



Fact Sheet

Technical Considerations when Bringing Hemodialysis Facilities' Water Systems Back on Line after Hurricane Katrina

These directions are for use if the building has not been flooded, and after utilities have been restored, the physical facility is in operational condition, and adequate water flow and pressure are available, although source water may be subject to a "boil water alert." If the facility was flooded, please see the CDC guidelines for recovery of a flooded building at <http://www.bt.cdc.gov/disasters/floods/>

Water Treatment System

- Flush all pretreatment equipment to drain for at least 30 minutes to remove the stagnant water from the system.
- Test the level of free chlorine and chloramine in the building's source water (expect it to be higher than normal).
- Test chlorine and chloramine after the primary carbon tank to verify that the water is <0.5ppm free chlorine, or <0.1ppm chloramine.
- If chlorine or chloramines after the primary carbon tank ≥ 0.5 ppm or ≥ 0.1 ppm, respectively, promptly change the primary carbon tank, or for systems with a secondary carbon tank, test the levels after the secondary carbon tank.
- If chlorine and chloramine are below these levels (0.5 ppm or 0.1 ppm), turn on the reverse osmosis (RO) machine.
- Flush the distribution system (to drain if possible).
- Disinfect the RO and the distribution system and rinse. Test for residual disinfectant levels to ensure proper rinsing.
- Replace all cartridge filters.
- Compare the product water quality readings to your historical data. A significant difference could mean that the RO membranes are damaged, or the quality of the incoming water has drastically decreased. (see note below) If the total dissolved solids (TDS) are greater than 20% higher than the historical readings, consider using the deionization (DI) tanks as a polisher on the product water, followed by an ultrafilter to minimize microbial contamination.
- Increase frequency of monitoring:
 - Check chlorine/chloramine hourly
 - Verify hourly that the product water quality is acceptable.
 - Monitor water cultures and endotoxin at least weekly. If possible, test for endotoxin on site daily.
- Draw representative water cultures and endotoxin tests as soon as possible. If possible to test for endotoxin on site, do this before treating patients; report the results to the facility's Medical Director.
- Anticipate an increased level of particulate matter in the water. Monitor the pressure drop across pretreatment components and backflush as necessary.
- Plan on re-bedding the carbon tanks as soon as possible.
- Send a sample of product water for an AAMI analysis as soon as is practical.

- Clean the RO membranes as soon as is practical.

Dialysis Machines

- Chemically disinfect the dialysis machines and rinse. Test for residual disinfectant levels to ensure proper rinsing.
- Bring up the conductivity and "self test" the machines to verify proper working condition. If a machine fails the "self test," perform needed repairs prior to using that machine.

Note

If the product water TDS is high and the percent rejection is in line with historical performance, then the RO membranes are most likely good, but the feed water may have a higher than usual level of contaminants. DI polishing will help cope with the extra burden in the feed water.

If the product water TDS is high and the percent rejection is lower than historical values, then the RO membranes are probably bad and should be replaced promptly. DI polishing may or may not be needed once the RO membranes are replaced.

This fact sheet was prepared in collaboration with the Food and Drug Administration and the Centers for Medicare and Medicaid Services.

Hemodialysis Water Treatment References

Northwest Renal Network document *Monitoring Your Dialysis Water Treatment System*
<http://www.nwrenalnetwork.org/watermanual.pdf>

Association for the Advancement of Medical Instrumentation, Recommended Practices for Dialysis Water Treatment Systems (RD 52 and RD 62)
<http://aami.org/publications/standards/dialysis.html>

Other Resources

Guidelines for Dialysis Care Providers on Boil Water Advisories
http://www.cdc.gov/ncidod/hip/dialysis/boilwater_advisory.htm

Water Related Emergencies
<http://www.bt.cdc.gov/disasters/watersystemrepair.asp>

Tips about Medical Devices and Hurricane Disasters
<http://www.fda.gov/cdrh/emergency/hurricane.html>

Medical Devices that Have Been Exposed to Heat and Humidity
<http://www.fda.gov/cdrh/emergency/heathumidity.html>

Medical Devices Requiring Refrigeration
<http://www.fda.gov/cdrh/emergency/refrigeration.html>

Fact Sheet: Flood Cleanup - Avoiding Indoor Air Quality Problems
<http://www.epa.gov/iaq/pubs/flood.html>

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NIOSH Hurricane Katrina Response: Storm and Flood Cleanup
<http://www.cdc.gov/niosh/topics/flood/>

OSHA Fact Sheet
http://www.osha.gov/OshDoc/data_Hurricane_Facts/Bulletin3.pdf

American Institute of Architects: Procedures for Cleaning Out a House or Building Following a Flood
http://www.aia.org/liv_disaster_floodproc

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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