Test Definition: SFRB

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS CoV-2), Influenza A and B, and Respiratory Syncytial Virus, Molecular Detection, Bronchoalveolar Lavage

Overview

Useful For

Aiding in the diagnosis of influenza A and B, respiratory syncytial virus, and SARS-CoV-2 infections in conjunction with clinical and epidemiological risk factors

This test **should be requested only on** patients meeting current clinical and/or epidemiologic criteria defined by institutional, federal, state, or local public health directives.

Testing Algorithm

For information see Respiratory Virus Testing Algorithm, including Coronavirus Disease 2019 (COVID-19), Influenza, Respiratory Syncytial Virus in Bronchoalveolar Lavage Specimens.

Special Instructions

- Respiratory Virus Testing Algorithm Coronavirus Disease 2019 (COVID-19), Influenza, Respiratory Syncytial Virus in Bronchoalveolar Lavage Specimens

Highlights

This test provides qualitative detection of SARS-CoV-2, influenza A and B, and respiratory syncytial virus (RSV) RNA from bronchoalveolar lavage.

Method Name

Real-Time Reverse Transcription Polymerase Chain Reaction (RT-PCR)

NY State Available

No

Specimen

Specimen Type

Bronchoalveolar Lavage

Specimen Required

Source: Bronchoalveolar lavage (BAL)
Container/Tube: Sterile container
Specimen Volume: 1 mL
Additional Information: Do not aliquot into viral transport medium.

Specimen Minimum Volume

See Specimen Required

Reject Due To

Specimen in viral transport medium	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Bronchoalveolar Lavage	Refrigerated (preferred)	72 hours	
	Ambient	24 hours	

Clinical & Interpretive

Clinical Information

Influenza, or the flu, is a contagious viral infection of the respiratory tract. Transmission of influenza is primarily airborne (ie, coughing or sneezing); the peak of transmission usually occurs in the winter months. Symptoms commonly include fever, chills, headache, muscle aches, malaise, cough, and sinus congestion. Gastrointestinal symptoms (ie, nausea, vomiting, or diarrhea) may also occur, primarily in children, but are less common in adults. Symptoms generally appear within 2 days of exposure to an infected person. Pneumonia may develop as a complication of influenza infection, causing increased morbidity and mortality in pediatric, elderly, and immunocompromised populations.

Influenza viruses are classified into types A, B, and C; types A and B cause most human infections. Influenza A is the most common type of influenza virus in humans and is generally responsible for seasonal flu epidemics and occasionally pandemics. Influenza A viruses are further divided into subtypes on the basis of 2 surface proteins: hemagglutinin (H) and neuraminidase (N). Seasonal flu is normally caused by subtypes H1, H2, H3, and N1 and N2. In addition to seasonal flu, a novel H1N1 strain was identified in humans in the United States in early 2009. Infections with influenza B virus are generally restricted to humans and are less frequent causes of epidemics.

Respiratory syncytial virus (RSV), a member of the Paramyxoviridae family consisting of subgroups A and B, is also the cause of a contagious disease that afflicts primarily infants and the elderly who are immunocompromised (eg, patients with chronic lung or heart disease or undergoing treatment for conditions that reduce the strength of their immune system). The virus causes both upper respiratory infections, such as tracheobronchitis and lower respiratory infections manifesting as bronchiolitis and pneumonia. By the age of 2, most children have already been infected by RSV, but because only weak immunity develops, both children and adults can become reinfected. Symptoms usually appear 4 to 6 days after infection. The disease is typically self-limiting, lasting about 1 to 2 weeks in infants. In adults, the infection lasts about 5 days and presents with symptoms consistent with a cold, such as rhinorrhea, fatigue, headache, and fever.

The RSV season overlaps with influenza season somewhat as infections begin to rise during the fall and continues through early spring. RSV infections may rarely occur at other times of the year.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a positive-sense, single-stranded RNA virus that causes COVID-19. Like other coronaviruses that infect humans, SARS-CoV-2 can cause both upper and lower respiratory tract infection. Symptoms can range from mild (ie, the common cold) to severe (ie, pneumonia) in both healthy and immunocompromised patients. SARS-CoV-2 transmission occurs primarily via respiratory droplets. During the early stages of COVID-19, symptoms may be nonspecific and resemble other common respiratory tract infections, such as influenza. If testing for other respiratory tract pathogens is negative, specific testing for SARS-CoV-2 may be warranted.

Reference Values

Negative

Interpretation

A "Detected" result indicates that target RNA is present. Test result should always be considered in the context of patient's clinical history, physical examination, and epidemiologic exposures when making the final diagnosis.

An "Undetected" result indicates that target RNA is not present in the patient's specimen. However, this result may be influenced by the stage of the infection and the quality of the specimen collected for testing. Result should be correlated with patient's history and clinical presentation.

An "Inconclusive" result indicates that the presence or absence of target RNA in the specimen could not be determined with certainty after repeat testing in the laboratory, possibly due to reverse transcription-polymerase chain reaction (RT-PCR) inhibition. Submission of a new specimen for testing is recommended.

Cautions

The sensitivity of the assay is dependent on the quality of the specimen collected for testing.

The test is specific for influenza, respiratory syncytial virus (RSV), and SARS-CoV-2, and positive test results do not exclude the possibility of concurrent infection with other respiratory viruses.

An undetected (ie, negative) result does not preclude infection with influenza, RSV, or SARS-CoV-2 and should not be used as the sole basis for decisions on treatment or other patient care management.

Clinical Reference

1. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. N Engl J Med. 2020;382(8):727-733. doi:10.1056/NEJMoa2001017
2. Patel A, Jernigan DB, 2019-nCoV CDC Response Team. Initial public health response and Interim Clinical Guidance for the 2019 Novel Coronavirus Outbreak-United States, December 31, 2019-February 4, 2020. MMWR Morb Mortal Wkly Rep. 2020;69(5):140-146. doi:10.15585/mmwr.mm6905e1
3. Holshue ML, DeBolt C, Lindquist S, et al. First case of 2019 novel coronavirus in the United States. N Engl J Med. 2020;382(10):929-936. doi:10.1056/NEJMoa2001191

4. Centers for Disease Control and Prevention. Influenza (Flu). Accessed February 18, 2025. Available at www.cdc.gov/flu/index.htm
5. Lee N, Lui GC, Wong KT, et al. High morbidity and mortality in adults hospitalized for respiratory syncytial virus infections. Clin Infect Dis. 2013;57(8):1069-1077
6. Meerhoff TJ, Houben ML, Coenjaerts FE, et al. Detection of multiple respiratory pathogens during primary respiratory infection: nasal swab versus nasopharyngeal aspirate using real-time polymerase chain reaction. Eur J Clin Microbiol Infect Dis. 2010;29(4):365-371
7. Heikkinen T, Marttila J, Salmi AA, Ruuskanen O. Nasal swab versus nasopharyngeal aspirate for isolation of respiratory viruses. J Clin Microbiol. 2002;40(11):4337-4339

Performance

Method Description

The Xpert Xpress SARS-CoV-2/Flu/RSV test is an automated in vitro diagnostic test for qualitative detection and differentiation of RNA from influenza A, influenza B, and SARS-CoV-2. The Xpert Xpress SARS-CoV-2/Flu/RSV test is performed on GeneXpert Instrument Systems.

The GeneXpert Instrument Systems automate and integrate sample preparation, nucleic acid extraction and amplification, and detection of the target sequences in simple or complex samples using real-time polymerase chain reaction (PCR) and reverse transcription (RT-PCR) assays. The systems require the use of single-use disposable cartridges that hold the RT-PCR reagents and host the RT-PCR process. Because the cartridges are self-contained, cross-contamination between samples is minimized.(Package insert: Xpert Xpress SARS-CoV-2/Flu/RSV. Cepheid; 302-4421, Rev B, 10/2020)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

Same day/1 to 3 days

Specimen Retention Time

7 days

Performing Laboratory Location

Mayo Clinic Jacksonville Clinical Lab

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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

87637

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
SFRB	SARS CoV-2, Flu A/B, RSV, PCR, BAL	95941-1

Result ID	Test Result Name	Result LOINC® Value
BPFLA	Influenza A, PCR	92142-9
BPFLB	Influenza B, PCR	92141-1
BPRSV	Respiratory Syncytial Virus, PCR	92131-2
BPSCV	SARS-CoV-2, PCR	94500-6