Bleach Exposure in Child Care Settings: Strategies for Elimination or Reduction
Outline

- Work-Related & Childhood Asthma
- Asthma Basics
- Infection Control
- Options for Maintaining Compliance with CA CCL Regulations
- What You Can Do
Work Related Asthma (WRA)

Asthma that is newly developed or worsens (is exacerbated) from exposures at work.

- People who never had asthma can develop respiratory symptoms from small amounts of chemicals in cleaning products such as bleach.

- On-the-job exposures may result in lifetime breathing problems or asthma.

- Importance: child care workers spray bleach frequently throughout the day.
Who is at risk for asthma in child care settings?
WRA Studies

WRA associated with exposure to bleach\(^1\)
- Statewide: 60% new-onset asthma

WRA associated with exposure to cleaning products\(^2\)
- Statewide: 10% WRA cases
- Nationwide: 72% new-onset asthma

In educational settings\(^3\)
- Cleaning staff are at the highest risk
- Potentially at risk:
  - Teachers and teachers’ aides

\(^1\) Unpublished Data, 1993-present, California Department of Public Health, Occupational Health Branch, Work-related Asthma Prevention Program
\(^2\) Rosenman KD, et al. 2003
\(^3\) Mazurek JM, et al 2008
Childhood Asthma

Cleaning products = environmental triggers
- children have a higher breathing rate than adults
- lungs are still developing

Asthma is
- leading chronic illness among children and youth in US
- leading cause of children’s hospitalizations
- one of the leading causes of school absenteeism

In San Francisco*
- 26.2% of children aged 5-17 years old diagnosed with asthma

Bleach is widely used in child care settings to meet Child Care Licensing Regulations for infection control.

Trade-offs for infection control in child care:
- Bleach has been associated with work-related asthma.
- Child care workers and children in their care are exposed to a known risk factor for asthma frequently throughout the day on a daily basis.
Signs of Asthma

Physical Symptoms: Warning Signs

- Coughing
- Wheezing
- Trouble breathing
- Long-lasting head colds
- Dry itchy skin, rash, or eczema

- Loss of appetite
- Stomach ache
- Cranky and tired
- Not sleeping well
- Playing less than usual
- Difficulty feeding (poor sucking, grunting sounds)
Triggers of Asthma

- Pets
- Pests
- Pollen
- Mold and mildew
- House dust
- Wood smoke/tobacco smoke
- Some cleaning products
  - Chemical content
  - Aerosol Sprays
  - Fragrances
- Perfumes
- Weather changes
Infection Control
<table>
<thead>
<tr>
<th>Classroom</th>
<th>Surface</th>
<th>How Often</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Disinfect</strong></td>
<td>Infant/Toddler Classrooms:</td>
<td>* After each use</td>
</tr>
<tr>
<td>Hard Non Porous, Non-Food Contact Surfaces</td>
<td>✓ Diaper Changing Areas *</td>
<td>** After each use if soiled</td>
</tr>
<tr>
<td></td>
<td>✓ Potty Training Chairs *</td>
<td>*** Daily</td>
</tr>
<tr>
<td></td>
<td>✓ Napping Equipment ****</td>
<td>**** Weekly</td>
</tr>
<tr>
<td></td>
<td>✓ Mouthed Objects (Including Toys) ***</td>
<td></td>
</tr>
<tr>
<td>Infant/Toddler/Classrooms with Mildly Ill Children:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Sinks **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Floors ***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Walls/Partitions ****</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sanitize</strong></td>
<td>All Classrooms:</td>
<td>* After each use</td>
</tr>
<tr>
<td>Food Contact Surfaces</td>
<td>✓ Snack/Meal Table *</td>
<td>*** Daily</td>
</tr>
<tr>
<td></td>
<td>✓ High Chairs *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Dishes/Utensils, Cups *</td>
<td></td>
</tr>
<tr>
<td><strong>Sanitize</strong></td>
<td>Infant/Toddler Classrooms:</td>
<td></td>
</tr>
<tr>
<td>Non- Food Contact Surfaces</td>
<td>✓ Disposable diaper containers ***</td>
<td></td>
</tr>
</tbody>
</table>
Why sanitize and disinfect?

• Infection Control
• Reduce the spread of infectious diseases
• Infectious people may be asymptomatic
Transmission of Infectious Diseases

- Coughing
- Sneezing
- Direct skin-to-skin contact
- Touching a contaminated object or surface
Delivery of Infectious Diseases

Human waste
- Urine
- Feces

Body fluids
- Saliva
- Blood
- Nasal Discharge
- Eye Discharge
- Injury or Tissue Discharge
Products Used in Child Care to Maintain Infection Control
Common Products Used in Child Care
and Potential Health Risks

**Active Ingredients**

- **Quaternary Ammonia Compounds**
  - Development and exacerbation of asthma

- **Ethylene Glycol Butyl Ether (2-Butoxyethanol)**
  - Cancer
  - Liver damage/cancer
  - Red blood cell damage resulting in anemia
  - Impaired fertility
  - Toxic for reproduction and development
Thymol

- Thymol has been added to the list of **asthmagens (known to cause or exacerbate asthma)**, maintained by the Association of Occupational and Environmental Clinics, as of 12/2010

Products containing thymol:
- Seventh Generation Multi-Surface Disinfectant
- Benefect® Botanical Disinfectant
- Sol-U-Guard Botanical® (Melaleuca)
No additional benefits using antibacterial soap containing triclosan.

May enable the spread of antibiotic-resistant bacteria.

May mimic hormones resulting in
1) reproductive harm
2) developmental effects on the nervous and endocrine systems.
Most Widely Used Product in Child Care: Bleach

Causes IRREVERSIBLE Eye Damage & Skin Burns
Top Three Concerns About Bleach

1) Irritates the skin and nose and makes providers feel allergic

2) Gives providers headaches

3) Damages clothing
Options to Maintain Compliance with Sanitizing and Disinfecting Regulations
Sanitizing and Disinfecting

**Sanitize**
- Reduce microorganisms
  - Kill rate: 99.9%
- Snack/Meal Tables
- High Chairs
- Dishes/Utensils
- Cups

**Disinfect**
- Destroy/Inactivate microorganisms
  - Kill rate: 99.99%
- Diaper Changing Tables
- Potty Chairs/Toilets
- Sinks
- Floors
- Walls/Partitions
- Cribs and Cots
Option 1: Use Bleach-Free Sanitizers and Disinfectants
Are Bleach-Free Products Compliant?

“Commercial disinfecting solutions, including one-step cleaning/disinfecting solutions, may be used **in accordance with label directions.**”

-CA Child Care Licensing

All sanitizers or disinfectants must be registered with the USEPA.
**NOTE:** Sanitizers for use in child care settings should be registered as “food contact sanitizers.”
How Were the Products Chosen?

Compliant

Ease of Use

Not Known to Cause Or Exacerbate Asthma
Bleach-Free Disinfectant for Classroom Use

**Oxivir TB™**

Active ingredient: Accelerated Hydrogen Peroxide
Ready-to-use disinfectant for hard, nonporous surfaces
(Diaper changing tables, toilets, sinks, activity tables)

1) Pre-clean using diluted triclosan-free soap
2) Leave surface wet: 1 minute contact time
3) Wipe dry or air dry

**NOTE:** Not registered with the USEPA for use on food surfaces.
Bleach-Free Food-Contact Sanitizer

ionator EXP™

Sanitizing device that is also used to pre-clean. Uses tap water only!

1) Pre-clean with a first pass step, wipe excess water

2) Sanitize by spraying surfaces continuously for six-seconds

3) Remove excess water, wipe dry or air dry

NOTE: Not registered with the USEPA for use as a disinfectant.
Bleach-Free Food-Contact Sanitizer: Pro-San® L

Active ingredient: Citric Acid
Ready-to-use sanitizer for hard, nonporous food contact surfaces (Meal/snack tables, high chair tables)

1) Pre-clean using diluted triclosan-free soap
2) Leave surface wet: 1 minute contact time
3) Wipe dry or air dry

NOTE: Not registered with the USEPA for use as a disinfectant.
Bleach-Free Sanitizer & Disinfectant for Custodial Use

Alpha HP®

Active ingredient: Accelerated Hydrogen Peroxide
Ready-to-use disinfectant or non-food contact sanitizer for hard, nonporous surfaces
(Diaper changing tables, toilets, sinks, activity tables, floors)
Ready-to-dilute using a utility sink

No pre-cleaning required.

1) Dilute to sanitizing/disinfecting level
2) Leave surface wet: 10 minutes contact time
3) Wipe dry or air dry

NOTE: Not registered with the USEPA for use on food-contact surfaces.
<table>
<thead>
<tr>
<th>Product</th>
<th>Use</th>
<th>Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oxivir® TB</strong></td>
<td><strong>Disinfect</strong></td>
<td>✓ Diaper Changing Tables ✓ Potty Training Chairs ✓ Cots/Cribs ✓ Mouthed Objects (Including Toys) ✓ Sinks ✓ Walls/Partitions</td>
</tr>
<tr>
<td></td>
<td><strong>Hard Non Porous, Non-Food Contact Surfaces</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Alpha HP®</strong></td>
<td><strong>Sanitize &amp; Disinfect</strong></td>
<td><strong>Sanitize</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Hard Non Porous, Non-Food Contact Surfaces</strong></td>
<td>✓ Floors (Pre-K, Hallways) ✓ Diaper Changing Tables ✓ Potty Training Chairs ✓ Cots/Cribs ✓ Sinks ✓ Walls/Partitions ✓ Floors (Infant/Toddler)</td>
</tr>
<tr>
<td><strong>ionatorEXP™/ Pro-San® L</strong></td>
<td><strong>Pre-Clean</strong></td>
<td><strong>Sanitize</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Any Surface</strong></td>
<td><strong>Food Contact Surfaces</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Snack/Meal Table ✓ High Chairs ✓ Dishes/Utensils ✓ Cups</td>
</tr>
</tbody>
</table>
Option 2: Use Bleach Properly
# Dilute Bleach

<table>
<thead>
<tr>
<th>When:</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What to Use:</strong></td>
<td><strong>Personal Protective Equipment</strong></td>
</tr>
<tr>
<td></td>
<td>Fragrance-free bleach containing 6% Sodium Hypochlorite</td>
</tr>
<tr>
<td></td>
<td>Quart-size bottles (32 ounces)</td>
</tr>
<tr>
<td><strong>How To Dilute:</strong></td>
<td>Prepare two separate dilutions: Disinfecting level and sanitizing level</td>
</tr>
</tbody>
</table>
Dilution for Sanitizing Food Contact Surfaces

~1 Teaspoon = 0.125 ounces
  Bleach

1 Quart = 32 ounces
  Water
Dilution for Disinfecting Hard Nonporous Surfaces

- 1 Tablespoon = 0.5 ounces
- 1 Quart = 32 ounces
- Bleach

Dilution for Disinfecting Body Fluid Spills

- 6 Tablespoons = 3 ounces
- 1 Quart = 32 ounces
- Bleach

**Important Notes:**
- 6 Tablespoons = 3 ounces
- 1 Quart = 32 ounces
- Bleach
- Water
Practical Tools for Bleach Use

- No metal calibrated dispensing pumps
- Quart-size bottles (32 ounces)
- Digital timers
- Protective eyewear
- Funnels
- Instructional placards
Proper Use of Bleach

Step 1: Pre-clean using diluted triclosan-free soap

Step 2: Apply bleach solution
- by spraying away from the breathing zone
- when children are in another area

Step 3: Leave the surface wet
- Appropriate contact time (specified on the label)
  2 Minutes for Bleach

Step 4: Rinse* and Wipe dry
- *When disinfecting
What Can You Do in Your Center or Classroom?
Simple Steps to Reduce Overexposure and Ensure Proper Practice

1) Purge your center or classroom of extra products.
   If using bleach, only one product is needed since bleach satisfies all requirements of Child Care Licensing.

2) Perform internal quarterly assessments within your center or classrooms that would inform training needs.
3) Raise Awareness Through Training & Create an Open Dialogue

For Who?
- Managers
- Teachers, aides, floaters, substitutes
- On-site health advocates
- Parents

When?
- In-services
- Staff meetings
- Meetings with parents
3) Raise Awareness Through Training & Create an Open Dialogue (continued)

What Topics?

- Asthma: symptoms and triggers
- Infection control
- Potential risks to chemicals in household products
- Proper practices
- Acceptable products for use in the classroom

How to provide continued support?

- Provide updates for substitutes, floaters and new teachers
- Provide suggestions to set up classroom environments to ensure reduced exposure
- Use hands-on training
- Encourage co-workers and parents to sustain best practices
## 5) Minimize Products Purchased

<table>
<thead>
<tr>
<th>Center Status</th>
<th>Products Used By</th>
<th># of Products Needed</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleach-Free</td>
<td>Classroom</td>
<td>3</td>
<td>1) Triclosan-free soap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Sanitizer: ionatorEXP™ or Pro-San® L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) Disinfectant: Oxivir® TB</td>
</tr>
<tr>
<td></td>
<td>Custodial services</td>
<td>1</td>
<td>Sanitizer &amp; Disinfectant: Alpha HP®</td>
</tr>
<tr>
<td>Bleach</td>
<td>Classroom and Custodial services</td>
<td>2</td>
<td>1) Triclosan-free soap</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) Sanitizer &amp; Disinfectant: Fragrance-free bleach containing 6.0% Sodium Hypochlorite</td>
</tr>
</tbody>
</table>
Conclusion

Know your environment and your co-workers
- Environmental triggers
- Ingredients of products
- Practices that enable overexposure

Minimize exposure
- Practical tools
- Proper use of bleach
- Safer products for asthma

Educate and disseminate
- Staff
- Parents
Resources

San Francisco Asthma Task Force
General site
http://www.sfgov/asthma
Reducing Overuse of Bleach Project

Regional Asthma Management & Prevention (RAMP)
http://www.rampasthma.org/

San Francisco Child Care Planning and Advisory Council (CPAC)
http://sfcpac.org/resources.html

California Department of Public Health,
Work-Related Asthma Prevention Program
www.cdph.ca.gov/programs/ohsep/Pages/Asthma.aspx
Contacts

Children's Environmental Health Promotion
Environmental Health Section
San Francisco Department of Public Health

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SAN FRANCISCO
Asthma Task Force
Asthma Education, Healthy Environments & Community Empowerment

RAMP
Regional Asthma Management & Prevention
Working together to reduce the burden of asthma
# Cost as of August 2010

<table>
<thead>
<tr>
<th>Product</th>
<th>Distributor</th>
<th>1-25 Cases/Units</th>
<th>26-50 Cases/Units</th>
<th>51-100 Cases/Units</th>
<th>100-500 Cases/Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha HP® 1 case= 2 x 1.5L</td>
<td>Waxie Sanitary Supply</td>
<td>$62</td>
<td>$57</td>
<td>$47</td>
<td>$42</td>
</tr>
<tr>
<td>Oxivir TB™ 1 case= 12 x 32oz.</td>
<td></td>
<td>$58</td>
<td>$53</td>
<td>$43</td>
<td>$40</td>
</tr>
<tr>
<td>ionatorEXP™ 1 unit/each</td>
<td>Laguna GreenWorks</td>
<td>$305</td>
<td></td>
<td></td>
<td>$289</td>
</tr>
<tr>
<td>Pro-San® L Ready-to-use spray 1 case= 12 x 1Qt. bottles</td>
<td>Microcide, Inc.</td>
<td>$57</td>
<td>$92</td>
<td>$73</td>
<td></td>
</tr>
<tr>
<td>Pro-San® L Ready-to-dilute pouches 1 case= 100 pouches (1 pouch per 32 oz.)</td>
<td></td>
<td>$325</td>
<td>$293</td>
<td>$263</td>
<td></td>
</tr>
<tr>
<td>Disinfecting Bleach Pump</td>
<td>Reike Packaging Systems</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Sanitizing Bleach Pump</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*~$7 min. order $500
~$1 min. order $500