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Preparing for the American Board of Pathology (ABPath) Examination of Fundamental Knowledge and Skills

Medical Microbiology

Content Specifications

Overview:

Medical Microbiology Content Specifications

This guide outlines the content that may appear on the American Board of Pathology's Medical Microbiology Subspecialty exam. It provides a framework based on the knowledge and skills typically covered in Fellow-level training, along with applicable Core and Advanced Resident topics from residency training that the trainee is expected to know or be able to perform.

Key to Designations:

C = Core/Foundational Knowledge

AR = Advanced Resident Knowledge

F = Fellow/Advanced Practitioner Knowledge

The exam assesses the knowledge, judgment, skills, and abilities necessary to identify specific entities, properly process specimens, and diagnose and monitor diseases using methods common in the practice of Medical Microbiology. The specific diseases, tests, and concepts listed in this document are important for candidates to know, but it is not possible to create a fully comprehensive list of all the material needed for certification and effective practice. Candidates should use this guide as a reference when preparing for certification and professional practice.

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1. Bacteria, including Mycobacteria, *Nocardia,* and other Aerobic Actinomycetes

a. Optimal Collection Methods

i.	Lower Respiratory Tract Culture	AR
ii.	Sinus Culture	AR
iii.	Urine Culture	AR
iv.	Superficial Wound Culture	AR
v.	Deep Wound Culture	AR

vi.	Stool Culture	AR
vii.	Blood Culture	AR
viii.	Tissue Culture	AR
ix.	Cerebrospinal Fluid Culture	AR
x.	Normally Sterile Fluid Culture	AR
xi.	Genital Cultures	AR
xii.	Anaerobic Cultures	AR
b.	Principles of Specimen Collection, Transport and Processing	
i.	Principles Regarding the Appropriate Use of Swabs for Bacterial Culture	AR
ii.	Principles Regarding the Volume of Specimen Required	AR
iii.	Principles Regarding the Use of Broth Enrichment	AR
iv.	Principles Regarding the Cultivation of Fastidious Microorganisms	AR
v.	Principles Regarding the Maintenance of the Specimen during Transport	AR
c.	Safety Issues Regarding the Processing of Specimens for Bacteria	AR
d.	Specimen Rejection Criteria	
i.	Specimen Rejection Criteria for Respiratory Tract Specimens	AR
ii.	Specimen Rejection Criteria for Stool Specimens	AR
iii.	Specimen Rejection Criteria for Transportation Delay and Specimen Integrity Issues	AR
e.	Media	
i.	*Campylobacter* Selective Agar	AR
ii.	Cefsulodin-Irgasan Novobiocin (CIN) Agar	AR
iii.	Charcoal Yeast Extract (CYE) Agar	AR
iv.	Chocolate Agar	AR
v.	Colistin-Nalidixic Acid (CNA) Blood Agar	AR
vi.	Hektoen-Enteric (HE) Agar	AR
vii.	MacConkey Agar	AR
viii.	Sheep Blood Agar	AR
ix.	Thayer Martin Agar	AR
x.	Media Selection for:	
1.	Lower Respiratory Tract Cultures	AR
2.	Sinus Culture	AR
3.	Urine Culture	AR
4.	Superficial Would Culture	AR
5.	Deep Wound Culture	AR
6.	Stool Culture	AR
7.	Tissue Culture	AR
8.	Cerebrospinal Fluid Culture	AR
9.	Normally Sterile Fluid Culture	AR
10.	Genital Cultures	AR
xi.	Regan-Lowe Agar	F
xii.	Anaerobic Media	F

xiii.	Other Bacteriologic Media	F
f.	Stains and Direct Examination	
i.	Gram stain	AR
ii.	Artifacts (e.g., crystals)	AR
iii.	Dark Field Examination	F
g.	Identification Methods and Instrumentation	
i.	Culture	AR
ii.	Automated Blood Culture Instrumentation	AR
iii.	Automated Bacterial Identification Systems	AR
iv.	Manual and Automated Bacterial Susceptibility Testing	AR
v.	Mass Spectrometry (MALDI TOF)	AR
vi.	Targeted Molecular Assays (e.g., PCR)	AR
vii.	Sequence-Based Identification	AR
h.	Key Tests in Bacteriology	
i.	Beta-lactamase Test	AR
ii.	Bile Solubility	AR
iii.	Catalase Test	AR
iv.	CLO/Urea Breath Test	AR
v.	Coagulase Test	AR
vi.	Optochin Susceptibility	AR
vii.	Oxidase Test	AR
viii.	PYR Test	AR
ix.	Urease Test	AR
x.	Motility	AR
xi.	Indole	AR
xii.	Bacitracin Susceptibility	F
xiii.	Beta-galactosidase Test	F
xiv.	Bile-Esculin Test	F
xv.	CAMP Test	F
xvi.	Esculin Hydrolysis Test	F
xvii.	Hippurate Hydrolysis Test	F
xviii.	Nitrate/Nitrate Reduction Test	F
xix.	Salt Tolerance	F
xx.	TSI/KIA Slant	F
xxi.	Other Key Tests in Bacteriology	F
i.	Antibacterial Susceptibility Testing	
i.	CLSI Standards	AR
ii.	Broth Microdilution	AR
iii.	Kirby-Bauer	AR
iv.	E-Test	AR
v.	Molecular AST Testing	AR
vi.	Interpretation/Reporting AST	AR
j.	Mechanisms of Antimicrobial Resistance	
i.	Beta-Lactamases	AR

ii. Carbapenemases		AR
iii. Extended-Spectrum Beta Lactamases		AR
iv. Inducible Clindamycin Resistance		AR
v. mecA Associated Resistance		AR
vi. vanA and vanB Associated Resistance		AR
vii. AMP C Resistance		AR
k. Serologic and Antigenic Tests for Bacteria		AR
l. Molecular Diagnostics for Bacteria		AR
m. Quality Control and Infection Prevention Regarding Bacteria		AR
n. Aerobic Bacteria		
i. Gram Positive Aerobic Bacteria		
1. *Abiotrophia* spp.		AR
2. *Aerococcus* spp.		AR
3. *Arcanobacterium* spp.		AR
4. *Bacillus anthracis*		AR
5. *Bacillus cereus*		AR
6. *Corynebacterium diphtheriae*		AR
7. *Enterococcus faecium*		AR
8. *Enterococcus faecalis*		AR
9. *Erysipelothrix rhusiopathiae*		AR
10. *Gardnerella vaginalis*		AR
11. *Granulicatella* spp.		AR
12. *Lactobacillus* spp.		AR
13. *Leuconostoc* spp.		AR
14. *Listeria monocytogenes*		AR
15. *Pediococcus* spp.		AR
16. *Staphylococcus aureus* complex		AR
17. *Staphylococcus epidermidis*		AR
18. *Staphylococcus saprophyticus*		AR
19. *Staphylococcus lugdunensis*		AR
20. *Streptococcus pneumoniae*		AR
21. *Streptococcus pyogenes*	AR	
22. *Streptococcus agalactiae*		AR
23. *Streptococcus bovis* Group		AR
24. *Streptococcus anginosus* Group		AR
25. *Actinomadura* spp.		F
26. *Bacillus* spp.		F
27. *Corynebacterium* spp.		F
28. *Enterococcus* spp.		F
29. *Facklamia* spp.		F
30. *Gemella* spp.		F
31. *Kocuria* spp.		F
32. *Lactococcus* spp.		F
33. *Microbacterium* spp.		F

34. *Micrococcus* spp.	F
35. *Paracoccus* spp.	F
36. *Rothia* spp.	F
37. Other *Staphylococcus* spp.	F
38. *Stomatococcus* spp.	F
39. *Streptococcus mitis* Group	F
40. *Streptococcus mutans* Group	F
41. *Streptococcus salivarius* Group	F
42. Other *Streptococcus* spp.	F
ii. Gram Negative Aerobic Bacteria	
1. *Acinetobacter baumannii* complex	AR
2. *Aeromonas* spp.	AR
3. *Aggregatibacter* spp.	AR
4. *Bartonella* spp.	AR
5. *Bordetella pertussis*	AR
6. *Brucella* spp.	AR
7. *Burkholderia pseudomallei*	AR
8. *Burkholderia cepacia* complex	AR
9. *Campylobacter jejuni*	AR
10. *Capnocytophaga* spp.	AR
11. *Cardiobacterium* spp.	AR
12. *Citrobacter* spp.	AR
13. *Eikenella* spp.	AR
14. *Elizabethkingia* spp.	AR
15. *Enterobacter* spp.	AR
16. *Escherichia coli*	AR
17. *Francisella tularensis*	AR
18. *Haemophilus influenzae*	AR
19. *Haemophilus parainfluenzae*	AR
20. *Haemophilus ducreyi*	AR
21. *Helicobacter pylori*	AR
22. *Kingella kingae*	AR
23. *Klebsiella* spp.	AR
24. *Legionella pneumophila*	AR
25. *Moraxella catarrhalis*	AR
26. *Neisseria meningitidis*	AR
27. *Neisseria gonorrhoeae*	AR
28. *Pasteurella multocida*	AR
29. *Proteus* spp. `	AR
30. *Providencia* spp.	AR
31. *Pseudomonas aeruginosa*	AR
32. *Salmonella Non-Typhi*	AR
33. *Salmonella Typhi* and *ParaTyphi*	AR
34. *Serratia marcescens*	AR

35. *Shigella* spp.		AR
36. *Stenotrophomonas maltophilia*		AR
37. *Streptobacillus moniliformis*		AR
38. *Vibrio cholerae*		AR
39. *Vibrio vulnificus*		AR
40. *Vibrio parahaemolyticus*		AR
41. *Yersinia pestis*		AR
42. *Yersinia enterocolitica*		AR
43. *Achromobacter* spp.		F
44. Other *Acinetobacter* spp.		F
45. *Actinobacillus* spp.		F
46. *Alcaligenes* spp.		F
47. *Bordetella parapertussis*		F
48. *Bordetella bronchiseptica*		F
49. Other *Bordetella* spp.		F
50. *Burkholderia mallei*		F
51. Other *Burkholderia* spp.		F
52. *Campylobacter coli*		F
53. *Campylobacter fetus*		F
54. Other *Campylobacter* spp.		F
55. *Chryseobacterium* spp.		F
56. *Comamonas* spp.		F
57. *Cronobacter* spp.		F
58. *Edwardsiella* spp.		F
59. Other *Haemophilus* spp.		F
60. Other *Legionella* spp.		F
61. *Methylobacterium* spp.		F
62. Other *Moraxella* spp.		F
63. *Morganella* spp.		F
64. Other *Neisseria* spp.		F
65. *Pantoea* spp.		F
66. *Plesiomonas* spp.		F
67. Other *Pseudomonas* spp.		F
68. *Roseomonas* spp.		F
69. *Sphingomonas* spp.		F
70. Other *Vibrio* spp.		F
71. Other *Yersinia* spp.		F
o. Procedures for the Isolation and Cultivation of Anaerobic Bacteria		F
p. Anaerobic Bacteria		
i. *Actinomyces* and Related Taxa		AR
ii. *Bacteroides fragilis* Group		AR
iii. *Clostridium botulinum*		AR
iv. *Clostridium perfringens*		AR
v. *Clostridium septicum*		AR

vi.	*Clostridium tetani*	AR
vii.	*Clostridioides difficile*	AR
viii.	*Cutibacterium acnes*	AR
ix.	*Fusobacterium nucleatum*	AR
x.	*Fusobacterium necrophorum*	AR
xi.	*Anaerococcus* spp.	F
xii.	Other *Bacteroides* spp.	F
xiii.	*Bifidobacterium* spp.	F
xiv.	Other *Clostridium* spp.	F
xv.	*Desulfovibrio* spp.	F
xvi.	*Eubacterium* spp.	F
xvii.	*Eggerthella* spp.	F
xviii.	*Fingoldia magna*	F
xix.	Other *Fusobacterium* spp.	F
xx.	*Leptotrichia* spp.	F
xxi.	*Mobiluncus* spp.	F
xxii.	*Peptostreptococcus* spp.	F
xxiii.	*Porphyromonas* spp.	F
xxiv.	*Prevotella* spp.	F
xxv.	*Veillonella* spp.	F
q. Mycoplasma and Ureaplasma		
i.	*Mycoplasma genitalium*	AR
ii.	*Mycoplasma pneumoniae*	AR
iii.	*Mycoplasma hominis*	F
iv.	Other *Mycoplasma* spp.	F
v.	*Ureaplasma* spp.	F
r. Spirochetes		
i.	*Borrelia burgdorferi*	AR
ii.	Leptospira spp.	AR
iii.	*Treponema pallidum*	AR
iv.	Other *Borrelia* and *Borreliella* spp.	F
v.	*Brachyspira* spp.	F
1.	*Spirillum minus*	F
vi.	Other *Treponema* species	F
s. Intracellular Bacteria		
i.	*Anaplasma phagocytophilum*	AR
ii.	*Chlamydia trachomatis*	AR
iii.	*Chlamydia pneumoniae*	AR
iv.	*Coxiella burnetti*	AR
v.	*Ehrlichia* spp.	AR
vi.	*Rickettsia rickettsii*	AR
vii.	*Chlamydia psittaci*	F
viii.	O*rientia tsutsugamushi*	F
ix.	Other *Rickettsia* spp.	F

t. Mycobacteria, *Nocardia*, and Other Aerobic Actinomycetes

i. Structure and Biology AR

ii. Taxonomy, Runyon Classification, & Nomenclature AR

iii. Specimen Collection, Handling, and Processing

1. Optimal Methods for Lower Respiratory Tract Specimen Collection for Mycobacteria AR
2. Specimens for Mycobacteria AR
3. Decontamination AR
4. The Use of PANTA F

iv. Media

1. Principles Regarding the Use of Broth and Solid Media AR

v. Stains and Direct Examination

1. Acid Fast Stain & Modified Acid Fast Stain AR
2. Ziehl-Neelsen & Kinyoun Methods AR
3. Fluorochrome Staining AR

vi. Identification Methods and Instrumentation F

vii. Empiric Therapy for Mycobacterial Infections AR

viii. Antimycobacterial and Nocardial Agents F

1. Carbapenems and Related Agents F
2. Ethambutol and Related Agents F
3. Isoniazid and Related Agents F
4. Kanamycin and Related Agents F
5. Pyrazinamide and Related Agents F
6. Quinolones and Related Agents F
7. Rifampin and Related Agents F
8. Streptomycin and Related Agents F
9. Trimethoprim-Sulfamethoxazole F
10. Clarithromycin and Related Agents F

ix. Susceptibility Testing F

1. Proportion Method F
2. Broth Dilution F
3. Molecular Susceptibility Testing F

x. Mechanisms of Resistance F

xi. Skin, Serologic Assays, & Host Response for Mycobacteria and Related Organisms AR

xii. Molecular Diagnostics for Mycobacteria and Related Organisms AR

xiii. Miscellaneous Topics & Subjects Regarding Mycobacteria and Related Organisms F

xiv. Mycobacteria, *Nocardia*, and Aerobic Actinomycetes

1. *Mycobacterium* spp.

a) *M. tuberculosis* complex AR
b) *M. bovis* AR
c) *M. bovis* BCG AR
d) *M. avium* complex AR

	e) *M. intracellulare*	AR
	f) *M. gordonae*	AR
	g) *M. haemophilum*	AR
	h) *M. marinum*	AR
	i) *M. xenopi*	AR
	j) *M. fortuitum*	AR
	k) *M. abscessus*	AR
	l) *M. chelonae*	AR
	m) *M. leprae*	AR
	n) Other *Mycobacterium* spp.	F
2.	*Nocardia* and Other Aerobic Actinomycetes	
	a) *Nocardia* spp.	AR
	b) *Rhodococcus equi*	AR
	c) *Tropheryma whipplei*	AR
	d) *Gordonia* spp.	F
	e) *Streptomyces* and Other Aerobic Actinomycetes	F
	f) *Tsukamurella* spp.	F

2. Fungi

a.	Structure and Biology	AR
b.	Specimen Collection, Transport, and Processing	AR
c.	Media	AR
d.	Stains and Direct Examination	
	i. Gram Stain Appearance	AR
	ii. KOH	AR
	iii. KOH-Calcofluor White	AR
	iv. Wet Mount	AR
	v. Mucicarmine	AR
	vi. Lactophenol Cotton Blue	AR
	vii. India Ink	F
	viii. Other Fungal Stains	F
e.	Identification Methods and Instrumentation	
	i. Automated Blood Culture Instrumentation for Yeasts	AR
	ii. Automated and Manual Identification Systems for Yeasts	AR
	iii. Automated Susceptibility Testing for Yeasts	AR
	iv. Mass Spectrometry	AR
	v. Molecular Identification (e.g., Sequence-Based Identification)	AR
f.	Antifungal Agents, Susceptibility Testing and Mechanisms of Resistance	F
g.	Serologic and Antigenic Tests for Fungi	AR
h.	Molecular Diagnostics for Fungi	AR
i.	Advanced Topics in Medical Mycology	F
j.	Specific Fungi	
	i. Yeast and Yeast-Like Fungi	

1. *Candida albicans*		AR
2. *Candida dubliniensis*		AR
3. *Candida auris*		AR
4. *Candida glabrata* (i.e., *Nakaseomyces glabrata*)		AR
5. *Candida krusei* (i.e., *Pichia kudriavzevii*)		AR
6. *Candida tropicalis*		AR
7. *Candida parapsilosis*		AR
8. *Candida lusitaniae* (i.e., *Clavispora lusitaniae*)		AR
9. *Candida guilliermondii* (i.e., Meyerosyma guilliermondii)		AR
10. *Cryptococcus neoformans*		AR
11. *Cryptococcus gattii*		AR
12. *Malassezia furfur*		AR
13. *Pneumocystis jirovecii*		AR
14. *Prototheca* spp.		AR
15. *Trichosporon asahii*		AR
16. Other *Candida* spp.		F
17. Other *Cryptococcus* spp.		F
18. *Malassezia pachydermatis*		F
19. *Rhodotorula mucilaginosa*		F
20. *Rhodotorula glutinis*		F
21. *Rhodotorula minuta*		F
22. Other *Rhodotorula* spp.	F	
23. *Saccharomyces cervisiae*		F
24. Other *Saccharomyces* spp.		F
25. *Sporobolomyces* spp.		F
26. *Trichosporon cutaneum*		F
27. *Trichosporon inkin*		F
28. Other *Trichosporon* spp.		F
29. *Ustilago* spp.		F
ii. Hyaline Septate Molds		
1. *Aspergillus fumigatus*		AR
2. *Aspergillus flavus*		AR
3. *Aspergillus terreus*		AR
4. *Aspergillus niger*		AR
5. *Aspergillus nidulans*		AR
6. *Epidermophyton* spp.		AR
7. *Fusarium solani* complex		AR
8. *Microsporum canis*		AR
9. *Microsporum gypseum* (i.e., *Nannizzia gypseum*)		AR
10. *Paecilomyces* spp.		AR
11. *Penicillium* spp.		AR
12. *Scedosporium apiospermum* complex		AR
13. *Scedosporium boydii* complex (i.e., *Pseudallescheria boydii*)		AR
14. *Trichophyton rubrum*		AR

15. *Trichophyton mentagrophytes*	AR
16. *Trichophyton tonsurans*	AR
17. *Acremonium* spp.	F
18. Other *Aspergillus* spp.	F
19. *Beauveria* spp.	F
20. *Fusarium* spp.	F
21. *Geotrichum candidum*	F
22. *Geotrichum capitatum* (i.e., *Magnusiomyces capitatus*)	F
23. *Geotrichum clavatum* (i.e., *Magnusiomyces clavtus*)	F
24. Other *Geotricum* spp.	F
25. *Malbranchea* spp.	F
26. *Microsporum audouinii*	F
27. Other *Microsporum* spp.	F
28. *Scopulariopsis* spp.	F
29. *Sepedonium* spp.	F
30. *Trichoderma* spp.	F
31. Other *Trichophyton* spp.	F
32. *Trichophyton verrucosum*	F
iii. Dimorphic Fungi	
1. *Blastomyces* spp. AR	
2. *Coccidioides* spp.	AR
3. *Histoplasma capsulatum*	AR
4. *Penicillium talaromyces* (i.e., *Talaromyces marneffei*)	AR
5. *Sporothrix schenckii* complex	AR
6. Other *Histoplasma* spp.	F
iv. Mucoraceous Fungi	
1. *Lichtheimia corymbifera* complex	AR
2. *Mucor* spp.	AR
3. *Rhizomucor* spp.	AR
4. *Rhizopus* spp.	AR
5. *Apophysomyces elegans*	F
6. *Basidiobolus ranarum*	F
7. *Basidiobolus* spp.	F
8. *Cokeromyces* spp.	F
9. *Conidiobolus coronatus*	F
10. *Conidiobolus* spp.	F
11. *Cunninghamella* spp.	F
12. *Saksenaea* spp.	F
13. *Syncephalastrum* spp.	F
v. Dematiaceous Fungi	
1. *Alternaria* spp.	AR
2. *Bipolaris* spp.	AR
3. *Cladosporium* spp.	AR

4. *Cladophialophora* spp.	AR
5. *Curvularia* spp.	AR
6. *Fonsecaea* spp.	AR
7. *Phialophora* spp.	AR
8. *Chaetomium* spp.	F
9. *Exophiala* spp.	F
10. *Exserohilum* spp.	F
11. *Piedra* spp.	F
12. *Lomentaspora prolificans* (i.e., *Scedosporium prolificans*)	F
13. *Stachybotrys* spp.	F
vi. Microsporidia	AR
vii. Rhinosporidium	AR

3. Viruses and Prions

a. Structure and Biology	AR
b. Taxonomy, Classification, and Nomenclature	AR
c. Specimen Collection, Transport, and Processing	AR
d. Identification Methods and Instrumentation	AR
e. Serologic, Immunologic, and Antigenic Assays for Viruses	AR
f. Molecular Diagnostics for Viruses	AR
g. Prevention and Treatment of Viral Diseases	AR
h. Quality Control and Infection Prevention with Respect to Viruses	AR
i. Miscellaneous Topics with Respect to Viruses	F
j. Specific Viruses	
i. Adenovirus	AR
ii. Hanta Virus (i.e., Sin Nombre)	AR
iii. Seasonal Coronaviruses	AR
iv. SARS-CoV-2	AR
v. Rhinovirus	AR
vi. Polio Virus	AR
vii. Coxsackie Virus	AR
viii. Enterovirus D-68	AR
ix. Parechovirus	AR
x. Ebola Virus	AR
xi. Hepatitis C Virus	AR
xii. Yellow Fever Virus	AR
xiii. Dengue Virus	AR
xiv. Zika Virus	AR
xv. West Nile Virus	AR
xvi. Herpesviridae	
1. HSV	AR
2. VZV	AR
3. EBV	AR

518		4. CMV	AR
519		5. HHV6	AR
520		6. HHV8	AR
521		7. HHV7	F
522	xvii.	Hepatitis B Virus	AR
523	xviii.	Hepatitis D Virus	AR
524	xix.	Rabies Virus	AR
525	xx.	Influenza A Virus	AR
526	xxi.	Influenza B Virus	AR
527	xxii.	Human Papilloma Viruses	AR
528	xxiii.	Paramyxoviruses	
529		1. Parainfluenza Virus	AR
530		2. Mumps	AR
531		3. Measles	AR
532		4. RSV	AR
533		5. hMPV	AR
534		6. Hendra	F
535		7. Nipah	F
536	xxiv.	Parvovirus B19	AR
537	xxv.	Hepatitis A Virus	AR
538	xxvi.	Polyoma Viruses	
539		1. BK Virus	AR
540		2. JC Virus	AR
541		3. Merkel Cell Polyoma Virus	F
542	xxvii.	Variola Viruses	
543		1. Variola Major	AR
544		2. Mpox Virus	AR
545		3. Molluscum Contagiosum	AR
546		4. Vaccinia Virus	F
547	xxviii.	Retroviruses	
548		1. HIV	AR
549		2. HTLV	AR
550	xxix.	Rhinovirus	AR
551	xxx.	Rotavirus	AR
552	xxxi.	Lassa Virus	F
553	xxxii.	Lymphocytic Choriomeningitis Virus	F
554	xxxiii.	Astroviruses	F
555	xxxiv.	Bocavirus	F
556	xxxv.	Rift Valley Fever Virus	F
557	xxxvi.	SARS-CoV-1	F
558	xxxvii.	Middle Eastern Respiratory Syndrome Coronavirus (MERS)	F
559	xxxviii.	Enterovirus	F
560	xxxix.	Marburg Virus	F
561	xl.	St. Louis Virus	F

xli.	Chikungunya Virus	F
xlii.	Japanese Encephalitis Virus	F
xliii.	Powassan Virus	F
xliv.	Less Common Influenza Variants	F
xlv.	Hepatitis E Virus	F
xlvi.	Colorado Tick Fever Virus	F
xlvii.	Sapovirus	F
xlviii.	Eastern Equine Encephalitis Virus	F
xlix.	Western Equine Encephalitis Virus	F
l.	California Serogroup Viruses	F
li.	Heartland Virus	F
k. Human Prion Diseases		AR

4. Parasites

a.	Structure and Biology	AR
b.	Specimen Collection, Transport, and Processing	AR
c.	Stains and Direct Examination	AR
d.	Identification Methods and Instrumentation	AR
e.	Geographic Distribution	AR
f.	Antiparasitic Agents, Susceptibility Testing, and Mechanisms	
i.	Albendazole, Thiabendazole, and Related Agents	F
ii.	Amphotericin B	F
iii.	Bithionol	F
iv.	Chloroquine and Related Agents	F
v.	Clindamycin plus Quinine	F
vi.	Diethylcarbamazine and Related Agents	F
vii.	Ivermectin and Related Agents	F
viii.	Nitaxoxanide	F
ix.	Pentavalen Antimonials and Related Agents	F
x.	Primaquine and Related Agents	F
xi.	Praziquantel	F
xii.	Quinidine and Related Agents	F
xiii.	Trimethoprim-Sulfamethoxazole	F
g.	Specific Parasites	
i.	Protozoa	
1.	Intestinal	
a)	*Blastocystis hominis*	AR
b)	*Cryptosporidium* spp.	AR
c)	*Cyclospora* sp.	AR
d)	*Cystoisospora* sp.	AR
e)	*Entamoeba histolytica*	AR
f)	*Entamoeba dispar*	AR
g)	*Entamoeba coli*	AR
h)	*Giardia* spp.	AR

i) *Leishmania* spp.	AR
j) *Trichomonas vaginalis*	AR
k) *Chilomastix* sp.	F
l) *Dientamoeba* sp.	AR
m) *Endolimax* sp.	F
n) Other *Entamoeba* spp.	F
o) *Iodamoeba* sp.	F
p) *Pentatrichomonas* sp.	F
2. Blood and Tissue	
a) *Acanthamoeba* spp.	AR
b) *Babesia* spp.	AR
c) *Leishmania* spp.	AR
d) *Naegleria fowleri*	AR
e) Plasmodium	
i. *Plasmodium falciparum*	AR
ii. *Plasmodium vivax*	AR
iii. *Plasmodium ovale*	AR
iv. *Plasmodium malariae*	AR
v. *Plasmodium knowlesi*	F
f) *Toxoplasma gondii*	AR
g) *Trypanosoma brucei*	AR
h) *Trypanosoma krusei*	AR
i) *Balamuthia* sp.	F
j) *Sarcocystis* spp.	F
k) *Sarcina* spp.	F
ii. Nematodes (Round Worms)	
1. *Ascaris* spp.	AR
2. *Enterobius* sp.	AR
3. Filarial Nematodes	F
4. Hookworms and Cutaneous Larva Migrans	AR
5. *Strongyloides* spp.	AR
6. *Trichuris* spp.	AR
7. Anisakids	F
8. *Baylisascaris* sp.	F
9. *Brugia* spp.	F
10. *Capillaria* spp.	F
11. *Dracunculus* sp.	F
12. *Gnathostoma* spp.	F
13. *Parastrongylus* sp. (i.e., *Angiostrongylus*)	F
14. *Toxocara* sp. and *Visceral Larva Migrans*	F
15. *Trichinella* spp.	F
16. *Trichostrongylus* sp.	F
iii. Trematodes	
1. *Schistosoma* spp.	AR

2. *Clonorchis* sp.	F
3. *Dirofilaria* spp.	F
4. *Echinostoma* sp.	F
5. *Fasciola* spp.	F
6. *Fasciolopsis* spp.	F
7. *Paragonimiasis* spp.	F
iv. Cestodes	
1. *Dibothriocephalus latus* (i.e., *Diphyllobothrium latum*)	AR
2. *Echinococcus* spp.	AR
3. *Taenia saginata*	AR
4. *Taenix solium* including Cysticercosis	AR
5. *Dipylidium* sp.	F
6. *Hymenolepsis* spp.	F
7. *Sparganum* spp.	F
v. Less Common Parasites	F
vi. Insects, Arthropods, and Arachnids	F

5. Microbiology Laboratory Management

a. Safety/Biosafety	C
b. Microbiology Laboratory Management	F
c. Rules and Regulations	F
d. Laboratory Inspections	F
e. QA/QC Issues	F
f. Other Administration/Laboratory Management Issues	F