CLINICAL AND LABORATORY STANDARDS INSTITUTE®

32nd Edition

M100

Performance Standards for Antimicrobial Susceptibility Testing

This document includes updated tables for the Clinical and Laboratory Standards Institute antimicrobial susceptibility testing standards M02, M07, and M11.

A CLSI supplement for global application.

Clinical and Laboratory Standards Institute

Setting the standard for quality in medical laboratory testing around the world.

The Clinical and Laboratory Standards Institute (CLSI) is a not-for-profit membership organization that brings together the varied perspectives and expertise of the worldwide laboratory community for the advancement of a common cause: to foster excellence in laboratory medicine by developing and implementing medical laboratory standards and guidelines that help laboratories fulfill their responsibilities with efficiency, effectiveness, and global applicability.

Consensus Process

Consensus—the substantial agreement by materially affected, competent, and interested parties—is core to the development of all CLSI documents. It does not always connote unanimous agreement but does mean that the participants in the development of a consensus document have considered and resolved all relevant objections and accept the resulting agreement.

Commenting on Documents

CLSI documents undergo periodic evaluation and modification to keep pace with advances in technologies, procedures, methods, and protocols affecting the laboratory or health care.

CLSI's consensus process depends on experts who volunteer to serve as contributing authors and/or as participants in the reviewing and commenting process. At the end of each comment period, the committee that developed the document is obligated to review all comments, respond in writing to all substantive comments, and revise the draft document as appropriate.

Comments on published CLSI documents are equally essential and may be submitted by anyone, at any time, on any document. All comments are managed according to the consensus process by a committee of experts.

Appeal Process

When it is believed that an objection has not been adequately considered and responded to, the process for appeal, documented in the CLSI *Standards Development Policies and Processes,* is followed.

All comments and responses submitted on draft and published documents are retained on file at CLSI and are available upon request.

Get Involved—Volunteer!

Do you use CLSI documents in your workplace? Do you see room for improvement? Would you like to get involved in the revision process? Or maybe you see a need to develop a new document for an emerging technology? CLSI wants to hear from you. We are always looking for volunteers. By donating your time and talents to improve the standards that affect your own work, you will play an active role in improving public health across the globe.

For additional information on committee participation or to submit comments, contact CLSI.

Clinical and Laboratory Standards Institute
P: +1.610.688.0100
F: +1.610.688.0700
www.clsi.org
standard@clsi.org

M100-Ed32
February 2022
Replaces M100-Ed31

Performance Standards for Antimicrobial Susceptibility Testing

James S. Lewis II, PharmD, FIDSA
Melvin P. Weinstein, MD
April M. Bobenchik, PhD, D(ABMM), MT(ASCP)
Shelley Campeau, PhD, D(ABMM)
Sharon K. Cullen, BS, RAC
Marcelo F. Galas, BSc
Howard Gold, MD, FIDSA
Romney M. Humphries, PhD, D(ABMM), FIDSA
Thomas J. Kirn, Jr., MD, PhD
Brandi Limbago, PhD
Amy J. Mathers, MD, D(ABMM)
Tony Mazzulli, MD, FACP, FRCP(C)
Sandra S. Richter, MD, D(ABMM), FIDSA
Michael Satlin, MD, MS
Audrey N. Schuetz, MD, MPH, D(ABMM)
Susan Sharp, PhD, D(ABMM), F(AAM)
Patricia J. Simner, PhD, D(ABMM)

Abstract

The data in the tables are valid only if the methodologies in CLSI documents M02,[1] M07,[2] and M11[3] are followed. These standards contain information about disk diffusion (M02[1]) and dilution (M07[2] and M11[3]) test procedures for aerobic and anaerobic bacteria. Clinicians depend heavily on information from the microbiology laboratory for treating their seriously ill patients. The clinical importance of antimicrobial susceptibility test results demands that these tests be performed under optimal conditions and that laboratories have the capability to provide results for the newest antimicrobial agents. The tables presented in M100 represent the most current information for drug selection, interpretation, and quality control using the procedures standardized in M02,[1] M07,[2] and M11.[3] Users should replace previously published tables with these new tables. Changes in the tables since the previous edition appear in boldface type.

Clinical and Laboratory Standards Institute (CLSI). *Performance Standards for Antimicrobial Susceptibility Testing*. 32nd ed. CLSI supplement M100 (ISBN 978-1-68440-134-5 [Print]; ISBN 978-1-68440-135-2 [Electronic]). Clinical and Laboratory Standards Institute, USA, 2022.

Suggested Citation

CLSI. *Performance Standards for Antimicrobial Susceptibility Testing*. 32nd ed. CLSI supplement M100. Clinical and Laboratory Standards Institute; 2022.

Previous Editions:
December 1986, December 1987, December 1991, December 1992, December 1994, December 1995, January 1997, January 1998, January 1999, January 2000, January 2001, January 2002, January 2003, January 2004, January 2005, January 2006, January 2007, January 2008, January 2009, January 2010, June 2010, January 2011, January 2012, January 2013, January 2014, January 2015, January 2016, January 2017, January 2018, January 2019, January 2020, March 2021

M100-Ed32
ISBN 978-1-68440-134-5 (Print)
ISBN 978-1-68440-135-2 (Electronic)
ISSN 1558-6502 (Print)
ISSN 2162-2914 (Electronic) Volume 42, Number 2

Committee Membership

Subcommittee on Antimicrobial Susceptibility Testing

Acknowledgment

CLSI and the Subcommittee on Antimicrobial Susceptibility Testing gratefully acknowledge the following volunteers for their important contributions to the revision of this document:

April M. Bobenchik, PhD, D(ABMM), MT(ASCP)
Penn State Health Milton S. Hershey Medical Center
USA

Shelley Campeau, PhD, D(ABMM)
Accelerate Diagnostics, Inc.
USA

Working Group on AST Breakpoints

Amy J. Mathers, MD, D(ABMM)
Co-Chairholder
University of Virginia Medical Center
USA

Michael Satlin, MD, MS
Co-Chairholder
Weill Cornell Medicine
USA

Karen Bush, PhD
Committee Secretary
Indiana University
USA

Marcelo F. Galas
Pan American Health Organization
USA

Romney M. Humphries, PhD, D(ABMM), FIDSA
Vanderbilt University Medical Center
USA

Navaneeth Narayanan, PharmD, MPH
Ernest Mario School of Pharmacy, Rutgers University
USA

Robin Patel, MD
Mayo Clinic, Rochester
USA

Simone M. Shurland
FDA Center for Drug Evaluation and Research
USA

Lauri D. Thrupp, MD
University of California Irvine Medical Center
USA

Hui Wang, MD
Peking University People's Hospital
China

Barbara L. Zimmer, PhD
Beckman Coulter, Inc.
USA

Joint CLSI-EUCAST Working Group on Antimicrobial Susceptibility Testing Criteria and Quality Control

Janet A. Hindler, MCLS, MT(ASCP), F(AAM)
Co-Chairholder
Los Angeles County Department of Health
USA

Erika Matuschek, PhD
Co-Chairholder
EUCAST Development Laboratory
Sweden

Mandy Wootton, PhD
Committee Secretary
University Hospital of Wales
United Kingdom

Mariana Castanheira, PhD
JMI Laboratories
USA

Sharon K. Cullen, BS, RAC
Beckman Coulter, Inc., Microbiology Business
USA

Christian G. Giske, MD, PhD
Karolinska University Hospital, Solna
Sweden

Gunnar Kahlmeter, MD, PhD
EUCAST Development Laboratory
Sweden

Laura M. Koeth, BS, MT(ASCP)
Laboratory Specialists, Inc.
USA

Maria M. Traczewski, BS, MT(ASCP)
The Clinical Microbiology Institute
USA

John D. Turnidge, MD, BS, FRACP, FASM, FRCPA
The University of Adelaide
Australia

Working Group on Methods Application and Interpretation

Thomas J. Kirn, Jr., MD, PhD
Co-Chairholder
Rutgers Robert Wood Johnson Medical School
USA

Brandi Limbago, PhD
Co-Chairholder
Centers for Disease Control and Prevention
USA

Kristie Johnson, PhD, D(ABMM)
Committee Secretary
University of Maryland, Baltimore
USA

Darcie E. Carpenter, PhD, CIC, CEM
International Health Management Associates, Inc.
USA

Joseph Kuti, PharmD, FIDP
Hartford Hospital
USA

Samir Patel, PhD, FCCM, D(ABMM)
Public Health Ontario
Canada

Virginia M. Pierce, MD
Massachusetts General Hospital
USA

Sandra S. Richter, MD, D(ABMM), FIDSA
Mayo Clinic, Jacksonville
USA

Susan Sharp, PhD, D(ABMM), F(AAM)
Copan Diagnostics, Inc.
USA

Patricia J. Simner, PhD, D(ABMM)
Johns Hopkins School of Medicine, Department of Pathology
USA

Working Group on Methods Development and Standardization

Dwight J. Hardy, PhD
Co-Chairholder
University of Rochester Medical Center
USA

Barbara L. Zimmer, PhD
Co-Chairholder
Beckman Coulter, Inc.
USA

Katherine Sei, BS
Committee Secretary
Beckman Coulter, Inc.
USA

Kevin Alby, PhD, D(ABMM)
UNC Hospital
USA

Susan Butler-Wu, PhD, D(ABMM), SM(ASCP)
LACUSC Medical Center
USA

Jennifer Dien Bard, PhD, D(ABMM), F(CCM)
Children's Hospital Los Angeles; University of Southern California
USA

Tanis Dingle, PhD, D(ABMM), FCCM
Alberta Precision Laboratories – Public Health Laboratory
Canada

German Esparza, MSc
Proasecal SAS Colombia
Colombia

Laura M. Koeth, BS, MT(ASCP)
Laboratory Specialists, Inc.
USA

Ribhi M. Shawar, PhD, D(ABMM), F(AAM)
FDA Center for Devices and Radiological Health
USA

Working Group on Outreach

Janet A. Hindler, MCLS, MT(ASCP), F(AAM)
Co-Chairholder
Los Angeles County Department of Health
USA

Audrey N. Schuetz, MD, MPH, D(ABMM)
Co-Chairholder
Mayo Clinic, Rochester
USA

Stella Antonara, PhD, D(ABMM)
Committee Secretary
OhioHealth
USA

April Abbott, PhD, D(ABMM)
Deaconess Hospital Laboratory
USA

April M. Bobenchik, PhD, D(ABMM), MT(ASCP)
Penn State Health Milton S. Hershey Medical Center
USA

Andrea L. Ferrell, MS, MLS(ASCP)^{CM}
Becton Dickinson
USA

Graeme Forrest, MBBS
Rush University Medical Center
USA

Romney M. Humphries, PhD, D(ABMM), FIDSA
Vanderbilt University Medical Center
USA

Shawn R. Lockhart, PhD, D(ABMM), F(AAM)
Centers for Disease Control and Prevention
USA

Nicole Scangarella-Oman, MS, BS, GlaxoSmithKline
USA

Paula M. Snippes Vagnone, MT(ASCP)
Minnesota Department of Health
USA

Priyanka Uprety, MSPH, PhD, D(ABMM)
Roche Diagnostics
USA

Lars F. Westblade, PhD, D(ABMM)
New York Presbyterian Hospital - Weill Cornell Campus
USA

Working Group on Quality Control

Sharon K. Cullen, BS, RAC
Co-Chairholder
Beckman Coulter, Inc., Microbiology Business
USA

Maria M. Traczewski, BS, MT(ASCP)
Co-Chairholder
The Clinical Microbiology Institute
USA

Michael D. Huband, BS
Committee Secretary
JMI Laboratories
USA

Alexandra Lynn Bryson, PhD, D(ABMM)
Virginia Commonwealth University Health
USA

Patricia S. Conville, MS, MT(ASCP)
FDA Center for Devices and Radiological Health
USA

Dana C. Dressel, BS, MT(ASCP)
International Health Management Associates, Inc.
USA

Janet A. Hindler, MCLS, MT(ASCP), F(AAM)
Los Angeles County Department of Health
USA

David Lonsway, MMSc
Centers for Disease Control and Prevention
USA

Erika Matuschek, PhD
EUCAST Development Laboratory
Sweden

Stephanie L. Mitchell, PhD, D(ABMM)
Cepheid
USA

David Paisey, BSc
Thermo Fisher Scientific
United Kingdom

Elizabeth Palavecino, MD
Wake Forest Baptist Medical Center
USA

Chris Pillar, PhD
Microbiologics
USA

Susan Thomson
MAST Group
United Kingdom

Katherine Young, MS
Merck & Company, Inc.
USA

Working Group on Text and Tables

April M. Bobenchik, PhD, D(ABMM), MT(ASCP)
Co-Chairholder
Penn State Health Milton S. Hershey Medical Center
USA

Shelley Campeau, PhD, D(ABMM)
Co-Chairholder
Accelerate Diagnostics, Inc.
USA

Carey-Ann Burnham, PhD, D(ABMM)
Committee Secretary
Washington University School of Medicine
USA

Sukantha Chandrasekaran, PhD, D(ABMM)
University of California
USA

Nicolynn Cole, MT(ASCP)
Mayo Clinic, Rochester
USA

Andrea L. Ferrell, MS, MLS(ASCP)^{CM}
Becton Dickinson
USA

Janet A. Hindler, MCLS, MT(ASCP), F(AAM)
Los Angeles County Department of Health
USA

Melissa Jones, MT(ASCP), CLS
DUHS Clinical Laboratories
USA

Jean B. Patel, PhD, D(ABMM)
Beckman Coulter
USA

L. Barth Reller, MD
Duke University School of Medicine
USA

Felicia Rice, MT(ASCP)
Mayo Clinic Hospital
USA

Flavia Rossi, MD, PhD
University of São Paulo
Brazil

Dale A. Schwab, PhD, D(ABMM)^{CM}
Quest Diagnostics Infectious Disease
USA

Maria M. Traczewski, BS, MT(ASCP)
The Clinical Microbiology Institute
USA

Nancy E. Watz, MS, MT(ASCP), CLS
Stanford Health Care
USA

Staff

Clinical and Laboratory Standards Institute
USA

Marcy L. Hackenbrack, MCM, M(ASCP)
Project Manager

Christine M. Lam, MT(ASCP)
Project Manager

Laura Martin
Editorial Manager

Catherine E.M. Jenkins, ELS
Editor

Kristy L. Leirer, MS
Editor

Contents

Contents (Continued)

Contents (Continued)

Contents (Continued)

Contents (Continued)

This page is intentionally left blank.

Overview of Changes

M100-Ed32 replaces the previous edition of the supplement, M100-Ed31, published in 2021. The major changes in M100-Ed32 are listed below. 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. The following are additions or changes unless otherwise noted as a ***"deletion."***

Users of M100-Ed32 should note recent formatting changes to Tables 2, including:

- **An intermediate (I) with a ^ in Tables 2 indicates agents that have the potential to concentrate in the urine. The I^ is for informational use only. The decision to report I^ is best made by each laboratory based on institution-specific guidelines and in consultation with appropriate medical personnel.**

M100 is updated and reviewed annually as new data and new agents become available. Use of outdated documents is strongly discouraged.

Section/Table	Changes
General	
CLSI Breakpoint Additions/Revisions Since 2010	**Revised:** • Cefiderocol – Disk diffusion breakpoints for Enterobacterales (p. xxiii) and *Acinetobacter* spp. (p. xxv) – Disk diffusion and MIC breakpoints for *Stenotrophomonas maltophilia* (p. xxvi) • Ceftolozane-tazobactam disk diffusion breakpoints for Enterobacterales (p. xxiii) • Piperacillin MIC breakpoints for Enterobacterales (p. xxiv) • Piperacillin-tazobactam disk diffusion and MIC breakpoints for Enterobacterales (p. xxiv) • Amoxicillin-clavulanate MIC breakpoints for *Haemophilus influenzae* and *Haemophilus parainfluenzae* (p. xxvii) • Lefamulin disk diffusion breakpoints for *H. influenzae* only (p. xxvii) and *Streptococcus pneumoniae* (p. xxviii) ***Deleted*:** • Piperacillin disk diffusion breakpoints for Enterobacterales • Amoxicillin-clavulanate disk diffusion breakpoints for *H. influenzae*

Overview of Changes (Continued)

Section/Table	Changes
Tables 1. Suggested Groupings of Antimicrobial Agents Approved by the US Food and Drug Administration for Clinical Use That Should Be Considered for Testing and Reporting by Microbiology Laboratories in the United States	
Table 1A. Nonfastidious Organisms	**Added:** Cefiderocol to Group B for Enterobacterales, *Pseudomonas aeruginosa, Acinetobacter* spp., and *S. maltophilia* (pp. 20 and 22)
Tables 2. Zone Diameter and/or MIC Breakpoints	
Table 2A. Zone Diameter and MIC Breakpoints for Enterobacterales	**Added:** • Ampicillin dosage regimen comments for parenteral and oral administration (p. 36) • Comment clarifying removal of piperacillin disk diffusion breakpoints (p. 36) • Comment for β-lactam combination agents regarding susceptibility of combination agents when the primary single agent is susceptible (replaced previous imipenem-relebactam surrogate testing comment) (p. 37) • Amoxicillin-clavulanate dosage regimen comments for parenteral and oral administration (p. 37) • Ampicillin-sulbactam dosage regimen comment (p. 37) • Piperacillin-tazobactam dosage regimen comment (p. 38) **Revised:** • General comment regarding reporting of results of amoxicillin testing with ampicillin (p. 34) • General comment regarding I^ (p. 35) • General comment and reference to associated tables regarding direct blood culture susceptibility testing of Enterobacterales with select antimicrobial agents (p. 35) • Piperacillin MIC breakpoints (p. 36) • Ceftolozane-tazobactam disk diffusion breakpoints and associated dosage regimen comment (p. 37) • Piperacillin-tazobactam disk diffusion and MIC breakpoints (p. 38) • Cefiderocol test group and disk diffusion breakpoints (p. 40) ***Deleted:*** • Piperacillin disk diffusion breakpoints • Imipenem-relebactam surrogate testing comment

Overview of Changes (Continued)

Section/Table	Changes
Tables 2. (Continued)	
Table 2B-1. Zone Diameter and MIC Breakpoints for *Pseudomonas aeruginosa*	**Added:** • Positive blood culture broth as an inoculum to the testing conditions box (p. 48) • General comment regarding direct blood culture susceptibility testing of *P. aeruginosa* with select antimicrobial agents (p. 49) • Comment for ß-lactam combination agents regarding susceptibility of combination agents when the primary single agent is susceptible (replaced previous imipenem-relebactam surrogate testing comment) (p. 50) **Revised:** • General comment regarding I^ (p. 48) • Ceftolozane-tazobactam dosage regimen comment (p. 50) • Cefiderocol test group (p. 50) ***Deleted:*** • Imipenem-relebactam surrogate testing comment
Table 2B-2. Zone Diameter and MIC Breakpoints for *Acinetobacter* spp.	**Added:** • Comment for ß-lactam combination agents regarding susceptibility of combination agents when the primary single agent is susceptible (p. 55) • Cefiderocol testing and reporting comment (p. 55) **Revised:** • Cefiderocol test group, disk diffusion breakpoints, and associated dosage regimen comment (p. 55)
Table 2B-4. Zone Diameter and MIC Breakpoints for *Stenotrophomonas maltophilia*	**Revised:** • Cefiderocol test group, disk diffusion and MIC breakpoints, and reporting comment (p. 61)
Table 2B-5. MIC Breakpoints for Other Non-Enterobacterales	**Added:** • Comment for ß-lactam combination agents regarding susceptibility of combination agents when the primary single agent is susceptible (p. 63)
Table 2C. Zone Diameter and MIC Breakpoints for *Staphylococcus* spp.	**Added:** • Dalbavancin, oritavancin, and telavancin dosage regimen comments (p. 72) • Tedizolid dosage regimen comment (p. 75) **Revised:** • *Staphylococcus* spp. indications for vancomycin (p. 72) and lefamulin (p. 75) to include methicillin-resistant *S. aureus*

Overview of Changes (Continued)

Section/Table	Changes
Tables 2. (Continued)	
Table 2D. Zone Diameter and MIC Breakpoints for *Enterococcus* spp.	**Added:** • Penicillin and ampicillin dosage regimen comments for parenteral and oral administration (p. 79) • Dalbavancin, oritavancin, and telavancin dosage regimen comments (p. 81) • Tedizolid dosage regimen comment (p. 83) **Revised:** • General comment regarding I^ (p. 78) • ***Rx*** combination therapy comment (p. 79)
Table 2E. Zone Diameter and MIC Breakpoints for *Haemophilus influenzae* and *Haemophilus parainfluenzae*	**Added:** • Ampicillin dosage regimen comment (p. 86) • Comment for ß-lactam combination agents regarding susceptibility of combination agents when the primary single agent is susceptible (p. 87) • Ampicillin-sulbactam, amoxicillin-clavulanate, and ceftolozane-tazobactam dosage regimen comments (p. 87) **Revised:** • Amoxicillin-clavulanate MIC breakpoints for susceptible and intermediate (p. 87) • Lefamulin disk diffusion breakpoint (for *H. influenzae* only) (p. 89) ***Deleted:*** • Amoxicillin-clavulanate disk diffusion breakpoints
Table 2F. Zone Diameter and MIC Breakpoints for *Neisseria gonorrhoeae*	**Revised:** • Tetracycline dosage regimen comment (p. 92)
Table 2G. Zone Diameter and MIC Breakpoints for *Streptococcus pneumoniae*	**Added:** • Amoxicillin (nonmeningitis) and amoxicillin-clavulanate (nonmeningitis) dosage regimen comment (p. 96) **Revised:** • Lefamulin disk diffusion breakpoint (p. 98)
Table 2H-1. Zone Diameter and MIC Breakpoints for *Streptococcus* spp. ß-Hemolytic Group	**Added:** • Dalbavancin, oritavancin, and telavancin dosage regimen comments (p. 102) • Tedizolid dosage regimen comment (p. 104)
Table 2H-2. Zone Diameter and MIC Breakpoints for *Streptococcus* spp. Viridans Group	**Added:** • Dalbavancin, oritavancin, and telavancin dosage regimen comments (pp. 107-108) • Tedizolid dosage regimen comment (p. 109)

Overview of Changes (Continued)

Section/Table	Changes
Tables 2. (Continued)	
Table 2I. Zone Diameter and MIC Breakpoints for *Neisseria meningitidis*	**Added:** • Ampicillin dosage regimen comment (p. 111)
Table 2J. MIC Breakpoints for Anaerobes	**Added:** • Comment for ß-lactam combination agents regarding susceptibility of combination agents when the primary single agent is susceptible (replaced previous imipenem-relebactam surrogate testing comment) (p. 115) **Revised:** • Imipenem-relebactam test group (p. 115) ***Deleted:*** • Imipenem-relebactam surrogate testing comment
Tables 3. Specialized Resistance Testing	
Table 3D. Tests for Colistin Resistance for Enterobacterales and *Pseudomonas aeruginosa*	**Revised:** • Nomenclature for *Escherichia coli* ATCC®[a] BAA-3170™ (formerly *E. coli* AR Bank #0349 *mcr-1*) (p. 148) • QC range for *E. coli* ATCC® BAA-3170™ (p. 148) • QC range for *P. aeruginosa* ATCC® 27853 (p. 148)
Table 3E-1. Test for Performing Disk Diffusion Directly From Positive Blood Culture Broth	**Revised:** • Applicable organism groups (p. 152) • Antimicrobial concentration information (refer to new Tables 3E-2 and 3E-3) (p. 152) • Applicable incubation length (p. 152) • Results reporting procedure (p. 152) • QC recommendations (p. 153)
Table 3E-2. Zone Diameter Disk Diffusion Breakpoints for Enterobacterales Direct From Blood Culture (new table)	**Added:** • Enterobacterales disk diffusion breakpoints for antimicrobial agents approved for susceptibility testing directly from blood culture bottles and associated comments and references (pp. 154-155)

Section/Table	Changes
Tables 3. (Continued)	
Table 3E-3. Zone Diameter Disk Diffusion Breakpoints for *Pseudomonas aeruginosa* Direct From Blood Culture (new table)	**Added:** • *P. aeruginosa* disk diffusion breakpoints for antimicrobial agents approved for susceptibility testing directly from blood culture bottles and associated comments and references (p. 156)
Table 3K. Test for Detecting High-Level Aminoglycoside Resistance in *Enterococcus* spp.	**Revised:** • Additional testing and reporting comments (p. 175)
Tables 5. MIC QC Ranges and Associated Tables	
Table 5A-1. MIC QC Ranges for Nonfastidious Organisms and Antimicrobial Agents Excluding β-Lactam Combination Agents	**Added:** • Gepotidacin QC range for *Enterococcus faecalis* ATCC® 29212 • Colistin QC ranges – *E. coli* NCTC 13486 – *E. coli* ATCC® BAA-3170™ (formerly AR Bank #0349 *mcr-1*) **Revised:** • Imipenem QC range for *E. coli* ATCC® 25922 • Ozenoxacin QC range for *E. faecalis* ATCC® 29212 • Tebipenem QC range for *S. aureus* ATCC® 29213
Table 5A-2. MIC QC Ranges for Nonfastidious Organisms and β-Lactam Combination Agents	**Added:** • Ceftibuten QC ranges: – *E. coli* ATCC® 25922 – *E. coli* NCTC 13353 – *Klebsiella pneumoniae* ATCC® BAA-1705™ – *K. pneumoniae* ATCC® BAA-2814™ • Meropenem QC ranges: – *E. coli* NCTC 13353 – *Acinetobacter baumannii* NCTC 13304 **Revised:** • Imipenem QC ranges: – *E. coli* ATCC® 25922 – *K. pneumoniae* ATCC® 700603 • Imipenem-relebactam QC ranges: – *E. coli* ATCC® 25922 – *K. pneumoniae* ATCC® 700603 • Meropenem-nacubactam QC range for *E. coli* ATCC® 25922

Overview of Changes (Continued)

Section/Table	Changes
Tables 5. (Continued)	
Table 5B. MIC QC Ranges for Fastidious Organisms (Broth Dilution Methods)	**Revised:** • Grepafloxacin QC range for *H. influenzae* ATCC® 49247
Table 5C. MIC QC Ranges for *Neisseria gonorrhoeae* (Agar Dilution Method)	**Added:** • Gentamicin QC range for *Neisseria gonorrhoeae* ATCC® 49226
Table 5D. MIC QC Ranges for Anaerobes (Agar Dilution Method)	**Added:** • Tebipenem QC ranges: – *Bacteroides fragilis* ATCC® 25285 – *Bacteroides thetaiotaomicron* ATCC® 29741 – *Clostridioides difficile* ATCC® 700057 – *Eggerthella lenta* ATCC® 43055 **Revised:** • Fidaxomicin QC range for C. *difficile* ATCC® 700057
Appendixes	
Appendix B. Intrinsic Resistance; B1. Enterobacterales	**Added:** • Polymyxin B and colistin for *Hafnia alvei* (p. 249) • Footnote regarding intrinsic resistance for *Hafnia paralvei* (p. 249)
Appendix C. QC Strains for Antimicrobial Susceptibility Tests	**Added:** • QC strain *E. coli* NCTC 13486 (p. 257) **Revised:** • Nomenclature for *E. coli* ATCC® BAA-3170™ (formerly *E. coli* AR Bank #0349 *mcr-1*) (p. 257)

Overview of Changes (Continued)

Section/Table	Changes
Appendixes (Continued)	
Appendix E. Dosage Regimens Used to Establish Susceptible or Susceptible-Dose Dependent Breakpoints	**Added:** • Enterobacterales – Ampicillin (parenteral and oral) (p. 268) – Amoxicillin-clavulanate (parenteral and oral) (p. 268) – Ampicillin-sulbactam (p. 268) – Indications for cefazolin (uncomplicated UTIs and infections other than uncomplicated UTIs) (p. 268) – Imipenem-relebactam exclusion for the family *Morganellaceae* (p. 269) – Piperacillin-tazobactam (p. 270) • *Staphylococcus* spp. – Dalbavancin, oritavancin, tedizolid, and televancin as applicable to *S. aureus* only (p. 271) • *Enterococcus* spp. – Ampicillin (parenteral and oral) (p. 271) – Dalbavancin as applicable to vancomycin-susceptible *E. faecalis* only (p. 271) • *H. influenzae* and *H. parainfluenzae* – Ampicillin (p. 272) – Ampicillin-sulbactam (p. 272) • *S. pneumoniae* – Amoxicillin (p. 272) – Amoxicillin-clavulanate (p. 272) • *Streptococcus* spp. ß-hemolytic group – Dalbavancin as applicable to *S. pyogenes*, *S. agalactiae*, and *S. dysgalactiae* only (p. 273) – Tedizolid as applicable to *S. pyogenes* and *S. agalactiae* only (p. 273) • *Streptococcus* spp. viridans group – Dalbavancin and tedizolid as applicable to *S. anginosus* group only (p. 273) • *Neisseria meningitis* – Ampicillin (p. 273) ***Deleted:*** • *P. aeruginosa* – Ticarcillin

Overview of Changes (Continued)

Section/Table	Changes
Glossaries	
Glossary II. Antimicrobial Agent Abbreviation(s), Route(s) of Administration, and Drug Class	**Added:** • Rifapentine **Corrected:** • Cefepime-nacubactam abbreviation • Rifaximin abbreviation • Sulbactam-durlobactam route of administration
Glossary III. List of Identical Abbreviations Used for More Than One Antimicrobial Agent in US Diagnostic Products	**Added:** • Cefdinir • Cefditoren • Clinafloxacin • Cloxacillin • Cefpirome • Cefprozil • Ceftolozane-tazobactam • Colistin • Tobramycin • Trimethoprim

Abbreviations: ATCC®, American Type Culture Collection; MIC, minimal inhibitory concentration; UTI, urinary tract infection.

Footnote

a. ATCC® is a registered trademark of the American Type Culture Collection.

CLSI Breakpoint Additions/Revisions Since 2010

Previous breakpoints can be found in the edition of M100 that precedes the document listed in the column labeled "Date of Addition/Revision (M100 edition)." For example, previous breakpoints for aztreonam are listed in M100-S19 (January 2009).

Antimicrobial Agent	Date of Addition/Revision (M100 edition)	Disk Diffusion Breakpoints		MIC Breakpoints		Comments
		New[a]	Revised[b]	New[a]	Revised[b]	
Enterobacterales						
Azithromycin	January 2015 (M100-S25)	X		X		*S. enterica* ser. Typhi only
	March 2021 (M100-Ed31)	X		X		*Shigella* spp. Previously assigned an ECV
Aztreonam	January 2010 (M100-S20)		X		X	
Cefazolin (parenteral)	January 2010 (M100-S20)				X	Removed disk diffusion breakpoints January 2010 (M100-S20)
	January 2011 (M100-S21)	X			X	
	January 2016 (M100-S26)	X		X		For uncomplicated UTIs
Cefazolin (oral)	January 2014 (M100-S24)	X		X		Surrogate test for oral cephalosporins and uncomplicated UTIs
Cefepime	January 2014 (M100-S24)		X		X	Revised breakpoints include SDD
Cefiderocol	January 2019 (M100, 29th ed.)			X		
	January 2020 (M100, 30th ed.)	X				
	February 2022 (M100-Ed32)		**X**			
Cefotaxime	January 2010 (M100-S20)		X		X	
Ceftaroline	January 2013 (M100-S23)	X		X		
Ceftazidime	January 2010 (M100-S20)		X		X	
Ceftazidime-avibactam	January 2018 (M100, 28th ed.)	X		X		
Ceftizoxime	January 2010 (M100-S20)		X		X	
Ceftolozane-tazobactam	January 2016 (M100-S26)			X		
	January 2018 (M100, 28th ed.)	X				
	February 2022 (M100-Ed32)		**X**			
Ceftriaxone	January 2010 (M100-S20)		X		X	

CLSI Breakpoint Additions/Revisions Since 2010 (Continued)

Antimicrobial Agent	Date of Addition/Revision (M100 edition)	Disk Diffusion Breakpoints		MIC Breakpoints		Comments
		New[a]	Revised[b]	New[a]	Revised[b]	
Enterobacterales (Continued)						
Ciprofloxacin	January 2012 (M100-S22)		X		X	***Salmonella* spp. (including *S. enterica* ser. Typhi)**
	January 2019 (M100, 29th ed.)		X		X	**Non-*Salmonella* spp.**
Colistin	January 2020 (M100, 30th ed.)			X		Previously assigned an ECV
Doripenem	June 2010 (M100-S20-U)	X		X		
Ertapenem	June 2010 (M100-S20-U)		X		X	
	January 2012 (M100-S22)		X		X	
Imipenem	June 2010 (M100-S20-U)		X		X	
Imipenem-relebactam	March 2021 (M100-Ed31)	X		X		
Levofloxacin	January 2013 (M100-S23)		X		X	***Salmonella* spp. (including *S. enterica* ser. Typhi)**
	January 2019 (M100, 29th ed.)		X		X	**Non-*Salmonella* spp.**
Meropenem	June 2010 (M100-S20-U)		X		X	
Meropenem-vaborbactam	January 2019 (M100, 29th ed.)	X		X		
Norfloxacin	January 2020 (M100, 30th ed.)	X		X		Reinstated breakpoints deleted from M100, 29th ed.
Ofloxacin	January 2013 (M100-S23)			X		*Salmonella* spp. (including *S. enterica* ser. Typhi)
Pefloxacin	January 2015 (M100-S25)	X				*Salmonella* spp. (including *S. enterica* ser. Typhi) Surrogate test for ciprofloxacin
Piperacillin	**February 2022 (M100-Ed32)**				**X**	**Removed disk diffusion breakpoints due to reassessment of disk correlates for revised MIC breakpoints**
Piperacillin-tazobactam	**February 2022 (M100-Ed32)**		**X**		**X**	
Polymyxin B	January 2020 (M100, 30th ed.)			X		

CLSI Breakpoint Additions/Revisions Since 2010 (Continued)

Antimicrobial Agent	Date of Addition/Revision (M100 edition)	Disk Diffusion Breakpoints		MIC Breakpoints		Comments
		New[a]	Revised[b]	New[a]	Revised[b]	
Pseudomonas aeruginosa						
Cefiderocol	January 2019 (M100, 29th ed.)			X		
	January 2020 (M100, 30th ed.)	X				
Ceftazidime-avibactam	January 2018 (M100, 28th ed.)	X		X		
Ciprofloxacin	January 2019 (M100, 29th ed.)		X		X	
Colistin	January 2017 (M100, 27th ed.)				X	
	January 2020 (M100, 30th ed.)				X	
Doripenem	January 2012 (M100-S22)	X		X		
Imipenem	January 2012 (M100-S22)		X		X	
Imipenem-relebactam	March 2021 (M100-Ed31)	X		X		
Levofloxacin	January 2019 (M100, 29th ed.)		X		X	
Meropenem	January 2012 (M100-S22)		X		X	
Norfloxacin	January 2020 (M100, 30th ed.)	X		X		Reinstated breakpoints deleted from M100, 29th ed.
Piperacillin	January 2012 (M100-S22)		X		X	
Piperacillin-tazobactam	January 2012 (M100-S22)		X		X	
Polymyxin B	January 2020 (M100, 30th ed.)				X	
Ticarcillin	January 2012 (M100-S22)		X		X	
Ticarcillin-clavulanate	January 2012 (M100-S22)		X		X	
***Acinetobacter* spp.**						
Cefiderocol	January 2019 (M100, 29th ed.)			X		
	January 2020 (M100, 30th ed.)	X				
	February 2022 (M100-Ed32)		**X**			
Colistin	January 2020 (M100, 30th ed.)				X	
Doripenem	January 2014 (M100-S24)	X		X		
Imipenem	January 2014 (M100-S24)		X		X	
Meropenem	January 2014 (M100-S24)		X		X	
Polymyxin B	January 2020 (M100, 30th ed.)				X	

CLSI Breakpoint Additions/Revisions Since 2010 (Continued)

Antimicrobial Agent	Date of Addition/Revision (M100 edition)	Disk Diffusion Breakpoints		MIC Breakpoints		Comments
		New[a]	Revised[b]	New[a]	Revised[b]	
Stenotrophomonas maltophilia						
Cefiderocol	January 2019 (M100, 29th ed.)			X		
	January 2020 (M100, 30th ed.)	X				
	February 2022 (M100-Ed32)		**X**		**X**	
Other Non-Enterobacterales						
Norfloxacin	January 2020 (M100, 30th ed.)	X		X		Reinstated breakpoints deleted from M100, 29th ed.
***Staphylococcus* spp.**						
Cefoxitin	January 2019 (M100, 29th ed.)		X			*S. epidermidis* Surrogate test for oxacillin
Ceftaroline	January 2013 (M100-S23)	X		X		
	January 2019 (M100, 29th ed.)		X		X	Revised breakpoints include SDD
Dalbavancin	January 2018 (M100, 28th ed.)			X		
Lefamulin	March 2021 (M100-Ed31)	X		X		
Norfloxacin	January 2020 (M100, 30th ed.)	X		X		Reinstated breakpoints deleted from M100, 29th ed.
Oritavancin	January 2016 (M100-S26)			X		
Oxacillin	January 2016 (M100-S26)		X		X	*S. pseudintermedius*
	January 2018 (M100, 28th ed.)		X		X	*S. schleiferi*
	January 2019 (M100, 29th ed.)		X			*S. epidermidis*
	March 2021 (M100-Ed31)				X	*Staphylococcus* spp. except *S. aureus* and *S. lugdunensis*
Tedizolid	January 2016 (M100-S26)			X		
Telavancin	January 2016 (M100-S26)	X		X		
	January 2017 (M100, 27th ed.)					Removed disk diffusion breakpoints January 2017 (M100, 27th ed.)

CLSI Breakpoint Additions/Revisions Since 2010 (Continued)

Antimicrobial Agent	Date of Addition/Revision (M100 edition)	Disk Diffusion Breakpoints		MIC Breakpoints		Comments
		New[a]	Revised[b]	New[a]	Revised[b]	
***Enterococcus* spp.**						
Dalbavancin	January 2018 (M100, 28th ed.)			X		
Daptomycin	January 2019 (M100, 29th ed.)				X	
	January 2020 (M100, 30th ed.)				X	Separated into two sets of breakpoints: • *Enterococcus* spp other than *Enterococcus faecium* • *E. faecium* (includes SDD)
Norfloxacin	January 2020 (M100, 30th ed.)	X		X		Reinstated breakpoints deleted from M100, 29th ed.
Oritavancin	January 2016 (M100-S26)			X		
Tedizolid	January 2016 (M100-S26)			X		
Telavancin	January 2016 (M100-S26)	X		X		
	January 2017 (M100, 27th ed.)					Removed disk diffusion breakpoints January 2017 (M100, 27th ed.)
Haemophilus influenzae* and *Haemophilus parainfluenzae						
Amoxicillin-clavulanate	**February 2022 (M100-Ed32)**				**X**	**Removed disk diffusion breakpoints February 2022 (M100-Ed32)**
Ceftaroline	January 2013 (M100-S23)	X		X		
Ceftolozane-tazobactam	March 2021 (M100-Ed31)			X		
Doripenem	January 2012 (M100-S22)	X		X		
Lefamulin	March 2021 (M100-Ed31)	X		X		
	February 2022 (M100-Ed32)		**X**			**For *H. influenzae* only**

CLSI Breakpoint Additions/Revisions Since 2010 (Continued)

Antimicrobial Agent	Date of Addition/Revision (M100 edition)	Disk Diffusion Breakpoints		MIC Breakpoints		Comments
		New[a]	Revised[b]	New[a]	Revised[b]	
Neisseria gonorrhoeae						
Azithromycin	January 2019 (M100, 29th ed.)			X		Previously assigned as ECV
	March 2021 (M100-Ed31)	X				
Streptococcus pneumoniae						
Ceftaroline	January 2013 (M100-S23)	X		X		
Doripenem	January 2012 (M100-S22)			X		
Doxycycline	January 2013 (M100-S23)	X		X		
Lefamulin	March 2021 (M100-Ed31)	X		X		
	February 2022 (M100-Ed32)		**X**			
Tetracycline	January 2013 (M100-S23)		X		X	
***Streptococcus* spp. β-Hemolytic Group**						
Ceftaroline	January 2013 (M100-S23)	X		X		
Dalbavancin	January 2018 (M100, 28th ed.)			X		
Doripenem	January 2012 (M100-S22)			X		
Oritavancin	January 2016 (M100-S26)			X		
Tedizolid	January 2016 (M100-S26)			X		
Telavancin	January 2016 (M100-S26)	X		X		
	January 2017 (M100, 27th ed.)					Removed disk diffusion breakpoints January 2017 (M100, 27th ed.)
***Streptococcus* spp. Viridans Group**						
Ceftolozane-tazobactam	January 2016 (M100-S26)			X		
Dalbavancin	January 2018 (M100, 28th ed.)			X		
Doripenem	January 2012 (M100-S22)			X		
Oritavancin	January 2016 (M100-S26)			X		
Tedizolid	January 2016 (M100-S26)			X		
Telavancin	January 2016 (M100-S26)	X		X		
	January 2017 (M100, 27th ed.)					Removed disk diffusion breakpoints January 2017 (M100, 27th ed.)

CLSI Breakpoint Additions/Revisions Since 2010 (Continued)

Antimicrobial Agent	Date of Addition/Revision (M100 edition)	Disk Diffusion Breakpoints		MIC Breakpoints		Comments
		New[a]	Revised[b]	New[a]	Revised[b]	
Anaerobes						
Doripenem	January 2012 (M100-S22)			X		
Imipenem-relebactam	March 2021 (M100-Ed31)			X		
Piperacillin-tazobactam	January 2017 (M100, 27th ed.)			X		
	January 2018 (M100, 28th ed.)			X		

Abbreviations: ECV, epidemiological cutoff value; SDD, susceptible-dose-dependent; UTI, urinary tract infection.

Footnotes

a. "New" indicates the breakpoints are listed for the first time for a specific organism or organism group in the respective Table 2.
b. "Revised" indicates previously established breakpoints for a specific organism or organism group in the respective Table 2 have changed. In some cases, unique breakpoints were added for a specific genus or species previously included within the organism or organism group breakpoints (eg, "*Salmonella* spp. [including *S. enterica* ser. Typhi]" was previously grouped with Enterobacterales).

CLSI Archived Resources

Resource	Web Address for Archived Table
Breakpoints that have been eliminated from M100 since 2010 have been relocated to the CLSI website.	https://clsi.org/media/pqlom3b5/_m100_archived_drugs_table.pdf
Methods that have been eliminated from M100 have been relocated to the CLSI website.	https://clsi.org/media/nszl4tbc/_m100_archived_methods_table.pdf
QC ranges that have been eliminated from M100 since 2010 have been relocated to the CLSI website.	https://clsi.org/media/r31oari2/_m100_archived_qc_table.pdf
ECVs that have been replaced by breakpoints have been relocated to the CLSI website.	https://clsi.org/media/3mekwxft/_m100_archived_ecvs_table.pdf

Abbreviations: ECV, epidemiological cutoff value; QC, quality control.

NOTE: The content of this document is supported by the CLSI consensus process and does not necessarily reflect the views of any single individual or organization.

Summary of CLSI Processes for Establishing Breakpoints and Quality Control Ranges

The Clinical and Laboratory Standards Institute (CLSI) is an international, voluntary, not-for-profit, interdisciplinary, standards-developing, and educational organization accredited by the American National Standards Institute that develops and promotes the use of consensus-developed standards and guidelines within the health care community. These consensus standards and guidelines are developed in an open and consensus-seeking forum to cover critical areas of diagnostic testing and patient health care. CLSI is open to anyone or any organization that has an interest in diagnostic testing and patient care. Information about CLSI can be found at www.clsi.org.

The CLSI Subcommittee on Antimicrobial Susceptibility Testing reviews data from a variety of sources and studies (eg, *in vitro*, pharmacokinetics-pharmacodynamics, and clinical studies) to establish antimicrobial susceptibility test methods, breakpoints, and QC parameters. The details of the data necessary to establish breakpoints, QC parameters, and how the data are presented for evaluation are described in CLSI document M23.[4]

Over time, a microorganism's susceptibility to an antimicrobial agent may decrease, resulting in a lack of clinical efficacy and/or safety. In addition, microbiological methods and QC parameters may be refined to ensure more accurate and better performance of susceptibility test methods. Because of these types of changes, CLSI continually monitors and updates information in its documents. Although CLSI standards and guidelines are developed using the most current information available at the time, the field of science and medicine is always changing; therefore, standards and guidelines should be used in conjunction with clinical judgment, current knowledge, and clinically relevant laboratory test results to guide patient treatment.

Additional information, updates, and changes in this document are found in the meeting summary minutes of the Subcommittee on Antimicrobial Susceptibility Testing at https://clsi.org/meetings/ast-file-resources/.

CLSI Reference Methods vs Commercial Methods and CLSI vs US Food and Drug Administration Breakpoints

It is important for users of M02,[1] M07,[2] and M100 to recognize that the standard methods described in CLSI documents are reference methods. These methods may be used for routine antimicrobial susceptibility testing of patient isolates, for evaluating commercial devices that will be used in medical laboratories, or by drug or device manufacturers for testing new agents or systems. Results generated by reference methods, such as those included in CLSI documents, may be used by regulatory authorities to evaluate the performance of commercial susceptibility testing devices as part of the approval process. Clearance by a regulatory authority indicates the commercial susceptibility testing device provides susceptibility results that are substantially equivalent to results generated using reference methods for the organisms and antimicrobial agents described in the device manufacturer's approved package insert.

CLSI breakpoints may differ from those approved by various regulatory authorities for many reasons, including use of different databases, differences in data interpretation, differences in doses used in different parts of the world, and public health policies. Differences also exist because CLSI proactively evaluates the need for changing breakpoints. The reasons why breakpoints may change and the manner in which CLSI evaluates data and determines breakpoints are outlined in CLSI document M23.[4]

Following a decision by CLSI to change an existing breakpoint, regulatory authorities may also review data to determine how changing breakpoints may affect the safety and effectiveness of the antimicrobial agent for the approved indications. If the regulatory authority changes breakpoints, commercial device manufacturers may have to conduct a clinical trial, submit the data to the regulatory authority, and await review and approval. For these reasons, a delay of one or more years may be needed if a breakpoint and interpretive category change is to be implemented by a device manufacturer. In the United States, it is acceptable for laboratories that use US Food and Drug Administration (FDA)–cleared susceptibility testing devices to use existing FDA breakpoints. Either FDA or CLSI susceptibility breakpoints are acceptable to laboratory accrediting organizations in the United States. Policies in other countries may vary. Each laboratory should check with the manufacturer of its antimicrobial susceptibility test system for additional information on the breakpoints and interpretive categories used in its system's software.

Following discussions with appropriate stakeholders (eg, infectious diseases and pharmacy practitioners, the pharmacy and therapeutics and infection prevention committees of the medical staff, and the antimicrobial stewardship team), newly approved or revised breakpoints may be implemented by laboratories. Following verification, CLSI disk diffusion test breakpoints may be implemented as soon as they are published in M100. If a device includes antimicrobial test concentrations sufficient to allow interpretation of susceptibility and resistance to an agent using the CLSI breakpoints, a laboratory could choose to, after appropriate verification, interpret and report results using CLSI breakpoints.

Subcommittee on Antimicrobial Susceptibility Testing Mission Statement

The Subcommittee on Antimicrobial Susceptibility Testing is composed of representatives from the professions, government, and industry, including microbiology laboratories, government agencies, health care providers and educators, and pharmaceutical and diagnostic microbiology industries. Using the CLSI voluntary consensus process, the subcommittee develops standards that promote accurate antimicrobial susceptibility testing and appropriate reporting. The mission of the Subcommittee on Antimicrobial Susceptibility Testing is to:

- Develop standard reference methods for antimicrobial susceptibility tests.
- Provide quality control parameters for standard test methods.
- Establish breakpoints and interpretive categories for the results of standard antimicrobial susceptibility tests and provide epidemiological cutoff values when breakpoints are not available.
- Provide suggestions for testing and reporting strategies that are clinically relevant and cost-effective.
- Continually refine standards and optimize detection of emerging resistance mechanisms through development of new or revised methods, breakpoints, and quality control parameters.
- Educate users through multimedia communication of standards and guidelines.
- Foster a dialogue with users of these methods and those who apply them.

The ultimate purpose of the subcommittee's mission is to provide useful information to enable laboratories to assist the clinician in the selection of appropriate antimicrobial therapy for patient care. The standards and guidelines are meant to be comprehensive and to include all antimicrobial agents for which the data meet established CLSI guidelines. The values that guide this mission are quality, accuracy, fairness, timeliness, teamwork, consensus, and trust.

Instructions for Use of Tables

These instructions apply to:

- **Tables 1A and 1B:** suggested groupings of antimicrobial agents that should be considered for testing and reporting by microbiology laboratories. These guidelines are based on antimicrobial agents approved by the US Food and Drug Administration (FDA) for clinical use in the United States. In other countries, placement of antimicrobial agents in Tables 1A and 1B should be based on available drugs approved for clinical use by relevant regulatory organizations.

- **Tables 2A through 2I:** tables for each organism group that contain:
  - Recommended testing conditions
  - Routine QC recommendations (also see Chapter 4 in M02[1] and M07[2])
  - General comments for testing the organism group and specific comments for testing particular agent/organism combinations
  - Suggested agents that should be considered for routine testing and reporting by medical microbiology laboratories, as specified in Tables 1A and 1B (test/report groups A, B, C, U)
  - Additional drugs that are appropriate for the respective organism group but would generally not warrant routine testing by a medical microbiology laboratory in the United States (test/report group O for "other"; test/report group Inv. for "investigational" [not yet FDA approved])
  - Zone diameter and minimal inhibitory concentration (MIC) breakpoints

- **Tables 1C and 2J:** tables containing specific recommendations for testing and reporting results on anaerobes and some of the information listed in the bullets above

- **Tables 3A to 3K:** tables describing tests to detect particular resistance types in specific organisms or organism groups