

IV Fluid Shortages

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Disclosure

- This presentation represents my own opinions – I am not speaking on behalf of University of Utah.
- University of Utah Drug Information Service has a contract with Vizient and ASHP to provide drug shortage information. No funds are paid to Erin Fox.

Shortages and University of Utah

- US drug shortage information since 2001
- Investigate voluntary reports from healthcare providers
- Confirm with drug companies
- Share information with US FDA
- Alternatives and safety recommendations



Current Drug Shortages

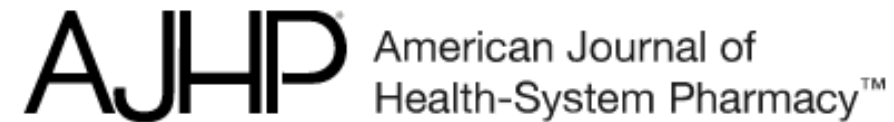
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Drug Shortages and Management

www.ashp.org/shortages

What is a drug shortage?

- “A supply issue that affects how the pharmacy prepares or dispenses a drug product or influences patient care when prescribers must use an alternative agent.”



ASHP guidelines on managing drug product shortages

<https://doi.org/10.2146/ajhp180441>

Fluids shortage of 2013 - 2014



2013

- Severe shortage from 3 suppliers (Baxter, B. Braun, Hospira)
- No clear reason beyond “increased demand”
- Bad flu season?

2014

- Baxter peritoneal dialysis line failed
- Irrigation line repurposed
- Hospitals cut to 60% of past use

Fluids shortage of 2017 – a “perfect storm”

- 2016 – Pfizer sells Hospira fluid business to ICU Medical
- May 2017 – FDA Warning letter to B. Braun – all customers told to find IV fluids from another supplier
- September 2017 – Hurricane Maria – devastated Puerto Rico impacting Baxter's facility (mainly small volume)
- (~3000 deaths)
- Severe influenza season

Fluids shortage of 2024 - 2025

- September 24, 2024, Hurricane Helene devastated many areas, including Baxter's facility in North Carolina (60% of all US fluids)
- Largest IV fluids producer in US (250 mL +, irrigations, PD fluids)
- All products immediately placed on allocation – 40% of usual use



<https://www.baxter.com/baxter-newsroom/hurricane-helene-updates>

Fluid shortages immediately create workarounds – and more shortages

Workarounds

- IV Push
- Repackage fluids
- Premix / frozen products
- Compounding
- Centralizing stock
- Use imports
- 503B products

Shortages

- Syringes
- Premixed / frozen products
- Caps
- Empty bags
- Water
- Albumin
- Alternative fluid sizes
(depending on shortage)

What's so hard about making salt or sugar water?

- Barrier to entry – facilities are costly to maintain and build, products are low margin (\$)
- Must be sterile, endotoxin-free
- Particle-free
- Large production volumes
 - Example – 750 bed hospital uses ~28,000 bags of IV fluids per month and ~1,800 large volume (3L +) irrigations in ORs (does not include medication doses mixed in IV fluids)
- Difficult to stockpile
 - 1 L bag is ~ size of a loaf of bread, weighs 1 kg (2.2 lb) –1 box of 12 bags weighs ~ 30 lb and is 1.6 square feet
 - A one-month buffer supply for the example 750 bed hospital would require ~2000 boxes weighing 60,000 lb and requiring 3,200 square feet.

Manufacturing sites*

Location	Baxter	B. Braun	Fresenius Kabi	ICU Medical
US Plants	NC*, IL, MS, PR	CA, FL	NC, IL, NY	TX
North America	Canada, Mexico	Dominican Republic	Mexico	Mexico
Europe	Belgium, France, Germany, Italy, Malta, Spain, UK	Czech Republic, France, Germany, Hungary, Italy, Slovakia, Spain, Switzerland, UK	Austria, France, Germany, Italy, Sweden,	
Asia-Pacific	Australia, China, India, Malaysia, Singapore	Malaysia	China, Vietnam	Japan (Otsuka partnership)
Other	---	Brazil, South Africa	Brazil	

*Assisted by AI and Google – locations are not transparent from suppliers or FDA – drug companies have zero requirement to provide the exact manufacturing location for any FDA approved drug

Purchasing IV fluids is unlike other medications

- 4 major suppliers (Baxter, Bbraun, ICU Medical, Fresenius)
- Fluids (FDA-approved drugs) are generally treated as *supplies* in health systems, unlike with other drugs, pharmacy generally doesn't own the contract
- Fluids are typically bundled into a contract with pumps, tubing, and other supplies
- Most hospitals use 1 supplier – and during shortages, suppliers *rarely* sell to non-contracted customers

Why are fluid shortages so challenging?

- Life saving medication
- Supply cleaning fluid
- Irrigation
- High volume – used for virtually every admission
- Inventory – mixed control, not always charted
- Large – difficult to stockpile
- Reducing use is complicated

Irrigations are even more challenging

- May not be charted
- Variable needs depending on types of surgeries
- Manual counts may be necessary
- May be purchased in many different areas (supply chain, vs. OR, entity vs. centrally)
- Obtain purchase history to better understand past use
- Work to understand liters / surgery

Summary

- US has experienced 3 major IV fluid shortages in past 13 years – mainly due to weather problems, but some due to quality problems
- 4 suppliers – a problem at 1 = a problem for all
- Contracting practices make it challenging for health systems to purchase from more than 1 supplier
- Stockpiling to buffer (even a 1 month supply) is challenging due to volumes, weight, size of products
- Most suppliers have alternative manufacturing – takes time to obtain imported product and challenge to use