

In late September, Hurricane Helene left a path of destruction through parts of the southeastern United States. A Baxter International manufacturing facility in North Cove, North Carolina, was shut down after significant impact from rain and storm surge. The facility was responsible for manufacturing most of the large-volume sterile fluids used in American hospitals and healthcare settings. Sterile fluids used for injection, irrigation, and peritoneal dialysis have been in short supply since the storm.

ASHP surveyed a sample of its members to learn about the severity and impact of the fluid shortages. The survey collected information about strategies implemented to conserve and manage the shortages and about current inventory levels for large-volume sterile solutions.

The survey results include responses from 401 participants who answered at least part of the online questionnaire. The survey was conducted Oct. 16–25, 2024.

KEY FINDINGS

- 84% of all respondents reported a moderate or critical impact of the fluid shortages. A critical impact was defined as requiring the delay or cancelation of treatments or procedures; a moderate impact was defined as requiring interventions affecting patient clinical care.
- Among settings where Baxter is the primary supplier of fluids, 91% of respondents reported a moderate or critical impact of the fluid shortages.
- The most common strategies used to manage the shortage of fluids include changes to how medications are purchased and administered, reserving supplies for specific clinical indications, asking patients to drink fluids instead of administering intravenous fluids, and using smaller bags of intravenous fluids.
- Nearly half of respondents responsible for purchasing and inventory management (47%) reported their current inventory of large-volume fluids are down to two weeks' supply or less.

SURVEY RESULTS

Severity of Fluid Shortages

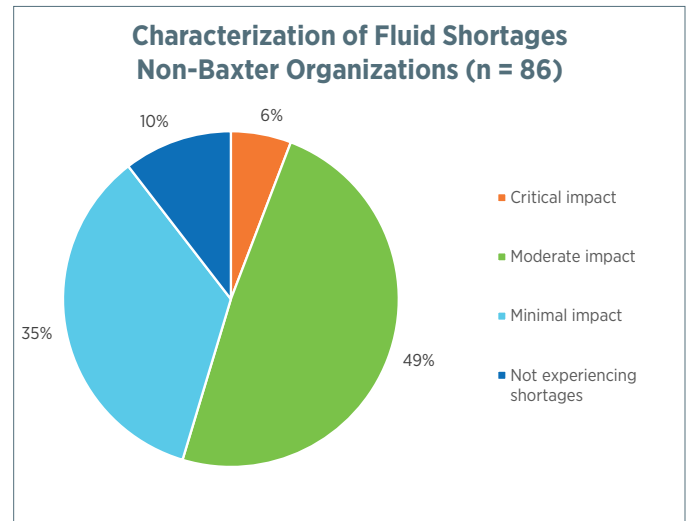
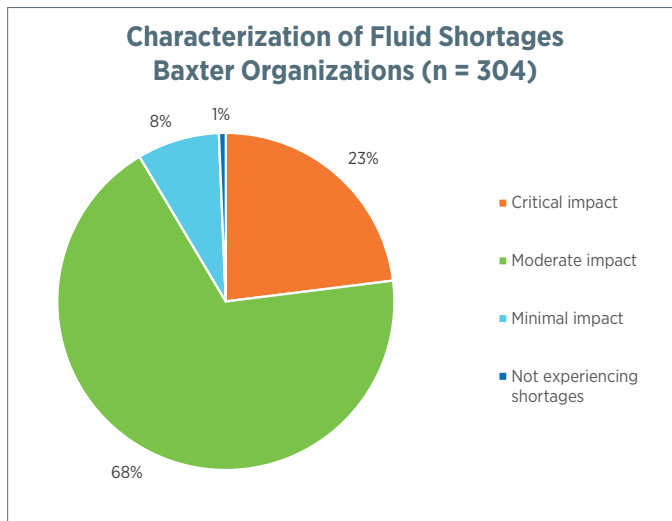
To better understand the differences in the shortage severity and strategies implemented to manage the shortages, participants were asked to indicate whether Baxter is the primary supplier of large-volume sterile fluids at their facility.

- 76% of respondents reported Baxter is the primary supplier of large-volume fluids at their facility
- 21.5% of respondents reported Baxter is not the primary supplier of large-volume fluids at their facility
- 2.5% were unsure

Participants were asked to rank the current state of the large-volume fluid shortages using a severity scale:

- Not experiencing a shortage
- Minimal impact, defined as managing shortages through operational changes not affecting patient care, including purchasing different sizes or concentrations of fluids or buying from alternative sources
- Moderate impact, defined as managing shortages but with some impact on patient clinical care, including converting to alternative treatments, administering medications by a different route, or implementing oral hydration protocols
- Critical impact, defined as canceling or delaying treatments or procedures

	ALL RESPONDENTS (n = 401)	BAXTER FACILITIES (n = 304)	NON-BAXTER FACILITIES (n = 86)
Not experiencing shortages	3%	1%	10%
Minimal impact	13%	8%	35%
Moderate impact	65%	68%	49%
Critical impact	19%	23%	6%



Strategies Used to Conserve Fluids or Manage Shortages

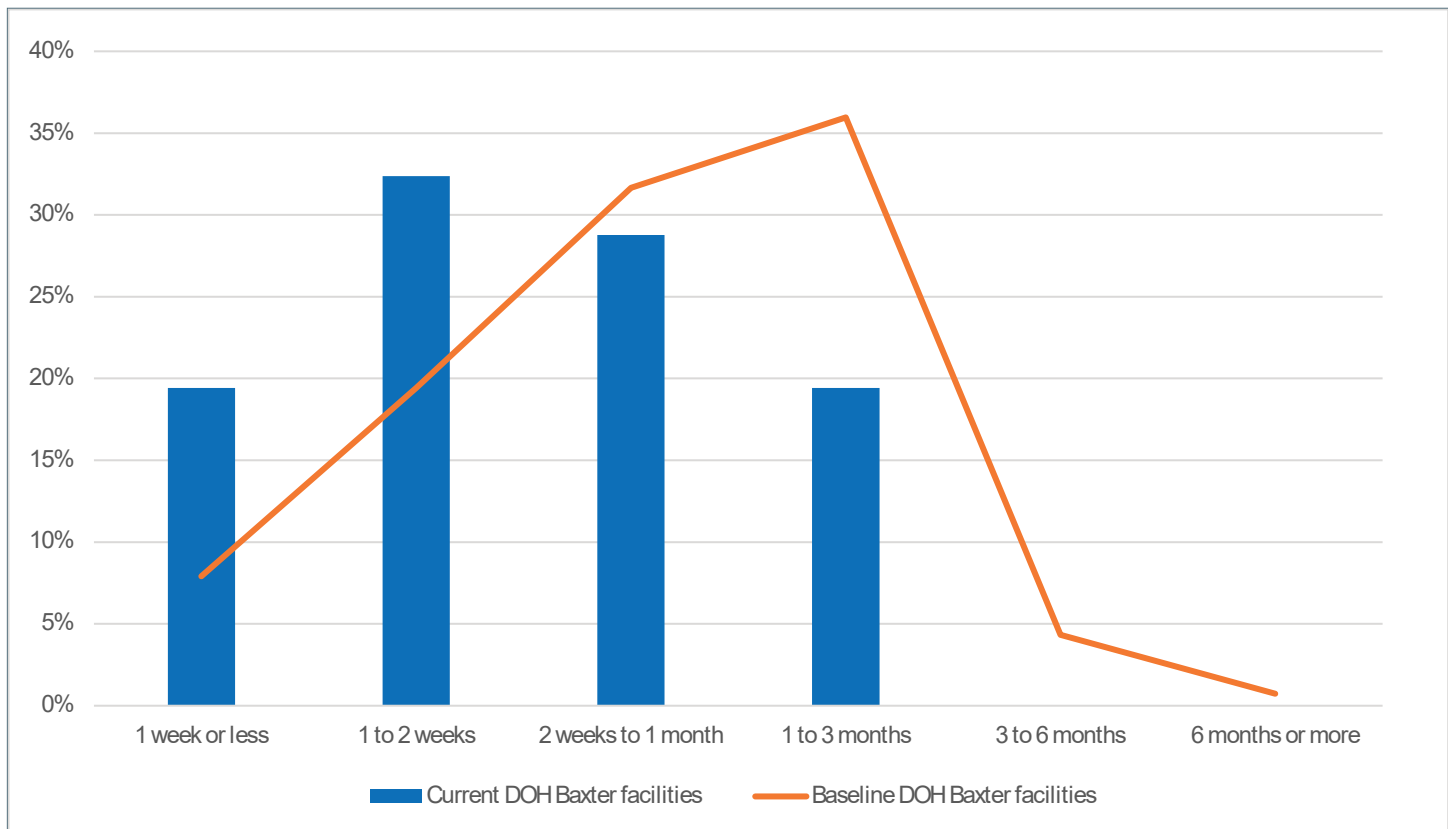
Participants were asked which of the following strategies have been implemented to conserve supplies and manage shortages of large-volume sterile fluids. Converting infused medications to injection or intramuscular administration and increasing the purchase of premixed medications were the conservation methods most commonly used by respondents. Strategies affecting delivery of care to patients are bolded in the table below.

	OVERALL (n = 349)	AMONG BAXTER FACILITIES (n = 268)	AMONG NON- BAXTER FACILITIES (n = 73)
Converting infused medications to injection or intramuscular administration	71%	74%	60%
Increased purchasing of premixed medications	66%	70%	49%
Made changes to the electronic health record to accommodate conservation or alternative treatments	63%	69%	42%
Reserved/restricted fluids for specific clinical indications	60%	66%	38%
Using smaller bag sizes for shorter IV durations	60%	70%	25%
Implementing oral hydration protocols	58%	65%	32%
Reduced the default minimum rate for intravenous fluid administration (known as a “keep vein open” or “to keep open” rate)	55%	59%	41%
Expanding policies to convert intravenous medications to oral equivalents	55%	58%	44%
Extended time allowed for infusions to be administered	42%	47%	26%
Increased purchases from large outsourcing facilities (503B compounders)	39%	42%	27%
Implemented a policy to allow automatic substitution of IV solutions	38%	40%	29%
Restricting parenteral nutrition (receiving calories and nutrients through an IV instead of the digestive tract)	23%	26%	14%
Canceling or delaying voluntary surgeries and procedures	17%	19%	7%
Repackaging liter bags to smaller-volume containers to prevent waste	15%	18%	7%
Compounding 0.9% saline from concentrated NaCl and empty bags	3%	4%	0%

Changes to Inventory Levels

Participants were asked whether they are responsible for purchasing or inventory management at their facility. Of the total respondents, 204 who reported being responsible were asked about the current inventory, reported as days-on-hand (DOH), for large-volume fluids compared to their baseline inventory levels. The graph below shows a visual representation of baseline compared to current inventory on hand at Baxter facilities.

		1 WEEK OR LESS	1 TO 2 WEEKS	2 WEEKS TO 1 MONTH	1 TO 3 MONTHS	3 TO 6 MONTHS	6 MONTHS OR MORE
ALL RESPONDENTS (n = 191)	Current DOH	16%	30%	30%	23%	1%	0%
	Baseline DOH	8%	21%	32%	35%	4%	1%
BAXTER FACILITIES (n = 139)	Current DOH	19%	32%	29%	19%	0%	0%
	Baseline DOH	8%	19%	32%	36%	4%	1%
NON-BAXTER FACILITIES (n = 50)	Current DOH	8%	26%	36%	28%	2%	0%
	Baseline DOH	8%	26%	32%	32%	2%	0%



SURVEY PARTICIPANTS

The survey was deployed to ASHP members on Oct. 16 and generated 401 usable responses. One email reminder was sent to survey participants. The survey was closed on Oct. 25.

Demographics

- Participant category (n = 401)
 - » Pharmacist: 83%
 - » Pharmacy technician: 15%
 - » Pharmacy resident: 2%
- Work setting (n = 401)
 - » Acute care hospital: 86%
 - » Infusion clinic: 6%
 - » Children's hospital: 5%
 - » Home care: 3%
 - » Ambulatory surgery center: 1%
- Hospital size (based on patient beds) among acute-care settings (n=312)
 - » < 200 beds: 27%
 - » 200-499 beds: 30%
 - » ≥ 500 beds: 36%

SUMMARY

These results reflect the status of fluid shortages about one month after the impacts of Hurricane Helene and its effects on the supply of large-volume sterile fluids in the United States. The shortages are disproportionately affecting facilities that primarily purchase large-volume fluids from Baxter and are affecting how clinical care is provided to patients.

As facilities conserve supplies and manage the resulting shortages, efforts are underway to provide additional supply through importation, extending expiration dates, compounding, and quickly resuming production at Baxter's North Cove plant. The severity and impacts of these shortages will likely fluctuate based on supply availability.

As of Oct. 25, 2024