

## Antibiograms: New NCCLS Guidelines, Development, and Clinical Application

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**Abstract** — Antibiograms are an important resource for health care providers. All clinicians involved in antibiotic selection and monitoring should become familiar with the NCCLS M39-A document "Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data: Approved Guideline." Providers who interpret and apply antibiogram data in clinical practice should know about susceptibility testing methods, the susceptibility breakpoint determination process, and problems associated with antibiogram data analysis. The M39-A guidelines contain more than 40 recommendations, including the following: antibiogram data should be analyzed at least annually; an attempt should be made to remove duplicate isolates, and only organisms with 10 isolates or more should be presented. Accurate antibiograms facilitate improved empiric antibiotic selection and more precise monitoring of bacterial resistance in the hospital. This article reviews common antimicrobial susceptibility testing methods and relevant issues, highlights the major NCCLS M39-A recommendations, discusses the antibiogram preparation process and challenges in data interpretation, and provides a general overview of how antibiogram data may be applied to clinical practice.

**Key Words** — antibiograms, NCCLS, M39-A, susceptibility reporting, susceptibility testing

**Hosp Pharm** — 2004;39:542-553

**A**ntibiograms, when properly prepared and interpreted, are an important source of information for health care providers. The development of antibiograms should be a collaborative effort between microbiology, pharmacy, physicians, and hospital policy committees such as infection control and

anti-infective subcommittees.

Although the term "antibiogram" has different connotations, the NCCLS (formerly known as the National Committee for Clinical Laboratory Standards) defines antibiograms as the overall profile of antimicrobial susceptibility results of a microbial species to a battery of antimicrobial agents.<sup>1</sup> Data

from antibiograms are most useful when initiating empiric therapy and when tracking antimicrobial resistance trends over time within a hospital or health care system.

The lack of standardization in the preparation of hospital antibiograms may lead to the misinterpretation and misapplication of aggregate susceptibility data in making empiric antimicrobial decisions. The paucity of published data on the clinical application of institution-specific antibiogram data and related microbiologic reporting issues has further hindered efforts to maximize the use of these data in clinical practice.

To assist health care institutions, the NCCLS organization published a document entitled "Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data: Approved Guideline" (NCCLS M39-A).<sup>1</sup>

This article will review common antimicrobial susceptibility testing methods and relevant issues, highlight important NCCLS M39-A recommendations, discuss the antibiogram preparation process and challenges in data interpretation, and provide an overview of how antibiogram data may be applied to clinical practice.

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# Nccls Guidelines Antibiotics

**Ian M. Gould, Jos W.M. van der Meer**

A red circular graphic with a gradient, appearing as a stylized arrow or a partial circle, located to the right of the authors' names.

## **Nccls Guidelines Antibiotics:**

**Antibiotics in Laboratory Medicine** Victor Lorian, 2005 Implement the most current science and practice in antimicrobial research Now find the newest approaches for evaluating the activity mechanisms of action and bacterial resistance to antibiotics with this completely updated landmark reference Turn to this comprehensive reference for groundbreaking evidence on the molecular link between chemical disinfectants sterilants and antibiotics On the latest methods for detecting antibacterial resistance genes in the clinical laboratory and antivirogram use to select the most active antiviral components against your patient s HIV *Antimicrobial Susceptibility Testing Protocols* Richard Schwalbe, Lynn Steele-Moore, Avery C. Goodwin, 2007-05-22 The clinical microbiology laboratory is often a sentinel for the detection of drug resistant strains of microorganisms Standardized protocols require continual scrutiny to detect emerging phenotypic resistance patterns The timely notification of clinicians with susceptibility results can initiate the alteration of antimicrobial chemotherapy and **Antibiotic Optimization** Robert C. Owens, Charles H. Nightingale, Paul G. Ambrose, 2004-11-04 This book focuses on topics ranging from the economics of drug resistant infections and the management of antimicrobial use to new information on methods to optimize the selection route of administration dosing and duration of antimicrobial therapies for common infections In addition to offering ideas on studied programmatic approaches for judi **Antibiotic Policies: Fighting Resistance** Ian M. Gould, Jos W.M. van der Meer, 2007-08-19 In 1971 I started a fellowship in infectious diseases and medical microbiology at the Channing Laboratory of the Harvard Medical Service at Boston City Hospital My mentor Dr Maxwell Finland had encouraged me to return there from the Center for Disease Control as CDC was known then where I had studied inf tious diseases epidemiology and hospital associated infection epidemiology with the idea that we would review the demographic patterns of bacteremia and several other infections during Dr Finland s long tenure at the hospital We did so but I was surprised to find that he also invited me to help with the assessment of the success or failure of the programs to control antimicrobial use that he and c leagues had put into place at the hospital over several years The paper describing that review finally was published in 1974 after a long and tortuous process of review at several journals Several reviewers felt that such attempts to improve use amounted to interference with the patient s physician to do what was best Others felt that such programs focused incorrectly on a subject other than treating the current patient Fortunately today it is clear that antimicrobial resistance results in major part but not entirely from the ways that we use antimicrobial agents and that the ov all interests of patients in general as well as those of society are well served by efforts to use these drugs as well as possible **Antibiotic Development and Resistance** Diarmaid Hughes, Dan I Andersson, 2001-10-11 The increasing resistance of bacteria towards all current classes of antibiotics is now a serious health problem in both developed and developing countries Antibiotic Development and Resistance presents 15 chapters that explore the medical issues raised by this development and review the relevant literature The book begins by reviewing the global **Impacts of**

**antibiotic-resistant bacteria : Thanks to penicillin-- He will come home! ,1995      **Food Safety and Foodborne Pathogen - A Global Perspective on the Diversity, Combating Multidrug Resistance and Management** Learn-Han Lee,Om V. Singh,Nurul-Syakima Ab Mutalib,Marta López,2020-12-11**

A question raised by many individuals today How Safe is Our Food Consumed Today Food safety has become a hot topic and an important public issue due to the increasingly widespread nature of foodborne illnesses in both developed and developing countries As food is biological in nature and supplies consumers with nutrients it is also equally capable of supporting the growth of microorganisms from the environmental sources A precise method of monitoring and detecting of foodborne pathogens including Salmonella sp Vibrio sp Listeria monocytogenes Campylobacter and Norovirus is needed to prevent and control human foodborne infections Clinical treatments of infection caused by foodborne pathogens are becoming tougher with the increase number of multidrug resistant pathogens in the environment This situation creates a huge healthcare burden e g prolonged treatment for infections decrease in the efficacy of antibiotic delay in treatment due to unavailability of new antibiotics and increased number of deaths As such continuous investigation of the foodborne pathogens is needed to pave the way for a deeper understanding on the foodborne diseases and to improve disease prevention management and treatments      *Antibiotics in Laboratory Medicine* Daniel Amsterdam,2014-08-08 Antibiotics in Laboratory Medicine has been a mainstay resource for practitioners providers investigators and pharmaceutical researchers of new anti infective compounds for the past 30 years This edition includes new chapters on the predictive value of in vitro laboratory testing and the improvement of patient care in the hospital environment through antimicrobial stewardship      **Emerging Infectious Diseases** ,2005      Koneman's Color Atlas and Textbook of Diagnostic Microbiology Elmer W. Koneman,2006 Long considered the definitive work in its field this new edition presents all the principles and practices readers need for a solid grounding in all aspects of clinical microbiology bacteriology mycology parasitology and virology Tests are presented according to the Clinical and Laboratory Standards Institute formerly NCCLS format This extensively revised edition includes practical guidelines for cost effective clinically relevant evaluation of clinical specimens including extent of workup and abbreviated identification schemes New chapters cover the increasingly important areas of immunologic and molecular diagnosis Clinical correlations link microorganisms to specific disease states Over 600 color plates depict salient identification features of organisms

Alternative Therapeutics Against Antimicrobial-Resistant Pathogens Rebecca Thombre,Kamlesh Jangid,Ravi Shukla,Noton Kumar Dutta,2019-12-19      **Basic Skills in Interpreting Laboratory Data** Mary Lee,2009-02-26 This new edition of Basic Skills in Interpreting Laboratory Data 4th Edition is a case based learning tool that will enhance your skills in clinical lab test interpretation It provides fundamentals of interpreting lab test results not only for pharmacy students but also for practitioners as an aid in assessing patient drug treatment responses It is the only text written by and for pharmacists and provides case studies and practical information on patient therapy Since the publication of the third edition

much has changed in the clinical lab and in the hospital pharmacy Consequently the new fourth edition incorporates significant revisions and a wealth of important new information NEW TO THIS EDITION Three new chapters including new information on men s health women s health and pharmacogenomics and laboratory tests Mini cases embedded in each chapter provide therapy related examples and reinforce important points made in the text Quickview Charts give an overview of important clinical information including reference ranges and critical values Learning Points focus on a clinical application of a major concept present in the chapter Practical Handbook of Microbiology Emanuel Goldman,Lorrence H

Green,2008-08-29 The field of microbiology has developed considerably in the last 20 years building exponentially on its own discoveries and growing to encompass many other disciplines Unfortunately the literature in the field tends to be either encyclopedic in scope or presented as a textbook and oriented for the student Finding its niche between these two pol

Microbial Food Safety in Animal Agriculture Mary E. Torrence,Richard E. Isaacson,2008-02-28 In answer to public concerns Microbial Food Safety in Animal Agriculture Current Topics provides timely information on this area of increasing importance giving a broad overview of pre harvest microbial food safety Written by specialists from around the world this essential reference focuses on research in the areas of antimicrobial resistance risk assessment microbial detection methods and diagnostics and emerging diseases Coverage provides balanced overviews of Federal industry and academic perspectives on key issues in food safety Specific organisms explored in depth include Salmonellaspp Campylobacterspp Escherichia coli 0157 H7 and Listeria monocytogene No other single source offers current information and detailed references on issues in pre harvest food safety in production animal agriculture Veterinarians researchers and food safety professionals in academia government agencies and food animal production industries will discover this resource crucial to defensive awareness

*Antibiotic resistance and its continuity in the environmental niche* Marina Spinu,Magdalena Rzewuska,2023-01-30

Conn's Current Therapy 2025 - E-BOOK Rick D. Kellerman,Joel J. Heidelbaugh,2024-11-29 Selected for 2025 Doody s Core Titles with Essential Purchase designation in Family Medicine and General Internal Medicine Trusted by clinicians for more than 75 years Conn s Current Therapy presents today s evidence based information along with the personal experience and discernment of expert physicians The 2025 edition is a helpful resource for a wide range of healthcare providers including primary care physicians subspecialists and allied health professionals providing current treatment information in a concise yet in depth format Nearly 350 topics have been carefully reviewed and updated to bring you state of the art content in even the most rapidly changing areas of medicine Offers personal approaches from recognized leaders in the field covering common complaints acute diseases and chronic illnesses along with the most current evidence based clinical management options Follows a consistent easy to use format throughout with diagnosis therapy drug protocols and treatment pearls presented in quick reference boxes and tables for point of care answers to common clinical questions Contains a new chapter on artificial intelligence while extensively revised chapters with new author teams cover autism constipation depressive

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**Textbook of Pharmaceutical Biotechnology** Chandrakant Kokate, Pramod H.J, SS Jalalpure, 2012-05-14 Textbook of Pharmaceutical Biotechnology

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*Polish Journal of Microbiology*, 2006

**Kucers' The Use of Antibiotics** M. Lindsay Grayson, Sara Cosgrove, Suzanne Crowe, William Hope, James McCarthy, John Mills, Johan W. Mouton, David Paterson, 2017-10-02 Kucers The Use of Antibiotics is the definitive internationally authored reference providing everything that the infectious diseases specialist and prescriber needs to know about antimicrobials in this vast and rapidly developing field The much expanded Seventh Edition comprises 4800 pages in 3 volumes in order to cover all new and existing therapies and emerging drugs not yet fully licensed Concentrating on the treatment of infectious diseases the content is divided into four sections antibiotics anti fungal drugs anti parasitic drugs and anti viral drugs and is highly structured for ease of reference Each chapter is organized in a consistent format covering susceptibility formulations and dosing adult and pediatric pharmacokinetics and pharmacodynamics toxicity and drug distribution with detailed discussion regarding clinical uses a feature unique to this title Compiled by an expanded team of internationally renowned and respected editors with expert contributors representing Europe Africa Asia Australia South America the US and Canada the Seventh Edition adopts a truly global approach It remains invaluable for anyone using antimicrobial agents in their clinical practice and provides in a systematic and concise manner all the information required when prescribing an antimicrobial to treat infection

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