
Overview

Useful For

Supporting the diagnosis of acute cerebral, ocular, disseminated, or congenital toxoplasmosis

Testing Algorithm

See [Meningitis/Encephalitis Panel Algorithm](#) in Special Instructions.

Special Instructions

- [Meningitis/Encephalitis Panel Algorithm](#)

Method Name

Polymerase Chain Reaction (PCR)/DNA Probe Hybridization

NY State Available

Yes

Specimen

Specimen Type

Varies

Necessary Information

Specimen source is required.

Specimen Required

Submit only 1 of the following specimens:

Specimen Type: Amniotic fluid

Container/Tube: Amniotic fluid container

Specimen Volume: 0.5 mL

Collection Instructions: **Do not centrifuge.**

Specimen Type: Spinal fluid

Supplies: Aliquot Tube, 5 mL (T465)

Container/Tube:

Preferred: 12 x 75-mm screw cap vial (T465)

Acceptable: Sterile vial

Specimen Volume: 0.5 mL

Collection Instructions: **Do not centrifuge.**

Specimen Type: Fresh tissue

Supplies: M4-RT (T605)

Container/Tube:

Preferred: Multimicrobe Medium (M4-RT) (T605)

Acceptable: Sterile container with 1 to 2 mL of sterile saline

Specimen Volume: Entire collection

Collection Instructions: Submit only fresh tissue in a sterile container containing 1 mL to 2 mL of sterile saline or multimicrobe medium (M4-RT, M4, or M5)

Specimen Type: Ocular fluid

Supplies: Aliquot Tube, 5 mL (T465)

Collection Container: 12 x 75-mm screw cap vial (T465)

Specimen Volume: 0.3 mL

Collection Instructions: Do not centrifuge.

Forms

If not ordering electronically, complete, print, and send a [Microbiology Test Request](#) (T244) with the specimen.

Specimen Minimum Volume

Amniotic Fluid, Ocular Fluid, Spinal Fluid: 0.3 mL

Tissue: 2 x 2mm biopsy

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Refrigerated (preferred)	7 days	
	Frozen	7 days	

Clinical and Interpretive

Clinical Information

Toxoplasma gondii is an obligate intracellular protozoan parasite that is capable of infecting a variety of intermediate hosts including humans. Infected definitive hosts (cats) shed oocysts in feces that rapidly mature in the soil and become infectious.(1) Toxoplasmosis is acquired by humans through ingestion of food or water contaminated with

cat feces or through eating undercooked meat containing viable oocysts. Vertical transmission of the parasite through the placenta can also occur, leading to congenital toxoplasmosis. Following primary infection, *T gondii* can remain latent for the life of the host; the risk for reactivation is highest among immunosuppressed individuals.

Seroprevalence studies performed in the United States indicate that approximately 9% to 11% of individuals between the ages of 6 and 49 have antibodies to *T gondii*.(2)

Infection of immunocompetent adults is typically asymptomatic. In symptomatic cases, patients most commonly present with lymphadenopathy and other nonspecific constitutional symptoms, making definitive diagnosis difficult to determine.

Severe-to-fatal infections can occur among patients with AIDS or individuals who are otherwise immunosuppressed. These infections are thought to be caused by reactivation of latent infections and commonly involved the central nervous system.(3)

Transplacental transmission of the parasites resulting in congenital toxoplasmosis can occur during the acute phase of acquired maternal infection. The risk of fetal infection is a function of the time at which acute maternal infection occurs during gestation.(4) The incidence of congenital toxoplasmosis increases as pregnancy progresses; conversely, the severity of congenital toxoplasmosis is greatest when maternal infection is acquired early during pregnancy. A majority of infants infected in utero are asymptomatic at birth, particularly if maternal infection occurs during the third trimester, with sequelae appearing later in life. Congenital toxoplasmosis results in severe generalized or neurologic disease in about 20% to 30% of the infants infected in utero; approximately 10% exhibit ocular involvement only and the remainder are asymptomatic at birth. Subclinical infection may result in premature delivery and subsequent neurologic, intellectual, and audiologic defects.

Serology is the traditional method for diagnosing toxoplasmosis and ascertaining the previous exposure history of the host. However, serology may be unreliable or challenging to interpret in immunocompromised patients and in suspected intrauterine infection. Detection of *T gondii* DNA by PCR has proven to be a rapid and reliable alternative or supportive method for the diagnosis of toxoplasmosis.

Reference Values

Negative

Interpretation

A positive result indicates presence of DNA from *Toxoplasma gondii*.

Negative results indicate absence of detectable DNA but do not exclude the presence of organism or active or recent disease.

Cautions

This assay is designed for use in patients with a clinical history and symptoms consistent with toxoplasmosis. This test should not be used to screen healthy patients. Depending on the population, varying percentages of patients may be found to be positive.

Results should be interpreted with consideration of clinical and laboratory findings. A negative result does not indicate absence of disease. Reliable results depend on adequate specimen collection and the absence of inhibiting substances.

Supportive Data

Accuracy/Diagnostic Sensitivity and Specificity:

Accuracy was determined using a combination of spiking and clinical specimens for each source accepted for

testing. Accuracy ranges from 97% to 100%.

Analytical Sensitivity/Limit of Detection (LoD):

The limit of detection for this assay is less than 5,000 copies/mL in CSF, tissue, ocular fluid, and amniotic fluid.

Analytical Specificity:

No PCR signal was obtained from extracts of 20 bacterial, parasitic, and viral isolates from similar organisms and from organisms commonly found in the specimen types tested.

Precision:

Intra-assay precision and interassay precision are 100%.

Reference Range:

The reference range is "Negative" for this assay.

Reportable Range:

This is a qualitative assay and results are reported as "Negative" or "Positive."

Clinical Reference

1. Robert-Gangneux F, Darde M: Epidemiology of and Diagnostic Strategies for Toxoplasmosis. Clin Microbiol Rev 2012;25(2):264
2. Mattos CCB, Meira CS, Ferreira AIC, et al: Contribution of laboratory methods in diagnosing clinically suspected ocular toxoplasmosis in Brazilian patients. Diagn Microbiol Infec Dis 2011;70:362-366
3. Martino R, Bretagne S, Einsele H, et al: Early detection of Toxoplasma infection by molecular monitoring of Toxoplasma gondii in peripheral blood samples after allogeneic stem cell transplantation. Clin Infect Dis 2005;40:67-78
4. Fricker-Hidalgo H, Bulabois C, Brenier-Pinchart M, et al: Diagnosis of toxoplasmosis after allogeneic stem cell transplantation: results of DNA detection and serological techniques. Clin Infect Dis 2009;48:e9-e15

Performance

Method Description

DNA from clinical specimens is first extracted using the Roche MagNA Pure system. *Toxoplasma gondii* DNA is then detected by using real-time PCR to amplify the target sequence of the *B1* gene. The LightCycler amplifies and monitors fluorescent development of target nucleic acid after each cycle. The continuous monitoring is derived from the fluorescence resonance energy transfer (FRET) principle: a hybridization probe with a donor fluorophore on the 3' end is excited by an external light source and emits light that is absorbed by a second hybridization probe with an acceptor fluorophore at the 5' end. The acceptor fluorophore emits light of a different wavelength that can be measured with a signal that is proportional to the amount of specific PCR product. Melting temperature analysis is used following amplification for sensitive and specific detection of amplified target DNA. (Cockerill FR, Uhl FR: Applications and challenges of real-time PCR for the clinical microbiology laboratory. In Rapid Cycle Real-Time PCR. Edited by U Reischl, C Wittwer, F Cockerill. Springer, NY, 2002)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Saturday; Varies

Analytic Time

Same day/1 day

Maximum Laboratory Time

4 days

Specimen Retention Time

1 week

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. For assistance, contact [Customer Service](#).

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information

87798

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
PTOX	Toxoplasma gondii PCR	42626-2

Result ID	Test Result Name	Result LOINC Value
SRC74	Specimen Source	31208-2
81795	Toxoplasma gondii PCR	42626-2