

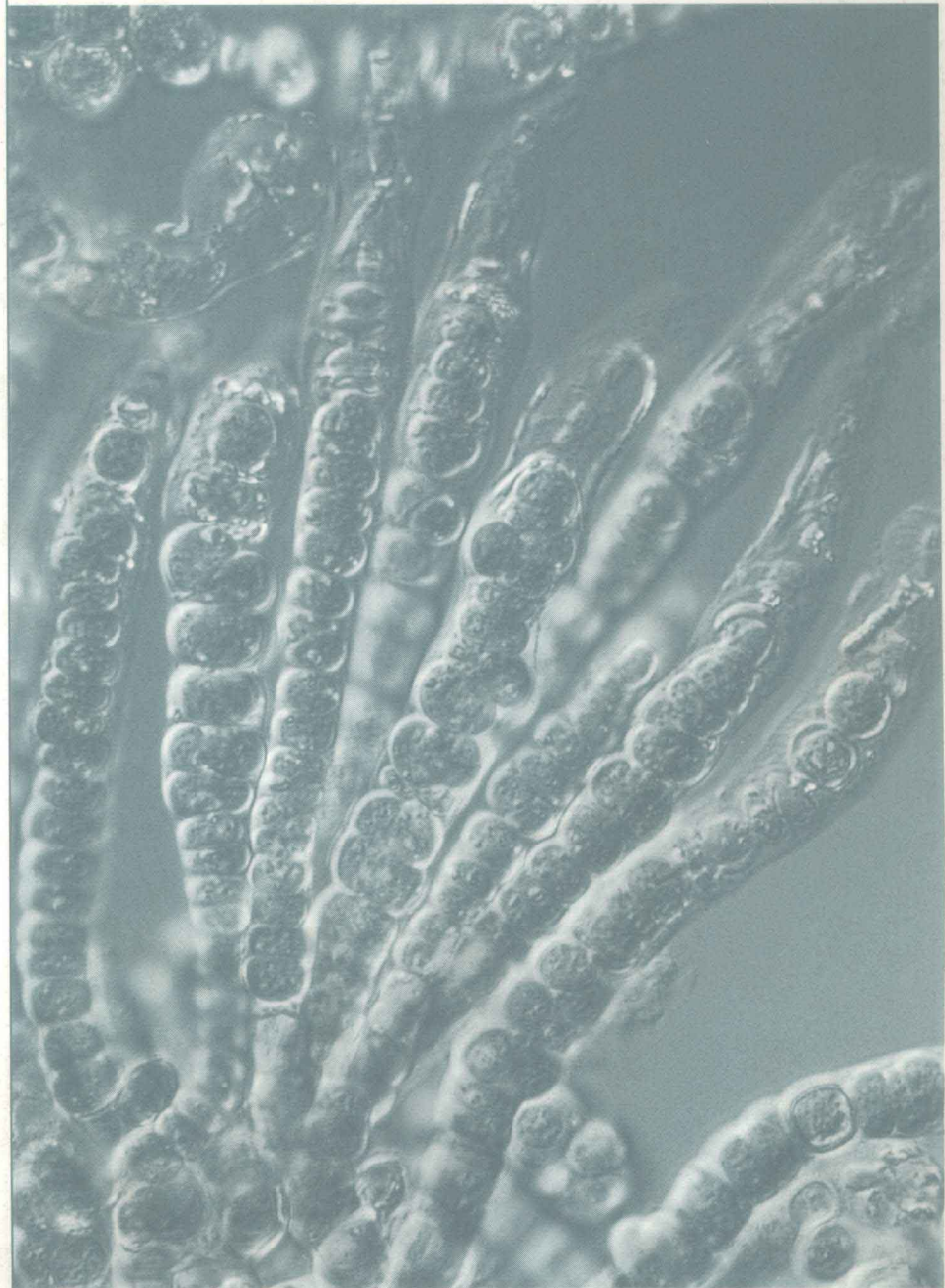
INSTRUCTOR'S GUIDE | TEST BANK

SEVENTH EDITION

# *Microbiology*

AN INTRODUCTION

TORTORA • FUNKE • CASE



CHRISTINE L. CASE

Instructor's Guide / Test Bank for

# MICROBIOLOGY AN INTRODUCTION

SEVENTH EDITION

TORTORA • FUNKE • CASE

CHRISTINE L. CASE



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# PREFACE

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There is no substitute for an instructor's interaction with students, and a student's enthusiasm for learning is stimulated by your presence. This *Instructor's Guide for Microbiology: An Introduction*, Seventh Edition, provides some new ideas and reinforcement for teaching your course. If you are just beginning to teach microbiology, this guide can provide a framework for developing your course.

This guide is divided into three sections. The first section, *Introduction*, includes several alternative course outlines for use with *Microbiology: An Introduction*, Seventh Edition. For presentation of microbial diseases by etiology (taxonomic group), portal of entry, or method of transmission, sequences of topics and pertinent pages in the text are listed in this section.

The second section, *Chapter Notes*, includes six subsections: Learning Objectives, Chapter Summary, The Loop, New in This Edition, Answers to Study Questions, and Case History. *Learning Objectives* provides an overview of the chapter contents. They are the same as the objectives in the text. The scope of each chapter is highlighted in *Chapter Summary*. Cross-references to other chapters are listed in *The Loop*.

For the many users of the Sixth Edition, changes and additions new to this Seventh Edition are highlighted in the section *New in This Edition*. *Answers to Study Questions* in the text follows the Chapter Summary. These answers are brief but should be sufficient to provide you with insight regarding our intent in asking particular questions. Answers to the end-of-chapter Review and Multiple Choice questions are also available on the web site (<http://www.microbiologyplace.com>). Answers to the Critical Thinking and Clinical Applications questions will not be posted on this website, so you can use these as homework or test questions if you wish. The *Case History* in each chapter can be used for testing, class discussion, or homework. They can also be found online at <http://www.microbiologyplace.com>. The case histories require analysis and application of new information; additionally, many require quantitative analysis. In Microbiology for Allied Health at Skyline College, we make selected case histories available for extra credit. The students can choose one or two to turn in. Many are suitable for use as essay questions on tests; however, keep in mind that students will need time to think through the problems. "Microtriviology" (Chapter 11) can be used to encourage students to use reference materials such as *Bergey's Manual*.

The third section is *Chapter Tests*. Each chapter has objective test questions with answers provided in the left margin. The tests can be reproduced and used directly from the guide to test students' recall and understanding of material presented in the text. Essay questions or analytical problems for each chapter are also provided. These same test questions are also available in TestGen 3.0, a cross-platform CD-ROM, which you can request from your Benjamin Cummings representative.

# Introduction

## THE FIRST DAY

The first day of a semester is hectic. Introductory remarks on regulations, requirements, and grading are needed; roll must be taken; and students are adding and dropping classes. Generally, the first day is not a good day to present material on which students will be tested.

I begin my class by distributing the course syllabus and explaining it. Then I show 35-mm color slides for the remainder of the period. Since students are usually unfamiliar with microbiology, slides can introduce the subject with pictures of representative organisms, laboratory cultures, and environmental and industrial applications. A discussion of food and agriculture generates an awareness of the importance of microbiology.

Course content can emphasize general microbiology with examples and specific details from medical microbiology and biotechnology. First-day slides focus on ecology and applied microbiology. I sometimes give the students study questions that can be answered from the slide narration and Chapter 1.

## EDUCATIONAL TECHNOLOGY

### Transparencies

Acetate overhead transparencies of 366 full-color line drawings from the text are available free to instructors who adopt *Microbiology: An Introduction*, Seventh Edition.

Transparencies are a useful teaching tool because they accurately illustrate structures or events and eliminate the need to spend time carefully drawing on the chalkboard during a lecture. Moreover, transparencies can be used in a fully lit room so that the students can take notes.

The use of transparencies copied directly from the text will stimulate the students to use their text as a reference. Additionally, the students will not have to copy the entire transparency but can make notes in their text or take notes that refer to a specific figure in the text.

### Slides

Eighty color slides are available free to instructors who adopt *Microbiology: An Introduction*, Seventh Edition. The slides present biological agents of disease and HIV-related topics with corresponding clinical photos.

### Web Site

The web site includes the study outline, answers to selected study questions, new multiple choice test questions, updated feature boxes from the text, links to other web sites, and a monthly microbe identification exercise. Students can also email questions to the authors at the web site.

### Interactive Student Tutorial CD

An Interactive Student Tutorial CD (v.2.0) is included with every textbook. The CD includes review questions for each chapter and interactive tutorials. Additionally, students can perform virtual experiments on enzyme activity, PCR, bacterial growth, and BOD



## SUGGESTED USES FOR SPECIAL FEATURES IN MICROBIOLOGY: AN INTRODUCTION, SEVENTH EDITION

### Learning Objectives

The objectives at the beginning of each major heading focus the student's attention on major concepts presented in the text. You may wish to modify the objectives into mastery objectives. To do this, identify the performance and conditions necessary for the student to show the desired competence.

For example, an additional sentence in the third objective on p. 7 of *Microbiology: An Introduction* ("Identify the contributions...") would define the test conditions. The students can be told whether they will be expected to identify contributions from a list or write an essay on the historical background of microbiology including contributions made by five of these people.

Objective 2, p. 7 of *Microbiology: An Introduction* ("Compare the theories...") should tell the student what test conditions to expect. The student might anticipate writing an essay or making a list to show differences between these theories. Should the student expect to differentiate between these theories by providing supporting evidence for each theory? Sample questions are sometimes useful to clarify an objective.

Additions and deletions can be made to the lists of objectives to suit your needs.

### Study Questions

Four levels of study questions are provided at the end of each chapter. The Review level allows students to test their recall of information. The Multiple Choice section includes questions that require recall and questions that require analysis. The Critical Thinking level provides problems that require knowledge and reasoning. Actual case histories are included in the Clinical Applications questions. Answers to the study questions are provided in this guide.

Study questions can be a basis for class discussion.

### Further Reading

Further Reading is included on the web site. Efforts were made to provide references for each chapter that are a balance between general reading for breadth, advanced texts, and scientific papers. Many of the references used by the authors are listed. Most, if not all, of these references will be found in college libraries.

Learning to use references is an integral part of education. Too often, a lecture leaves the student with the notion that what they just heard is all there is to know. Periodically, I give library assignments. The students receive a sheet of questions that can be answered using selected references. Selections from Further Reading can be used this way.

A special reference section for Part Four of *Microbiology: An Introduction*, Seventh Edition, is provided. These are textbooks that are used in medical microbiology. I find that allied health students use these texts frequently for additional information on "unknown" reports or special topics on diseases.

MMWR, Clinical Problem-Solving, and Microbiology in the News boxes will be updated monthly on the microbiology web site.

### Appendices

Pertinent topics in the Chapter Notes in this guide are cross-referenced to the Appendices in the text.

## Mycology and Parasitology

In addition to bacteriology and virology, an overview of mycology and parasitology is provided in Chapter 12, and representative diseases are included in Chapters 21 through 26. A few examples from mycology and parasitology can provide students with an introduction to general biological principles as well as broaden their concept of disease-causing organisms.

The content of your course is determined by you and the other faculty involved in allied health programs. Most health personnel must have some familiarity with a wide range of disease-causing organisms. Your state public health department publishes reference material on diseases that may occur in your geographic area. When discussing mycology and parasitology, I find it useful to refer to organisms that local clinicians have encountered.

## Scheduling Topics

The following outline is suggested for a one-semester course. It is based on 45 fifty-minute lectures.

Topic	Number of Lectures
Welcome and First-Day Business	1
The Microbial World and You	1
Chemical Principles	3
Observing Microorganisms Through a Microscope	1
Functional Anatomy of Prokaryotic and Eukaryotic Cells	3
Microbial Metabolism	3
Microbial Growth	1
The Control of Microbial Growth	2
Microbial Genetics	3
Biotechnology and Recombinant DNA	1
Classification of Microorganisms	0.5
Bacteria and Archaea	1
Fungi	1
Protozoa and Algae	1
Multicellular Parasites	1
Viruses	2
Principles of Disease and Epidemiology	0.5
Microbial Mechanisms of Pathogenicity	0.5
Nonspecific Defenses of the Host	1
Specific Defenses of the Host: The Immune Response	3
Disorders Associated with the Immune System	2
Practical Applications of Immunology	0.5
Antimicrobial Drugs	1
Microbial Diseases of the Skin and Eyes	1
Nosocomial Infections	1
Microbial Diseases of the Nervous System	1
Microbial Diseases of the Cardiovascular and Lymphatic Systems	1
Microbial Diseases of the Respiratory System	2
Microbial Diseases of the Digestive System	2
Microbial Diseases of the Urinary and Reproductive Systems	1
Environmental Microbiology	1.5
Applied and Industrial Microbiology	0.5

The text is flexible and can be adapted to suit the schedule you prefer. On the following pages, selected topics are grouped to assist you in preparing your course outline.

## Biotechnology

Introduction	pp. 18–19
What Makes Sourdough Bread Different?	p. 5
Bioremediation—Bacterial Banqueters Attend Oil Spill	p. 35
Can Bacteria Make Food Safe?	p. 60
What Is Fermentation?	p. 133
Bacteria Make a Faster, Smarter Computer	p. 144
Studying Hydrothermal Bacteria	p. 161
Designer Jeans	p. 251
From Plant Disease to Shampoo and Salad Dressing	p. 328
New Weapons Against AIDS	p. 543
Biosensors—Bacteria That Detect Toxic Pollutants and Pathogens	p. 786
Food Production	pp. 775–779
Genetic Engineering	Chapter 9
Industrial Products from Microbes	pp. 775–779, 782–787
Fermentation Technology	pp. 779–782
Vaccines	pp. 500–506
Diagnostics	pp. 506–515
Immunotherapy	pp. 533–535
Monoclonal Antibodies	pp. 486–488
Bioremediation	pp. 35, 752–753

## Biochemistry

Many instructors do not cover basic chemistry (Chapter 2) as a lecture topic because chemistry is a prerequisite to their microbiology courses. Some instructors feel that they can incorporate the necessary basic concepts of chemistry into metabolism and genetics. In either case, Chapter 2 can provide a review for the students.

The following sections deal with the biochemical process in living cells.

Organic Chemistry	pp. 40–51
Microbial Metabolism	Chapter 5
Microbial Genetics	Chapter 8
Biochemical Pathways	Appendix C
Bacteria Contribute to Global Warming; Can They Cool It Too?	p. 747
Studying Hydrothermal Bacteria	p. 161
Bioremediation	pp. 35, 752–753

## Control of Microbial Growth

Exponents, Exponential Notation, and Logarithms	p. 173, Appendix D
Microbial Growth	Chapter 6
Plate Counts	p. 176
Most Probable Numbers (MPN)	pp. 176–177
Control of Microbial Growth	Chapter 7
Food Preservation	pp. 200, 771–775
Antimicrobial Drugs	Chapter 20
Antibiotics in Animal Feed Linked to Human Disease	p. 562
A Hospital-Acquired Infection	p. 201



**Immunology**

Nonspecific Defenses of the Host	Chapter 16
Macrophages Say NO	p. 463
Complement	pp. 467–469, 470
Interferon	pp. 469–472
Specific Defenses of the Host: The Immune Response	Chapter 17
Hypersensitivities	pp. 521–529
Immune Deficiencies	p. 533
Immune Responses to Cancer	pp. 533–535
Why Not Vaccinate Against Everything?	p. 505
Is IL-12 the Next “Magic Bullet”?	p. 490
Autoimmunity	pp. 529–530
Transplants	pp. 530–533
Vaccines	pp. 500–506
Diagnostic Immunology (Serology)	pp. 506–515

**Epidemiology**

Principles of Disease and Epidemiology	Chapter 14
How Human Behavior Influences the Evolution of Virulence in Microorganisms	p. 437
Mechanisms of Pathogenicity	Chapter 15
Microbial Diseases of the Skin and Eyes	Chapter 21
Microbial Diseases of the Nervous System	Chapter 22
Microbial Diseases of the Cardiovascular and Lymphatic Systems	Chapter 23
Microbial Diseases of the Respiratory System	Chapter 24
Microbial Diseases of the Digestive System	Chapter 25
Microbial Diseases of the Urinary and Reproductive Systems	Chapter 26
Methods for Taking Clinical Samples	Appendix B
A Hospital-Acquired Infection	p. 201
A Vectorborne Disease—Or Is It?	p. 646

**Nosocomial Infections**

Nosocomial Infections	pp. 420–423
Universal Precautions and Methods for Taking Clinical Samples	Appendix B
AIDS Update: The Risk to Health-Care Workers	p. 395
A Hospital-Acquired Infection	p. 201
Streptococcal Toxic-Shock Syndrome	p. 423

**Diseases Associated with Food and Water**

Diseases of the Gastrointestinal System	Chapter 25
Botulism	Chapter 22
Listeriosis	Chapter 22
Endotoxins	pp. 443–445
Exotoxins	pp. 442–443
Mycotoxins and Algal Toxins	pp. 449, 705
Shigellosis	p. 694

## Environmental Microbiology

Biodiversity	pp. 327, 742–745
Microbial Ecology	pp. 17–18
Mass Deaths of Marine Mammals Spur Veterinary Microbiology	p. 292
Studying Hydrothermal Bacteria	p. 162
Bacteria Make a Faster, Smarter Computer (Halophiles)	p. 144
Important Activities of Fungi	pp. 341–342
Important Activities of Algae	pp. 347–349
Lichens	pp. 342–344
Slime Molds	pp. 354–356
Biogeochemical Cycles	pp. 744–751
Bacteria Contribute to Global Warming; Can They Cool It Too?	p. 747
Biodegradation	pp. 751–754
Bioremediation—Bacterial Banqueters Attend Oil Spill	p. 35
Biosensors: Bacteria That Detect Pollutants and Pathogens	p. 786
Aquatic Microbiota	pp. 754–756
Water Pollution	pp. 756–759
Water Treatment	pp. 760–761
Sewage Treatment	pp. 761–766

## Acquired Immunodeficiency Syndrome (AIDS)

Introduction	pp. 21–22, 535
SAIDS	p. 379
Origin of AIDS	p. 536
Retroviruses	pp. 392–393
HIV Infection	pp. 536–539
Diagnostic Methods	pp. 539–540
Transmission	p. 541
Risk to Health-Care Workers	p. 395
AIDS Worldwide	pp. 541–542
Prevention and Treatment	pp. 542–543

## Cancer

Ames Test for Chemical Carcinogens	pp. 231–233
Viruses and Cancer	pp. 394–397
The Role of Bacteria in Cancer	p. 236
<i>Helicobacter</i>	pp. 697–699

## Alternative Course Outlines

Specific diseases and etiologies can be covered by systems, taxa, or methods of transmission. It is up to you to decide which diseases need to be covered for each group of students. An instructor may wish to emphasize bacterial diseases but include a representative disease caused by a virus, fungus, protozoan, and helminth for comparison and breadth. Some nonbacterial agents are important causes of diseases worldwide. In a class in which all the students are in an allied health program, all the microbial diseases relevant to those students could be presented. For example, respiratory therapy students need to learn about diseases of the respiratory and circulatory systems. Although bacterial and viral diseases are the most common, protozoan and multicellular parasites will be encountered in clinical work. Additionally, liberal arts students often find examples from parasitology interesting.

## Taxonomic Approach

### Bacteria and the Diseases They Cause

#### Proteobacteria

##### $\alpha$ -Proteobacteria

Cat scratch fever, <i>Bartonella henselae</i>	p. 632
Ehrlichiosis, <i>Ehrlichia</i> spp.	p. 635
Endemic murine typhus, <i>Rickettsia typhi</i>	p. 637
Epidemic typhus, <i>R. prowazekii</i>	p. 637
Rocky Mountain spotted fever, <i>R. rickettsii</i>	pp. 637–638
Brucellosis, <i>Brucella</i> spp.	pp. 630–631

##### $\beta$ -Proteobacteria

Gonorrhea, <i>Neisseria gonorrhoeae</i>	pp. 697–700
Meningitis, <i>N. meningitidis</i>	pp. 582–583
Neonatal gonorrheal ophthalmia, <i>N. gonorrhoeae</i>	pp. 574–575
Pelvic inflammatory disease, <i>N. gonorrhoeae</i>	p. 701
Nosocomial infections, <i>Burkholderia</i> spp.	p. 201
Whooping cough, <i>Bordetella pertussis</i>	pp. 636–638

##### $\gamma$ -Proteobacteria

Animal bites, <i>Pasteurella multocida</i>	p. 632
Bacillary dysentery, <i>Shigella</i> spp.	pp. 691–692
Epiglottitis, <i>Haemophilus influenzae</i>	p. 658
Meningitis, <i>H. influenzae</i>	pp. 604–605
Otitis media, <i>H. influenzae</i>	p. 661
Pneumonia, <i>H. influenzae</i>	p. 669
Chancroid, <i>H. ducreyi</i>	pp. 731–732
Cholera, <i>Vibrio cholerae</i>	pp. 695–696
Gastroenteritis, <i>V. parahaemolyticus</i>	p. 696
Gastroenteritis, <i>V. vulnificus</i>	p. 697
Cystitis, <i>Escherichia coli</i>	p. 723
Gastroenteritis, <i>E. coli</i>	pp. 697
Pyelonephritis, <i>E. coli</i>	p. 723
Pneumonia, <i>Klebsiella pneumoniae</i>	p. 671
Dermatitis, <i>Pseudomonas aeruginosa</i>	p. 586
Otitis externa, <i>P. aeruginosa</i>	p. 586
Legionellosis, <i>Legionella pneumophila</i>	pp. 669–670
Plague, <i>Yersinia pestis</i>	pp. 633–634
Gastroenteritis, <i>Y. enterocolitica</i>	p. 696
Pneumonia, <i>Moraxella catarrhalis</i>	p. 671
Q-fever, <i>Coxiella burnetii</i>	p. 671
Salmonellosis, <i>Salmonella enterica</i>	pp. 692–694
Typhoid fever, <i>S. enterica typhi</i>	pp. 695
Tularemia, <i>Francisella tularensis</i>	pp. 629–630

##### $\epsilon$ -Proteobacteria

Gastroenteritis, <i>Campylobacter jejuni</i>	p. 697
Gastritis, <i>Helicobacter pylori</i>	pp. 697–699
Peptic ulcers, <i>H. pylori</i>	pp. 697–699

Clostridia

Tetanus, <i>Clostridium tetani</i>	pp. 607–608
Gangrene, <i>C. perfringens</i>	pp. 631–632
Gastroenteritis, <i>C. perfringens</i>	p. 699
Botulism, <i>C. botulinum</i>	pp. 608–610

Mollicutes

Pneumonia, <i>Mycoplasma pneumoniae</i>	p. 669
Urethritis, <i>M. hominis</i>	p. 728
Urethritis, <i>Ureaplasma ureolyticum</i>	p. 728

Bacilli

Anthrax, <i>Bacillus anthracis</i>	p. 631
Gastroenteritis, <i>B. cereus</i>	p. 699
Listeriosis, <i>Listeria monocytogenes</i>	p. 606
Acute bacterial endocarditis, <i>Staphylococcus aureus</i>	p. 628
Folliculitis, <i>S. aureus</i>	p. 583
Food poisoning, <i>S. aureus</i>	pp. 690–691
Impetigo, <i>S. aureus</i>	p. 583
Otitis media, <i>S. aureus</i>	p. 661
Scalded skin syndrome, <i>S. aureus</i>	p. 583
Toxic shock syndrome, <i>S. aureus</i>	p. 584
Cystitis, <i>S. saprophyticus</i>	p. 723
Erysipelas, <i>Streptococcus pyogenes</i>	p. 585
Impetigo, <i>S. pyogenes</i>	p. 585
Meningitis, <i>S. pyogenes</i>	p. 603
Necrotizing fasciitis, <i>S. pyogenes</i>	p. 586
Puerperal sepsis, <i>S. pyogenes</i>	pp. 627–628
Rheumatic fever, <i>S. pyogenes</i>	p. 629
Scarlet fever, <i>S. pyogenes</i>	p. 659–660
Strep throat, <i>S. pyogenes</i>	p. 659
Streptococcal toxic shock syndrome, <i>S. pyogenes</i>	p. 423
Meningitis, <i>S. pneumoniae</i>	pp. 605–606
Otitis media, <i>S. pneumoniae</i>	p. 661
Pneumonia, <i>S. pneumoniae</i>	pp. 667–669
Dental caries, <i>S. mutans</i>	pp. 686–688
Subacute bacterial endocarditis, $\alpha$ -hemolytic streptococci	p. 628

Actinobacteria

Acne, <i>Propionibacterium acnes</i>	p. 587
Buruli ulcer, <i>Mycobacterium ulcerans</i>	p. 584
Diphtheria, <i>Corynebacterium diphtheriae</i>	pp. 660–661
Leprosy, <i>Mycobacterium leprae</i>	pp. 610–611
Tuberculosis, <i>M. tuberculosis</i>	pp. 663–667
Mycetoma, <i>Nocardia asteroides</i>	p. 325
Vaginosis, <i>Gardnerella vaginalis</i>	pp. 732

Chlamydiae

Inclusion conjunctivitis, <i>Chlamydia trachomatis</i>	p. 596
Lymphogranuloma venereum, <i>C. trachomatis</i>	p. 731
Pelvic inflammatory disease, <i>C. trachomatis</i>	p. 728
Trachoma, <i>C. trachomatis</i>	p. 596
Urethritis, <i>C. trachomatis</i>	p. 727
Pneumonia, <i>C. pneumoniae</i>	pp. 670–671
Psittacosis, <i>C. psittaci</i>	p. 670

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Leptospirosis, <i>Leptospira interrogans</i>	pp. 723–725
Relapsing fever, <i>Borrelia</i> spp.	p. 634
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Syphilis, <i>Treponema pallidum</i>	pp. 728–731
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Coccidioidomycosis, <i>Coccidioides immitis</i>	pp. 675–676
Pneumonia, <i>Pneumocystis carinii</i>	pp. 676–677
Sporotrichosis, <i>Sporothrix schenckii</i>	p. 594
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Meningitis, <i>Cryptococcus neoformans</i>	p. 616
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Trichomoniasis, <i>Trichomonas vaginalis</i>	p. 735
Apicomplexa	
Babesiosis, <i>Babesia microti</i>	p. 647
Cryptosporidiosis, <i>Cryptosporidium parvum</i>	pp. 706–707
Cyclospora infection, <i>Cyclospora cayetanensis</i>	p. 707
Malaria, <i>Plasmodium</i> spp.	pp. 642–645
Toxoplasmosis, <i>Toxoplasma gondii</i>	p. 642
Rhizopoda	
Amoebic dysentery, <i>Entamoeba histolytica</i>	p. 707
Keratitis, <i>Acanthamoeba</i> spp.	pp. 597
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Paralytic shellfish poisoning, <i>Alexandrium</i> spp.	p. 347
Possible estuary-associated syndrome, <i>Pfiesteria</i> sp.	p. 348
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African trypanosomiasis, <i>Trypanosoma brucei</i>	p. 595
American trypanosomiasis, <i>T. cruzi</i>	p. 618
Leishmaniasis, <i>Leishmania</i> spp.	pp. 645–647
Meningoencephalitis, <i>Naegleria fowleri</i>	p. 595
<b>Helminths and the Diseases They Cause</b>	
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<b>Nematodes</b>	
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Hookworms, <i>Necator americanus</i>	p. 709–710
Pinworms, <i>Enterobius vermicularis</i>	p. 709
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Influenza, <i>Orthomyxovirus</i>	pp. 672–674
Fifth disease, <i>Parvovirus</i>	p. 592
Common cold, <i>Picornavirus</i>	p. 662
Hepatitis A, <i>Picornavirus</i>	p. 702
Poliomyelitis, <i>Picornavirus</i>	pp. 611–613
Measles, <i>Paramyxovirus</i>	pp. 590–591
Mumps, <i>Paramyxovirus</i>	pp. 699–700
Pneumonia, <i>Paramyxovirus</i>	p. 672
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AIDS, <i>Retrovirus</i>	pp. 395, 535–544
Rabies, <i>Rhabdovirus</i>	pp. 613–615, 617
Dengue, <i>Togavirus</i>	p. 640
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**Prions and the Diseases They Cause**

Creutzfeldt-Jakob disease

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Kuru

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**Portal of Entry Approach**

Portals of Entry

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Methods for Taking Clinical Samples

Appendix B

**Bacterial Diseases Acquired Through the Respiratory Tract**

Chlamydial pneumonia

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Diphtheria

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*Haemophilus* pneumonia

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Legionellosis

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Meningitis

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Mycoplasmal pneumonia

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Otitis media

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Pertussis

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Plague

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Pneumococcal pneumonia

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Psittacosis

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Q fever

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Scarlet fever

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Streptococcal pharyngitis

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Tuberculosis

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**Viral Diseases Acquired Through the Respiratory Tract**

Chickenpox

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Common cold

p. 662

*Hantavirus* pulmonary syndrome

p. 641

Influenza

pp. 672–674

Measles

pp. 590–591

RSV Disease

p. 672

Rubella

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Smallpox

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**Fungal Diseases Acquired Through the Respiratory Tract**

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Blastomycosis

p. 678

Coccidioidomycosis

pp. 675–676

*Cryptococcus* meningitis

p. 616

Histoplasmosis

pp. 674–675

*Pneumocystis* pneumonia

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**Bacterial Diseases Acquired Through the Gastrointestinal Tract***Bacillus cereus* gastroenteritis

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Botulism

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*Campylobacter* gastroenteritis

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Cholera

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*Clostridium perfringens* gastroenteritis

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Dental caries

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*E. coli* gastroenteritis

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Epiglottitis

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<b>Protozoan Diseases Acquired Through the Gastrointestinal Tract</b>	
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<b>Helminthic Diseases Acquired Through the Gastrointestinal Tract</b>	
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Trichinosis	pp. 710–712
<b>Prion Diseases Acquired Through the Gastrointestinal Tract</b>	
Creutzfeldt-Jacob disease	pp. 619–620

For a listing of pathogens that enter through the skin/mucous membranes and parenteral route or by vectors, see the following section, Method of Transmission Approach.

## Method of Transmission Approach

A discussion of the transmission of disease is on pages 417–419. Diseases acquired through the respiratory tract are usually transmitted by direct contact including droplet infection. Diseases acquired through the gastrointestinal tract are most often transmitted by indirect contact in food and water. These diseases are listed in the Portal of Entry Approach section of this guide.

Pathogens that enter through the skin/mucous membranes and parenteral route have the most varied methods of transmission and are listed below.

### Diseases Acquired by Direct Contact Through the Skin/Mucous Membranes

Bacterial	
Chancroid	pp. 731–732
Cystitis	p. 723

Gonorrhea	pp. 725–727
Impetigo	p. 583
Lymphogranuloma venereum	p. 731
Necrotizing fasciitis	p. 586
Neonatal gonorrheal ophthalmia	p. 596
Pelvic inflammatory disease	p. 728
Puerperal sepsis	pp. 627–628
Pyelonephritis	p. 723
Syphilis	pp. 728–731
Urethritis	p. 727
Vaginosis	p. 732
<b>Viral</b>	
Cold sores	p. 590
Genital warts	p. 734
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<b>Arthropod</b>	
Scabies	p. 595
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Animal bites and scratches	p. 632
Rabies	pp. 613–615, 617
 <b>Diseases Acquired by Indirect Contact Through the Skin/Mucous Membranes</b>	
<b>Bacterial</b>	
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Inclusion conjunctivitis	p. 596
Infections by pseudomonads	p. 586
Leprosy	pp. 610–611
Leptospirosis	pp. 723–725
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Tetanus	pp. 607–608
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Ringworm	pp. 593–594
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<b>Viral</b>	
Arthropod-borne encephalitis	p. 615
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