



Alameda County Health
Emergency Medical Services

MEMORANDUM

DATE: October 8, 2024

TO: All Alameda County Acute Care Hospitals
All Alameda County EMS Providers

FROM: Alameda County EMS Agency

SUBJECT: IV Fluid Shortage Due to Hurricane-Related Disruption

Given the potential for decreased supply availability, we strongly recommend that all hospitals and prehospital care providers take steps to manage current stock levels and implement rationing protocols where appropriate.

As you are all aware, there is an IV fluid shortage that may impact your operations. This shortage is largely due to supply chain disruptions caused by a recent hurricane that affected Baxter International's manufacturing facility in North Carolina, one of the primary producers of IV fluids, including normal saline and lactated Ringer's solution. The hurricane has led to temporary production halts, and we anticipate national, regional, and local shortages as a result.

A list of medical supply providers is attached to assist you in alternative suppliers. However, please be aware that some companies are already on allocation and may be restricting new accounts or orders due to high demand.

Best Practices for Procuring and Rationing IV Fluids:

1. **Regular Inventory Review:** Continuously monitor and assess your current IV fluid inventory to prevent shortages before they occur.
2. **Alternative Fluid Consideration:** Use alternative fluids when clinically appropriate to conserve normal saline and lactated Ringer's.
3. **Conservation of IV Fluids:** Limit IV fluid administration to cases where it is absolutely necessary. Encourage oral hydration in appropriate cases.
4. **Collaboration Between Facilities:** Explore resource-sharing opportunities with nearby facilities to optimize regional supply use.
5. **Early Contact with Suppliers:** Reach out to your suppliers as early as possible to inquire about current stock and to place orders in anticipation of further delays.

We will continue to monitor the situation closely and provide additional updates as more information becomes available. Your cooperation and adherence to these best practices are essential to managing this shortage effectively.

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Potential IV Fluid Vendors

This list is for reference only as open available sources. Alameda County is not endorsing the use of any of these vendors.

Company	Website	Contact Phone #
Life Assist	www.life-assist.com	800-824-6016
BoundTree	www.boundtree.com	800-533-0523
Medline	www.medline.com	800-633-5463
Henry Schein Medical	www.henryschein.com	800-472-4346
McKesson	www.mckesson.com	855-571-2100

Resource Request Link

If your facility or organization are at critical inventory levels for IV fluids and have exhausted both internal procurement and external procurement processes, to include contacting the list of vendors noted above, please submit a resource request specifying your need.

Attempts to fill the request will be made locally. If unable to fulfill at the local level, the request may be escalated to the regional or state level.

Link to Resource Request Form: <https://tinyurl.com/4zk2tbua>



QR Code to Access Form:

IV Fluid Shortage Best Practices – Medication Conversion:

Conversion of medications from an IV formulation to a PO formulation will be dependent on patient condition, clinical presentation, physical capacity, and tolerance.

General Inclusion Criteria:

- Patient is able to tolerate oral or enteral medications
- Patient is able to eat (i.e. active diet orders), swallow, or tolerate enteral feeding.

General Exclusion Criteria:

- Pediatric patients
- Intravenous medication in question has been active for less than 24 hours
- Nausea and/or Vomiting in last 24 hours and on scheduled anti-emetics or refractory to PO anti-emetics.
- Gastrointestinal conditions that affect absorption.

When possible, transition patients to appropriate oral antibiotics when clinically indicated.

IV to oral conversions reduce overall medication costs and can reduce hospital length of stay due to extended duration of IV antibiotic treatment.

References:

Dellit TH, Owens RC, McGowan Jr JE, et al. Infectious Diseases Society of America and the Society for healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clin Infect Dis. 2007;44:159-177.

Kuti JL, Le TN, Nightingale C, et al. Pharmacoeconomics of a pharmacist-managed program for automatically converting levofloxacin route from IV to oral. Am J Health Syst Pharm. 2002;59:2209-2215.

Oosterheert JJ, Bonten MJ, Schneider MM, et al. Effectiveness of early switch from intravenous to oral antibiotics in severe community acquired pneumonia: multicenter randomised trial. BMJ. 2006;333:1193.

Sallach-Ruma R, Nieman J, Sankaranarayanan J, et al. Correlates and economic and clinical outcomes of an adult IV to PO antimicrobial conversion program at an academic medical center in Midwest United States. J Pharm Pract. 2015;28(3):238-248.

When possible, transition patients to appropriate oral non-antibiotics medications when clinically indicated.

Transition patients to equivalent oral medications when clinically indicated to reduce overall medication costs, improve patient experience, and potentially reduce hospital length of stay.



Sample Intravenous to Oral Formulation Conversions:

Medication	Example IV Regimen:	Convert to:
Acetaminophen	500-1,000 mg IV q 6 hours	Acetaminophen tablets or suspension Same dose and frequency
Ethacrynic Acid	50 mg IV q 24 hours	Ethacrynic Acid tablets Same dose and frequency
Famotidine	20 mg IV q 12 – 24 hours	Famotidine 20mg tablets Ranitidine 150mg tablets Same frequency
Folic Acid*	400 mcg (0.4 mg) - 1,000 mcg (1 mg) IV q 24 hours	Folic acid tablets Convert all doses to 1 mg PO q 24 hours
Lacosamide (maintenance doses only)	50 – 200 mg IV q 12 – 24 hours	Lacosamide tablets or oral solution Same dose and frequency
Levetiracetam (maintenance doses only)	500-1500 mg IV q 12 hours	Levetiracetam tablets or oral solution Same dose and frequency
Levothyroxine (Do not interchange for myxedema coma)	Any dose, IV daily	Levothyroxine tablets 3:4 IV to PO conversion* (i.e. 75 mcg IV → 100 mcg PO) Unless otherwise specified by Endocrinology
MVI*	1 vial IV (10ml) q 24 hours	Multivitamin tablets or oral liquid 1 tablet PO q 24 hours or 30 mL oral liquid PO q 24 hours
Pantoprazole	20 – 40 mg IV q 12 – 24 hours	Oral: Pantoprazole capsules Same dose and frequency
		Feeding Tube/Liquid Diet: Esomeprazole capsules Same dose and frequency
Thiamine*	100 mg IV q 24 hours	Thiamine tablets Same dose and frequency
	Doses >100 mg and/or Frequencies > q 24 hours (ex. 500 mg IV q 8 hours)	Do not convert to PO
Valproate/Valproic acid (maintenance doses only)	500 mg IV q 8 hours	Oral: divalproex EC (Depakote EC) tablets Take total daily dose and round to nearest 125 mg → then divide BID Do not convert to Depakote ER
		Feeding Tube: valproic acid oral solution Same dose and frequency

Intravenous to Oral Conversion of Intravenous Fluids with Vitamins and Minerals (Banana Bags)

Medication	IV Regimen:	Convert to:
Banana Bag	IVF (D5, D5-1/2NS, NS, etc) + Thiamine 100 mg + Folic acid 1 mg + MVI 3,300 units (10 mL) IV once daily	Discontinue IVF + Thiamine 100 mg tablet PO daily + Folic acid 1 mg tablet PO daily + MVI 1 tab PO daily or 30 mL oral liquid daily

References:

Cyriac J.S. and Jame E., Switch over from intravenous to oral therapy: A concise overview. *J Pharmacol Pharmacother.* 2014 Apr-Jun; 5(2): 83–87.

Fischer MA, Solomon DH, Teich JM, Ahorn J. Conversion from intravenous to oral medications. *Arch intern Med.* 2003;163:2585-9.

Fox ER, Beckwith MC & Tyler LS. Pharmacy-Adjusted IV to oral therapeutic interchange program: development, implementation, and cost-assessment. *Hosp Pharm.* 2003;38:444-52.

Lau BD, Pinto BL, Thiemann DR, Lehmann CU. Budget impact analysis of conversion from intravenous to oral medication when clinically eligible for oral intake. *Clin Ther* 2011; 33:1792–6.

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