
CONTENTS

Foreword	xiii
Preface	xv
Contributors	xvii

PART I PHYSICAL HAZARDS

1 Introduction to Physical Hazards	3
---	----------

Peter H. Wald, M.D., M.P.H.

Section I Worker-Material Interfaces

2 Ergonomics and Upper Extremity Musculoskeletal Disorders	19
---	-----------

Thomas R. Hales, M.D., M.P.H.

3 Manual Materials Handling	51
------------------------------------	-----------

Thomas R. Waters, Ph.D.

4 Occupational Vibration Exposure	79
--	-----------

*David G. Wilder, Ph.D., P.E., C.P.E., Donald E. Wasserman, M.S.E.E., M.B.A.,
and Jack Wasserman, Ph.D., P.E.*

5 Mechanical Energy	105
----------------------------	------------

James Kubalik, M.S., C.S.P.

Section II The Physical Work Environment

6 Hot Environments	129
---------------------------	------------

Gail M. Gullickson, M.D., M.P.H.

7 Cold Environments	149
<i>Eric T. Evenson, M.D., M.P.H.</i>	
8 High-pressure Environments	161
<i>David J. Smith, M.D., M.S.</i>	
9 Low-pressure and High-altitude Environments	189
<i>Glenn Merchant, M.D., M.P.H., & T.M.</i>	
10 Shiftwork	199
<i>Allene J. Scott, M.D., M.P.H., M.T. (ASCP)</i>	
 Section III Energy and Electromagnetic Radiation	
11 Ionizing Radiation	227
<i>Bryce D. Breitenstein, Jr., M.D., M.P.H., and James P. Seward, M.D., M.P.P.</i>	
12 Ultraviolet Radiation	243
<i>James A. Hathaway, M.D., M.P.H., and David H. Sliney, Ph.D.</i>	
13 Visible Light and Infrared Radiation	249
<i>James A. Hathaway, M.D., M.P.H., and David H. Sliney, Ph.D.</i>	
14 Laser Radiation	257
<i>James A. Hathaway, M.D., M.P.H., and David H. Sliney, Ph.D.</i>	
15 Microwave, Radiofrequency and Extremely Low-frequency Energy	267
<i>Richard Cohen, M.D., M.P.H., and Peter H. Wald, M.D., M.P.H.</i>	
16 Noise	279
<i>Robert A. Dobie, M.D.</i>	
17 Electrical Power and Electrical Injuries	291
<i>Jeffrey R. Jones, M.P.H., M.S., C.I.H.</i>	
 PART II BIOLOGICAL HAZARDS	
18 General Principles of Microbiology and Infectious Disease	305
<i>Jerry J. Tulis, Ph.D., and Woodhall Stopford, M.D., M.S.P.H.</i>	

19	Clinical Recognition of Occupational Exposure and Health Consequences	313
	<i>Gary N. Greenberg, M.D., M.P.H., and Gregg M. Stave, M.D., J.D., M.P.H.</i>	
20	Prevention of Illness from Biological Hazards	329
	<i>Linda M. Frazier, M.D., M.P.H., Gregg M. Stave, M.D., J.D., M.P.H., and Jerry J. Tulis, Ph.D.</i>	
21	Viruses	347
	<i>George W. Jackson, M.D.</i>	
	Arboviruses	347
	Arenaviruses	348
	Cytomegalovirus (CMV)	350
	Filoviruses	352
	Hantaviruses	353
	Hepatitis A Virus (HAV)	356
	Hepatitis B Virus (HBV)	359
	Hepatitis C Virus (HCV)	366
	Herpes B Virus	368
	Herpes Simplex Virus (HSV)	370
	Human Immunodeficiency Virus (HIV-1)	371
	Human T-Cell Lymphotropic Virus Type I (HTLV-I) and Type II (HTLV-II)	377
	Influenza Virus	378
	Measles Virus	380
	Mumps Virus	383
	Norwalk Virus (and Other Enteric Viruses)	386
	Parvovirus B19	387
	Rabies Virus	389
	Respiratory Syncytial Virus (RSV)	396
	Rubella Virus	397
	Simian Immunodeficiency Virus (SIV)	400
	Vaccinia	402
	Varicella-Zoster Virus (VZV)	404
22	Bacteria	409
	<i>Christopher J. Martin, M.D., M.Sc., and John D. Meyer, M.D., M.P.H.</i>	
	Acinetobacter Species	409
	Bacillus Anthracis	410
	Borrelia Burgdorferi	413
	Brucella Species	418
	Campylobacter Species	421
	Clostridium Botulinum	423
	Clostridium Difficile	426
	Clostridium Perfringens	427
	Clostridium Tetani	430
	Corynebacterium Species	433

X **CONTENTS**

Erysipelothrix Rhusiopathiae	436
Escherichia Coli	438
Francisella Tularensis	441
Haemophilus Ducreyi	443
Haemophilus Influenza	444
Helicobacter Pylori	446
Legionella Species	448
Leptospira Interrogans	451
Listeria Monocytogenes	453
Mycoplasma Pneumoniae	455
Neisseria Gonorrhoea	458
Neisseria Meningitidis	459
Pasteurella Multocida	463
Pseudomonas and Burkholderia Species	464
Rat-Bite Fever	466
Relapsing Fever	468
Salmonella Species	470
Shigella Species	474
Staphylococcus Species	477
Streptococcus Species	480
Treponema Pallidum	483
Vibrio Cholerae	484
Vibrio Species other than V. Cholerae (V. Parahemolyticus, V. Vulnificus)	487
Yersinia Pestis	489
Yersinia Pseudotuberculosis and Enterocolitica	493

23 Mycobacteria 495

<i>Linda M. Frazier, M.D., M.P.H.</i>	
Mycobacterium Tuberculosis	495
Mycobacteria	506

24 Fungi 511

<i>Craig S. Glazer, M.D., M.S.P.H., and Cecile S. Rose, M.D., M.P.H.</i>	
Alternaria Species	511
Aspergillus Species	512
Basidiomycetes (Including Merulius Lacrymans, Lycoperdon, and Mushrooms)	516
Blastomyces Dermatitidis	518
Candida Species	521
Cladosporium Species	521
Coccidioides Immitis	523
Cryptococcus Neoformans	526
Cryptosporidium Parvum	528
Fonsecaea and Other Agents of Chromomycosis	529
Histoplasma Capsulatum	530
Madurella Species and Other Agents of Mycetoma	533
Paracoccidioides Brasiliensis	534

28 Allergens	605
<i>Gwendolyn S. Powell, M.D., M.P.H.</i>	
Enzymes	605
Farm Animals	608
Grain Dust	609
Insects	611
Laboratory Animals	614
Mites	617
Plants	620
Shellfish and Other Marine Invertebrates	623
Wheat Flour and Egg	625
29 Latex	629
<i>Charles C. Goodno, M.D., M.P.H., and Carol A. Epling, M.D., M.S.P.H.</i>	
30 Malignant Cells	637
<i>Aubrey K. Miller, M.D., M.P.H.</i>	
31 Recombinant Organisms	641
<i>Jessica Herzstein, M.D., M.P.H., Ed Fritsch, Ph.D., and John L. Ryan, Ph.D., M.D.</i>	
32 Prions: Creutzfeldt–Jakob Disease (CJD) and Related Transmissible Spongiform Encephalopathies (TSE)	649
<i>Dennis J. Darcey, M.D., M.S.P.H.</i>	
33 Endotoxins	655
<i>Brian A. Boehlecke, M.D., M.S.P.H., and Robert Jacobs, Ph.D.</i>	
34 Wood Dust	661
<i>Harold R. Imbus, M.D., M.Sc.D.</i>	
Index	669
About the Authors	681