

Decontamination during emergencies response

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Choosing decontamination

Many decontamination options



What is the best?
Why?



Chlorine

□ How can the proper use of chlorine solutions help protect me?

- Chlorine can inactivate the virus on personal protective equipment (PPE) or other surfaces, reducing the risk of healthcare worker infection

□ How should those concentrations be made?

- Clean water is used to dissolve powdered or tablet chlorine or to dilute liquid bleach in specified concentrations
- Label solutions accordingly

From: Preparing Healthcare Workers to Work in Ebola Treatment Units (ETUs) in Africa
Centers for Disease Control and Prevention (CDC), Médecins Sans Frontières (MSF), and World Health Organization (WHO).

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Bleach, sodium hypochlorite (NaClO)

Usually sold as a diluted solution between 2–8%



Calcium hypochlorite $\text{Ca}(\text{ClO})_2$ or “HTH”

Powder form

Relatively stable



Purification tablets, sodium dichloro-isocyanurate (NaDCC)

Tablets can come in varying strengths



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REMEMBER!!!

Chlorine degrades after preparation: chlorine solutions must be daily prepared or, if information are available, according to manufacturing instructions

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□ Limitations

- Chlorine solutions will be much less effective on grossly contaminated surfaces
 - Organic material must be reduced to improve disinfection effectiveness
- Strength of chlorine solutions can degrade over time, especially in hot climates
 - Use fresh chlorine products to make dilutions, i.e. , <3 months old (bleach, HTH, tablets)
 - Properly store chlorine (no heat, light, humidity)
 - Test locally acquired products or use verified imported products
 - Prepare diluted chlorine solutions daily
 - Label all chlorine solutions with strength of solution (0.5%, 0.05%)

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Concentrations of Chlorine Solutions

- 0.5% - most non-living items
 - Corpses, surfaces, vomit, diarrhea, blood, gloved hands
- 0.05% - living tissue and sensitive materials
 - Bare hands, face, and other exposed skin, linens (scrubs), thermometers, plates/cups/eating utensils used by patients and remaining in high-risk zone

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Chlorine preparation

- **Using Liquid Bleach (~5% Chlorine)**

$$\frac{\% \text{ chlorine in liquid bleach}}{\% \text{ chlorine desired}} - 1 = \text{Total parts of water for each part bleach}$$

Example: To make a 0.5% chlorine solution from 5.0% bleach:

$$\frac{5.0\%}{0.5\%} - 1 = 9 \text{ parts water for each part bleach}$$

- **Using Powdered Chlorine (bleach powder, HTH)**

$$\frac{\% \text{ chlorine desired}}{\% \text{ chlorine in powder}} * 1000 = \text{Grams of powder for each liter of water}$$

Example: To make a 0.5% chlorine solution from powder containing 35% active chlorine:

$$\frac{0.5\%}{35\%} * 1000 = 14.3 \text{ grams of powder in each liter of water}$$

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Chlorine preparation

A 1:10 solution has 9 parts water and 1 part bleach



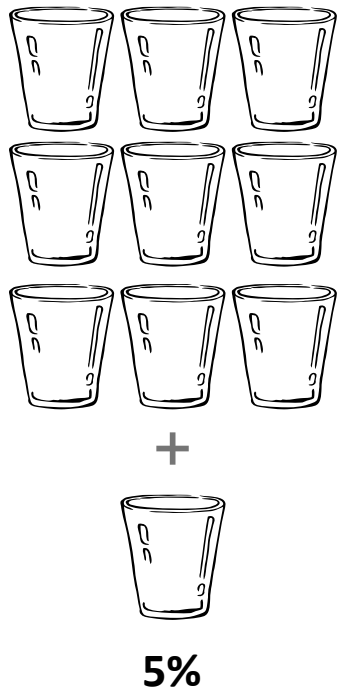
Mark inside the container to show where 9 parts of water should be



Mark the level when bleach is added

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Chlorine preparation



9 parts water



0.5%

1 part bleach



9 parts water



0.05%

1 part 1:10 bleach

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Chlorine uses



Chlorine Solution	Recommended Uses as Disinfectant
0.5% (5.000 ppm or 1:10)	<ul style="list-style-type: none"> • Surfaces or objects contaminated with blood or other body fluids (let stand on object/surface for 15 minutes) • Toilets and bathroom (let stand on surface for 15 minutes) • Soiled linens (soak fully immersed in solution for 10-15 minutes) • Mattress covers (let stand on objects/surface for 15 minutes) • Corpses (wipe body bag and coffin with disinfectant) • Gloved hands, aprons, and goggles when removing PPE • Footbaths • Layer packaging when transporting blood samples (spray each layer before packing into next) <p>Note: This is a strong, caustic solution. Avoid direct contact with skin and eyes.</p>
0.05% (500 ppm or 1:100)	<ul style="list-style-type: none"> • Everyday cleaning of surfaces and floors • Hand-washing for bare hands and skin • Medical equipment, including thermometers • Patient bedding and clothing (soak for 30 minutes) • Plates, cups, and eating utensils • Contaminated waste for disposal



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Incineration

Burn all the items that are not likely to be reused



WASTE, NOT INSTRUMENTS, BEDS OR SIMILAR!

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Any Questions?

THANK YOU FOR YOUR ATTENTION

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