

**A GUIDE TO**  
**Specimen Management in**  
**Clinical Microbiology**

**THIRD EDITION**

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# Preface

From syndrome-based molecular panels to total lab automation, clinical microbiology has evolved rapidly over the past 18 years since the previous edition of this book. We have witnessed increases in infections due to multidrug-resistant organisms, have overcome a major Ebola outbreak, and are currently tackling the geographic expansion of Zika virus and its potentially devastating effects. Aside from these more contemporary headliner agents, we continue to battle the threat of microorganisms that have been plaguing our world for decades, including HIV, syphilis, and influenza, just to name a few. And while the laboratory processes, diagnostic methods, and diseases may be more advanced and exotic, one unwavering aspect is the need for appropriate, well-collected specimens. In a world where we find ourselves trying to do more each day within the same 24-hour period, it is imperative that time not be wasted on correcting issues that are easily remedied with upfront attention to quality of specimens.

For some reason, clinical microbiologists seem to get more formal training in appropriate specimen selection, collection, preservation, and transport than nurses, physicians, and other medical personnel who are actually obtaining the specimens. Microbiologists can usually agree that a poor specimen, regardless of how it is transported or stored, will provide poor, even inaccurate, results for the physician. Physicians must be able to trust the microbiology laboratory to deliver accurate, clinically relevant results; so it must be emphasized that the quality of the specimen submitted for culture and, ultimately, the person selecting, collecting, labeling, preserving, and transporting it, are essential first steps to achieve this. Therefore, this book is for every member of the health care team—the partnership.

The overall aim of this edition was not to reinvent the wheel when it comes to providing guidance on specimen collection and management, because not much has changed since prior editions. Rather, it is meant to make the content more readable and accessible for its users, both specimen collectors and laboratory personnel, as well as to provide updates in specimen collection for newer methodologies (e.g., nucleic acid amplification tests) that are now in almost every laboratory. In the age of molecular testing in microbiology, the principles



of specimen selection, collection, and transport are certainly no less important than they have been over the years. Close attention must be paid to the manufacturer recommendations for specimen collection and management, and unless the laboratory is prepared to validate an alternative process, one must follow these recommendations. Additionally, for labs based in the United States, the imminent threat of stricter FDA regulations on these modified tests is a reminder to us all that we must do our due diligence to prove the reliability and value in the tests we perform daily.

While the paradigm of the conventional gold standard may slowly be shifting away from cultures and organism isolation and on to more rapid, molecular-based methods, it is critical that we, as a laboratory community, continue to insist upon specimen collectors to follow collection guidelines so we can contribute what is expected of us. Anything less borders on malpractice and should be addressed before aberrant and potentially harmful results are reported. Regardless of the issue, we must remember, even in the era of decentralized labs, the specimen is not just a swab or a tube of fluid passing through our doors; it represents a sick patient, a concerned family member, and a treating physician, desperately depending on us to provide accurate, significant, and clinically relevant data. It is our mission to ensure that what comes to our lab in the form of a specimen and what leaves our lab in the form of results is of the highest quality. Please share these policies and processes with all of the medical staff involved in specimen management, share your knowledge, and spread this important information. If you don't do it, who will?

*J. Michael Miller  
Shelley A. Miller*

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## About the Authors



**J. Michael Miller** currently directs Microbiology Technical Services, LLC, a private laboratory consulting service. Prior to this, Dr. Miller was with the Centers for Disease Control and Prevention (CDC) for 35 years until he retired in 2011. He received his BS and MS at Northwestern State University in Louisiana and a PhD at the University of Texas Health Science Center at San Antonio. He is a Diplomate of the American Board of Medical Microbiology, a Fellow of the American Academy of Microbiology and former member of the Board of Governors, former dean of the American College of Microbiology, and holds a Clinical Laboratory Director License in Georgia and Microbiology Laboratory Director License for New York and New Jersey.



**Shelley A. Miller** completed a clinical and public health microbiology postdoctoral fellowship at UC Los Angeles and has since stayed on as a clinical instructor, assisting with clinical teaching duties and translational research projects. Dr. Miller received her BS at UC Santa Barbara and went on to complete a one-year Emerging Infectious Disease fellowship at the Arkansas Department of Health Laboratory, sponsored by the Association of Public Health Laboratories and CDC, prior to attending graduate school at UC Irvine. She is a Diplomate of the American Board of Medical Microbiology and is licensed as a technologist in both clinical and public health microbiology. Unfortunately, she has no genetic relation to the great Mike Miller.

# How To Use This Book

Since this text is intended to be used by all members of a health care team, some parts are more useful than others to particular members of the team. The book has four major sections.

## Communicating Laboratory Needs

*For physicians, nurses, specimen collectors, and laboratorians*

This section details the premises on which quality microbiology specimen management processes depend. It introduces the concepts of specimen quality and of the relationship of specimen quality to clinical relevance, but it does not detail methods for specimen management. It also outlines some of the criteria that must be adhered to by the microbiology laboratory in the interest of good laboratory practice.

## Specimen Management Policies and Rationale

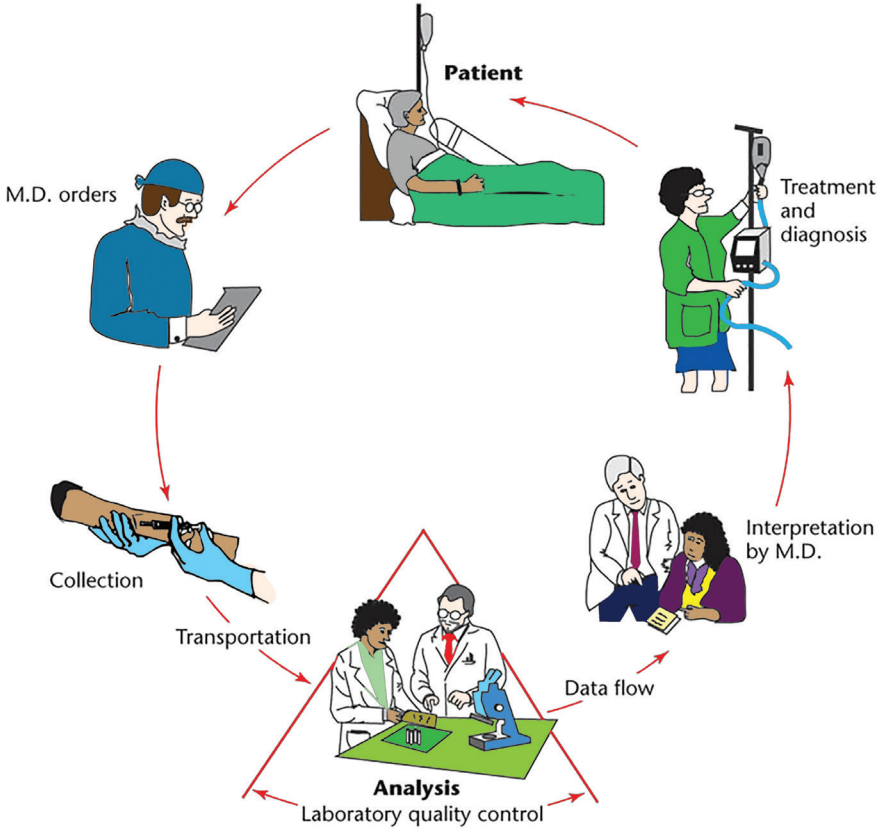
*For physicians, nurses, and laboratorians*

This important section details why the microbiology laboratory must be involved in each part of the testing process, including the preanalytical, analytical, and postanalytical steps (Fig. 1). It gives the rationale for stringent standards for specimen quality and explains some of the reasons why microbiologists may reject a specimen or insist on additional information.

## Specimen Collection and Processing

*For all specimen collectors and laboratorians*

This “how to collect . . .” section is written in the Clinical and Laboratory Standards Institute format for laboratorians and is intended to help them prepare the collection portion of their procedure manuals. This section also provides instructions for any member of the medical staff involved in selecting, collecting, storing, and transporting specimens to the laboratory for analysis. Each procedure can become a part of a laboratory or nursing procedure manual on specimen collection. Included in this section are specific directions for pediatric needs.



**Figure 1** The total laboratory testing process. Laboratorians must involve themselves in all aspects of specimen management, not just the analytical process.

## Specimen Management Summary Tables

*For all personnel involved with specimen management*

This section contains summary information in tabular form for specimen management practices for bacteria, viruses, fungi, and parasites. It is to be used as a quick reference guide that can answer most questions regarding the laboratory needs for a particular specimen.

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