MAYO CLINIC LABORATORIES

Test Definition: PNRP

Pneumocystis jiroveci, Molecular Detection, PCR, Varies

Overview

Useful For
Preferred test for detection of *Pneumocystis*

Method Name
Real-Time Polymerase Chain Reaction (PCR)

NY State Available
Yes

Specimen

Specimen Type
Varies

Shipping Instructions
Specimen must arrive within 7 days of collection; specimens older than 7 days will be rejected.

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 *Pneumocystis* species DNA is unlikely.

Preferred Specimens: Pleural, respiratory (eg, bronchoalveolar lavage [BAL], bronchial washing, sputum), or fresh tissue

Acceptable Specimens: If no fresh specimen is available, digested respiratory specimens treated with N-acetyl-L-cysteine-sodium hydroxide (NALC/NaOH) are acceptable (eg, BAL, bronchial washing, respiratory fluid, sputum, or tracheal secretion)

Submit only 1 of the following specimens:

Preferred
Specimen Type: Body fluid
Sources: Pleural
Container/Tube: Sterile container
Specimen Volume: 1 mL
Additional Information: Only fresh, non-NALC/NaOH-digested body fluid is acceptable.

Specimen Type: Respiratory
Sources: BAL, bronchial washing, tracheal secretions, or sputum
Container/Tube: Sterile container
Specimen Volume: 1 mL if only PCR ordered or 3 mL if PCR ordered with smear and culture

Specimen Type: Tissue
Sources: Respiratory
Container/Tube: Sterile container
Specimen Volume: 5-10 mm
Collection Instructions:
1. Submit fresh tissue.
2. Keep tissue moist with sterile water or sterile saline

Acceptable
Specimen Type: NALC/NaOH-digested respiratory specimens
Sources: BAL, bronchial washing, respiratory fluid, sputum, or tracheal secretion
Container/Tube: Sterile container
Specimen Volume: 2 mL
Collection Instructions:
1. Submit digested specimen treated with NALC/NaOH.
2. Clearly indicate on container and order form that specimen is a digested specimen.

Forms

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

Specimen Minimum Volume

Body fluid or nondigested respiratory specimen: 0.5 mL; Fresh tissue: 5 mm; NALC-NaOH-digested specimen: 1 mL

Reject Due To

Body fluid other than pleural fluid Blood Bone Nonrespiratory tissue Bone marrow Organ tissues other than lung Paraffin-embedded tissue	Reject

Specimen in anaerobe vial or viral transport medium Feces Swab Tissue in formalin fluid Urine	

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Pneumocystis pneumonia is an important cause of opportunistic infection in patients who are immunocompromised, particularly those with HIV. The causative agent, *Pneumocystis jiroveci*, cannot be cultured in vitro, and, therefore, laboratory detection has historically relied upon microscopic identification directly from patient specimens using fluorescent stains or antibodies. Stains often lack sensitivity and require expertise on the part of the reader to differentiate *Pneumocystis jiroveci* from staining artifacts and other fungi. This real-time polymerase chain reaction assay provides a sensitive and specific detection of *Pneumocystis* from bronchoalveolar lavage fluid and other respiratory specimens.

Reference Values

Not applicable

Interpretation

A positive result indicates the presence of *Pneumocystis* DNA.

A negative result indicates the absence of detectable *Pneumocystis* DNA.

Cautions

Test results should be used as an aid in diagnosis and should not be considered diagnostic in themselves. The literature indicates that *Pneumocystis* can cause asymptomatic colonization of healthy individuals and those who are immunocompromised. Therefore, test results should be correlated with patient symptoms and clinical presentation.

A negative result does not rule out the presence of *Pneumocystis* or active disease because the organism may be present at undetectable levels.

Clinical Reference

1. Senecal J, Smyth E, Del Corpo O, et al: Non-invasive diagnosis of Pneumocystis jirovecii pneumonia: a systematic review and meta-analysis. Clin Microbiol Infect. 2022 Jan;28(1):23-30. doi: 10.1016/j.cmi.2021.08.017
2. Apostolopoulou A, Fishman JA: The pathogenesis and diagnosis of Pneumocystis jiroveci pneumonia. J Fungi (Basel). 2022 Nov 5;8(11):1167. doi: 10.3390/jof8111167
3. Fishman JA. Pneumocystis jiroveci. Semin Respir Crit Care Med. 2020 Feb;41(1):141-157. doi: 10.1055/s-0039-3399559

Performance

Method Description

Nucleic acids are extracted using the MagNA Pure LC Instrument (Roche). The extract is then amplified using the LightCycler real-time polymerase chain reaction (PCR) platform (Roche). The detection of amplicon is based on fluorescence resonance energy transfer (FRET), which utilizes hybridization probes. The presence of the specific organism nucleic acid is confirmed by performing a melting curve analysis of the amplicon.(Arcenas RC, Uhl JR, Buckwalter SP, et al: A real-time PCR assay for detection of *Pneumocystis* from bronchoalveolar lavage fluid. Diagn Microbiol Infect Dis. 2006 Mar;54(3):169-175)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

1 to 3 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.

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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

87594

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
PNRP	Pneumocystis PCR	89996-3

Result ID	Test Result Name	Result LOINC® Value
SRC63	Specimen Source	31208-2
81698	Pneumocystis PCR, Result	89996-3
24188	Special Information	48767-8
24189	Report Status	No LOINC Needed