

Outbreak Investigation, Prevention, and Control in Health Care Settings: Critical Issues in Patient Safety, 2nd edition. Kathleen Meehan Arias MS. Boston: Jones & Bartlett. 2010, Soft cover, 435 pages, \$75.95.

With the newly emerged H1N1 influenza virus causing illness from person to person worldwide, all eyes are on the efficacy and efficiency of local and international outbreak prevention and control initiatives. With today's fast worldwide transportation systems, the spread of newly identified and well known, sometimes re-emerging, pathogens is a constant threat. Recently, next to the pandemic Influenza A virus infections, transmission of relatively newly identified microorganisms, such as the severe acute respiratory syndrome coronavirus and the avian influenza virus H5N1, have highlighted the ongoing global need for optimal infection surveillance, prevention, and control systems and infrastructure. Additionally, well known multiple-drug-resistant pathogens, such as methicillin-resistant *Staphylococcus aureus* and certain strains of *Klebsiella*, *Pseudomonas*, and *Enterobacter*, continue to spread and cause outbreaks in health-care settings worldwide. Also, myriad non-infectious agents can cause disease and constitute serious public health hazards.

Clinicians play a pivotal role in recognizing, preventing, and controlling outbreaks of infectious and non-infectious agents, and this second edition of **Outbreak Investigation, Prevention, and Control in Health Care Settings: Critical Issues in Patient Safety** is doubtlessly a useful and relevant work for those interested or involved in outbreak investigations. The intended readership is broad, and is specified to consist of infection-prevention-and-control professionals, health-care epidemiologists, clinical laboratory scientists, health-care quality-management personnel, public-health personnel, students, educators, and all those interested in using epidemiologic methods to monitor health-care outcomes. The book explains epidemiology principles applicable to the health-care setting and serves as a reference. It presents practical guidelines for identifying, investigating, preventing, and controlling outbreaks, and discusses information technology used in in-

fection surveillance, prevention and control programs.

In this book, outbreaks are categorized according to the setting in which they occur most frequently (acute, long-term, or ambulatory care), so the reader can easily navigate to topics of interest. The text consists of 12 chapters. Chapter 2, on surveillance programs, was co-authored by Harkavy, and Chapter 10, on statistics, was co-authored by Phillips. Each chapter is followed by an extensive list of references and suggested reading, and these present a broad range of up-to-date information, including Web-based resources. There is also a glossary, and the book has its own Web site, where a number of interesting appendixes (eg, prevention, and control guidelines and case definitions) are available for downloading.

The well structured first chapter introduces the principles of epidemiology and the multifactorial nature of disease. Epidemiology definitions and study methods are explained and illustrated with relevant, well organized tables and figures. As most outbreak investigations in the health-care setting involve infectious diseases, an extensive section of this chapter is dedicated to their epidemiology. This chapter is a "crash course" in epidemiology and is well balanced between essential definitions, basic principles, and indispensable insights about host and environmental factors in the dynamics of communicable diseases.

The second chapter has detailed discussion on surveillance programs, including the reasons for and methods of their implementation, and their various components. Useful guidelines for developing and evaluating surveillance programs in acute care, long-term care, and ambulatory-care settings are clearly presented. Particularly the section on how to calculate epidemiologic rates, such as prevalence and incidence rates, and integrating the most important formulas for these calculations, in an easy-to-understand manner, is of practical use.

Chapters 3, 4, and 5 discuss outbreaks that have occurred in acute-care settings, long-term settings, and ambulatory-care settings, respectively. In the past few decades, health-care in the developed countries has transitioned from the acute care hospital setting to long-term, ambulatory and home-

care settings. Infection surveillance, prevention, and control programs are no longer limited to the acute-care setting, but have to be implemented on a much larger scale. The author succeeds in providing the essentials of such a broad range of information, and in illustrating these with recent and clarifying specific examples and well organized tables. For each setting, the organisms responsible for the majority of endemic and epidemic outbreaks, and the routes of disease transmission are discussed. Common source outbreaks are reviewed, as well as outbreaks associated with devices, products, and procedures.

The short sixth chapter deals with pseudo-outbreaks and with the ill effects health-care workers, patients, and the community may suffer from such false infections or artifactual clusterings of real infections.

Chapter 7 focuses on pathogens that have frequently been associated with health-care-associated and nosocomial infection, such as methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant *Enterococcus*, and *Clostridium difficile*; on several parasitic diseases; and on the gastrointestinal illness disease syndrome. Control measures to prevent and stop these outbreaks are outlined.

Chapter 8 describes practical guidelines and measures that clinicians in the health-care setting can use to identify, analyze, prevent, and control outbreaks. Useful and handy information, such as suggested thresholds for investigating potential outbreaks, a sample line-listing form, and step-by-step schemes, are included to guide health-care workers in daily practice.

Chapter 9 focuses on the rapidly increasing role of information technology and computerized systems in modern outbreak investigation. Chapter 10 outlines statistical measures and methods to organize, summarize, and analyze epidemiologic data, in a way that is clear and easy to understand. Chapter 11 deals with the role of the laboratory in outbreak investigations. Chapter 12 covers the use of practical tools, such as tables, graphs, charts and forms, to communicate epidemiologic data.

Overall, this book meets its broad aims of providing a concise overview of epidemiology principles applied to the various health-

care settings and a sound reference concerning outbreak identification, investigation, and prevention. The text is clearly set out, logical, up to date, and includes useful illustrations and exhaustive suggested-reading sections. However, attempting to write a book for a broad readership, ranging from infection-control specialists to medical students, sometimes makes it difficult for an author to meet the appropriate knowledge level of such a heterogeneous target group. Some sections seem to lack some depth or to be unnecessarily simplified from the viewpoint of the experienced infection-control professional or health-care epidemiologist, while being considered quite complicated by the novice student, who definitely has to go through the introduction chapters.

In conclusion, we would certainly advise departmental and institutional libraries to add this book to their shelves. It is highly recommendable as a reference and as a practical tool for developing, implementing, evaluating, or optimizing an outbreak investigation, prevention, or control program in various health-care settings.

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Inhalation Studies: Foundations and Techniques, 2nd edition. Robert F Phalen. New York: Informa Healthcare. 2009. Hard cover, illustrated, 320 pages, \$179.95.

The second edition of this book was written as a result of the explosion of knowledge, since its first edition in 1985, in the field of aerosol medicine, the increased appreciation of nonpulmonary effects of inhaled substances, and the introduction of new devices for production and characterization of aerosols.

The typeset of the text is easy to read, and the statements are clear and logically

sound. Inside an attractive cover, the book has a good balance of text, tables, and figures. I found only one major typographical error, on all the odd pages of the running title in Chapter 2 “The Respiratory Tract.” While the book contains meaningful tables, few carry excessive information or extensive narrative (Chapters 1, 6, and 9). In a couple of the tables (in Chapters 1 and 7), along with several sections of the book, the author lists some useful references that could have been better utilized by creating a table as an appendix, where each section highlighted the “must-read” references with comments previously used in separate chapters. Almost 30 pages list close to 800 references. However, the author chose old references for topics that certainly have more recent citations. As an example, the 1978 citation of Giordano’s paper on mucus rheology and mucociliary clearance should have been replaced by any or all the series¹ on airway mucus that appeared in the *European Respiratory Journal* in 1997 and 1998 or a chapter in Rubin’s 2008 book on mucus-controlling drugs.²

The book has 10 chapters. The first chapter, on aerosols and gases, introduces the main concepts of particle size distribution, aerosol properties, and aerosol dynamics, with an entire page dedicated to definitions of key aerosol terms. An interesting segment of this chapter is dedicated to explaining the properties of gases, explaining very briefly important features of cigarette smoke. The section on size distribution and aerosol dynamics is very detail-driven. A plethora of normalized equations that fit commonly encountered particle size data are shown.

The second chapter, on the respiratory tract, covers relevant anatomical aspects, deposition of aerosol particles, and uptake of inhaled gases. A table nicely explains how compartments of the respiratory tract are used for analyzing particle inhalation. Instead of a mere summary of an anatomy textbook, I commend the author for pairing anatomical sections with descriptions on how particle deposition is affected in each segment of the respiratory tract. I will surely use this 35-page section to expand my material on anatomy and physiology of the respiratory tract. The only bit of surprise was Phalen’s preference for using several citations from the field of toxicology in this anatomy section.

Chapter 3, on establishing and controlling exposures, provides detailed informa-

tion on aerosol and gas generation. Phalen explains the differences between monodisperse and polydisperse aerosols and expands on the process of gas generation, which includes compressed gas cylinders and vaporization and sublimation systems, among others. While describing the necessary air purification and conditioning of the research physical environment, Phalen lists the criteria for selecting aerosol and gas generators and explains the importance of output stability in the atmosphere where particles are being analyzed.

The following chapter, on characterizing exposures, explains what should be measured and the instrumentation required for aerosol and gas characterization, along with various sampling protocols. Phalen describes characterization of exposures as an essential element in inhalation toxicology. A nice table lists some of the most common aerosol-measurement instruments for inhalation studies.

Chapter 5, on methods for exposing subjects, compares various inhalation exposure methods. Several figures provide enough detail to understand how the different systems work. However, only half a page is dedicated to systems for ambient-air pollutants with human subjects. The discussions of ethical responsibilities are all written from the perspective of using only animal subjects.

Chapter 6 covers testing for toxicity, and defines quantitation, morphometry, and pulmonary function. Unfortunately, Phalen unnecessarily repeats some content from Chapter 2, in an attempt to bring new description of the airways response to inhaled materials.

Chapter 7 provides an overview of the experimental designs, in particular those that directly apply to repeated exposures.

A detailed description of exposure systems, animal housing, necropsy, data handling, physical space, and shop support is the main content of Chapter 8, which describes facilities and support necessary for selecting the right animal laboratory.

Chapter 9, on animal models, covers various issues, including considerations about the different species used in inhalation research, and comparison of physiologic and anatomical features of humans and animals. A very interesting segment covers the controversial issue of extrapolation from laboratory animals to humans, and provides a table of animal models commonly used to study some lung diseases.