



TRACIE
HEALTHCARE EMERGENCY PREPAREDNESS
INFORMATION GATEWAY

GOING WITH NO FLOW

Coping with Hospital Water Supply Issues



On the evening of July 12th, 2018, staff at the MedStar Washington (DC) Hospital Center noticed a significant drop in water pressure. While this loss of water was remedied by the District of Columbia Water and Sewer Authority (DC Water) within hours, residents and facilities across much of the city were urged to boil water before drinking or cooking with it. Dr. John Hick (ASPR TRACIE's Senior Editor) interviewed Craig DeAtley (PA-C, Director, Institute for Public Health Emergency Readiness, MedStar Washington Hospital Center) to discuss this incident, lessons learned, and planning considerations healthcare facilities can incorporate to improve preparedness and response to similar incidents.

■ John Hick (JH)

Craig, please give us an overview of the situation and how your facility responded.

■ Craig DeAtley (CD)

Late in the evening of July 12th, staff noticed a drop in water pressure and water flow. We quickly learned that there had been problem with water transfer points—a valve had been left open—and the outage was affecting a wide area in the city. Once the problem was recognized, DC Water fixed it within 60 minutes, but within that first hour, our facility and a number of other local hospitals implemented their water emergency plans.

First, we determined no additional surgeries would be performed. We then notified DC's Fire and Emergency Medical Services Department (DC Fire) to re-route patients until further notice. We began to organize the deployment of our emergency water cache to each unit (and plan to supplement that with offsite inventory if necessary). Third, we notified staff that we were operating under our water emergency plan and to follow it. We continued to implement the emergency plan, including delivering water to individual units and communicating instructions regarding handwashing, oral consumption, and ice machine usage. Personnel placed signs on ice machines and water fountains prohibiting the use of ice and water for oral consumption; using ice therapeutically was still allowed. By 11:30 p.m. (about an hour and half after the incident started), we were assured that everything was back to normal, so we took ourselves off of diversion and began to resume normal operations.

At 4:15 a.m., I was notified that both DC Water and the department of health were concerned that contamination could have occurred during that hour or so where no water flowed through the pipes and they would be issuing a “Boil Water Advisory” to areas of the city that had been affected by the outage. This activated the second part of our response, which included messaging to off-site hospital staff (since these offices would be open for business) and patients (via food trays and in-person visits). We also partially activated our incident command system (ICS) because we were told this wouldn’t be remedied until the next day around noon.

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Our traditional plans included being able to provide enough bottled water for patients and staff in the event of an outage. We had no concept of the actual number of water hydration stations in our units. We subsequently found out how many 5 gallon jugs of water were available on site and have incorporated this information into our plan.

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■ JH

What supplies do you have on site, how is your system set up, and what kind of vendor agreements do you have in place to deal with potable water emergencies?

■ CD

This facility is licensed for 1000 beds. On the day of the water outage, our census was 738 patients. We estimate one gallon of potable water per person per 24-hour period. We do not have the space to keep that amount of potable water on site, so we keep about a 1/3 of the supply here, another third is available at a warehouse within two miles, and we have an agreement with a vendor to supply us with the remaining third. Our water vendor responded very quickly and brought two truckloads full of 5-gallon jugs of water.

■ JH

How did you use the water in the trucks?

■ CD

We started by using our on-hand water supply (12 and 16 ounce bottles). The delivery truck carrying primarily 5 gallon jugs arrived right when we had no water, so we distributed the jugs to floors to assist with flushing toilets as necessary. We also requested a tanker response, but ended up cancelling that request because we solved the problem before the truck arrived.

LESSONS LEARNED

Document your facility’s water inventory

Make sure you not only know the number of sinks, showers, and toilets throughout your facility, but also your water fountains, ice machines, and on-hand inventory of bottled water. Don’t forget to list any “hydration stations” and water coolers in your facility (many of these use 5-gallon jugs).

When you request water, be specific regarding the quantity and size

We were expecting 16 ounce bottles from our vendor and got two truckloads of 5 gallon jugs of water. These jugs can help when it comes to flushing toilets, but aren’t as practical when it comes to patient and staff hydration.

Know the context of the emergency you’re dealing with when deciding on response and next steps

It’s one thing to be without pressure or flow for four hours or less or for longer than four hours. It’s another thing to have water but believe it may be contaminated. We were less concerned when we had water flow (though it may have been contaminated) then we were when we had no flow. The longer we were going to go without water at all, the more we had to consider preparing to evacuate the facility. Not only does lack of water affect our ability to provide care, it is needed for our heating, ventilation, air conditioning system, and sewer drainage.

Be familiar with your alternative sources

Make sure your connections match those of your alternate source before an incident occurs. Our primary system is set at a lower flow than the alternative main, which is important for engineering staff to know when they switch back and forth. If you are going to use a tanker to provide a large volume of water, make sure proper connections can be made with the building or the storage container(s).

Have a plan in place for expired water

A few months before this incident, we realized that a portion of our water had to be rotated. In our case, we kept it to supplement our non-potable supply.

Don't forget about ice

While the water might have been contaminated and we prohibited the oral consumption of ice and water, we did allow ice to be used for therapeutic purposes only. Having a vendor to deliver ice is also important. Make sure you have signs pre-made in bulk and you know where they are stored. Recognize you will have to dispose of non-potable ice and clean the machines if testing does reveal that the water supply feeding the machine was contaminated.

JH

How was your ICS process?

CD

We partially activated our ICS, which included logistics support, and representatives from safety, infrastructure, materials management, and public information. We didn't formalize our command center Thursday night, but our IC team drafted an Incident Action Plan the next day to deal with the water advisory. We physically met at 7:00 a.m. Friday, then we virtually met throughout the rest of the incident. We used our plan as a guidance document, but we definitely learned some lessons along the way.

As luck would have it, seven years ago, DC Water invited our hospital and the other three hospitals on our campus to be added to the city's emergency water supply system at no cost. We call this the "Third High Main System." DC Water is a great partner—they knew our four facilities held 50% of the beds in the city, including the only pediatric burn and trauma center in the area, and serve as the busiest adult burn and trauma center in the area. Since then, we have conducted annual tests to ensure we could easily transfer over to the third main. Ironically, I had just met with my four facility directors that Monday and we agreed that we needed to schedule another test of the connections. Well, that Thursday, we tested it for real.

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■ JH

Did you flush all of the taps and toilets once you got the “all clear?”

■ CD

Yes, once water pressure was restored the first time, our engineering staff went through the hospital to flush all sinks and toilets to get rid of the sediment. We repeated this process two more times: once after we moved to the Third High Main System and again when the boil water advisory was called off and we were switched back to our usual water main.

DID YOU KNOW?

One U.S. gallon of water weighs 8.3 pounds - keep that in mind when you plan to distribute 5-gallon jugs (> 40 pounds) throughout a hospital in a water emergency!



ADDITIONAL PLANNING CONSIDERATIONS

Vendor agreements

Ensure your agreements specify the role of the vendor and the amount of time it will take them deliver supplies so that you can plan accordingly. Test these agreements periodically to ensure contact information is still current.

Transporting water throughout the facility

Water is heavy and bulky. If the emergency is limited to the water supply, determine where your hand trucks are stored and create a process for using them to transport water. Have an alternative plan in the event that your facility has lost power as well and remember to account for the movement of non-potable water throughout the facility, too.

Stocking water

Establish where you will stock potable and non-potable water. Consider stocking some on site, some off site (but nearby) and having a vendor lined up to deliver water in an emergency.

Prioritizing non-potable water sources

Determine how many bathrooms you will service in these situations (knowing this may change as the incident progresses). How many toilets will be maintained on each floor? Then make sure you have ample supply of water in these areas for flushing. Post signs outside of the out-of-service bathrooms.

Food preparation and hygiene

Have a plan for preparing food for patients that either does not require water or only requires non-potable water. Prepare to use paper products until you can wash dishes and trays again.

Laundry and other maintenance

Many facilities work with outside vendors to manage soiled laundry, but if you don't, ensure your plan accounts for not being able to do laundry or other maintenance (e.g., housekeeping, disinfection) for some time.

Communicate. Repeat

Redundancy is as important as providing timely and clear messages, to staff and facility-wide. Nursing supervisors shared the first round of messages in our case and our public information officer conducted the rest of the messages via electronic messaging and cell phone notification. Ensure you have pre-printed signs that can be posted throughout the facility (e.g., at water stations, on ice machines) and cards that can be delivered to patients on their food trays.

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In our facility, dialysis is handled by a national contractor. They use a water re-osmosis process that renders the water safe regardless of potability. The contractor was able to continue providing dialysis during the incident, but they (and we) received many questions about the safety of the process from clients and staff due to the public messaging about not using the water. Ensure that your facility has in place clear messaging supported by the local department of health that informs providers and reassures patients and their loved ones about the safety of the process.

Also, if city water plants have to hyper-chlorinate or use other additional chemicals due to water contamination, situations like this can have adverse effects on dialysis patients (e.g., hemolysis) – make sure the water department alerts the healthcare coalition and dialysis providers about changes to water treatment processes.

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[Post-Disaster Lessons Learned: Dialysis Patient Management](#)

[Sterile Processing Department Resources](#)

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