This document provides updated tables for the Clinical and Laboratory Standards Institute antimicrobial susceptibility testing standards M02-A12, M07-A10, and M11-A8.

An informational supplement for global application developed through the Clinical and Laboratory Standards Institute consensus process.
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For further information on committee participation or to submit comments, contact CLSI.

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Performance Standards for Antimicrobial Susceptibility Testing; Twenty-Fifth Informational Supplement

Abstract

The supplemental information presented in this document is intended for use with the antimicrobial susceptibility testing procedures published in the following Clinical and Laboratory Standards Institute (CLSI)–approved standards: M02-A12—Performance Standards for Antimicrobial Disk Susceptibility Tests; Approved Standard—Twelfth Edition; M07-A10—Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically; Approved Standard—Tenth Edition; and M11-A8—Methods for Antimicrobial Susceptibility Testing of Anaerobic Bacteria; Approved Standard—Eighth Edition. The standards contain information about both disk (M02) and dilution (M07 and M11) test procedures for aerobic and anaerobic bacteria.

Clinicians depend heavily on information from the clinical microbiology laboratory for treatment of their seriously ill patients. The clinical importance of antimicrobial susceptibility test results requires that these tests be performed under optimal conditions and that laboratories have the capability to provide results for the newest antimicrobial agents.

The tabular information presented here represents the most current information for drug selection, interpretation, and QC using the procedures standardized in the most current editions of M02, M07, and M11. Users should replace the tables published earlier with these new tables. (Changes in the tables since the previous edition appear in boldface type.)


The data in the interpretive tables in this supplement are valid only if the methodologies in M02-A12—Performance Standards for Antimicrobial Disk Susceptibility Tests; Approved Standard—Twelfth Edition; M07-A10—Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically; Approved Standard—Tenth Edition; and M11-A8—Methods for Antimicrobial Susceptibility Testing of Anaerobic Bacteria; Approved Standard—Eighth Edition are followed.
Performance Standards for Antimicrobial Susceptibility Testing; Twenty-Fifth Informational Supplement

Volume 35 Number 3

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The Clinical and Laboratory Standards Institute consensus process, which is the mechanism for moving a document through two or more levels of review by the health care community, is an ongoing process. Users should expect revised editions of any given document. Because rapid changes in technology may affect the procedures, methods, and protocols in a standard or guideline, users should replace outdated editions with the current editions of CLSI documents. Current editions are listed in the CLSI catalog and posted on our website at www.clsi.org. If you or your organization is not a member and would like to become one, and to request a copy of the catalog, contact us at: Telephone: +610.688.0100; Fax: +610.688.0700; E-mail: customerservice@clsi.org; Website: www.clsi.org.
Summary of Changes

This list includes the “major” changes in this document. Other minor or editorial changes were made to the general formatting and to some of the table footnotes and comments. Changes to the tables since the previous edition appear in boldface type.

Additions, Changes, and Deletions
The following are additions or changes unless otherwise noted as a “deletion.”

Instructions for Use of Tables

Noted that cefazolin is a surrogate agent in Test and Report Group U for *Enterobacteriaceae* and is not reported exclusively on urine isolates (p. 22).

Described the concept of epidemiological cutoff value (ECV), which is being introduced for *Propionibacterium acnes* and vancomycin (p. 25).

Clarified recommendations for the β-lactamase screen in coagulase-negative staphylococci (p. 28).

Tables 1A, 1B, 1C – Drugs Recommended for Testing and Reporting

Deleted from Tables 1A, 1B, and 1C – gatifloxacin, grepafloxacin, lomefloxacin, ticarcillin, trovafloxacin.

*Enterobacteriaceae*:
Added fosfomycin to Test Report Group U for testing and reporting of *E. coli* urinary tract isolates only (p. 32).

*Enterococcus* spp.:
Added fosfomycin to Test Report Group U with indications for use against *E. faecalis* urinary tract isolates only (p. 32).

Expanded recommendations for performing susceptibility testing on anaerobic isolates associated with polymicrobial infections (p. 43).

Tables 2A Through 2J-2 – Interpretive Criteria (Breakpoints)

Added instructions for following the manufacturer’s recommendations for QC when using a commercial test system.

*Enterobacteriaceae* (Table 2A):
Added azithromycin disk diffusion and MIC interpretive criteria for *Salmonella* Typhi (p. 49).

Added pefloxacin disk diffusion interpretive criteria for *Salmonella* spp. for use as a surrogate test for detecting nonsusceptibility to ciprofloxacin (p. 49).

*Haemophilus influenzae* and *Haemophilus parainfluenzae* (Table 2E):
Clarified recommendations for selecting QC strains based on the antimicrobial agents tested (p. 76).
Summary of Changes (Continued)

Streptococcus pneumoniae (Table 2G):
Added suggestions for assessing deterioration of oxacillin disk content (p. 84).

Anaerobes (Table 2J-1):
Clarified recommendations for selecting QC strains tested for routine QC (p. 102).

Expanded the definition of the intermediate interpretive category when used with anaerobic bacteria and addressed several clinical factors associated with this definition (p. 102).

Epidemiological Cutoff Values for Propionibacterium acnes (Table 2J-2):
New table with epidemiological cutoff values (ECVs) for vancomycin related to therapy of P. acnes infections (p. 106).

Tables 3A Through 3I – Screening and Confirmatory Tests

Tests for Carbapenemases in Enterobacteriaceae, Pseudomonas aeruginosa, and Acinetobacter spp. (Introduction to Tables 3B and 3C):
Added table that introduces Tables 3B and 3B-1 by summarizing methods for detecting carbapenemase-producing Enterobacteriaceae, P. aeruginosa, and Acinetobacter spp. (p. 112).

The Modified Hodge Confirmatory Test for Suspected Carbapenemase Production in Enterobacteriaceae (Table 3B):
Expanded recommendations for when the modified Hodge test might be used (pp. 114 to 115).

 Modifications of Table 3B When Using Interpretive Criteria for Carbapenems Described in M100-S20 (January 2010) (Table 3B-1):
Eliminated details of MHT performance (now only in Table 3B) and included only steps related to testing and reporting decisions for the MHT (p. 116).

Carba NP Confirmatory Test for Suspected Carbapenemase Production in Enterobacteriaceae, Pseudomonas aeruginosa, and Acinetobacter spp. (Table 3C):
Added new table with detailed instructions for performance of this phenotypic test for carbapenemase production in Enterobacteriaceae, P. aeruginosa, and Acinetobacter spp. (pp. 120 to 126).

 Modifications of Table 3C When Using Minimal Inhibitory Concentration Interpretive Criteria for Carbapenems Described in M100-S20 (January 2010) (Table 3C-1):
Added new table that includes only steps related to testing and reporting decisions for the Carba NP Test (pp. 123 to 126).

Tables 4 and 5 – Quality Control

Table 4A (p. 146):
Added QC range for:

*Escherichia coli* ATCC® 25922
Pefloxacin

*Klebsiella pneumoniae* ATCC® 700603
Ceftaroline-avibactam
Ceftazidime-avibactam
Ceftolozane-tazobactam
Summary of Changes (Continued)

Added recommendations for handling *E. coli* ATCC® 35218 to ensure it maintains its β-lactamase production integrity.

**Table 5A (p. 158):**
Added QC ranges for:

*Klebsiella pneumoniae* ATCC® 700603
Amoxicillin
Amoxicillin-clavulanate
Ampicillin
Ampicillin-sulbactam
Ceftriaxone
Ceftazidime
Piperacillin-tazobactam
Ticarcillin
Ticarcillin-clavulanate

Added recommendations for handling *E. coli* ATCC® 35218 to ensure it maintains its β-lactamase production integrity.

Added footnote to piperacillin for *K. pneumoniae* ATCC® 700603 that explains no range is recommended due to exquisite susceptibility of this organism to piperacillin (very low and off-scale MICs).

**Table 6A – Solvents and Diluents (p. 180):**
Revised diluent for tedizolid along with instructions for preparation of stock solutions.

**Appendixes and Glossaries**

**Appendix A. Suggestions for Confirmation of Resistant (R), Intermediate (I), or Nonsusceptible (NS) Antimicrobial Susceptibility Test Results and Organism Identification:**
Corrected susceptibility category result that should be investigated for *S. pneumoniae* with ceftaroline (previously “R”; now “NS”) (p. 196).

**Appendix D. Cumulative Antimicrobial Susceptibility Report for Anaerobic Organisms (p. 208):**
Updated table with current data available.

**New Appendix F. Cefepime Breakpoint Change for Enterobacteriaceae and Introduction of the Susceptible-Dose Dependent Interpretive Category (p. 216):**
Relocated information previously positioned in the front of M100 to new Appendix F (no changes to content).

**New Appendix G. Epidemiological Cutoff Values (p. 220):**
Added new appendix containing a detailed description of ECVs that is aimed at answering questions about this concept, which is appearing in M100 for the first time. Content defines ECVs and describes their intended use.

Glossary II – added pefloxacin (p. 228).
The Quality Management System Approach

Clinical and Laboratory Standards Institute (CLSI) subscribes to a quality management system (QMS) approach in the development of standards and guidelines, which facilitates project management; defines a document structure via a template; and provides a process to identify needed documents. The QMS approach applies a core set of “quality system essentials” (QSEs), basic to any organization, to all operations in any health care service’s path of workflow (ie, operational aspects that define how a particular product or service is provided). The QSEs provide the framework for delivery of any type of product or service, serving as a manager’s guide. The QSEs are as follows:

- Organization Personnel
- Process Management Equipment
- Customer Focus Purchasing and Inventory
- Facilities and Safety Documents and Records
- Process Management Information Management
- Nonconforming Event Management Assessments
- Continual Improvement

M100-S25 does not address any of the QSEs. For a description of the documents listed in the grid, please refer to the Related CLSI Reference Materials section on the following page.

Path of Workflow

A path of workflow is the description of the necessary processes to deliver the particular product or service that the organization or entity provides. A laboratory path of workflow consists of the sequential processes: preexamination, examination, and postexamination and their respective sequential subprocesses. All laboratories follow these processes to deliver the laboratory’s services, namely quality laboratory information.

M100-S25 addresses the clinical laboratory path of workflow steps indicated by an “X.” For a description of the other documents listed in the grid, please refer to the Related CLSI Reference Materials section on the following page.
Related CLSI Reference Materials

EP23-A™ Laboratory Quality Control Based on Risk Management; Approved Guideline (2011). This document provides guidance based on risk management for laboratories to develop quality control plans tailored to the particular combination of measuring system, laboratory setting, and clinical application of the test.


M23-A3 Development of In Vitro Susceptibility Testing Criteria and Quality Control Parameters; Approved Guideline—Third Edition (2008). This document addresses the required and recommended data needed for the selection of appropriate interpretive criteria and quality control ranges for antimicrobial agents.


M45-A2 Methods for Antimicrobial Dilution and Disk Susceptibility Testing of Infrequently Isolated or Fastidious Bacteria; Approved Guideline—Second Edition (2010). This document provides guidance to clinical microbiology laboratories for standardized susceptibility testing of infrequently isolated or fastidious bacteria that are not presently included in CLSI documents M02 or M07. The tabular information in this document presents the most current information for drug selection, interpretation, and quality control for the infrequently isolated or fastidious bacterial pathogens included in this guideline.

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