Test Definition: CBRP

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

Overview

Useful For

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

Testing Algorithm

For more information see Infective Endocarditis: Diagnostic Testing for Identification of Microbiological Etiology

Special Instructions

- Infective Endocarditis: Diagnostic Testing for Identification of Microbiological Etiology

Method Name

Real-Time Polymerase Chain Reaction (PCR)

NY State Available

Yes

Specimen

Specimen Type

Varies

Necessary Information

Specimen source is required.

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.

Submit only 1 of the following specimens:

Specimen Type: Fresh tissue or biopsy
Sources: Lung, bone, liver, heart valve, aorta, or endocardium
Container/Tube: Sterile container
Specimen Volume: Entire collection or 5 mm(3) - approximately the size of a pencil eraser
Collection Instructions:
1. Collect fresh tissue specimen.
2. Submit tissue only, do not add fluid to tissue
3. Refrigerate or freeze specimen.
Specimen Stability Information: Refrigerated (preferred) <7 days/ Frozen <7 days

Preferred Paraffin-embedded tissue block:
Specimen Type: Formalin-fixed, paraffin-embedded tissue block (FFPE)
Sources: Lung, bone, liver, heart valve, aorta, or endocardium
Supplies: Tissue Block Container (T553)
Container/Tube: Tissue block
Collection Instructions: Submit a formalin-fixed, paraffin-embedded tissue block to be cut and returned.
Specimen Stability Information: Ambient (preferred)/Refrigerated

Acceptable Paraffin-embedded tissue block:
Specimen Type: Formalin-fixed, paraffin-embedded tissue block (FFPE)
Sources: Lung, bone, liver, heart valve, aorta, or endocardium
Container/Tube: Sterile container for each individual cut section (scroll).
Collection Instructions: Perform microtomy and prepare 5 separate 10-micron sections. **Each section (scroll) must be placed in a separate sterile container for submission.**
Specimen Stability Information: Ambient (preferred)/Refrigerated

Forms

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

Specimen Minimum Volume

Fresh tissue or biopsy: 5 mm(3)
Paraffin-embedded tissue block: two 10-micron sections

Reject Due To

Tissue in formalin formaldehyde, or acetone Bone marrow Decalcified bone Unstained slides	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Varies		

Clinical & Interpretive

Clinical Information

Coxiella burnetii, the causative agent of Q fever, is a small obligate 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 *C burnetii* infection. Mayo Clinic Laboratories has developed a real-time PCR test that rapidly detects *C burnetii* DNA in clinical specimens by targeting a sequence of the shikimate dehydrogenase gene (*aroE*) unique to *C 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 it does not negate the presence of the organism and may occur due to inhibition of polymerase chain reaction, 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 determined to contain polymerase chain reaction (PCR) inhibitors was 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 216 targets/mcL for fresh tissue and estimated (by Probit analysis) to be 9.7 targets/mcL in formalin-fixed paraffin-embedded tissue.

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 *C 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
CBRP	Coxiella burnetii (Q fever) PCR	90442-5

Result ID	Test Result Name	Result LOINC® Value
SRCQF	Specimen Source	31208-2
62193	Coxiella burnetii PCR	90442-5