MAYO CLINIC LABORATORIES

Test Definition: TOXCG

Toxocara Antibody, IgG, Serum

Overview

Useful For

Aiding in the diagnosis of *Toxocara* infection

Method Name

Enzyme-Linked Immunosorbent Assay (ELISA)

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
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 a plastic vial.

Forms

If not ordering electronically, complete, print, and send a Kidney Transplant Test Request 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	Frozen (preferred)	30 days	
	Refrigerated	5 days	

Clinical & Interpretive

Clinical Information

Toxocariasis is a zoonotic parasitic disease caused by the nematode, *Toxocara,* of which there are 2 species: *Toxocara canis* and *Toxocara cati*. *Toxocara* eggs are shed in the feces of infected animals and, once in the environment, become infectious within 2 to 4 weeks. Humans are accidental hosts and become infected through ingestion of dirt or contaminated material containing *Toxocara* eggs. Although uncommon, individuals can also get toxocariasis by eating undercooked or raw meat from infected animals. Upon ingestion, *Toxocara* eggs hatch and larvae are released, which can penetrate the intestinal wall, travel through the bloodstream, and migrate to a variety of tissues (eg, liver, heart, lungs, brain, muscles, eyes). Although *Toxocara* larvae do not undergo any further development at these sites, they can cause severe local inflammatory reactions, which are the basis of toxocariasis.

While the majority of infected people do not have any symptoms, the 2 primary clinical presentations of toxocariasis are visceral larva migrans (visceral toxocariasis) and ocular larva migrans (ocular toxocariasis). Manifestations of toxocariasis reflect parasitic burden, immune response, and resulting inflammation. Symptoms of larva migrans may be characterized by Loffler syndrome (eg, fever, coughing, wheezing, abdominal pain), hepatomegaly, eosinophilia, or irreversible eye problems. Rarely, larvae migrate to the central nervous system, causing eosinophilic meningoencephalitis or granuloma formation. Larvae can also migrate to and penetrate the eye, resulting in ocular toxocariasis, which may lead to retinal scarring, decreased vision, and leukocoria.

A *Toxocara* seroprevalence study in the United States showed that approximately 5% of the US population is infected with *Toxocara*. Globally, toxocariasis is found in many countries, and rates of prevalence can be as high as 40%, particularly in tropical regions where eggs remain viable in the soil. Children and adolescents under the age of 20, as well as dog owners, are at higher risk of infection.

Diagnosis of *Toxocara* infections involves obtaining relevant clinical and exposure history and relies on antibody detection to *Toxocara* species. Eosinophilia may also be present, more commonly in visceral toxocariasis. Stool examination for ova and parasites is not useful since eggs are not excreted by humans, only by domestic animals. Currently, antibody testing is the only means of confirming a clinical diagnosis. The recommended serologic test for toxocariasis is an enzyme-linked immunosorbent assay using larval-stage antigens. However, a measurable titer does not distinguish between current and past *Toxocara* infection. Laboratory findings should be correlated with clinical history.

Reference Values

Negative

Reference values apply to all ages.

Interpretation

Positive:
IgG antibodies to *Toxocara* species detected, suggesting current or past infection. False-positive results may occur in

patients with other helminth infections (eg, *Ascaris lumbricoides*, *Schistosoma* species, *Strongyloides*).

Equivocal:
Recommend follow-up testing in 10 to 14 days if clinically indicated.

Negative:
No antibodies to *Toxocara* species detected.

Cautions

A single negative result does not rule out infection. Assay sensitivity may be decreased depending on the site of infection, in cases of low parasitic burden, and timing of sample collection relative to exposure. In ocular toxocariasis, *Toxocara* antibody levels in serum can be low or absent despite clinical disease. Repeat testing should be considered in patients who are at high risk of exposure or infection.

False-negative results may occur in severely immunosuppressed patients.

Positive results should be interpreted with patient's clinical status and exposure history.

Positive results by this assay do not distinguish acute versus remote infection.

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

This assay uses synthetic antigens derived from *Toxocara canis*. Studies evaluating the sensitivity of this assay in patients infected with *Toxocara cati* have not been performed.

Clinical Reference

1. Smith HV. Antibody reactivity in human toxocariasis. In: Lewis JW, Maizels RM, eds. Toxocara and Toxocariasis: Clinical, Epidemiological, and Molecular Perspectives. Institute of Biology and the British Society for Parasitology; 1993:91-109
2. Liu EW, Chastain HM, Shin SH, et al. Seroprevalence of antibodies to Toxocara species in the United States and associated risk factors, 2011-2014. Clin Infect Dis. 2018;66(2):206-212
3. Woodhall DM, Fiore AE. Toxocariasis: a review for pediatricians. J Pediatric Infect Dis Soc. 2014;3(2):154-159

Performance

Method Description

Microtiter strip wells are precoated with synthetic *Toxocara canis* antigens to bind corresponding antibodies of the specimen. After washing the wells to remove all unbound sample material, horseradish peroxidase-labeled protein A conjugate is added. This conjugate binds to the captured *T canis*-specific antibodies. The immune complex formed by the bound conjugate is visualized by adding tetramethylbenzidine substrate, which gives a blue reaction product. The intensity of this product is proportional to the amount of *T canis*-specific antibodies in the specimen. Sulfuric acid is added to stop the reaction. This produces a yellow endpoint color. Absorbance at 450 nm is read using an enzyme-linked immunosorbent assay microwell plate reader.(Package insert: Toxocara canis ELISA IgG Test Kit. Gold Standard Diagnostics; 07/11/2023)

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Toxocara Antibody, IgG, Serum

PDF Report
No

Day(s) Performed
Tuesday, Friday

Report Available
1 to 5 days

Specimen Retention Time
14 days

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
TOXCG	Toxocara Ab, IgG, S	40674-4

Result ID	Test Result Name	Result LOINC® Value
TOXCG	Toxocara Ab, IgG, S	40674-4