MAYO CLINIC LABORATORIES

Test Definition: CFRC

Bacterial Culture, Cystic Fibrosis, Respiratory

Overview

Useful For

Detecting disease-causing aerobic bacteria in specimens from patients with cystic fibrosis

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
COMM	Identification Commercial Kit	No, (Bill Only)	No
RMALD	Ident by MALDI-TOF mass spec	No, (Bill Only)	No
GID	Bacteria Identification	No, (Bill Only)	No
ISAE	Aerobe Ident by Sequencing	No, (Bill Only)	No
REFID	Additional Identification Procedure	No, (Bill Only)	No
SALS	Serologic Agglut Method 1 Ident	No, (Bill Only)	No
EC	Serologic Agglut Method 2 Ident	No, (Bill Only)	No
SHIG	Serologic Agglut Method 3 Ident	No, (Bill Only)	No
STAP	Identification Staphylococcus	No, (Bill Only)	No
STRP	Identification Streptococcus	No, (Bill Only)	No
SIDC	Ident Serologic Agglut Method 4	No, (Bill Only)	No
PCRID	Identification by PCR	No, (Bill Only)	No

Testing Algorithm

When this test is ordered, the reflex tests may be performed at an additional charge.

Method Name

Conventional Culture Technique

NY State Available

Yes

Specimen

Specimen Type

Varies

Ordering Guidance

If susceptibilities are also desired, order CFRCS / Bacterial Culture, Cystic Fibrosis with Antimicrobial Susceptibilities, Varies.

Shipping Instructions

Specimen must arrive within 48 hours of collection.

Necessary Information

Specimen source is required.

Specimen Required

Submit only 1 of the following specimens:

Preferred:
Specimen Type: Sputum, expectorated or induced
Patient Preparation: Have the patient brush their teeth or gargle with water immediately prior to specimen collection. This reduces the number of contaminating oropharyngeal bacteria.
Container/Tube: Sterile container
Specimen Volume: Entire collection

Acceptable:
Specimen Type: Bronchial aspirate or washing, sinus aspirate, bronchoalveolar lavage, endotracheal, or tracheal
Container/Tube: Sterile container
Specimen Volume: Entire collection

Specimen Type: Throat swab
Supplies:
-Culturette (BBL Culture Swab) (T092)
-BD E-Swab (T853)
Container/Tube: Culture transport swab (Dacron or rayon swab with aluminum or plastic shaft with either Stuart or Amies liquid medium), or ESwab

Specimen Minimum Volume

See Specimen Required

Reject Due To

Dry swab	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Refrigerated	48 hours	

Clinical & Interpretive

Clinical Information

Life expectancy of patients with cystic fibrosis (CF) has increased steadily over the past 50 years, in large part due to improvements in the management of lung disease in this patient population. Still, chronic lung infection is responsible for 75% to 85% of deaths in patients with CF. Appropriate treatment for the causative organism can reduce morbidity and mortality.

The number of microbial species associated with CF lung disease is relatively limited. These include *Pseudomonas aeruginosa* (mucoid and nonmucoid), *Staphylococcus aureus*, *Burkholderia cepacia* complex, *Stenotrophomonas maltophilia*, other non-fermenting gram-negative rods, *Haemophilus influenzae,* and *Streptococcus pneumoniae*. Nontuberculous mycobacteria and *Aspergillus* species may also play a role in CF lung disease, in addition to common respiratory viruses. This culture is specifically designed and utilizes conventional and additional selective media (compared to non-CF respiratory cultures) to isolate bacteria commonly associated with pulmonary disease in patients with CF.

In selected centers, lung transplantation is performed on patients with CF. This test is appropriate for lung transplant patients with underlying CF because they can continue to harbor the same types of organisms as they did pretransplantation. Patients with CF may be colonized or chronically infected by these organisms over a long period of time.

Reference Values

No growth or usual microbiota
Identification of probable pathogens

Interpretation

A negative test result is no growth of bacteria or growth of only usual microbiota. A negative result does not rule out all causes of infectious lung disease. For more information, see Cautions.

Organisms associated with lower respiratory tract infections are reported.

For positive test results, disease-causing bacteria are identified. Patients with cystic fibrosis may be colonized or chronically infected by some organisms over a long period of time, therefore, positive results must be interpreted in conjunction with previous findings and the clinical picture to appropriately evaluate results.

Cautions

When culture of sputum is delayed, successful isolation of bacterial pathogens is less likely, due to the overgrowth of usual oropharyngeal microbiota.

Some bacterial agents that cause lower respiratory infections (eg, mycobacteria, *Legionella* species, *Mycoplasma pneumoniae*) are not detected by this assay and require special procedures. If the bacterial culture is negative, clinicians should consider additional testing to detect other bacterial, viral, or fungal agents.

Results must be interpreted in conjunction with clinical findings and previous culture results.

Clinical Reference

1. Miller JM, Binnicker MJ, Campbell S, et al: A guide to utilization of the microbiology laboratory for diagnosis of infectious diseases: 2018 Update by the Infectious Diseases Society of America and the American Society for Microbiology. Clin Infect Dis. 2018 Aug 31;67(6):e1-e94. doi: 10.1093/cid/ciy381

2. York MK, Gilligan P, Alby K: Lower respiratory tract cultures. In: Leber AL, ed. Clinical Microbiology Procedures Handbook. Vol 1. 4th ed. ASM Press; 2016:section 3.11.2

3. LiPuma JJ, Currie BJ, Peacock SJ, VanDamme PAR: *Burkholderia, Stenotrophomonas, Ralstonia, Cupriavidus, Pandoraea, Brevundimonas, Comamonas, Delftia*, and *Acidovorax*. In: Jorgensen JH, Carroll KC, Pfaller MC, eds. Manual of Clinical Microbiology. 12th ed. ASM Press; 2019:807-828

Performance

Method Description

Standard media (5% sheep blood, chocolate, and eosin methylene blue agar plates) used for respiratory cultures are inoculated. In addition, 2 selective agar plates are utilized to enable isolation of slower-growing pathogens that may be easily overgrown by usual microbiota and the longstanding colonization by *Pseudomonas aeruginosa*. *Burkholderia cepacia* Selective Agar plate is used for the isolation of *Burkholderia cepacia* complex, which includes 9 distinct species. Isolates of *Burkholderia cepacia* will be forwarded to the University of Michigan's CFF Research Testing and Repository for genotyping. There is no additional charge for this shipping/testing. A chromogenic *Staphylococcus aureus* agar is used to enhance the isolation of *Staphylococcus aureus*. Finally, a second chocolate blood agar plate is incubated in an anaerobic atmosphere. The anaerobic atmosphere allows for the detection of *Haemophilus* species that may otherwise be overgrown by *Pseudomonas aeruginosa*. Pathogens or possible pathogens are identified using 1 or a combination of the following techniques: commercial identification strips or panels, matrix-assisted laser desorption/ionization time-of-flight mass spectrometry, conventional biochemical tests, carbon source utilization, real-time polymerase chain reaction, and nucleic acid sequencing of the 16S ribosomal RNA gene.(Gilligan P, Alby K, York MK: Respiratory cultures from cystic fibrosis patients. In: Leber AL, eds. Clinical Microbiology Procedures Handbook. Vol 1. 4th ed. ASM Press; 2016:section 3.11.3)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

5 to 12 days

Specimen Retention Time

1 day

Performing Laboratory Location

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 has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

87070-Bacteria, culture, cystic fibrosis, respiratory
87077-Identification commercial kit (if appropriate)
87077-Ident by MALDI-TOF mass spec (if appropriate)
87077-Bacteria Identification (if appropriate)
87077-Additional Identification procedure (if appropriate)
87077-Identification Staphylococcus (if appropriate)
87077-Identification Streptococcus (if appropriate)
87147 x 1-3-Serologic agglut method 1 ident (if appropriate)
87147-Serologic agglut method 2 ident (if appropriate)
87147 x 4-Serologic agglut method 3 ident (if appropriate)
87147 x 2-6-Serologic Agglut Method 4 Ident (if appropriate)
87153-Aerobe Ident by sequencing (if appropriate)
87150-Identification by PCR (if appropriate)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
CFRC	Bacterial Culture, Cystic Fibrosis	44798-7

Result ID	Test Result Name	Result LOINC® Value
CFRC	Bacterial Culture, Cystic Fibrosis	44798-7