Guideline for the Collection and Testing of Stool Specimens for Ova and Parasites in Symptomatic Patients

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1. Purpose

The purpose of this guideline is to recommend to physicians which clinical situations warrant a stool sample for ova and parasites (O&P), how to order the test, collect the specimen, interpret the results, and understand the test limitations.

2. Background

Parasitic infections are exceedingly common worldwide. It has been estimated that nearly 25% of the population in less developed countries harbour the roundworm *Ascaris lumbricoides*.

The examination of the stool for O&P is the most rewarding test for diagnosis of a parasitic infection because the majority of parasitic infections occur in the bowel.

It is important to recognize that certain chronic parasitic infections from organisms such as, *Strongyloides stercoralis*, *Schistosoma* species, and invasive *Entamoeba histolytica* may compromise a patient's health. Patients suspected of being infected with these organisms warrant extensive parasitological evaluation.

3. Clinical Situations that Warrant Requesting a Stool Sample for O&P

- **Patients with:**
  - persistent or recurring diarrheal conditions, including patients with bloody diarrhea;
  - chronic bowel dysfunction or persisting irritable bowel like symptoms, particularly if it can be related to travel or rural residence;
  - a variety of systemic conditions such as anemia, weight loss, chronic cough, particularly if associated with past ingestion of potentially contaminated food;
  - eosinophilia and/or serum IgE elevation;
  - persistent diarrhea with exposure to infants in day care centres (associated with *Giardia lamblia*, *Cryptosporidium parvum*);
  - chronic diarrhea and history of HIV infection or other risk factors causing immunosuppression;
  - chronic diarrhea and a history of raw fish ingestion.
- Symptomatic patients with a history of extended residence in developing areas of the world.
- Diarrhea in a man who has sex with a man (MSM). MSM status is associated with *Giardia lamblia* and *Entamoeba histolytica*.

4. Ordering Instruction

While *Giardia lamblia* and *Cryptosporidium parvum* can cause acute diarrhea, over 80% of acute diarrheas are bacterial in etiology. It is important to consider whether the patient is a likely candidate for parasitological testing based on epidemiologic history (e.g., travel, rural water supplies) before automatically ordering O&P. If the epidemiology is pertinent, the diarrhea has persisted for more than several days, and the potential incubation period is at least a week, then do order an O&P test.

DO NOT initially order multiple tests (e.g., do not order x3). More than 90% of parasites can be detected from one appropriately collected, properly preserved single stool specimen.[1] Evidence has demonstrated that ordering multiple specimens is unnecessary for the diagnosis of most protozoal infections.[1, 2] If helminthic infections are strongly suspected, more than one specimen for O&P examination may be required due to the intermittency of helminth egg shedding.

If the first specimen is negative and intestinal parasites are still strongly suspected from the clinical condition or there is a significant travel history, resubmit a second and a third specimen collected on separate days. [1, 2]

5. Collecting Specimens

The patient should be provided with an O&P collection kit that consists of a screw cap jar containing Sodium Acetate-Acetic Acid Formalin (SAF) preservative to stabilize and preserve pathogens en route to the laboratory.

Please refer to an individual laboratory's specimen collection guideline for complete specimen collection directions that should be provided to the patient.

The patient should be advised that if the specimen is not labelled with 2 identifiers it will be discarded e.g. patient's full name and either birth date or OHIP number.

6. Limitations [3]

Antimicrobials may reduce amoeboid parasitic levels significantly for up to 3 weeks resulting in false negatives.

Specimens contaminated with water or urine may yield false negative results, as water or urine may have lysed any trophozoites that were present.

Where possible, avoid ordering O&P examination for 10 days after a patient has had barium studies, bismuth, antacids, mineral oil, anti-malarials, non-absorbable anti-diarrheal preparations, or recent mineral laxatives.

Improper collection may result in extraneous organisms and artifacts resembling cysts and eggs.

7. Results

It may take 3 to 5 days to generate a report due to the labor intensive nature of the examination process. For the rare instances where processing must be expedited, a telephone request must be made to the laboratory's microbiologist.

	Results:	Interpretation
1	No pathogenic parasites seen	This does not exclude non-pathogenic protozoa, which may be present in the sample.
2	Pathogenic or potentially pathogenic protozoa: *Giardia intestinalis (syn.Giardia lamblia)* *Cryptosporidium spp.* *Cyclospora cayetanensis* *Microsporidia* *Dientamoeba fragilis* *Balantidium coli* *Cystoisopora belli (syn. Isospora belli)* *Sarcocystis*	Clinical correlation is required for treatment decisions.
	*Entamoeba histolytica/dispar**	***Labs will report *Entamoeba histolytica/dispar* as these 2 species cannot be distinguished using microscopy. Only *Entamoeba histolytica* is capable of causing disease and should be treated. If clinically indicated, submit an unpreserved stool specimen for ELISA testing to discriminate and confirm *E. histolytica* as directed in section 8.[4]
	*Blastocystis hominis***	****Although, generally regarded as a non-pathogen *Blastocystis hominis* may have pathogenic potential when present in high number or in immunocompromised hosts. Clinical correlation is suggested.[4,5]
3	Any helminth species detected e.g. *Strongyloides stercoralis*, *Taenia* sp., *Enterobius vermicularis*, *Ascaris lumbricoides, Necator americanus* etc. The life cycle stage is not routinely reported, with the exception of *Strongyloides stercoralis*; report will indicate rhabditiform larvae, filariform larvae, eggs, or free-living adults. The quantity of parasite(s) is not routinely reported, with the exception of repeat testing for disseminated strongyloidiasis.	Treatment is indicated for the majority of helminth infections, but in some cases, clinical correlation would also be required (i.e., pregnancy; contraindication to anti-helminthic etc.).

8. Additional Tests

Although most intestinal parasites can be identified by examination of preserved stools, some infections may require the collection of other types of specimens, such as peri-rectal/anal swabs (pinworm paddles), duodenal aspirates, or tissue biopsies. Special laboratory techniques may only be performed, if sufficient relevant clinical information is provided to the laboratory.

Enzyme Immunoassays (EIA) & Polymerase Chain Reaction (PCR) assays can be used to screen some stool specimens and for confirmatory testing in some cases (e.g. PCR may be useful for the differentiation of the potentially invasive *E. histolytica* from the non-invasive species).

These tests must be ordered on a Public Health Ontario Laboratory (PHOL) requisition. Requisitions and specimen collection instructions for these tests are available on the Public Health Ontario website at http://www.publichealthontario.ca/.

References

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