MAYO CLINIC LABORATORIES

Test Definition: ECHNG

Echinococcus Antibody, IgG, Serum

Overview

Useful For

Detection of antibodies to *Echinococcus granulosus*

Method Name

Enzyme Immunoassay (EIA)

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.

Forms

If not ordering electronically, complete, print, and send an Infectious Disease Serology Test Request (T916) with the specimen.

Specimen Minimum Volume

0.4 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Heat-inactivated	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Echinococcosis, also referred to as hydatidosis or hydatid disease, is 1 of the 17 neglected tropical diseases recognized by the World Health Organization and affects over 1 million people worldwide. *Echinococcus* species are tapeworms or cestodes, and 2 main species infect humans: *Echinococcus granulosus* and *Echinococcus multilocularis*.

With respect to geographic distribution, *E granulosus* can be found worldwide but, more frequently, is found in rural grazing areas where dogs may feed on infected sheep or cattle carcasses. *E multilocularis* is largely localized to the northern hemisphere. The definitive hosts for *E granulosus* are dogs or other canids, while the definitive host for *E multilocularis* are foxes and, to a much lesser extent, canids. *Echinococcus* tapeworms reside in the small intestine of definitive hosts and release eggs that are passed in the feces and ingested by an intermediate host, typically sheep or cattle in the case of *E granulosus* or small rodents for *E multilocularis*. The eggs hatch in the small bowel, releasing an oncosphere that penetrates the intestinal wall and migrates through the circulatory system to various organs where it develops into a cyst that gradually enlarges, producing protoscolices and daughter cysts, which fill the interior. The definitive host becomes infected following ingestion of these infectious cysts. Humans become accidentally infected following ingestion of *Echinococcus* eggs.

In humans, *E granulosus* (cystic echinococcal disease) cysts typically develop in the lungs and liver. The infection may remain silent or latent for years (5-20 years) prior to cyst enlargement and symptom manifestation. Symptomatic manifestations include chest pain, hemoptysis, and cough for pulmonary involvement and abdominal pain and biliary duct obstruction for liver infection. *E multilocularis* (alveolar echinococcal disease) infections manifest more rapidly than those of *E granulosus* and similarly to a rapidly growing, destructive tumor, resulting in abdominal pain and biliary obstruction. Rupture of cysts can produce fever, urticaria, and anaphylactic shock.

Diagnosis of echinococcal infections relies on characteristic findings by ultrasound or other imaging techniques and serologic findings. Fine-needle aspirates of cystic fluid may be performed; however, they carry the risk of cyst puncture and fluid leakage, potentially leading to severe allergic reactions. Importantly, infected individuals do not shed eggs in stool.

Reference Values

Negative
Reference values apply to all ages.

Interpretation

Negative:
The absence of antibodies to *Echinococcus* species suggests that the individual has not been exposed to this cestode. A single negative result should not be used to rule out infection (see Cautions).

Positive:

Results suggest infection with *Echinococcus*. False-positive results may occur in settings of infection with other helminths or in patients with chronic immune disorders. Results should be considered alongside other clinical findings (eg, characteristic findings on imaging) and exposure history.

Cautions

Depending on cyst location, individuals may not develop high enough antibody titers to be detectable by serologic assays, leading to false-negative results. Cysts localized to the lungs, central nervous system, or spleen or cysts that are senescent, calcified, or dead are associated with lower serologic reactivity.

False-positive results may occur in patients with other helminth infections, including with *Taenia* species, *Schistosoma* species, and *Strongyloides*. Careful correlation with imaging findings and exposure history is required.

This assay may not detect antibodies to other species of *Echinococcus*, including *Echinococcus vogeli* and *Echinococcus oligarthrus*, both fairly uncommon causes of hydatid disease in humans.

Clinical Reference

1. Agudelo Higuita NI, Brunetti E, McCloskey C. Cystic Echinococcosis. J Clin Microbiol. 2016;54(3):518-523
2. Sarkari B, Rezaei Z. Immunodiagnosis of human hydatid disease: Where do we stand? World J Methodol. 2015;5(4):185-195

Performance

Method Description

The Bordier *Echinococcus granulosus* IgG ELISA is an enzymatically amplified sandwich-type immunoassay. After a blocking step, diluted serum and controls are incubated in antigen coated microtiter wells, then washed and incubated with anti-human IgG antibody labeled with protein A-alkaline phosphatase conjugate. After a washing step, the wells are incubated with the colorless pNPP substrate. The enzyme converts the substrate to a yellow product. The reaction is stopped by adding potassium phosphate and the degree of enzymatic turnover is determined by absorbance measured at 405 nm on the ELISA microplate reader on the Dynex Agility. OD results of the patient sample are compared to the assay calibrator to establish a final index value for qualitative interpretation.(Package insert: Bordier *Echinococcus granulosus* IgG ELISA, Bordier Affinity Products SA; 01/2018)

PDF Report

No

Day(s) Performed

Tuesday

Report Available

Same day/1 to 7 days

Specimen Retention Time

14 days

Test Definition: ECHNG

Echinococcus Antibody, 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
ECHNG	Echinococcus Ab, IgG, S	32171-1

Result ID	Test Result Name	Result LOINC® Value
ECHNG	Echinococcus Ab, IgG, S	32171-1