MAYO CLINIC LABORATORIES

Test Definition: CYSTG

Cysticercosis (Taenia solium), IgG, Serum

Overview

Useful For

Aid for the diagnosis of cysticercosis caused by infection with *Taenia solium*

Method Name

Enzyme-Linked Immunosorbent Assay (ELISA)

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Collection Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 0.5 mL

Collection Instructions: Centrifuge and aliquot serum into plastic vial.

Specimen Minimum Volume

0.4 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Heat-inactivated specimen	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	14 days	
	Frozen	30 days	

Clinical & Interpretive

Clinical Information

Cysticercosis is caused by infection with *Taenia solium*, a tapeworm (cestode). In this form of infection, humans and pigs serve as the intermediate host and have the cystic larval form in their tissues. Humans can also serve as the definitive host for *T solium* and have the adult form in their intestine (known as taeniasis).

Humans acquire cysticercosis by ingesting microscopic *T solium* eggs in contaminated food, water, or on fomites. The eggs enter the environment when they are shed in stool from a person with the intestinal form of infection; this could be the same patient (autoinfection) or a different patient. Once ingested, the eggs hatch in the intestine to release oncospheres, which invade the intestinal wall and disseminate via the blood to muscles, liver, brain, and other tissues where they form cysts (cysticerci).

Taeniasis occurs when cysticerci are ingested in the undercooked flesh of an infected intermediate host (eg, pig). In the small intestine, cysticerci will evaginate and attach via a scolex to the intestinal wall. They then grow to become mature adult tapeworms. Adults can reside in the intestine for years and grow from 2 to 7 meters with over 500 proglottids, each filled with 50,000 eggs.

While cysticercosis and taeniasis occur globally, in the United States, infections are predominantly encountered in immigrants from Latin and Central America who acquired the infection locally.

The symptoms associated with cysticercosis depend on where the cysticerci localize, their size, number, and stage (degenerating, calcified, etc). The time between initial infection and symptom onset may vary from several months to years. The presence of cysts in the brain or spinal cord, referred to as neurocysticercosis, is the most serious form of disease and, while some individuals may be asymptomatic, many present with seizures (70%-90%), headache, confusion, and difficulty with balance. Cysts present in striated muscle are typically asymptomatic.

Diagnosis of cysticercosis relies on both imaging studies and serologic testing results. Importantly, detection of *T solium* eggs or proglottids in stool by an ova and parasite exam is diagnostic for taeniasis, not cysticercosis. Individuals with taeniasis should be evaluated for cysticercosis by serology since autoinfection can occur.

Due to imperfect sensitivity and specificity of commercially available enzyme-linked immunosorbent assays (ELISA) for cysticercosis, it is recommended that both positive and negative results by commercial ELISA be confirmed by a cysticercosis immunoblot offered through the Centers for Disease Control and Prevention (www.cdc.gov/dpdx/cysticercosis/index.html) for patients strongly suspected of having cysticercosis. Currently available antibody detection assays are unable to distinguish between active and inactive infections.

Reference Values

Negative

Reference values apply to all ages.

Interpretation

Positive:

Antibodies to *Taenia solium* (cysticercosis) detected. Confirmatory testing through the Centers for Disease Control and

Prevention is recommended. False-positive results may occur in patients with other helminth infections.

Negative:
No antibodies to *T solium* (cysticercosis) detected. A negative result may not rule-out infection as the sample may have been collected prior to the development of a detectable level of antibodies. Sensitivity is negatively impacted by the presence of few cysticerci or location in areas less accessible to the immune system. Repeat testing on a new sample is recommended for patients at high risk of cysticercosis.

Cautions

Diagnosis of cysticercosis should be based on exposure history, clinical presentation, other laboratory findings, and imaging studies.

False-negative results may occur in severely immunosuppressed patients.

Clinical Reference

1. Garvey BT, Moyano LM, Ayvar V, et al: Neurocysticercosis among people living near pigs heavily infected with cysticercosis in rural endemic Peru. Am J Trop Med Hyg. 2018;98(2):558-564
2. Garcia HH, Gonzalez AE, Gilman RH. Taenia solium cysticercosis and its impact in neurological disease. Clin Microbiol Rev. 2020;33(3):e00085-19. doi:10.1128/CMR.00085-19

Performance

Method Description

The kit provides all the material needed to perform 96 enzyme-linked immunosorbent assays (ELISA) on breakable microtitration wells sensitized with *Taenia solium* cyst soluble antigens. Specific antibodies in the sample will bind to these antigens and washing will remove unspecific antibodies. The presence of parasite specific antibodies is detected with a protein A - alkaline phosphatase conjugate. A second washing step will remove unbound conjugate. Revealing bound antibodies is made by the addition of p-nitrophenyl phosphate (pNPP) substrate, which turns yellow in the presence of alkaline phosphatase. Color intensity is proportional to the amount of *T solium* specific antibodies in the sample. Potassium phosphate is added to stop the reaction. Absorbance at 405 nm is read using an ELISA microplate reader.(Package insert: Taenia solium Enzyme immunoassay for the diagnosis of human cysticercosis. Bordier Affinity Products SA; 04/2018)

PDF Report

No

Day(s) Performed

Tuesday

Report Available

1 to 7 days

Specimen Retention Time

14 days

Test Definition: CYSTG

Cysticercosis (Taenia solium), IgG, Serum

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

86682

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CYSTG	Cysticercosis (T. solium), IgG, S	56485-6

Result ID	Test Result Name	Result LOINC® Value
CYSTG	Cysticercosis (T. solium), IgG, S	56485-6