

## **Cryptosporidiosis and the Water Supply: Public Health Guidance for Clinicians regarding Immunocompromised Patients**

*Note: This document is provided as background and should not be the sole basis upon which clinical decisions are made. It is based partly on several documents published by public health officials in [Ireland](#)<sup>1</sup> and the [UK](#).<sup>2,3</sup> Please refer to [CDC's page on cryptosporidiosis](#) for more information.*

### **General information about cryptosporidiosis**

- Cryptosporidiosis is caused by *Cryptosporidium*, a protozoan parasite, with *C. parvum* and *C. hominis* causing most human cases, though other species can also cause human cases<sup>4</sup>
- The protozoan spreads through the fecal–oral route, with common modes of transmission including waterborne, direct animal contact, person to person, and foodborne<sup>5</sup>
- In otherwise healthy individuals, cryptosporidiosis can be asymptomatic or can cause self-limiting watery diarrhea with abdominal pain that typically lasts several days to weeks<sup>6–10</sup>
- Among immunocompromised patients, the illness can be severe, protracted, and sometimes fatal<sup>5</sup>
- *Cryptosporidium* is commonly found in rivers and lakes, which forms part of the water supply<sup>11</sup>
- *Cryptosporidium* oocysts are extremely chlorine tolerant and thus standard chemical disinfection approaches used for drinking water and recreational water (e.g., swimming pools) may not fully inactivate them<sup>12</sup>

### **What are the public health implications of *Cryptosporidium* in the water supply?**

- Disease can occur with just a few oocysts<sup>5,13</sup>
- Standard drinking water testing cannot determine whether oocysts are alive (and thus infectious)
- Since cryptosporidiosis can be asymptomatic (particularly in a largely immunocompetent population), there may be no clinical cases of cryptosporidiosis detected even if there are very low levels of oocysts in drinking water supply
- Therefore, a general boil water advisory may not be put out on the water supply

### **Which groups of immunocompromised patients are at high risk?**

- Not all immunocompromised patients are at equal risk—those at particular risk are patients with dysfunction in cell-mediated immunity (especially with CD4<sup>+</sup> T cells),<sup>5,14,15</sup> which include:
  - HIV/AIDS: especially with CD4<sup>+</sup> < 50 cells/mm<sup>3</sup>; patients with ≥180 cells/mm<sup>3</sup> tend to have less severe, self-limiting disease<sup>5,14</sup>
  - Primary immunodeficiencies, especially with impaired T-cell function: e.g., SCID, CD40L deficiency, hyper-IgM syndrome, CD4 lymphopenia<sup>5,14</sup>
  - Patients with hematological malignancies: during chemotherapy or post-bone marrow transplant<sup>5,14</sup>
- Severe cases have been less consistently described in other groups, such as solid organ transplantation recipients or non-hematological malignancies, precluding adequate risk assessment<sup>5,14,16,17</sup>

## What should I tell patients whom I consider to be at high risk of cryptosporidiosis to do to help prevent the disease?

- Please refer to the CDC [website](#). In brief,
  - Wash your hands.
  - Practice safer sex, in particular, avoiding practices that might result in oral exposure to stool.
  - Avoid touching farm animals or the stool of pets.
  - Avoid swallowing water when swimming, showering, bathing, or when using hot tubs.
  - Drink safe water, such as boiling water. Please refer to the [website](#) for the full list.
  - Wash and/or cook your food.
  - Take extra care when travelling.

## References

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