

**State of Vermont****Department of Health**

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*Agency of Human Services***MEMORANDUM**

**TO: Vermont Advanced EMS Services/Providers (VT I-03, AEMT, EMT-P, Paramedics)  
and VT District Medical Advisors**

FROM: Daniel Wolfson, MD - VT State EMS Medical Director

DATE: February 20th, 2014

**Subject: Normal Saline Shortage**

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We have received notification that some areas in VT are experiencing shortages of 0.9% Sodium Chloride (Normal Saline). This trend reflects a national shortage as well. Until Normal Saline returns to its usual availability, Vermont EMS endorses the following:

Lactated Ringers may be used as a direct substitute for Normal Saline with the following exceptions and precautions:

- Lactated Ringers (LR) **should NOT** be directly combined with the following drug agents (due to limited data or clear evidence of incompatibility). These medications should be administered at a site separate from where the LR is infusing via a normal saline lock/line, or stop the LR infusion for medication injection, then administer a saline flush, and then restart the LR infusion.
  - Amiodarone
  - Atropine
  - Diltiazem
  - Fentanyl
  - Metoprolol
  - Naloxone
  - Vasopressin
  - Calcium Chloride
  - Blood products should not be infused with LR
- Use Lactated Ringers with **caution** in patients with:
  - Hyperkalemia or severe renal failure (potassium)
  - Severe hepatic failure (impaired lactate clearance)
  - Severe metabolic acidosis or alkalosis (potassium and worsening alkalosis)



- Lactic acidosis
- Neonates and infants less than 6 months (lactate effects on neonates)

Please consider initiating the following conservation measures in response to the Normal Saline shortage:

- For patients who require IV access but no fluids, use saline locks only
- Consider using D5W to mix medication drips when appropriate
- When Normal Saline is indicated, use lowest volume necessary (use 250-500mL bags when available)
- Consider reserving available Normal Saline for use in patients with contraindications to Lactated Ringers.

**General thoughts on temporary drug shortages:** Temporary shortages of specific medications/solutions are becoming a regularly occurring problem. EMS systems must be prepared for complete unavailability of certain drugs. Substituting medications in a certain class (for example, midazolam substitution for lorazepam), or changing the concentration/packaging of medications may lead to medication administration errors and compromise patient safety. A team approach is needed to deal with drug shortages and alternative plans should be coordinated with the EMS agency, affiliate hospital ED medical director, affiliate hospital pharmacy director and VT State EMS. Temporary medication substitutions must deliver the same amount of active medication and be packaged in a manner that prevents as far as possible any medication errors. This should include clear labeling, separate packaging (e.g. zip-seal plastic bags) containing the medication with diluents, if any, and instructions for administration. In all such substitutions, careful attention to medication expiration, sterility, potency, and dose equivalent is required. EMS agencies must ensure that all personnel who will be administering such substitute dosage forms of medications in times of temporary shortage are appropriately trained and oriented on use of the substitute dosage form of the medication. Use of expired medications/solutions is not acceptable at this time. The Vermont Office of Public Health Preparedness and Emergency Medical Services will continue to monitor drug supplies and issue additional advisories as needed on a case by case basis. Please feel free to contact the EMS office with any questions at [vtems@state.vt.us](mailto:vtems@state.vt.us).

