Recreational Water Illness

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Acknowledgments

- Waterborne Disease Coordinators
  - States
  - District of Columbia
  - Territories
  - Freely Associated States

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    - Sharon Roy
  - NCEH/EHSB
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    - Charles Otto
Outline

- What do national data on outbreaks of recreational water illness tell us?
- How do we respond to the outbreak data?
Problem: Swimming is fun and a great form of physical activity, but it can lead to illness and injury.

Solution: Work together to minimize risk of illness and injury.
Recreational Water Illness (RWI)

Caused by

- Pathogens transmitted by ingesting, inhaling aerosols of, or having contact with contaminated water in pools, spas/hot tubs, interactive fountains, lakes, rivers, or oceans

- Chemicals in water or chemicals that volatilize from water and cause indoor air–quality problems
RWI Outbreak

- >2 persons linked by time, exposure to recreational water, and characteristics of illness
- Evidence implicates recreational water or volatilization of water-associated compounds into air surrounding water
RWI Outbreaks, by Year
United States, 1978–2010*

2009 and 2010 data are preliminary (updated 08/16/2012).
RWI Outbreaks of Cryptosporidiosis, by Water Treatment and Year United States, 1988–2010*

RWI Outbreaks of Gastroenteritis Associated with Treated Recreational Water United States, 1999–2008 (n=164)

Chlorine sensitive:
Poor pool operation & maintenance

Other includes
Campylobacter, Salmonella, Plesiomonas, and multiple pathogens

Cryptosporidium ("Crypto") 74.4%
Shigella 4.9%
E.coli 2.4%
Giardia 3.0%
Norovirus 5.5%
Other 3.0%
Unknown 6.7%

Chlorine tolerant

THREE E’S OF HEALTHY SWIMMING
EDUCATING the Swimming Public

POOL CHEMICAL SAFETY: USE

BEFORE YOU USE POOL CHEMICALS

- Read the label to ensure proper use of chemicals.
- Follow the manufacturer’s recommendations for chemical use.
- Keep chemicals out of reach of children and pets.

USING POOL CHEMICALS SAFELY

- Use for safety: store in a secure location.
- Keep out of reach of children.
- Use pool chemicals only with proper equipment.
- Use only in the pool.

Recreational Water Illness and Injury Prevention Week 2012

Think Healthy, Be Healthy, Swim Healthy!

Remember, you share the pool water with everyone. If someone has diarrhea or vomits in the water, swimmers can get sick. If it's not treated, it can make you sick.

It's not drinking water. So, you think chlorine kills germs. Yes, it does. But it doesn't work right away. It takes time to kill germs. Without your help, even the best-maintained pools can spread illness.

Fact sheets

Facts About Cryptosporidium and Swimming Pools

Man is a Crypto and has a bad case of water:

- Man drinks water
- Man gets sick
- Man looks for answers

Is anyone else a Crypto? Yes!

- Man drinks water
- Man gets sick
- Man finds answers

That's what we're here for.

www.cdc.gov/healthywater

button

brochures

Protect Yourself and Your Family Against Recreational Water Illnesses

Three Steps for Water Safety

1. Keep an eye on your child at all times. Remember, kids can drown in seconds.
2. Keep your child away from other children who are not supervised.
3. Keep your child away from other children who are not supervised.

Recreational Water Illness Prevention

Thats what were here for.

www.cdc.gov/healthywater

videos

Winmer - Recreational Water Illness Prevention

YouTube
## Knowledge of Healthy Swimming, by State of Residence — HealthStyles Survey, 2009

<table>
<thead>
<tr>
<th>Behavior or concept</th>
<th>Utah % correct (95% Confidence Interval [CI])</th>
<th>Rest of Continental U.S. % correct (95%CI)</th>
<th>Rao-Scott Adjusted Chi-Square P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not swimming when you have diarrhea</td>
<td>100.0 (100.0–100.0)</td>
<td>78.4 (76.5–80.2)</td>
<td>—</td>
</tr>
<tr>
<td>Not swallowing water while swimming</td>
<td>96.4 (90.8–100.0)</td>
<td>85.7 (84.4–87.1)</td>
<td>0.0464</td>
</tr>
<tr>
<td>Making sure that pools are treated</td>
<td>49.3 (8.8–89.8)</td>
<td>86.0 (84.7–87.4)</td>
<td>0.0096</td>
</tr>
<tr>
<td>Chlorine does not kill germs instantly</td>
<td>85.8 (71.3–100.0)</td>
<td>65.9 (63.8–68.1)</td>
<td>0.0483</td>
</tr>
</tbody>
</table>
ENGINEERING 99.9% *Cryptosporidium* Inactivation*: Chlorine Dioxide

<table>
<thead>
<tr>
<th>Experiment</th>
<th>5 mg/L ClO₂</th>
<th>5 mg/L ClO₂ + 2 mg/L free chlorine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>564</td>
<td>422</td>
</tr>
<tr>
<td>2</td>
<td>473</td>
<td>453</td>
</tr>
<tr>
<td>3</td>
<td>666</td>
<td>428</td>
</tr>
<tr>
<td>4</td>
<td>784</td>
<td>654</td>
</tr>
<tr>
<td>Mean ±SD</td>
<td>622 ±134</td>
<td>489 ±111</td>
</tr>
</tbody>
</table>

* PRELIMINARY CDC data; Authors: Jennifer Murphy, Michael Arrowood, and Vince Hill.
ENGINEERING Removal of *Cryptosporidium*

ENFORCEMENT
Current U.S. Pool Code Situation

- Lack minimum national standards for design, construction, operation, and maintenance of treated recreational water venues
  - No federal agency regulates all
- Regulate at state or local level
- Reflect differences variability
  - Outbreaks or events
  - Ability to keep up with latest scientific data
Impetus for the Model Aquatic Health Code (MAHC)

- CDC—sponsored workshop in 2005
- Problem: Variability in state and local pool codes identified as barrier to prevention of RWIs
- Solution: Develop model code as resource for state and local partners to voluntarily adopt
  - Base on scientific data, best practices
  - Provide free, open access
  - Update regularly, using latest data
MAHC Progress

- 14 MAHC modules
  - 12 (86%) 14 posted to date for 1st 60-day public comment period
- Goals for all 14 modules
  - Post all 14 modules individually for first 60-day public comment period by October 2012
  - Re-post complete MAHC for second 60-day public comment period 1st quarter of 2013
  - Post 1st edition of MAHC for 2013 summer swim season
Evaluation of Recreational Water Illness & Injury Prevention Week

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www.cdc.gov/healthyswimming