



Cryptosporidium, Giardia, Legionella – Myth or Fact

Midwest Workshop 2013

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Outline

- Background of the big three waterborne pathogens
 - *Cryptosporidium*
 - *Giardia*
 - *Legionella*
- Myth or fact
- Case studies



Enteric – *Cryptosporidium*

- *Cryptosporidium*
 - Symptoms: Diarrhea, abdominal cramps, bloat
 - Vehicles: Food, person-2-person, water

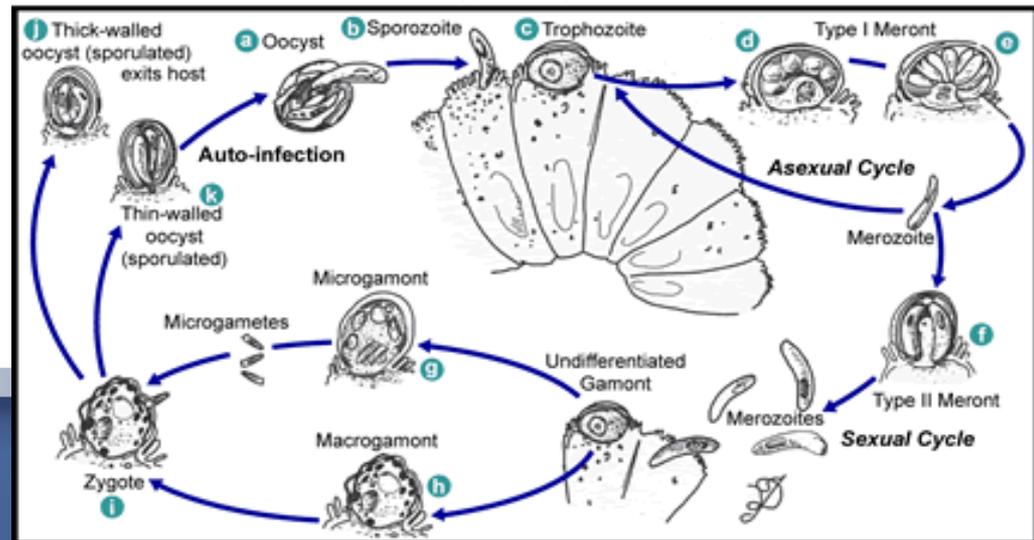
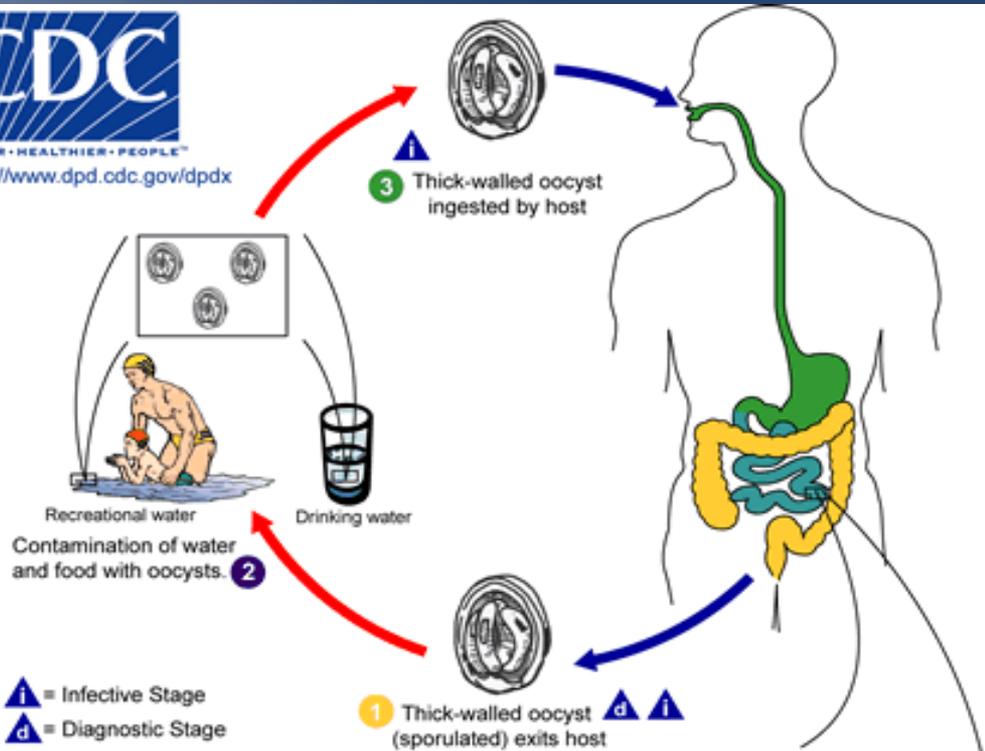


BA4205 [RM] © www.visualphotos.com

Cryptosporidium Lifecycle



SAFER • HEALTHIER • PEOPLE™
<http://www.dpd.cdc.gov/dpdx>



Water Filtration

Package and Label Information for Purchasing Water Filters

Filters designed to remove Crypto
(any of the four messages below on a package label indicate that the filter should be able to remove Crypto)

Reverse osmosis (with or without NSF testing)

Absolute pore size of 1 micron or smaller
(with or without NSF testing)

Tested and certified by NSF Standard 53 or NSF Standard 58 for cyst removal

Tested and certified by NSF Standard 53 or NSF Standard 58 for cyst reduction

Filters labeled only with these words may NOT be designed to remove Crypto

Nominal pore size of 1 micron or smaller

One micron filter

Effective against Giardia

Effective against parasites

Carbon filter

Water purifier

EPA approved *Caution: EPA does not approve or test filters*

EPA registered *Caution: EPA does not register filters based on their ability to remove Cryptosporidium*

Activated carbon

Removes chlorine

Ultraviolet light

Pentiodide resins

Water softener

Chlorinated

Enteric – *Giardia*

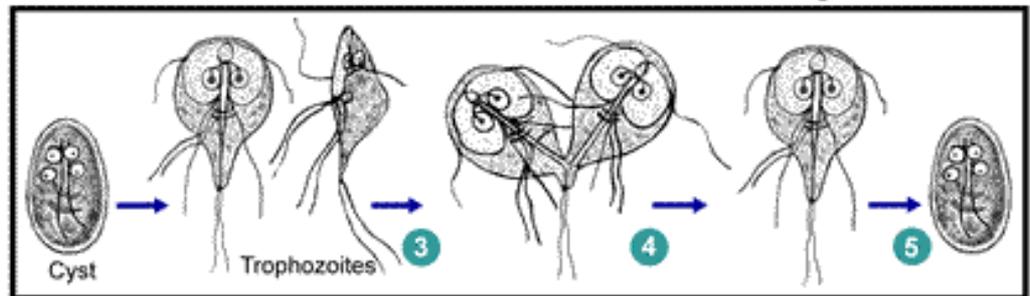
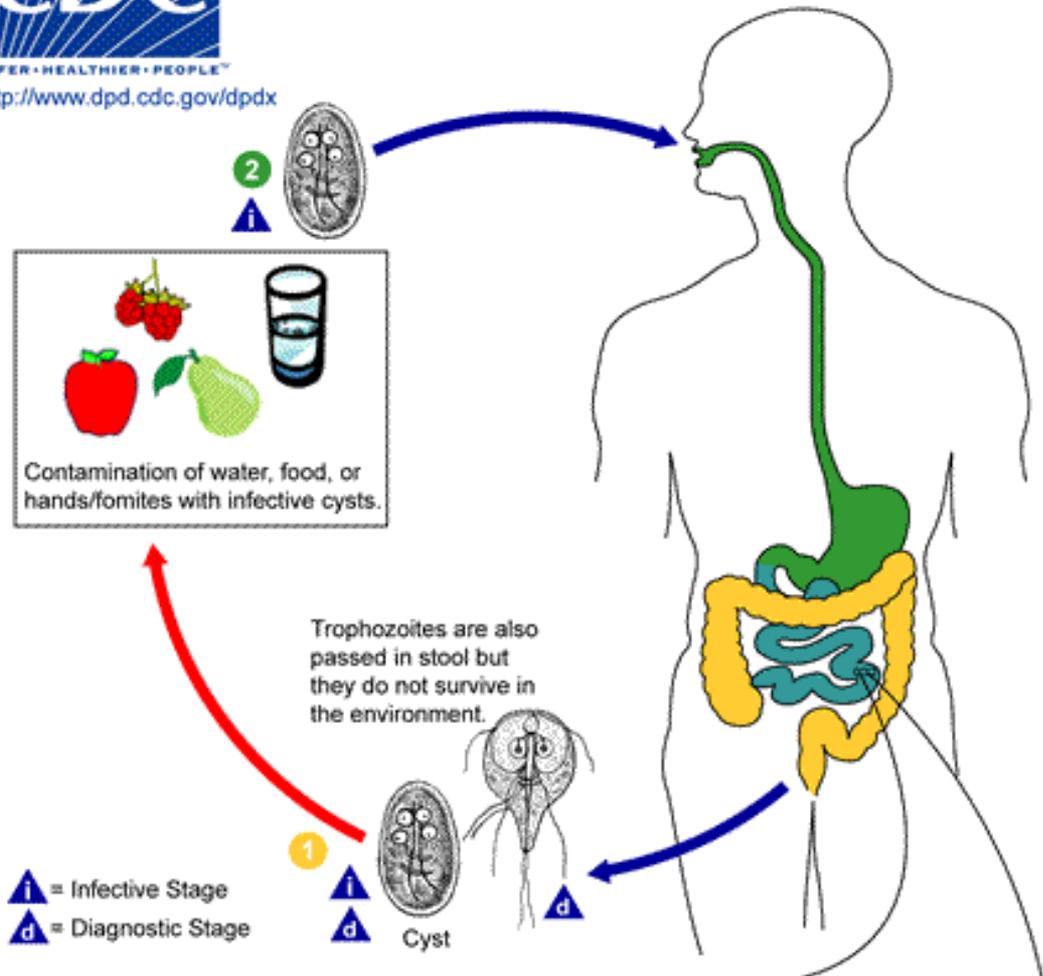
- *Giardia*
 - Symptoms: Diarrhea, abdominal cramps, bloat
 - Vehicles: Food, person-2-person, water
 - Complications: Delay physical & mental growth & development



Giardia Lifecycle



<http://www.dpd.cdc.gov/dpdx>



Well



Examples of Water Quality Indicators

- Total *Coliforms*
- Fecal *Coliforms*
- *pH*

Are they good indicators for *Cryptosporidiosis* and *Giardia*?





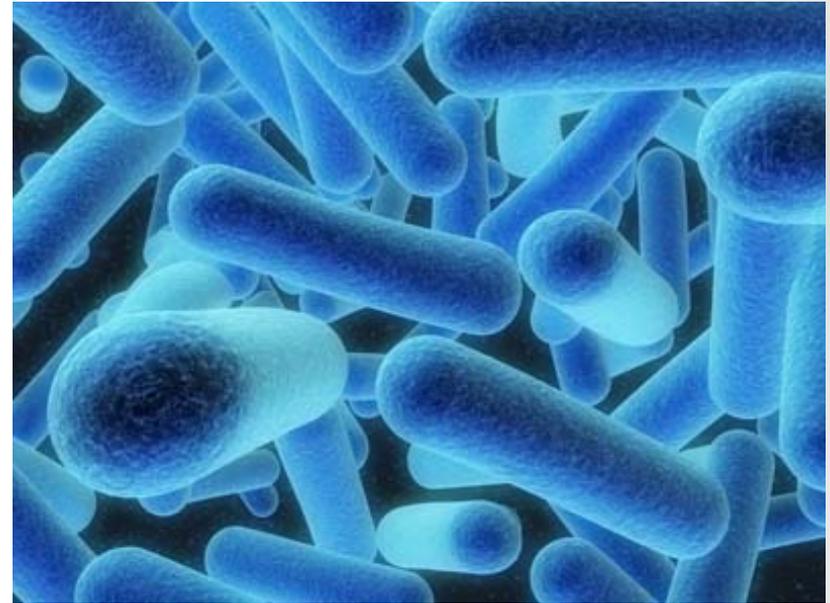
Top 5 Causes of Waterborne Outbreaks in Private Groundwater Wells

1. Hepatitis A (CDC, CDC-Water)
2. Giardia intestinalis (CDC, CDC-Water)
3. Shigella spp. (CDC, CDC-Water)
4. E. coli 0157:H7 (CDC, CDC-Water, EPA)
5. Tied for 5th:
Campylobacter jejuni (CDC, CDC-Water) and
Salmonella serotype Typhimurium (CDC, CDC-Water)

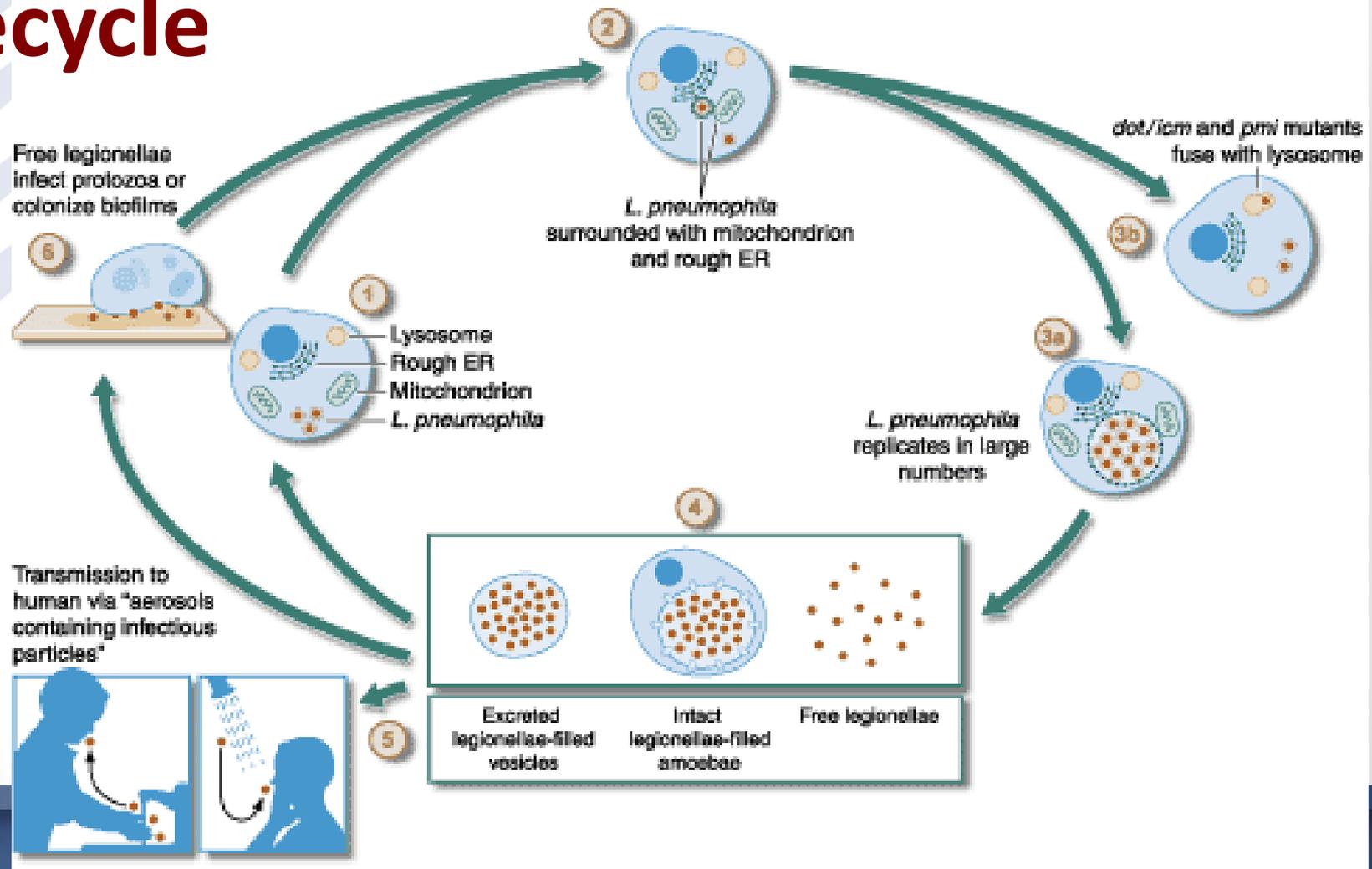


Respiratory - *Legionella*

- *Legionella*
 - Symptoms: Pneumonia
 - Vehicles: Drinking water, recreational water, water not intended for drinking
 - No person-2-person
 - Complications:
 - Lung failure
 - Death (5-30%)



Legionella Lifecycle



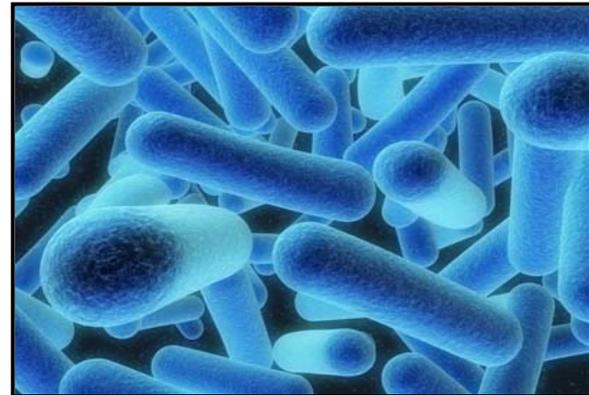
Legionella Transmission

- Transmission is from environmental sources
 - No person-to-person transmission
- Inhalation or aspiration of *Legionella*-contaminated water
- Bodies of freshwater may contain *Legionella* but the concentration is usually too low to cause disease
- Manmade water systems have the 3 conditions necessary for Legionella growth and transmission:
 - Heat
 - Stasis
 - Aerosolization



Legionella Detection in Water Samples

- Select a laboratory that is proficient at performing the culture of *Legionella* from environmental water samples
 - Which species will be tested for?
 - Rapid testing not recommended
 - Concentration of water samples
- ELITE program from CDC
 - “Environmental *Legionella* Isolation Techniques Evaluation”
 - Laboratories that elect to complete this program and pass the testing are listed on the ELITE website by state
 - www.cdc.gov/legionella/elite-intro.htm



Legionella Guidance from CDC

- Definitions of Legionella outbreak:
 - 2 or more associated cases of lab-confirmed *Legionella*
- Temporal association of cases
- Maintenance of water systems
- Testing of patients with health-care associated pneumonia
- Epidemiologic investigation associated cases
- Contact state health department if assistance is needed
- State will contact CDC at local health department's request
- No recommendation on routine culturing of facility water for *Legionella* in the absence of an outbreak investigation



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Myth or Fact?

Most
Legionella
outbreaks
originate in
building
heating &
cooling
systems

MYTH



Wikimedia: GeographBot

Myth or Fact

Chlorine
can not kill
Cryptosporidium
or *Giardia*.

MYTH



Myth or Fact

You can't get
Legionella
from a
shower
head.

MYTH



Myth or Fact

Legionella is more likely to be associated with man-made water systems than naturally occurring water systems.

Fact



Myth or Fact

Ohio Department of Health does not test for *Giardia* and *Cryptosporidium* in water samples.

Fact



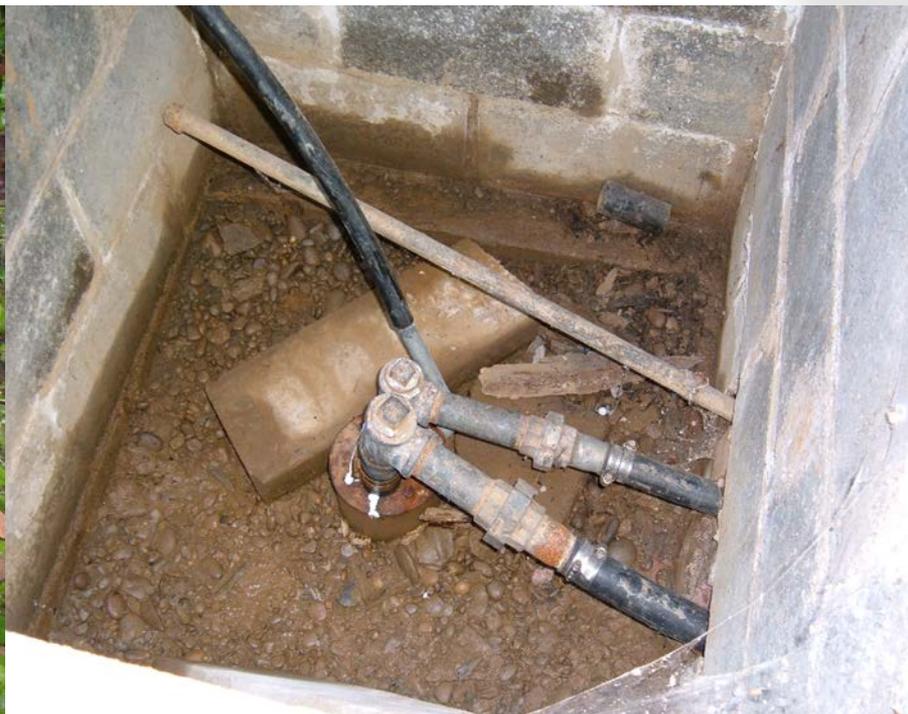
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Case Studies

Test my well, please!



Responsibility of Public Health (Local & State):

- Ensure health and safety of residents, workers & visitors to their jurisdiction
- Surveillance, reporting & investigation
- Prevention and control
- Give guidance or consultation
- Provide resource materials



In Conclusion

Keep in mind the connection between illnesses and the environment

- Advocate for clean water
- Promote up-to-code wells
- Test when appropriate
- Educate the public on safe water
- And – **know that you and your work make a difference**



Resources

- Your local health department
 - <https://odhgateway.odh.ohio.gov/lhdinformationsystem/Directory/GetMyLHD>
- Ohio Department of Health
 - www.odh.ohio.gov
- Centers for Disease Control and Prevention (CDC)
 - www.cdc.gov



Thank you!

Please contact the Outbreak Response & Bioterrorism Investigation Team (ORBIT) at 614-995-5599, if you have questions.

Please call your local health department to
? report an outbreak.

