Overview

Useful For
Determining the in vitro susceptibility on isolates of anaerobic bacteria involved in human 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>BLA</td>
<td>Beta Lactamase</td>
<td>No, (Bill Only)</td>
<td>No</td>
</tr>
<tr>
<td>SANA</td>
<td>Anaerobe Suscep per agent</td>
<td>No, (Bill Only)</td>
<td>No</td>
</tr>
<tr>
<td>MIC</td>
<td>Sensitivity, MIC</td>
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<td>No</td>
</tr>
<tr>
<td>SUS</td>
<td>Susceptibility</td>
<td>No, (Bill Only)</td>
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<tr>
<td>RMALA</td>
<td>Id MALDI-TOF Mass Spec Anaerobe</td>
<td>No, (Bill Only)</td>
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<td>ANAID</td>
<td>Anaerobe Ident</td>
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<tr>
<td>ISAN</td>
<td>Anaerobe Ident by Sequencing</td>
<td>No, (Bill Only)</td>
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Additional Tests

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<th>Test ID</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
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<tbody>
<tr>
<td>BATTA</td>
<td>Anaerobe Suscep Battery</td>
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</tr>
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</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

Minimum Inhibitory Concentration (MIC) by Agar Dilution

NY State Available
Specimen

Necessary Information
Organism identification and specimen source are required.

Specimen Required

Supplies:

- Anaerobic Transport Tube (T588)
- Infectious Container, Large (T146)

Specimen Type: Organism in pure culture

Acceptable Sources: Available on isolates from blood cultures, bone and joint infections, or brain abscesses and organisms isolated in pure culture from other sources

Container/Tube:

- Preferred: Anaerobic Transport Tube
- Acceptable: Thioglycollate broth or any other suitable anaerobic transport system

Collection Instructions:

1. Organism must be in pure culture, actively growing. Do not submit mixed cultures.

2. Place specimen in a large infectious container and label as an etiologic agent/infectious substance, if appropriate.

Forms

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

Reject Due To

<table>
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<tr>
<th>Other</th>
<th>Agar plate</th>
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Specimen Stability Information
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

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 (vancomycin, ciprofloxacin, and minocycline) 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 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

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

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

An agar dilution method is used for routine 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
8 days

Maximum Laboratory Time
14 days

Specimen Retention Time
30 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 has been cleared, approved or is exempt by the U.S. 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
87186-Antimicrobial Susceptibility, Anaerobic Bacteria, MIC
87076-Id MALDI-TOF mass spec anaerobe (if appropriate)
87181-Anaerobe Susceptibility per Agent (if appropriate)
87185-Beta Lactamase (if appropriate)
87186-Sensitivity, MIC-per organism for routine battery (if appropriate)
87181-Susceptibility per drug and per organism for drugs not in routine battery (if appropriate)
87076-Anaerobe Ident (if appropriate)
87153-Aneerobe ident by sequencing (if appropriate)

**LOINC® Information**

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<th>Order LOINC Value</th>
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<td>Susceptibility, Anaerobic, MIC</td>
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