

Disinfecting and Sanitizing with Bleach

Guidelines for Mixing Bleach Solutions for Child Care and Similar Environments

Preparation Tips

- **Prepare** a fresh bleach solution each day in a well-ventilated area that is separate from children.
- **Label** bottles of bleach solution with contents, ratio and date mixed.
- **Use cool water. Always add** bleach to cool water, **NOT** water to bleach.
- **Wear** gloves and eye protection.
- **Prepare** solution in an area with an eye wash.

Disinfecting Solutions

For use on diaper change tables, hand washing sinks, bathrooms (including toilet bowls, toilet seats, training rings, soap dispensers, potty chairs), door and cabinet handles, etc.

Water	Bleach Strength* 2.75%	Bleach Strength* 5.25-6.25%	Bleach Strength* 8.25%
1 Gallon	1/3 Cup, plus 1 Tablespoon	3 Tablespoons	2 Tablespoons
1 Quart	1 1/2 Tablespoons	2 1/4 Teaspoons	1 1/2 Teaspoons

Sanitizing Solutions

For use on eating utensils, food use contact surfaces, mixed use tables, high chair trays, crib frames and mattresses, toys, pacifiers, floors, sleep mats, etc.

1 Gallon	1 Tablespoon	2 Teaspoons	1 Teaspoon
1 Quart	1 Teaspoon	1/2 Teaspoon	1/4 Teaspoon

Disinfection of non-porous non-food contact surfaces can be achieved with 600 parts per million (ppm) of chlorine bleach. To make measuring easier, the strengths listed in this table represent approximately 600-800 ppm of bleach for disinfecting, and approximately 100 ppm for sanitizing. Chlorine test strips with a measuring range of 0-800 ppm or higher can also be used to determine the strength of the solution.

Contact your local health jurisdiction for further instructions on cleaning and disinfecting if specific disease or organisms are identified as causing illness in your program.

***Use only plain unscented bleach** that lists the percent (%) strength on the manufacturer's label. Read the label on the bleach bottle to determine the bleach strength. For example, Sodium Hypochlorite...6.25% or 8.25%.

Steps to Follow

- **Clean** the surface with soap and water before disinfecting or sanitizing.
- **Rinse** with clean water and dry with paper towel.
- **Apply** chlorine bleach and water solution to the entire area to be disinfected or sanitized.
- **Air dry** for at least 2 minutes.

This chart was created by the Disinfection Workgroup led by the Washington State Department of Health. Workgroup members consist of staff from the Department of Early Learning, Snohomish Health District, Local Hazardous Waste Management Program in King County, Washington State Department of Ecology, the Coalition for Safety and Health in Early Learning, and the Washington State Department of Health.

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Chlorine Bleach Disinfecting and Sanitizing Chart Companion Document

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Background: Sodium hypochlorite is the active ingredient in household bleach or chlorine bleach. It is economical, and is an effective disinfectant with a broad spectrum of antimicrobial activity. It has been the primary disinfectant used in early learning programs in Washington State for more than 30 years. During this time, most household chlorine bleach was available at strengths of 5.25-6.25%. The recommended concentration for disinfection has been 600-800 ppm of chlorine bleach and 50 to 200 parts per million (ppm) for sanitizing.

In 2012, some manufacturers changed their chlorine bleach formulation to a strength of 8.25% with a registered non-food contact surface disinfection level of 2400 ppm, the level often used in hospitals. Their sanitizing level is 200 ppm, the upper end of the range allowed by the Food and Drug Administration (FDA).

Problem: As of 2014, the most available household chlorine bleach used for disinfection in children's programs in many areas of Washington State is at a strength of 8.25%. Instructions for use of these products and other strength bleaches indicate 2400 ppm of chlorine bleach is needed for disinfection. This represents 3 to 4 times the levels previously recommended for Washington's child cares. This issue has raised the question of what guidance to give child care providers regarding the concentration of disinfection and sanitizing solutions for use in their programs.

Discussion: It is prudent to use as few chemicals as possible in a child's environment. We believe 2400 ppm is too strong to use in children's environments when they are present, especially since children's lungs are still developing, and are more vulnerable to exposures to toxic chemicals.

The U.S. Environmental Protection Agency (EPA) (2014) guidelines contain procedures for testing, and test organisms that products must be able to destroy at 99.9% in order to be labeled as disinfectants and receive EPA's approval. The Disinfection Workgroup found several products that received EPA approval for disinfection at a strength of 600 ppm. For example:

Name of Product	Strength of Sodium Hypochlorite	EPA's Approval date
Aqua Guard Bleach	12.5%	August 4, 2014
Clorox Ultra Bleach	6.15%	August 29, 2012
KA Steel	12.5%	February 25, 2014
KIK International –Pure Bright Disinfectant Bleach	5.25%	January 13, 2014
So White Brand Bleach and Disinfectant	5.25%	July 11, 2013
Vertex	5.25%	February 12, 2014

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Based on the information contained herein, careful review of the literature and correspondence with EPA, the Disinfection Workgroup recommends staying as close as possible to a 600 ppm disinfection level for general non-food contact surface disinfection.

A thorough review of evidence-based literature has shown that 600 ppm to be an effective disinfectant when used appropriately. The literature suggests that there are key advantages to using lower strength chlorine bleach as a disinfectant (CDC, 2009). Chlorine bleach:

- Does not leave a toxic residue that requires rinsing in children's areas.
- Is unaffected by water hardness.
- Is inexpensive and fast acting.

The Disinfection Workgroup created a chart titled *Disinfecting and Sanitizing with Bleach: Guidelines for Mixing Bleach Solutions for Child Care and Similar Environments* that lists recipes for creating disinfection and sanitizing solutions for the most common concentrations of chlorine bleach currently on the market. The chart uses a disinfection level of 600-800 ppm, and a sanitizing level at approximately 100 ppm. The chart also reminds providers to check with their local health department when disease or pathogenic organisms are present that require a higher level of disinfection to kill. For example, a norovirus outbreak, or dealing with a child with *Clostridium difficile*.

How to Determine Chlorine Bleach strength:

- Read the fine print on the label.
- The active ingredients may be listed on the back or front of the container's label, and listed in a similar manner to the example below showing the strength or percent of chlorine in a container of 8.25% bleach.

Active Ingredients	
Sodium Hypochlorite...	8.25%
Other ingredients.....	91.75%
Total.....	100%

References

Centers for Disease Control and Prevention (CDC). (2009, December 29). Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008. Retrieved from

http://www.cdc.gov/hicpac/disinfection_sterilization/6_0disinfection.html.

Environmental Protection Agency (EPA). (2014, June 12). Pesticides: Regulating Pesticides – Antimicrobial Policy & Guidance Documents. Retrieved from

<http://www.epa.gov/oppad001/regpolicy.htm>.

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