

## Parasitic Diseases in Vermont

Parasites are a significant cause of morbidity in Vermont residents. Infections with *Giardia sp* and *Cryptosporidium sp* are the most common parasitic infections reported to the Vermont Department of Health. Over the past 5 years, an average of 196 cases of giardiasis and 56 cases of cryptosporidiosis were reported annually, and reports of both infections have been increasing. Vermont consistently has one of the highest rates of giardia infection in the country. Almost all Vermont cases are sporadic or occur among close contacts, usually family members, but outbreaks can occur.

These parasites have low infectious doses, protracted communicability, and are not readily inactivated by chlorine. Risk factors for both infections include travel to disease-endemic areas, close contact with infected persons, contact with young children in diapers, ingestion of contaminated drinking water or recreational water (e.g., water in lakes, rivers, and pools), consumption of unfiltered or untreated water, and contact with infected animals.

Other parasites that are occasionally diagnosed by the Vermont Department of Health Laboratory (VDHL) include *Blastocystis sp.*, *Dientamoeba fragilis*, *Ascaris sp.* and *Trichuris sp.*

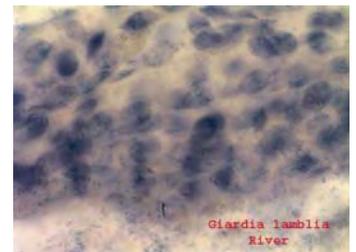
### Diagnostic Testing Performed at the Vermont Department of Health Laboratory

Microscopic examination is still considered the “gold standard” for the diagnosis of parasitic diseases. Diagnosis begins with the collection of stool specimens. Parasites are not shed on a daily basis so, for ova and parasite screens (O&P), it is recommended that more than one specimen, collected on different days, be submitted for optimal recovery and the best diagnosis. In low prevalence populations, studies have shown the sensitivity rate to be 91% if a single specimen is submitted and 100% if at least 2 specimens are submitted. In high prevalence populations, sensitivity drops to 75.9% for one stool specimen, 92% for two submitted specimens, but increases to 100% for three submitted specimens. Based on that research, it is our recommendation that at least **two** stool specimens, collected on different days, be submitted for all O&P examinations.

VDHL provides kits for the collection of stool specimens. The kits include a single vial of transport medium containing the preservative SAF (Sodium Acetate-Acetic Acid-Formalin). SAF is compatible with the stains and diagnostic tests used at the VDHL, including the enzyme immunoassays (EIAs) used for the detection of *Giardia* and *Cryptosporidium* antigens.

Testing is performed at the VDHL Monday through Friday and results are available 24 hours after specimen receipt. Test options available at the VDHL include:

1. **Ova and Parasite Exam (O&P):** An O&P exam is a microscopic evaluation that is performed on stool specimens and looks for the presence of parasites and/or eggs (ova). Testing includes the wet mount examination of a concentrated stool specimen as well as a permanent slide stained with Iron Hematoxylin stain.
2. **Acid-Fast Staining procedure:** This technique is performed with the O&P exam and is useful for identifying parasites such as *Cyclospora*, *Cryptosporidium*, and *Isospora* which are hard to detect with routine staining.
3. **Pinworm (*Enterobius vermicularis*):** Adult female pinworms emerge at night from the body and lay their eggs around the perianal region. The sticky part of a disposable pinworm paddle is used to collect specimens. The pinworm paddle is pressed against the perianal region and submitted to the VDHL where it is examined microscopically for the presence of pinworms and eggs.
4. **EIA for *Giardia* and/or *Cryptosporidium*:** The enzyme immunoassay (EIA) tests for the presence of *Giardia* and *Cryptosporidium* antigen in a patient stool specimen. These tests are very sensitive and specific.



Note: VDHL has the ability to electronically send images to the Centers for Disease Control and Prevention and consult with their parasitologists to identify unusual parasites. This was recently used to identify the parasite *Tritrichomonas hominis* in a sample from a person from Southeast Asia.

