Test Definition: CBSRP

Coxiella burnetii (Q Fever), Molecular Detection, PCR, Serum

Overview

Useful For

Aiding in the diagnosis of *Coxiella burnetii* infection (ie, Q fever) using serum specimens

Method Name

Real-Time Polymerase Chain Reaction (PCR)

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

The high sensitivity of amplification by polymerase chain reaction requires the specimen to be processed in an environment in which contamination of the specimen by *Coxiella burnetii* DNA is unlikely.

Collection Container/Tube:
Preferred: Red top
Acceptable: Serum gel
Submission Container/Tube: Sterile vial
Specimen Volume: 1 mL
Collection Instructions: Centrifuge and aliquot serum into a sterile vial within 2 hours of collection.

Forms

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

Specimen Minimum Volume

0.5 mL

Reject Due To

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

Specimen Stability Information

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

	Refrigerated	7 days	

Clinical & Interpretive

Clinical Information

Coxiella burnetii, the causative agent of Q fever, is a small obligately intracellular bacterium associated with animals. Acquired through aerosol exposure, it generally causes mild respiratory disease. A small number of acute cases advance to a chronic infection, which typically manifests as endocarditis. Left untreated, Q fever endocarditis may be fatal. Serologic and histopathologic studies may be nonspecific and subjective, respectively, limiting usefulness for patient diagnosis.

Evaluation of infected tissue, blood, or serum using polymerase chain reaction (PCR) may be a useful tool for diagnosing some cases of *Coxiella burnetii* infection. Mayo Clinic Laboratories has developed a real-time PCR test that rapidly detects *Coxiella burnetii* DNA in clinical specimens by targeting a sequence of the shikimate dehydrogenase gene (*aroE*) unique to *Coxiella burnetii*.

Reference Values

Not applicable

Interpretation

A positive result indicates the presence of *Coxiella burnetii* DNA.

A negative result indicates the absence of detectable *C burnetii* DNA but does not negate the presence of the organism and may occur due to inhibition of PCR, sequence variability underlying primers or probes, or the presence of *C burnetii* DNA in quantities less than the limit of detection of the assay.

Cautions

Test results should be used as an aid in diagnosis and not be considered diagnostic in themselves. A single assay should not be used as the only criteria to form a clinical conclusion, but results should be correlated with patient symptoms and clinical presentation. A negative result does not negate the presence of the organism or active disease.

Supportive Data

This assay was clinically validated in a blinded manner using 52 archived, formalin-fixed, paraffin-embedded heart valve specimens from patients with endocarditis. A single sample within this set was determined to contain polymerase chain reaction (PCR) inhibitors and omitted from the final analysis set. Compared with existing diagnostic data, PCR had a sensitivity of 100% (8/8) and specificity of 100% (43/43). All samples were assayed with a second PCR assay targeting the IS*1111* element.(1) Complete concordance was noted between the 2 assays (P >0.999). The limit of detection of the assay is 21.6 targets/mcL for serum.

Clinical Reference

1. Frangoulidis D, Meyer H, Kahlhofer C, Splettstoesser WD: 'Real-time' PCR-based detection of *Coxiella burnetii* using conventional techniques. FEMS Immunol Med Microbiol 2012 Feb;64(1):134-136
2. Liesman RM, Pritt BS, Maleszewski JJ, Patel R. Laboratory diagnosis of infective endocarditis. J Clin Microbiol. 2017 Sep;55(9):2599-2608. doi: 10.1128/jcm.00635-17

3. Kersh GJ, Bleeker-Rovers CP: Coxiella: Evaluation, interpretation, and reporting results. In: Carroll K, Pfaller M, eds. Manual of Clinical Microbiology. 12th ed. ASM Press; 2019:1185-1186
4. Anderson A, Bijlmer H, Fournier PE, et al: Diagnosis and management of Q fever-United States, 2013: recommendations from CDC and the Q Fever Working Group. MMWR Recomm Rep 2013;62(RR-03):1-30

Performance

Method Description

Bacterial nucleic acid is extracted from the specimen using the automated MagNA Pure instrument. The purified DNA is placed on the LightCycler instrument, which amplifies and monitors by fluorescence the development of target nucleic sequences after each PCR cycle. A specific target sequence from *Coxiella burnetii* is amplified and the resulting segment is detected using specific hybridization probes. Detection of the *Coxiella burnetii* target is performed through melting curve analysis using the LightCycler software.(Cockerill FR, Uhl FR: Applications and challenges of real-time PCR for the clinical microbiology laboratory. In: Reischl U, Wittwer C, Cockerill F, eds. Rapid Cycle Real-Time PCR, 2002:3-27; Kersh GJ, Bleeker-Rovers CP: Coxiella. In: Carroll K, Pfaller M, eds. Manual of Clinical Microbiology. 12th ed. ASM Press; 2019:1180-1188)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

2 to 7 days

Specimen Retention Time

7 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA

requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

87798

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CBSRP	Coxiella burnetii (Q fever) PCR, S	90443-3

Result ID	Test Result Name	Result LOINC® Value
35189	Specimen Source	31208-2
35190	Coxiella burnetii PCR	90443-3