

NEW YORK STATE

Parasitology Proficiency Testing Program

Parasitology Comprehensive 15 May 2012

The purpose of the New York State Proficiency Testing Program in the category of Parasitology - Comprehensive is to monitor the performance of applicant laboratories that detect and identify parasites in fecal emulsions, fecal smears, and blood films. This document reports the results for the May 2012 proficiency test in Parasitology-Comprehensive. Most laboratories in this category previously participated in the Parasitology-General category, which was renamed after the June 2011 event.

Sample Preparation and Quality Control

All emulsions and slides used in this test were prepared by a commercial source. The emulsions were dispensed into the vials from pools, which were continuously mixed during the loading process. Numerous samples of each test specimen were selected at random by the Parasitology Laboratory of the New York State Department of Health, and were assayed for quality and confirmation of organisms. Extensive quality control tests were also conducted by the supplying vendor and a detailed quality control report was submitted for inspection and verification. Samples were authenticated by at least 80% of participating laboratories and/or referee laboratories.

12-F (All Parasites)

Correct identification: *Cryptosporidium* sp.

Results of Participating Laboratories

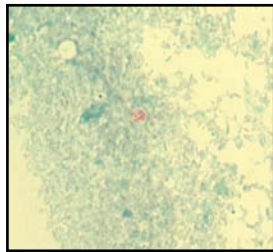
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Cryptosporidium</i> sp.	79/107	74	6/10	Unauthenticated
<i>Blastocystis hominis</i>	26	24	5	No Penalty
No Parasites Seen	13	12	0	No Penalty
<i>Dientamoeba fragilis</i>	2	2	0	No Penalty

Quality Control and Referee Information

Participating and referee laboratories failed to agree that *Cryptosporidium* sp. was the correct response (74 and 60%). Quality control examination of 4% of this sample showed pink staining oocysts in every 8-10 40 X fields on modified acid-fast stained smears. Although *Blastocystis hominis* was reported by a large number of labs it was not detected on quality control examination by either the vendor or our lab. In addition, because *Dientamoeba fragilis* has no known cyst stage, it cannot be seen on wet preparations. Other tests performed included a Direct Immunofluorescent Assay, which was positive for *Cryptosporidium* sp. and negative for *Giardia lamblia*.

Please note: The instructions for completing this survey state that a test for *Cryptosporidium* sp. should be performed whenever required by the type of parasite requested. Specific directions for this sample requested "Report All Parasites". Therefore a test for *Cryptosporidium* sp. should have been performed.

Diagnostic Characteristics



Cryptosporidium sp. has become one of the most important opportunistic infections seen in the immunocompromised patient. This coccidian parasite is spread through contaminated food or water. The diagnostic stage is the oocyst passed in the stool. On a modified acid-fast stained smear these oocyst measure 4-5 µm and stain pale to deep pink. It is sometimes possible to see the 4 sporozoites within the oocyst. Other methods of diagnosis include immunoassays and immunofluorescent stains.

12-G (Helminths Only)

Correct identification: No Parasites Seen.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	106/107	99	10/10	Correct
<i>Taenia</i> sp.	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that **No Parasites Seen** was the correct response (99 and 100%). Quality control examination of 4% of this sample showed normal fecal elements and no organisms present. Other tests performed included a Direct Immunofluorescent Assay for *Giardia lamblia* and *Cryptosporidium* sp., which was negative for both organisms. A modified acid-fast stained smear was also negative.

12-H (Helminths Only)

Correct identification: *Taenia* sp.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Taenia</i> sp.	104/107	97	10/10	Correct
<i>Ascaris lumbricoides</i>	1	1	0	Incorrect
<i>Cryptosporidium</i> sp.	1	1	0	Incorrect
No Parasites Seen	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that *Taenia* sp. was the correct response (97 and 100%). Quality control examination of 4% of this sample showed an average of 8 ova per coverslip. Other tests performed included a Direct Immunofluorescent Assay for *Giardia lamblia* and *Cryptosporidium* sp., which was negative for both organisms and a modified acid-fast stained smear, which was also negative.

Diagnostic Characteristics



The diagnostic stage of the intestinal cestode *Taenia* sp. is the characteristic egg found in stool. These eggs are yellow-brown, round to oval and measure 35-40 μ m. They have a thick radially striated shell and contain an oncosphere with visible hooks. Infection occurs when raw or poorly cooked beef or pork containing encysted larvae is ingested. The larvae are digested out of the meat in the stomach and attach to the wall of the small intestine. The adult worms mature in about 5-12 weeks and begin to produce proglottids containing infective eggs. These eggs are passed in the stool to the environment where the cycle is continued.

12-I (Protozoa Only)

Correct identification: *Giardia lamblia*.

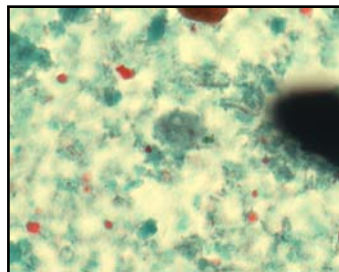
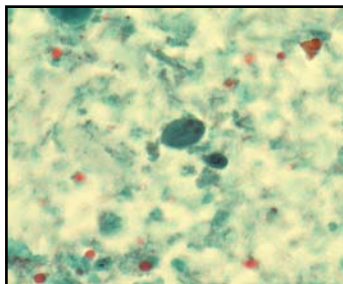
Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Giardia lamblia</i>	107/107	100	10/10	Correct

Quality Control and Referee Information

Participating and referee laboratories agreed that *Giardia lamblia* was the correct response (100%). Quality control examination of 4% of this sample showed cysts and trophozoites in every 8-10 100 X oil immersion fields.

Diagnostic Characteristics



Giardia lamblia is the most commonly diagnosed flagellate in humans. It has a worldwide distribution and is more prevalent in children than in adults. Trophozoites are pear shaped and measure 10-20 μ m. They have 2 nuclei, 4 pair of flagella, 2 axonemes, and 2 median bodies. The infective cysts are oval and measure 11-15 μ m. They contain 4 nuclei usually located at one end, filaments, and median bodies.

12-J (All Parasites)

Correct identification: *Plasmodium falciparum* and *Plasmodium ovale*.

Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Plasmodium ovale</i>	70/102	69	7/10	Correct
<i>Plasmodium falciparum</i>	73	72	6	Correct
<i>Plasmodium vivax</i>	10	10	2	No Penalty
<i>Babesia</i> sp.	1	1	0	Incorrect

Quality Control and Referee Information

Participating and referee laboratories agreed that *Plasmodium* sp. was the correct response (99 and 100%). Quality control examination of 4% of this sample showed parasites in every 10-12 100 X oil immersion fields. The predominant organism seen was the trophozoite of *Plasmodium ovale*, which enlarged the infected red blood cell. These infected cells were fimbriated and Schüffner's

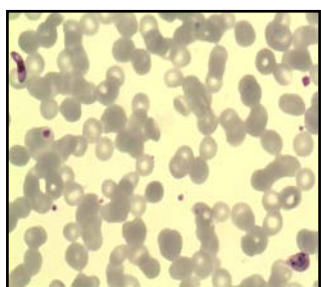
stippling was present. There were also banana-shaped gametocytes of *Plasmodium falciparum* present. Both of the images shown here have both species present.

Diagnostic Characteristics



Plasmodium falciparum is one of the four species of Plasmodium known to infect humans. It causes the most dangerous and severe form of malaria and is always considered to be a medical emergency. Death may occur rapidly if proper treatment is not started immediately. *P. falciparum* distribution is limited to the tropics, primarily Africa and Asia. Because this species invades all ages of RBCs the parasitemia can exceed 50%. The usual stages seen in the peripheral blood are rings and gametocytes. Schizogony occurs in the internal organs so it is rare to see other stages although they may be present in cases of severe malaria.

The infected RBCs are not enlarged nor do they contain Schüffner's dots. The rings are generally small, and may have one or two chromatin dots. Appliqué forms are also characteristic. Gametocytes are rounded to banana-shaped and contain a single well-defined chromatin and coarse rice-grain like pigment.



Plasmodium ovale infections occur primarily in Central West Africa and some South Pacific Islands and accounts for fewer than 5% of all malaria cases. *P. ovale* malaria is usually less severe than other malarias and often ends in spontaneous recovery. The infected cells are usually enlarged, fimbriated, and have Schüffner's stippling. The cytoplasm of the trophozoites is usually less amoeboid than that of *P. vivax* and the schizonts have 4-12 merozoites compared to 12-24 for *P. vivax*. The chromatin is usually very pronounced and the pigment is coarse.

Scoring Information

Immunoassay Results

<i>Cryptosporidium</i>	12-F		12-G		12-H	
METHOD	-	+	-	+	-	+
Alere Giardia/Cryptosporidium Quik Check	0	1	1	0	1	0
MCC Para-Tect Cryptosporidium/Giardia DFA	0	1	1	0	1	0
Meridian ImmunoCard STAT Cryptosporidium/Giardia	0	28	28	0	28	0
Meridian Merifluor Cryptosporidium/Giardia	0	18	18	0	18	0
Meridian Premier Cryptosporidium	0	1	1	0	1	0

Remel ProspeCT Cryptosporidium EIA	0	16	16	0	16	0
Remel Xpect Giardia/Cryptosporidium	0	5	5	0	5	0
TechLab Cryptosporidium II ELISA	0	3	3	0	3	0
TechLab/Wampole Test EIA	0	4	4	0	4	0
TechLab Giardia/Cryptosporidium Quick Check	0	1	1	0	1	0

<i>Giardia</i>	12-F		12-G		12-H	
METHOD	-	+	-	+	-	+
Alere Giardia/Cryptosporidium Quik Check	1	0	1	0	1	0
MCC Para-Tect Cryptosporidium/Giardia DFA	1	0	1	0	1	0
Meridian ImmunoCard STAT Crypto/Giardia	28	0	28	0	28	0
Meridian Merifluor Crypto/Giardia	14	0	14	0	14	0
Meridian Premier Giardia	1	0	1	0	1	0
Remel ProspeCT Giardia EIA	24	0	24	0	24	0
Remel ProSpect Giardia EZ	2	0	2	0	2	0
Remel Xpect Giardia	5	0	5	0	5	0
Remel Xpect Giardia/Cryptosporidium	6	0	6	0	6	0
TechLab/Wampole Test EIA	8	0	8	0	8	0
TechLab Giardia II ELISA	2	0	2	0	2	0
TechLab Giardia/Cryptosporidium Quick Check	1	0	1	0	1	0

Distribution of Scores

Score	# of labs	% of labs
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100	102	95
90-99	2	2
80-89	2	2
60-69	1	1

Answer Key

Sample	Correct Answer	Points
12-F	<i>Cryptosporidium</i> sp.	20
12-G	No Parasites Seen	20
12-H	<i>Taenia</i> sp.	20
12-I	<i>Giardia lamblia</i>	20
12-J	<i>Plasmodium falciparum</i> and <i>Plasmodium ovale</i>	20

TOTAL POSSIBLE POINTS 100

Grading

The answer key was derived from the response of all participating laboratories as per **CLIA Regulations**, Part 493, Subpart I, Section 493.917. These regulations can be viewed at www.cdc.gov/clia/regs/toc.aspx. These regulations state that 80% or more of participating laboratories **or** referee laboratories must identify the parasite for it to be authenticated as a correct answer. Similarly, reporting of a parasite identified by less than 10% of the participating laboratories **or** referees is an incorrect response. Organisms that are not authenticated, but which were reported by more than 10% of the participating laboratories or referees, are "Unauthenticated" and are not considered for grading.

Each sample has a maximum value of 20 points. Credit is given according to the formula:

$$(\# \text{ of Correct Responses} / (\# \text{ of Correct Responses} + \# \text{ of Incorrect Answers})) \times 100$$

Important Reminders

The next Parasitology Proficiency Test is scheduled for **October 2, 2012**. You are responsible for notifying us **before October 9, 2012** if you do not receive your samples. Proficiency test results must be electronically submitted through EPTRS by **October 16, 2012** or the laboratory will receive a score of zero. These requirements are stated in the NYS Proficiency Testing Handbook provided by the NYS Clinical Laboratory Evaluation Program or can be accessed via the Internet at:

<http://www.wadsworth.org/labcert/clep/ProgramGuide/pg.htm>

News and Notes

Beginning with the February 2009 proficiency exam, the **grading policy changed**. In order to make the score on the NYS Parasitology PT exam more accurately reflect laboratory performance, and be more consistent across categories, a new scoring system was put into effect. Under the new scoring system, grades are based only on the specimen or organism types processed by your laboratory.