

# Guidelines on the Use of Disinfectants

As of 2011/10/31

## 1. Disinfection guidelines

### 1.1 Surfaces and items to disinfect

Floors, door knobs, window handles, buttons, switches, furniture surfaces, telephones, intercoms, trash cans, sinks, toilets, bath tubs, faucets, shower heads, floor drains, ventilators, computers, keyboards, fans, etc.

### 1.2 Tools and equipment

Alcohol or bleach (0.05% sodium hypochlorite), towels, rubber gloves and masks.

### 1.3 Disinfection procedures

1.3.1 Start with wiping clean the less soiled surfaces.

1.3.2 Towels should be soaked in bleach before use.

1.3.3 Rinse articles and surfaces with water and wipe dry ten minutes after disinfection.

1.3.4 Diluted bleach can be used to disinfect toilets.

1.3.5 Do not flush large amounts or highly concentrated bleach down the toilet to keep sewage treatment plant running smoothly.

1.3.6 Wear a mask and rubber gloves while using bleach.

(The text below is extracted from the 2007 WHO Interim Guidelines for Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care)

## 2. Alcohol

Alcohol is effective against influenza virus. Ethyl alcohol (70%) is a powerful broad-spectrum germicide and is considered generally superior to isopropyl alcohol. Alcohol is often used to disinfect small surfaces (e.g. rubber stoppers of multiple-dose

medication vials, and thermometers) and occasionally external surfaces of equipment (e.g. stethoscopes and ventilators). Because alcohol is flammable, its use as a surface disinfectant should be limited to small surface areas and it should be used in well-ventilated spaces only. Alcohol may also cause discoloration, swelling, hardening, and cracking of rubber and certain plastics after prolonged and repeated use. Most drugstore ethyl alcohol is 95% by volume. Dilute 95% alcohol using distilled or cooled boiled water to 70-75% concentrations. Use 3 parts 95% alcohol to 1 part water to make 71.25% alcohol.

### **3. Sodium hypochlorite (bleach)**

Bleach is a strong and effective disinfectant, but it is readily inactivated in the presence of organic material. Its active ingredient, sodium hypochlorite, is effective in killing bacteria, fungi and viruses, including influenza virus. Diluted household bleach disinfects within 10–60 minutes contact time (see the table below for concentrations and contact times), is widely available at a low cost, and may be recommended for surface disinfection in healthcare facilities. However, bleach irritates mucous membranes, the skin and the airways, decomposes under heat and light, and reacts readily with other chemicals. Therefore, caution is advised when bleach is used. Ventilation should be adequate and consistent with relevant occupational health and safety guidance. Improper use of bleach, including deviation from recommended dilutions (either stronger or weaker), may reduce its effectiveness for disinfection and can result in injury.

### **4. Procedures for preparing/using diluted bleach**

- 4.1 Use a mask, rubber gloves, and waterproof apron. Goggles also are recommended to protect the eyes from splashes.
- 4.2 Mix and use bleach solutions in well-ventilated areas.
- 4.3 Mix bleach with cold water because hot water decomposes the sodium hypochlorite and renders it ineffective.

4.4 Bleach containing 5% sodium hypochlorite should be diluted as shown in the table below.

**Sodium hypochlorite: concentration and use:**

Starting solution	Most household bleach solutions contain 5% sodium hypochlorite (50,000 ppm* available chlorine)
Recommended dilution	<p>1:100 dilution of 5% sodium hypochlorite is the usual recommendation. Use 1 part bleach to 99 parts cold tap water (1:100 dilution) for disinfection of surfaces.</p> <p>Adjust ratio of bleach to water as needed to achieve appropriate concentration of sodium hypochlorite, e.g. for bleach preparations containing 2.5% sodium hypochlorite, use twice as much bleach (i.e. 2 parts bleach to 98 parts water).</p>
Available chlorine after dilution	<p>For bleach preparations containing 5% sodium hypochlorite, a 1:100 dilution will yield 0.05% or 500 ppm available chlorine.</p> <p>Bleach solutions containing other concentrations of sodium hypochlorite will contain different amounts of available chlorine when diluted.</p>
<p>Contact times for different uses</p> <ul style="list-style-type: none"> <li>▪ Disinfection by <u>wiping</u> of</li> </ul>	<ul style="list-style-type: none"> <li>▪ Disinfection by <u>wiping</u> of nonporous surfaces:</li> </ul>

<p>nonporous surfaces</p> <ul style="list-style-type: none"> <li>▪ Disinfection by <u>immersion</u> of items.</li> </ul> <p>N.B. Surfaces must be cleaned of organic materials, such as secretions, mucus, vomit, feces, blood, or other body fluids before disinfection or immersion.</p>	<p>a contact time of <math>\geq 10</math> min is recommended.</p> <ul style="list-style-type: none"> <li>▪ Disinfection by <u>immersion</u> of items: a contact time of 30 min is recommended</li> </ul>
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\*ppm : parts per million

## 5. Precautions for the use of bleach

- 5.1 Bleach can corrode metals and damage painted surfaces.
- 5.2 Avoid touching the eyes. If bleach gets into the eyes, immediately rinse with water for at least 15 minutes, and consult a physician.
- 5.3 Bleach should not be used together with, or mixed with, other household detergents because this reduces its effectiveness and can cause chemical reactions.
- 5.4 A toxic gas is produced when bleach is mixed with acidic detergents, such as those used for toilet cleaning, and this gas can cause death or injury. If necessary, use detergents first, and rinse thoroughly with water before using bleach for disinfection.
- 5.5 Undiluted bleach liberates a toxic gas when exposed to sunlight and should be stored in a cool, shaded place, out of the reach of children.
- 5.6 Sodium hypochlorite decomposes with time. To ensure its effectiveness, purchase recently-produced bleach, and avoid over-stocking.
- 5.7 Diluted bleach should be made fresh daily, labeled, dated, and unused portions

discarded 24 hours after preparation.

- 5.8 Organic materials inactivate bleach; surfaces must be cleaned of organic materials before disinfection with bleach.
- 5.9 Keep diluted bleach covered, protected from sunlight, in a dark container (if possible), and out of the reach of children.