

Annex G Use of disinfectants: alcohol and bleach

Different countries have different [disinfection](#) protocols. Health-care facilities with limited resources may not have access to a variety of hospital disinfectants, however, alcohol and bleach are acceptable chemical disinfectants if used appropriately. As with any other disinfectants, soiled surfaces need to be cleaned with water and detergent first.

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G.1. Alcohol

Alcohol is effective against influenza virus ([252](#)). 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). Since alcohol is flammable, limit its use as a surface disinfectant to small surface-areas and use it in well-ventilated spaces only. Prolonged and repeated use of alcohol as a disinfectant can also cause discoloration, swelling, hardening and cracking of rubber and certain plastics.

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G.2. Bleach

Bleach is a strong and effective disinfectant – its active ingredient sodium hypochlorite is effective in killing bacteria, fungi and viruses, including influenza virus – but it is easily inactivated by organic material. Diluted household bleach disinfects within 10–60 minutes contact time (see [Table G.1](#) below for concentrations and contact times), is widely available at a low cost, and is recommended for surface [disinfection](#) in health-care facilities. However, bleach irritates mucous membranes, the skin and the airways; decomposes under heat and light; and reacts easily with other chemicals. Therefore, bleach should be used with caution; 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 injure health-care workers.

Table G.1 Sodium hypochlorite: concentration and use
Starting solution Most household bleach solutions contain 5% sodium hypochlorite (50 000 ppm available)
Recommended dilution 1:100 dilution of 5% sodium hypochlorite is the usual recommendation. Use 1 part bleach water (1:100 dilution) for disinfection of surfaces. Adjust ratio of bleach to water as needed to achieve appropriate concentration of sodium hypochlorite. For bleach preparations containing 2.5% sodium hypochlorite, use twice as much bleach (i.e. 1:50 dilution).
Available chlorine after dilution For bleach preparations containing 5% sodium hypochlorite, a 1:100 dilution will yield 1 available chlorine. Bleach solutions containing other concentration of sodium hypochlorite will contain different available chlorine when diluted.
Contact times for different uses

Table G.1

Sodium hypochlorite: concentration and use.

Procedures for preparing and using diluted bleach

To prepare and use diluted bleach:

- use a mask, rubber gloves and waterproof apron; goggles also are recommended to protect the eyes from splashes;
- mix and use bleach solutions in well-ventilated areas;
- mix bleach with cold water (hot water decomposes the sodium hypochlorite and renders it ineffective);
- if using bleach containing 5% sodium hypochlorite, dilute it to 0.05%, as shown in [Table G.1](#) below.

Precautions for the use of bleach

- Bleach can corrode metals and damage painted surfaces.
- Avoid touching the eyes. If bleach gets into the eyes, immediately rinse with water for at least 15 minutes, and consult a physician.
- Do not use bleach together with other household detergents, because this reduces its effectiveness and can cause dangerous chemical reactions. For example, 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](#).
- **Undiluted bleach emits a toxic gas when exposed to sunlight; thus, store bleach in a cool, shaded place, out of the reach of children.**

- Sodium hypochlorite decomposes with time. To ensure its effectiveness, purchase recently produced bleach, and avoid overstocking.
- If using diluted bleach, prepare the diluted solution fresh daily. Label and date it, and discard unused mixtures 24 hours after preparation.
- Organic materials inactivate bleach; clean surfaces so that they are clear of organic materials before disinfection with bleach.
- Keep diluted bleach covered and protected from sunlight, and if possible in a dark container, and out of the reach of children.

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