



GUIDELINES FOR THE USE OF ETHANOL LOCK PROPHYLAXIS IN ADULT PATIENTS

IMPORTANT NOTE: The cost of 98% ethanol has escalated significantly. Due to this cost and meticulous inpatient line care, **inpatient ethanol lock therapy is not available.**

- If inpatient prophylactic therapy (new or continuation) is deemed necessary, consider [antibiotic lock therapy](#). Patients on ethanol lock therapy at home will have therapy held in the hospital
- For patients in whom outpatient ethanol lock therapy is being considered, below provides criteria for inpatient coordination of new outpatient ethanol lock therapy or outpatient initiation. Please note that these criteria are consistent with HomeMed standards but may not apply to other home infusion companies.

DEFINITIONS:

Adult patient: Patient managed by an Adult primary service

Ethanol lock: Ethanol lock therapy (ELT) is created by filling the lumen of a central venous access device (CVAD) with a high concentration ethanol solution (70%) and leaving the solution in the lumen for a certain dwelling time. Ethanol's properties of both bactericidal and fungicidal activity, as well as being without known clinical resistance make ethanol an attractive option for prevention of CVAD-related bloodstream infection in high risk patients.

Central Venous Access Device: a long term, central venous catheter including central tunneled venous catheters, implanted ports, and non tunneled central venous catheters, including PICC lines.

Ethanol compatible central venous access device: a central venous access device that is documented as compatible with ethanol 70% lock solution for the necessary dwelling time, as provided by the manufacturer guidelines. The prescriber is responsible for evaluating the patient's CVAD compatibility for ethanol lock therapy. Ethanol is incompatible with most CVADs used at Michigan Medicine. If a patient does not already have an ethanol-compatible CVAD, then ethanol lock therapy may be utilized if a new, ethanol-compatible CVAD is placed. This decision is made in consultation with Infectious Diseases, and need for a compatible catheter should be documented in the IR Tunneled Catheter order set. (see Attachment A for ethanol compatible adult CVADs that are available in the formulary at Michigan Medicine. For other ethanol compatible CVAD, special ordering is required). Note that polyurethane CVAD that are used at Michigan Medicine are NOT ethanol compatible.

PROCEDURE ACTIONS

A. Inclusion: Patient Selection for Ethanol-Lock Prophylaxis:

1. All of the following criteria must be met:

- a. Patient has a history of recurrent CVAD related bloodstream infections
- b. Patient who is at risk of limited venous access (venous access in patients who require anticipated long-term (i.e., >6 months), has poor vascular access, or is at risk of losing venous access during periods of treatment).
- c. The patient has an ethanol compatible CVAD (see Attachment A)
- d. A dwell time of a minimum of two hours with the ethanol-lock solution within the patient's central venous access device is possible
- e. Patient and/or caregiver is capable of performing lock therapy.
- f. Antibiotic lock therapy is not feasible (due to history of polymicrobial infection necessitating multiple agents, resistance excluding use of available regimens, etc)

For inpatients where outpatient initiation is being considered, inpatient Infectious Diseases should be consulted while the patient is in the hospital. New starts in outpatients *who do not meet above criteria for use* requires a referral to Infectious Diseases to assess eligibility.

B. Exclusion: Patients Ineligible for Ethanol-Lock Therapy: If any of the following criteria are met, patients are ineligible for ethanol-lock prophylaxis:

1. The patient has an ethanol incompatible central venous access device, according to manufacturer guidelines and/or attachment A
2. Heparin or citrate of any type are injected through, or instilled in, the central venous access device (due to incompatibilities of ethanol with these agents). Heparin may be administered via other routes or access devices if necessary.
3. Documented allergy to ethyl alcohol or thrombolytic agents
4. Central venous access devices used for hemodialysis treatment are ineligible for ethanol-lock prophylaxis at Michigan Medicine. Note that these devices are eligible for antibiotic lock therapy.
5. Patient or caregiver objects to the use of ethanol-lock therapy due to social or religious reasons

C. Special considerations: Special consideration are given to the following populations prior to initiating ethanol lock prophylaxis

1. Patients who received drugs with potential interaction with ethanol within 48 hours (Metronidazole, Isoniazid) or within 7 days (disulfiram) of ethanol lock administration should be monitored for adverse reaction
2. For patients with active or past substance abuse, review and discussion should be performed, with case by case decision as to whether benefit outweighs risks of ethanol lock treatment. A statement outlining risks, education provided, and patient/family understanding should be documented in the medical record for all decisions.

D. Special precautions: special precautions are given for the following settings:

1. Patients who are smokers should be advised for the risk of fire in the presence flammable ethanol lock solution.
2. Ethanol concentration of 30% and higher may be associated with protein precipitation and clotting. Close monitoring for clotting of CVAD is required for patients who are treated with ethanol lock prophylaxis.
3. Ethanol lock may be associated with protein precipitation when administered with heparin through the same catheter. Patients who have coagulation disorders and frequently require IV heparin should be evaluated for the risk and benefits of ethanol lock prophylaxis

E: Other considerations:

1. Discharge planning: discharge planners should discuss with HomeMed or other outpatient ELT provider for transition to home. HomeMed does have an Ethanol lock policy.
 - a. Service provider is required to notify case management of any patient receiving ethanol lock so that discharge services can be coordinated.
 - b. Patients and/or caregivers need to have a plan in place for training and assessment of comprehension on ethanol lock administration prior to discharge. This training will be performed by the ELT provider, not inpatient nursing. The case manager will arrange education.
 - c. Upon request information regarding IVAD (e.g., type of catheter, catheter material, and volume of lumens- see below) should be sent with referral (can attach documentation in All Scripts) or faxed. This information should be entered into the home care order. This information will then be attached into All Scripts. This point might not be necessary as long as this information is easily accessible in Michart.
2. Measurement of the Lumen for Ethanol-Lock Administration (Applicable when the volume of CVAD is unknown)
 - a. To estimate the volume of the venous access device, a practitioner (RN, MD, PA, NP) measures the volume of the catheter:
 - a. Prepare a 3 mL syringe filled with 1 mL of Normal Saline
 - b. Attach syringe to hub on the end of the catheter (hub must be connected directly to the end of the venous access device without extension tubing)
 - c. Draw back on plunger until drops of blood enter the syringe

- d. Subtract 1 mL from the volume on the syringe when blood enters the syringe (for example, if the finishing volume on the syringe is 1.2 mL after blood enters the syringe, the volume would be 0.2 mL)
- e. Clamp tubing and record this volume
- f. Flush tubing
- g. Document findings in the “lines, drains and airway” MiChart tab (‘volume’ space of ‘line’ portion)
- h. Communicate volume to ordering prescriber

***NOTE** The prescriber will add an additional 0.2 mL to this measured volume to ensure the volume of the ethanol-lock covers the entire length of the venous access device.

***NOTE** Interventional Radiology provides the following “approximate” volumes: Hickman catheter 1 mL; port 1.5 mL

Attachment A: Ethanol compatible central venous access device available at Michigan Medicine:

1. Hickman catheter 9.6 Fr single lumen ingrowth/4 antimicrobial cuff Silicone (BARD)
2. Broviac 6.6 Fr single lumen ingrowth cuff w/peel stylet Silicone (BARD)
3. Hickman catheter 10 Fr. double lumen ingrowth cuff, Silicone (BARD)
4. Hickman catheter 10 Fr. triple lumen ingrowth cuff, Silicone (BARD)

Notes:

- a. Other ethanol compatible catheter venous access devices that are not listed above require special ordering following consultation with the Interventional Radiology service
- b. Polyurethane CVAD that are used at Michigan Medicine are NOT ethanol compatible

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The recommendations in this guide are meant to serve as treatment guidelines for use at Michigan Medicine facilities. If you are an individual experiencing a medical emergency, call 911 immediately. These guidelines should not replace a provider’s professional medical advice based on clinical judgment, or be used in lieu of an Infectious Diseases consultation when necessary. As a result of ongoing research, practice guidelines may from time to time change. The authors of these guidelines have made all attempts to ensure the accuracy based on current information, however, due to ongoing research, users of these guidelines are strongly encouraged to confirm the information contained within them through an independent source.

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