Overview

Useful For

Diagnosing anaerobic bacterial infections

Directing antimicrobial therapy for anaerobic infections

Reflex Tests

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAID</td>
<td>Anaerobe Ident</td>
<td>No, (Bill Only)</td>
<td>No</td>
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<tr>
<td>RMALA</td>
<td>Id MALDI-TOF Mass Spec Anaerobe</td>
<td>No, (Bill Only)</td>
<td>No</td>
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<tr>
<td>BATTA</td>
<td>Anaerobe Suscep Battery</td>
<td>No, (Bill Only)</td>
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<tr>
<td>ISAN</td>
<td>Anaerobe Ident by Sequencing</td>
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<td>TISSR</td>
<td>Tissue Processing</td>
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<td>SANA</td>
<td>Anaerobe Suscep per agent</td>
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<td>BLA</td>
<td>Beta Lactamase</td>
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<tr>
<td>PCRID</td>
<td>Identification by PCR</td>
<td>No, (Bill Only)</td>
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</tbody>
</table>

Testing Algorithm

When this test is ordered the reflex tests may be performed and charged separately. All bacterial organisms submitted will automatically have susceptibility testing performed and billed as appropriate. Antimicrobial agents appropriate to the organism and specimen source will be tested according to Mayo's practice and the laboratory's standard operating procedures.

See Anaerobic Bacteria Antimicrobials in Special Instructions for a listing of the antimicrobials routinely tested in our laboratory as well as antimicrobials that may be tested upon request. Call 800-533-1710 and ask to speak to the Bacteriology Anaerobe Laboratory if the organism or antimicrobial of interest is not listed in this table.

Special Instructions

- Infectious Specimen Shipping Guidelines
- Anaerobic Bacteria Antimicrobials

Method Name

Conventional Culture Technique with Minimum Inhibitory Concentration (MIC) by Agar Dilution (if appropriate)

NY State Available

Yes

Specimen

Specimen Type
Test Definition: ANAES
Bacterial Culture, Anaerobic + Susc

Shipping Instructions
Specimen should arrive within 72 hours of collection.

See Infectious Specimen Shipping Guidelines in Special Instructions for shipping information.

Necessary Information
Specimen source is required.

Specimen Required
Supplies: Anaerobic Transport Tube (T588)

Acceptable Sources: Abscesses, percutaneous transtracheal aspirates, sterile body fluids, suprapubic aspirations, or wounds

Collection Instructions: Specimen should be obtained by using a needle and syringe from a source not normally colonized by anaerobes.

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

Reject Due To

<table>
<thead>
<tr>
<th>Other</th>
<th>Swab</th>
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</thead>
</table>

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varies</td>
<td>Ambient</td>
<td>72 hours</td>
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Clinical and Interpretive

Clinical Information

Anaerobic bacteria are the greatest component of the human body's normal bacterial flora. Anaerobes colonize the skin, oral cavity, and genitourinary and lower gastrointestinal tracts and generally do not cause infection. Their presence is important for vitamin and other nutrient absorption and in preventing infection with pathogenic bacteria.

When usual skin and mucosal barriers are compromised, in an anaerobic environment, these bacteria can behave as pathogens. Typical anaerobic infections include periodontitis, abdominal or pelvic abscesses, endometritis, pelvic inflammatory disease, aspiration pneumonia, empyema and lung abscesses, sinusitis, brain abscesses, gas gangrene, and other soft tissue infections.

Anaerobes grow aggressively in the body under anaerobic conditions and may possess a variety of virulence factors including capsules and extracellular enzymes. They also can develop resistance to antimicrobials by producing beta-lactamase and other modifying enzymes and by alterations in membrane permeability and structure of penicillin-binding proteins. Because anaerobic bacteria are a significant cause of human infection and they are often resistant to commonly used antimicrobials, susceptibility testing results are useful to clinicians. Bacteroides and
Parabacteroides species produce beta-lactamases. Ertapenem, metronidazole, and clindamycin are generally effective agents although resistance to clindamycin, and occasionally ertapenem, is increasing. The minimum inhibitory concentration (MIC) obtained during antimicrobial susceptibility testing is helpful in indicating the concentration of antimicrobial agent required at the site of infection necessary to inhibit the infecting organism. The MICs are accompanied by interpretive categories (ie, susceptible, intermediate, resistant, or epidemiological cutoff value (ECV) when applicable.

Reference Values

No growth

Identification of probable pathogens

Results are reported as minimal inhibitory concentration (MIC) in mcg/mL. Breakpoints (also known as "clinical breakpoints") are used to categorize an organism as susceptible, susceptible-dose dependent, intermediate, resistant, or nonsusceptible according to the Clinical and Laboratory Standards Institute (CLSI) guidelines.

In some instances an interpretive category cannot be provided based on available data and the following comment will be included: "There are no established interpretive guidelines for agents reported without interpretations."

Susceptible (S):

A category defined by a breakpoint that implies that isolates with an MIC at or below the susceptible breakpoint are inhibited by the usually achievable concentrations of antimicrobial agent when the dosage recommended to treat the site of infection is used, resulting in likely clinical efficacy.

Intermediate (I):

A category defined by a breakpoint that includes isolates with MICs within the intermediate range that approach usually attainable blood and tissue levels and for which response rates may be lower than for susceptible isolates.

Note: The intermediate category implies clinical efficacy in body sites where the drugs are physiologically concentrated or when a higher than normal dosage of a drug can be used. This category also includes a buffer zone, which should prevent small, uncontrolled, technical factors from causing major discrepancies in interpretations, especially for drugs with narrow pharmacotoxicity margins.

Resistant (R):

A category defined by a breakpoint that implies that isolates with an MIC at or above the resistant breakpoint are not inhibited by the usually achievable concentrations of the agent with normal dosage schedules and/or that demonstrate MICs that fall in the range in which specific microbial resistance mechanisms are likely, and clinical efficacy of the agent against the isolate has not been reliably shown in treatment studies.

Epidemiological Cutoff Value (ECV):

The minimum inhibitory concentration (MIC) that separates microbial populations into those with and without acquired resistance (non-wild-type or wild-type, respectively). The ECV defines the highest MIC for the wild type population of isolates. ECVs are based on in vitro data only, using MIC distributions. ECVs are not clinical breakpoints, and the clinical relevance of ECVs for a particular patient has not yet been identified or approved by CLSI or any regulatory agency.

When an ECV is reported, the following comment will be included: “This MIC is consistent with the Epidemiological Cutoff Value (ECV) observed in isolates [WITH / WITHOUT] acquired resistance; however, correlation with treatment outcome is unknown.”

**Interpretation**

Isolation of anaerobes in significant numbers from specimens collected under sterile conditions including blood, other normally sterile body fluids, or closed collections of purulent fluid indicates infection with those organisms.

A "susceptible" category result and a low minimum inhibitory concentration value indicate in vitro susceptibility of the organism to the antimicrobial tested.

Refer to the Reference Values section for interpretation of various antimicrobial categories.

**Cautions**

Specimens may be collected by needle and syringe aspiration or surgical drainage to avoid contamination with normal-flora anaerobes; such contamination would make interpretation of culture results impossible.

Specimens must be transported in anaerobic transport vials.

When antimicrobial susceptibilities are performed, in vitro susceptibility does not guarantee clinical response. Therefore, the decision to treat with a particular agent should not be based solely on the antimicrobial susceptibility testing result.

**Clinical Reference**


**Performance**

**Method Description**

Appropriate specimens are inoculated onto blood agar, phenylethyl alcohol agar, and lysed blood agar containing gentamicin and vancomycin and into thioglycollate broth tubes. After 48 hours of incubation at 35 degrees C in an anaerobic atmosphere, colonies are identified using one or a combination of the following techniques: Gram stain, use of various differential media, aerotolerance testing, conventional biochemical tests, matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry, real-time polymerase chain reaction (RT PCR), or 16S ribosomal RNA gene sequencing (rRNA). (The Anaerobic Bacteriology. Koneman's Color Atlas and Textbook of
An agar dilution method is used for routine susceptibility testing. The antimicrobial is added to agar in various concentrations depending upon levels attainable in serum. A standardized suspension of the organism is applied to the agar plates, which are incubated anaerobically for 42 to 48 hours at 35 to 37 degrees C. The end point is that in which a marked reduction occurs in the appearance of growth on the test plate as compared to that of growth on the control plate. Examples of marked change include a change from confluent growth to a haze, less than 10 tiny colonies, or 1 to 3 normal-sized colonies. (CLSI: Methods for Antimicrobial Susceptibility Testing of Anaerobic Bacteria, Ninth edition. CLSI document M11-A9. Wayne PA, CLSI, Oct 2018)

PDF Report
No

Day(s) and Time(s) Test Performed
Monday through Sunday

Analytic Time
14 days

Maximum Laboratory Time
20 days

Specimen Retention Time
7 days

Performing Laboratory Location
Rochester

Fees and 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 Regional Manager. For assistance, contact Customer Service.

Test Classification
This test uses a standard method. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information
87075-Bacterial Culture, Anaerobic

87076-Anaerobe Ident (if appropriate)

87076-Id MALDI-TOF Mass Spec Anaerobe (if appropriate)

87153-Anaerobe Ident by Sequencing (if appropriate)

87186-Antimicrobial Susceptibility, Anaerobic Bacteria, MIC (if appropriate)
Test Definition: ANAES
Bacterial Culture, Anaerobic + Susc

87181-Anaerobe Susceptibility per agent (if appropriate)
87185-Beta Lactamase (if appropriate)
87176-Tissue Processing (if appropriate)
87798-Identification by PCR (if appropriate)

**LOINC® Information**

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<tr>
<th>Test ID</th>
<th>Test Order Name</th>
<th>Order LOINC Value</th>
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<tr>
<td>ANAES</td>
<td>Bacterial Culture, Anaerobic + Susc</td>
<td>635-3</td>
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<table>
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<tr>
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<tr>
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<td>Bacterial Culture, Anaerobic + Susc</td>
<td>635-3</td>
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