

**H**ealth officials say a parasite often found in drinking water may prove harmful to people with suppressed immune systems. The parasite, *Cryptosporidium parvum*, causes the disease cryptosporidiosis, of which the symptoms include diarrhea and vomiting. Once infected, immunocompromised citizens, such as cancer chemotherapy patients or those with HIV/AIDS, are at risk for severe illness.

"We do know of cases of people coming down with cryptosporidiosis in the Portland area, but it's very difficult to trace the source of that contamination," says Susan Stoltenberg, executive director of the Cascade AIDS Project, Oregon's largest HIV/AIDS service organization.

According to health officials, cryptosporidiosis is spread by putting something in the mouth that has been contaminated with the feces of an infected person or animal. In this way, people swallow the parasite, which is too small to be seen with the naked eye. A person can become infected by drinking contaminated water or eating raw or undercooked food contaminated with *Cryptosporidium* oocysts (an egg-like form of the parasite that is in the infectious stage); direct contact with the feces of infected humans or animals; or hand-to-mouth transfer of oocysts from surfaces that may have become contaminated with microscopic amounts of the feces of an infected person or animal.

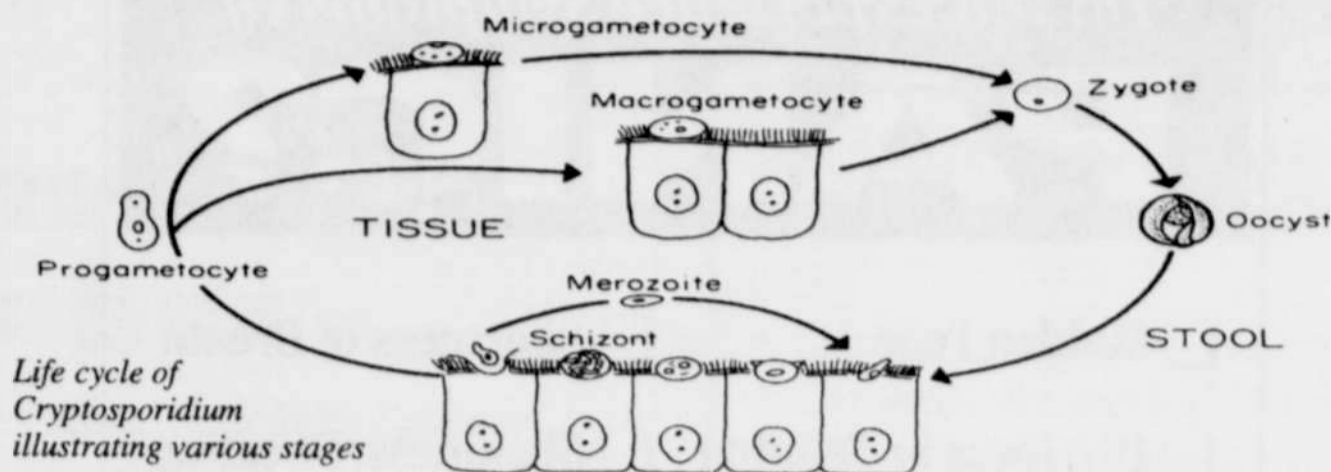
Those most at risk for cryptosporidiosis include child care workers; diaper-aged children who attend day-care centers; persons exposed to human feces through sexual contact; and caregivers who might come in direct contact with feces while caring for a person infected with cryptosporidiosis.

Symptoms include diarrhea, headache, abdominal cramps, nausea, vomiting and low-grade fever which may lead to weight loss and dehydration. In otherwise healthy people, these symptoms usually last one to two weeks, but for immunocompromised people the infection may persist and become life-threatening.

According to Stoltenberg, CAP received several concerned phone calls following an airing of NBC's *Dateline*, a weekly newsmagazine that recently featured a segment on the potential dangers of *Cryptosporidium*.

"It's very understandable that the people we service would want to know more about this because of their depressed immune systems," she says.

**Y**et health officials say there is little information available about the parasite as it relates to human infection. In fact, as late as 1976, the parasite was not known to cause disease in humans. Until 1993, when more than 400,000 people in Milwaukee, Wis., became ill with diarrhea after drinking water contaminated with the parasite, few people had heard of *Cryptosporidium*. According to Milwaukee health officials, nearly



Life cycle of *Cryptosporidium* illustrating various stages

ILLUSTRATION BY OWEN GLOEGE

## Watch what you drink

*A parasite often found in drinking water may pose a threat to those with weakened immune systems*

by Inga Sorensen

50 people died, including several people with AIDS.

Since that outbreak, there has been increased concern about the nation's water supplies, but there remain no governmental guidelines mandating that water be tested for the parasite.

"This is a relatively new disease, and it is a significant disease," says Dr. William Keene, a communicable disease epidemiologist for the Oregon Health Division. Keene has been following *Cryptosporidium* outbreaks since 1986.

"There are already lots of government standards regarding the testing of the public water supply, but none deal specifically with crypto. That's changing, however. The EPA [federal Environmental Protection Agency] is in the process of developing guidelines that are specific to crypto."

The Portland Water Bureau has been voluntarily testing for *Cryptosporidium* for eight years. Portland's public water supply primarily comes from the Bull Run Reservoir near Mount Hood. According to health and water officials, livestock and people are kept away from the reservoir in order to decrease the risk of contamination. Livestock in particular may pose a threat because parasite-infected feces may wash into the water supply during heavy rains. While many wild animals are infected, their importance as a source of human infection is not clear. Officials say surface water supplies are more prone to contamination than ground water supplies.

"Since 1986 we've taken 68 samples. In 19 of

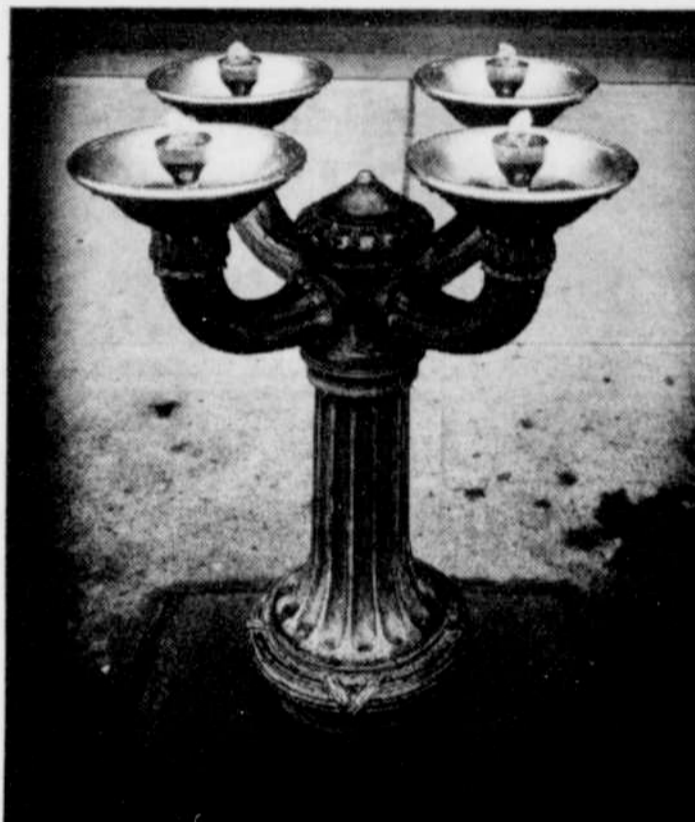


PHOTO COURTESY OF PORTLAND WATER BUREAU

those samples we have found *Cryptosporidium* in the water," says Mark Knudson, a Portland water quality manager. "The measurements range from .5 to 5.3 oocysts per hundred liters of water." Knudson cautions the figures mean little, due to an uncertainty in testing methods (for example, algae may look like an oocyst) and because testing and study of *Cryptosporidium* has not occurred on a widespread level.

For comparison's sake, however, New York City's water supply has measured 17 oocysts per hundred liters of water. "And I guess we can take some comfort in the fact that during the Milwaukee outbreak levels were at 100 oocysts per hundred liters," Knudson says, adding, "Most outbreaks seem to occur when the measurement hits about 30 oocysts per hundred liters of water. Quite frankly, though, if you've got a depressed immune system, it could take a lot less to affect you. It really varies from individual to individual."

According to Knudson, Bull Run water is treated with chlorine before the public is allowed to drink it. *Cryptosporidium* is not responsive to chlorine, though it can be filtered. Bull Run water does not undergo a filtering process, and Knudson says it would cost roughly \$120 million to put such a system in place.

So what exactly can someone do to try to avoid infection? Some suggest installing a home water filtering system. "There is a standard for home

filtering systems known as NSF Cyst Removal that ensures that crypto will be filtered out," explains Tom Richardson, coordinator of the Oregon AIDS Hotline. Richardson is currently gathering information about the costs and availability of such systems.

"You could also bring your tap water to a full boil before drinking it—that will kill the parasite, but it may be a very inconvenient way to handle the situation," he admits.

Some may think bottled water is safer to drink, but, says Knudson, "That water may or may not contain oocysts. There are no regulations saying bottled water has to be tested." He further cautions that home filtering systems often require diligent maintenance in order to be effective.

"You can install the best system, but if you forget to change your filters, then you've defeated the purpose," he says. "What I tell people is that if they have a suppressed immune system, they should consult with their physician about the best way to avoid contamination."

These are the most often mentioned steps one can take to avoid infection: don't drink untreated surface water, including private water supplies or water from streams or lakes; bring water to a full, rolling boil before ingesting it; purchase and properly maintain an appropriate home water filter system; avoid fecal-oral modes of transmission.

Richardson says that although cases of cryptosporidiosis may be brought on by the water-borne parasite, gay men may be picking it up in other ways.

"*Cryptosporidium* in the water may be a problem for the general public, but we also have to be aware that in cases involving gay men, the infection is brought on by unsafe anal-oral sexual practices," he says. "We need to be aware of the threat, and we certainly address this in our safer-sex educational materials."

According to Keene, the state will soon make cryptosporidiosis reportable, meaning that when a health care provider diagnoses cryptosporidiosis in a patient, the information will be forwarded to state health officials. The purpose of the reporting is to help pinpoint the source of infection in order to prevent further transmission. State health officials admit cryptosporidiosis is "grossly underdiagnosed" in part because the parasite is rarely identified on a routine stool exam.

"Crypto will soon become reportable, and when it does we will launch an educational campaign to better inform other health care providers and the public about its dangers and ways to avoid it," says Keene. Knudson adds the Portland Water Bureau will soon make a *Cryptosporidium* consumer packet available to the public.

"The fact of the matter is, there is no treatment for cryptosporidiosis, and people are dying from it," says Knudson. "We're concerned and will do what we can to inform the public about the problem."

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