

## **ICE MACHINES and ICE**

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**Recommendations of Centers for Disease Control and Prevention (CDC), and the Healthcare Infection Control Practices Advisory Committee (HICPAC)**  
[http://www.cdc.gov/hicpac/pdf/guidelines/eic\\_in\\_HCF\\_03.pdf](http://www.cdc.gov/hicpac/pdf/guidelines/eic_in_HCF_03.pdf)

Microorganisms may be present in ice, ice-storage chests and ice-making machines. The two main sources of microorganisms in ice are the potable water from which it is made and a transferral of organisms from hands.

**Ice from contaminated ice machines has been associated with patient colonization, blood stream infections, pulmonary and gastrointestinal illnesses, and pseudoinfections.** Microorganisms in ice can secondarily contaminate clinical specimens and medical solutions that require cold temperatures for either transport or holding. An outbreak of surgical site infections was interrupted when sterile ice was used in place of tap water ice to cool cardioplegia solutions.

**Ice machines in health-care settings are no more heavily contaminated compared with ice machines in the community.** In a study comparing the microbial populations of hospital ice machines with organisms recovered from ice samples gathered from the community, samples from 27 hospital ice machines yielded low numbers (<10 CFU/mL) of several potentially opportunistic microorganisms, mainly gram-negative bacilli. During the survey period, no health-care-associated infections were attributed to the use of ice. Ice from community sources had higher levels of microbial contamination (75% - 95% of 194 samples had total heterotrophic plate counts <500 CFU/mL, with the proportion of positive cultures dependent on the incubation temperature), and showed evidence of fecal contamination from the source water. Thus, ice machines in health-care settings are no more heavily contaminated compared with ice machines in the community. If the source water for ice in a health-care facility is not fecally contaminated, then ice from clean ice machines and chests should pose no increased hazard for immunocompetent patients.

**Some waterborne bacteria found in ice could potentially be a risk to immunocompromised patients** if they consume ice or drink beverages with ice. For example, *Burkholderia cepacia* in ice could present an infection risk for cystic fibrosis patients. Therefore, protecting immunosuppressed and otherwise medically at-risk patients from exposure to tap water and ice potentially contaminated with opportunistic pathogens is prudent.

**No microbiologic standards for ice, ice-making machines, or ice storage equipment** have been established, although several investigators have suggested the need for such standards. Culturing of ice machines is not routinely recommended, but it may be useful as part of an epidemiologic investigation. Sampling might also help determine the best schedule for cleaning open ice-storage chests.

**Recommendations for a regular program of maintenance and disinfection have been published.**

Health-care facilities are advised to clean ice-storage chests on a regular basis. Open ice chests may require a more frequent cleaning schedule compared with chests that have covers. Portable ice chests and containers require cleaning and low-level disinfection before the addition of ice intended for consumption. Ice-making machines may require less frequent cleaning, but their maintenance is important to proper performance. The manufacturer's instructions for both the proper method of cleaning and/or maintenance should be followed. These instructions may also recommend an EPA-registered disinfectant to ensure chemical potency, materials compatibility, and safety. In the event that instructions and suitable EPA-registered disinfectants are not available for this process, then a generic approach to cleaning, disinfecting, and maintaining ice machines and dispensers can be used:

**General steps for cleaning, maintaining ice machines, dispensers, & storage chests**

- 1. Disconnect unit from power supply.**
- 2. Remove and discard ice from bin or storage chest.**
- 3. Allow unit to warm to room temperature.**
- 4. Disassemble removable parts of machine that make contact with water to make ice.**
- 5. Thoroughly clean machine and parts with water and detergent.**
- 6. Dry external surfaces of removable parts before reassembling.**
- 7. Check for any needed repair.**
- 8. Replace feeder lines, as appropriate (e.g., when damaged, old, or difficult to clean).**
- 9. Ensure presence of an air space in tubing leading from water inlet into water distribution system of machine.**
- 10. Inspect for rodent or insect infestations under the unit and treat, as needed.**
- 11. Check door gaskets (open compartment models) for evidence of leakage or dripping into the storage chest.**
- 12. Clean the ice-storage chest or bin with fresh water and detergent; rinse with fresh tap water.**
- 13. Sanitize machine by circulating a 50-100 parts per million (ppm) solution of sodium hypochlorite (i.e., 4-8 mL sodium hypochlorite/gallon of water) through the ice-making and storage systems for 2 hours (100 ppm solution), or 4 hours (50 ppm solution).**
- 14. Drain sodium hypochlorite solutions and flush with fresh tap water.**
- 15. Allow all surfaces of equipment to dry before returning to service.**

Ice and ice-making machines also may be contaminated via improper storage or handling of ice by patients and/or staff. Suggested steps to avoid this means of contamination include:

- a) minimizing or avoiding direct hand contact with ice intended for consumption
- b) using a hard-surface scoop to dispense ice
- c) installing machines that dispense ice directly into portable containers at the touch of a control.