physician order).
- Designate the line locked with ethanol with a label. If a patient has multiple lumens and only one lumen is to be locked with ethanol, accurately identify that lumen with a label.
- Document on MAR the lumen treated and the time the ethanol was instilled
- After completion of dwell time, unclamp tubing, withdraw ethanol and discard, flush the catheter lumen with appropriate volume of normal saline (DO NOT use heparin flushes as heparin is incompatible with ethanol) to clear the catheter lumen. Repeat process to each lumen of the catheter as directed by the physician order if there are multiple lumens.
- Document in the comment section of the eMAR the time the ethanol was removed.
- Problems during therapy (e.g. precipitation, clotting, malfunction) should be immediately reported to the on call physician.
- At the end of the designated instillation time, hang TPN, IVF, or other IV solution as previously ordered.