

5/30/2018

Recommendations for Boil-Water Advisories

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Boil-Water Advisory

A boil-water advisory is a public health announcement that the public should boil tap water before drinking it. When issued, the public should assume that the water is unsafe to drink.

Check CDC Page titled: Healthcare Water System Repair and Recovery Following a Boil Water Alert or Disruption of Water Supply

<https://www.cdc.gov/disasters/watersystemrepair.html>

Types of Advisories

Common reasons for a Boil Water Order/Notice include the following:

Precautionary Advisory

- Failure of or substantial interruption in water treatment processes that result in increased turbidity levels, or particle counts and mechanical or equipment failure
- Circumstances that compromise the distribution system (e.g., loss of pressure in the distribution system, water main break, loss of disinfection, and unexpected water quality problems. These may result from disasters (e.g., flood, hurricane or earthquake), or system failures (power outages).

Advisory with Evidence of Contamination

- Violations of the total coliform rule or the turbidity standard of the surface water treatment rule
- Positive test results for pathogens (e.g., *Cryptosporidium*, *Giardia* or *Shigella*) in water.

Waterborne Pathogens

-Tap water (safe drinking water) is not sterile. Tap water contains bacteria that are not pathogenic for normal individuals.

-There are many possible waterborne pathogens. The organisms of concern include protozoa such as *Giardia* and *Cryptosporidium*; bacteria such as *Escherichia coli* and species of *Shigella*, *Salmonella*, *Vibrio*, *Camphylobacter*; and viruses such as Hepatitis A, Adenoviruses, Hepatitis E, Enteroviruses (including Polio-, Echo, and Coxsackie viruses), Rotaviruses, Noroviruses and other Caliciviruses.

-These organisms primarily affect the gastrointestinal system, causing diarrhea, abdominal cramps, nausea, and vomiting with or without fever. Sometimes these illnesses are contracted by ingesting contaminated water, and in some circumstances skin contact could also lead to infection. Most of these illnesses are not usually serious or life threatening except in the elderly, the very young or those who are immune compromised.

-There is also the potential for opportunistic organisms, such as nontuberculous mycobacteria and *Ralstonia pickettii*, to be present in the water which may put immunocompromised or otherwise sick patients at risk.

Making Water Safe

- Tap water is water from the public water supply. Usually this water is safe for drinking, cooking and other domestic uses. Boil advisories or boil orders are issued when the tap water is no longer safe to drink.
- Safe water as referred in this document is ‘water treated’ as follows:
 - Boiled water:
 - Boiling water will inactivate pathogenic microorganisms from the water.
 - How to boil water: Fill a pot with water. Heat the water until bubbles come from the bottom of the pot to the top.
 - Once the water reaches a rolling boil, let it boil for one minute. Turn off the heat source and let the water cool. Make sure that the water is cooled enough to prevent scalding. Pour water into a clean container with a cover for storage.
 - Some people do not like the taste of boiled water. To improve the taste: Pour cooled water back and forth from one clean glass into another to add air to the water. Let the water stand for a few hours. Add a pinch of salt to each quart of boiled water.
 - Freezing will not disinfect water.
 - Bottled water is not sterile, but does not contain any pathogens. There is an expiration date for bottle water. Many manufacturers advise a two-year period for taste, but bottled water can be used indefinitely if stored properly. The International Bottled Water Association advises consumers to store bottled water at room temperature (or cooler), out of direct sunlight and away from solvents and chemicals such as gasoline, paint thinners and dry cleaning chemicals.
 - Disinfected water:
 - Chemical disinfection can also be used, however this may not be as reliable as boiling water for destroying organisms. Chemical disinfection is limited in effectiveness; it is not appropriate for very turbid (muddy) water, or where raw sewage or other fecal matter may be present. In this case, **only use** an alternate source of water.
 - If tap water is cloudy: Filter through a clean cloth until it is clear.
 - If the tap water is clear: Use bleach that does not have an added scent (like lemon). Add 1/8 teaspoon (eight (8) drops) of household liquid bleach to one gallon (16 cups) of water. Mix well and wait 30 minutes or more. Store disinfected water in a clean container with a cover. Drinking this water is safe but may not be pleasant to the taste of many people.
 - To disinfect using iodine, put eight drops of 2% tincture of iodine in one quart of water. Allow the water to stand at least 30 minutes before it is used.

- Chemical disinfection may not be appropriate for vulnerable patients or where raw sewage or cyst (i.e. *Cryptosporidium*) contamination may be present. Chemical disinfection is only marginally effective against *Giardia* and *Cryptosporidium* contamination, and may not be effective when high volumes of solids or suspended matter are present (i.e. sewage contamination).

- **Filtered water:** Boil tap water, even if it is filtered. Most kitchen and other household water filters typically do not remove bacteria or viruses. Filtering through a reverse osmosis filter, with an absolute 1 micron filter or a filter certified under NSF International Standard #53 for either cyst removal or cyst reduction is acceptable, provided these conditions are met and verified.
- **Storing water:** Containers may need to be sanitized before using them to store safe water: Use bleach that does not have an added scent (like lemon). Add one teaspoon (64 drops or five (5) milliliters) of household liquid bleach to one quart (32 ounces, four (4) cups, or about one liter) of water. Pour this into a clean storage container and shake well, making sure that the solution coats the entire inside of the container. Let sit at least 30 seconds, and then pour out solution. Let air dry OR rinse with clean water that has already been made safe, if available. Note: Never mix bleach with ammonia or other cleaners. Open windows and doors to get fresh air when you use bleach.
- **Safe, relatively safe and safest:** Throughout this document, the expressions “relatively safe” and “safest” are going to be used.
 - In most situations, this document will show a safe approach to deal with the issue.
 - In some cases a more simple and feasible approach is called “relatively safe”. This means that the risk of using tap water is not expected to have dire consequences.
 - However, some people will want to take all necessary precautions to be extremely safe no matter what, or how cumbersome the precautions are. These precautions are designated as “safest”.

Home

Beverages

- Use only safe water for coffee maker, ice trays in freezers, and other appliances into which water is poured. Brewing coffee does not provide sufficient heat to make water safe. Use safe water when preparing drinks, such as tea, lemonade, and even for mixed drinks with alcohol.
- Do not use water from any appliance (connected to water lines) such as ice or water dispenser from a refrigerator. Filters usually do not remove or inactivate bacteria or viruses.
- Ice: Do not use ice from ice trays made with tap water before the advisory, ice dispensers, or ice makers. Throw out all ice made with tap water. Make new ice with boiled or bottled water.

Food

- Wash fruits and vegetables with safe water.
- Bring water to a rolling boil for one minute before adding food to cook.
- Wash food preparation surfaces with boiled water, or disinfected water.

Baby feeding:

- Breastfeeding is best. Continue to breastfeed. Any cleaning must be done with safe water.
- If breastfeeding is not an option: Use ready-to-use formula, if possible. Prepare powdered or concentrated formula with safe water (bottled water would be best). Use safe water to wash and sterilize bottles, and nipples before use.

Dishes:

- Dishwashers are safe to use if the water reaches a temperature of at least 160°F, or if the dishwasher has a sanitizing cycle.
- To wash dishes by hand: Wash and rinse the dishes as normal using hot water. In a separate basin, add one teaspoon of unscented household bleach for each gallon of warm water. Soak the rinsed dishes in the water for at least one minute. Let the dishes air dry completely.

Health

- Those that already drank the water most probably will not get sick, but for those who may get sick, the symptoms are similar to food poisoning: nausea, diarrhea, cramps, and possibly a mild fever.
- The most important thing to do is to avoid dehydration. Drink plenty of fluids and avoid drinks with caffeine, such as soda, coffee, and tea. Those that are concerned about their health should contact a health care provider.

Hygiene

- Brushing teeth: It is best to use safe water to teeth. However, when brushing teeth, the amount of water swallowed is much less than when drinking water.
- Washing hands: Use soap and tap water, dry hands then apply hand sanitizer; the safest option is to wash with safe water.
- Shower or bath: Being careful not to swallow any water, one may take a shower safely. Using caution when bathing infants and young children so that no water is swallowed, is considered

fairly safe. A sponge bath reduces the chance of swallowing water. The time spent bathing should be minimized. Children and disabled individuals should have their bath supervised to ensure water is not ingested. Though the risk of illness is minimal, individuals who have recent surgical wounds, are immunosuppressed, or have a chronic illness may want to consider using bottled or boiled water for cleansing until the advisory is lifted. For those who want to be absolutely safe, use safe water.

- Shaving: Use tap water.

- Laundry: It is safe to wash clothes and linens in tap water as long as the clothes are completely dried with heat before being used. However, increased turbidity that sometimes occurs during a boil water event may discolor items.

- Toilets: Use as usual.

Pets and Plants

- Dogs and cats: Many pets are drinking water when they are outside and seldom get sick, so tap water is relatively safe. The safest option is to give them safe water.

- Fish or aquatic pets (e.g., reptiles, frogs) do not usually get infected by the same germs that infect people. If the water system is using more chlorine or changing disinfection, it may be hazardous to change the water in a fish tank or aquarium. Contact a local pet store or veterinarian for more advice.

- It is safe to water garden and house plants.

Health Care Facilities (HCF)

This is a simplified list prepared to help health care facilities deal with issues arising from boil water advisories or orders. These are not enforceable rules. A thorough guide was prepared by the American Water Works Association and the Center for Disease Control and Prevention (CDC) entitled “Emergency Water Supply Planning Guide for Hospitals and Health Care Facilities” (95 pages- <https://www.cdc.gov/healthywater/pdf/emergency/emergency-water-supply-planning-guide.pdf>) to help HCF develop an Emergency Water Supply Plan (EWSP) to prepare for, respond to, and recover from a total or partial interruption of the facilities’ normal water supply.

- Drinking water: Patients, visitors, staff should not drink water from the tap. Use bottled water.
- Water fountains: Do not use water fountains. Place clearly labeled signs on each fountain.
- Coffee machines: Do not put tap water to percolate. Percolating is not sufficient to inactivate all microorganisms. Water must be boiled for two minutes before being put through the machine.
- Hot water taps: Do not use water from hot water taps because the time/temperature is not sufficient to inactivate pathogenic microorganisms.
- Ice machines: Do not use ice machines. Place clearly labeled signs on each machine. Ice from the ice maker may be used **if** it can be positively confirmed that it was **all** made well in advance of the boil water order/notice.
- Brushing teeth /Dentures: Do not brush teeth with tap water. Dentures should not be soaked in tap water.
- Bath for Newborn infants: Do not use tap water to bathe infants. Use bottled water or boiled water that has been cooled. (Make sure that it has been properly cooled.)
- Bath /Shower:
For a precautionary advisory, tap water may be used for patients with healthy immune systems. Use bottled or boiled water for infants, young children and anyone with a weakened immune system. For an advisory with evidence of contamination: do not use tap water for bath or shower.
- Sitz bath:
For a precautionary advisory tap water may be used with addition of an antiseptic for patients with healthy immune systems. Use bottled or boiled water for infants, young children and anyone with a weakened immune system. For an advisory with evidence of contamination, do not use tap water.
- Toilet: there is no restriction or concern about using toilets.
- Wound care: Do not use tap water.
- Eye care: Use normal saline.
- Handwashing (Staff):
If hands are not soiled, use hand sanitizers. Hand sanitizers are not effective if hands are wet or visibly soiled.
If hands are wet, dry them before applying hand sanitizers.
If hands are visibly soiled, wash them preferably with boiled water or disposable wipes. Once dry, use hand sanitizers.
- Humidifiers and other equipment using water: Use boiled or bottled water.
- Laundry, environmental cleaning (e.g. floors): Tap water may be used.
- Equipment/Carts should not be cleaned with tap water. Use disinfectant solutions.
- Any instrument /equipment connected to the plumbing system should not be used.

- Food preparation: Use boiled water or bottled water to wash fruits or vegetables, and for all food & drink preparation

Consider changing the menu to remove items that are difficult to prepare with limited water

- Add menu items that require little or no water for preparation
- Change food sources, switch to pre-washed produce, canned vegetables, and bottled drinks
- Use single-service tableware
- Discontinue use of post-mix beverage equipment
- Make sure all staff, on all shifts, understand and implement all needed protective measures

- Employees with diarrheal illness should be regulated by standard rules of exclusion from work.

- Monitor patients closely for signs and symptoms of gastrointestinal illness.

- Restrict burn patients and patients with open sores or wounds from whirlpool treatments.

Use Boil Order Advisory on ...to remind the potential users.	Boil Order Advisory Do not drink water From this fountain	Boil Order Advisory Do not use ice machine	Boil Order Advisory Use boiled or bottled water for this coffee machine
Signed to be removed only by maintenance staff Date __/__/__			

When an advisory is canceled, flush the water lines: Flushing of waterlines is necessary to reduce residual microbial contamination. All incoming waterlines from the public water system inside the facility (e.g., faucets, waterlines, and equipment) should be flushed. No consensus exists regarding the optimal duration for flushing procedures after cancellation of the advisory; recommendations range from one to five minutes.

Actions to Take in Dental Offices

The Centers for Disease Control and Prevention (CDC) has been asked by the American Dental Association (ADA), state and local health departments, and local water regulators to provide guidance and scientific information regarding the risk of contamination from cross-connections from the dental operative unit.

The dental operative unit is a medical device at each dental chair through which water and compressed air flow during dental procedures. Cross-connections are the links through which contaminated materials may enter a potable water supply system when the pressure of the polluted source exceeds the pressure of the potable source (e.g., during a water main break).

- Equipment: Water should not be delivered to patients through the dental unit, ultrasonic scaler, or other dental equipment that uses the public water system. This restriction does not apply if the water source is isolated from the municipal water system (e.g., a separate water reservoir or other water treatment device cleared for marketing by the Food and Drug Administration [FDA]).
- Patients should rinse with bottled or distilled water until the boil-water advisory has been cancelled. During these advisory periods, tap water should not be used to dilute germicides or for hand hygiene unless the water has been brought to a rolling boil for more than one minute and cooled before use.
- For hand hygiene, antimicrobial products that do not require water (e.g., alcohol-based hand rubs) can be used until the boil-water notice is cancelled. If hands are visibly contaminated, bottled water and soap should be used for handwashing; if bottled water is not immediately available, an antiseptic towelette should be used.
- After the incoming public water system lines are flushed, dental unit waterlines should be disinfected according to the manufacturer's instructions

Alternatives

Because water from the affected public system should not be delivered to the patient during a boil-water advisory, many dental procedures cannot be performed. Alternative water sources, such as separate water reservoirs that have been cleared for marketing by the FDA, can be used. However, if the alternative water source were to flow through a dental operative unit previously connected to the affected public water supply, the dental operative unit water lines should first be flushed and disinfected according to the manufacturer's instructions.

Dialysis Units

Regulations of the U.S. Department of Health and Human Services, Centralized Medicaid and Medicare System (CMS) require that dialysis units be supplied a very high quality water that meets the standards set by the Association for Advancement of Medical Instrumentation (AAMI).

A dialysis center equipped with a supplemental water treatment system that meets the AAMI water quality standards, and operated in full conformance with the CMS regulations, should be able to continue treating patients without the need for boiling or other supplemental disinfection. To help ensure that these standards are met, it is recommended that the supplemental water treatment system be run and maintained by an operator Certified in Biomedical Nephrology Technology (CBNT) by the National Nephrology Certification Organization (NNCO). Additionally, an operator should be aware of the boil-water event so that the operations of the supplemental system can be closely watched and adjusted, if needed, to maintain AAMI quality water during the boil-water event.

Dialysis treatment should be discontinued if there is any doubt whether your system is in full compliance with the AAMI water quality standards and the applicable CMS regulations. If providing dialysis treatment is interrupted as a result of potential water quality concerns, ensure that all patients receive their needed treatment at an alternative location. Since few (if any) dialysis facilities provide water that is treated to AAMI standards to their sinks, fountains, hot water tanks, etc., the same precautions appropriate for other medical facilities to control potential exposures to patients, the public, and staff should be taken.

See <http://www.aami.org/productspublications/ProductDetail.aspx?ItemNumber=920>.

AAMI Dialysis Standards Collection

No dialysis professional, facility, or manufacturer of dialysis equipment or products should be without the complete collection of current dialysis standards from AAMI.

Just updated, the 2015 edition incorporates six new dialysis standards.

- ANSI/AAMI/ISO 11663, *Quality of dialysis fluid for hemodialysis and related therapies*
- ANSI/AAMI/ISO 13958, *Concentrates for hemodialysis and related therapies*
- ANSI/AAMI/ISO 13959, *Water for hemodialysis and related therapies*
- ANSI/AAMI/ISO 23500, *Guidance for the preparation and quality management of fluids for hemodialysis and related therapies*
- ANSI/AAMI/ISO 26722, *Water treatment equipment for hemodialysis applications and related therapies*
- AAMI TIR58, *Water testing methodologies*



Other Units Possibly Affected

This depends on the equipment, infrastructure, procedures, and infection control measures employed by the facility. Some other processes and equipment with possible water borne microorganism concerns include: bronchoscopy and instrument reprocessing, potable water ingestion prior to sputum specimen collection, endoscope reprocessors and rinse water, decorative fountains, contaminated solutions and disinfectants, distilled water, nebulizers, water baths, ventilator temperature probes, vaporizers, humidifiers, hydrotherapy tanks, aerosols from showers or cleaning, ice and ice machines, ice baths for thermolysis catheters, eye wash stations, mist tents, vacuum suction equipment, deionized water and holy water.