

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.

Sonia O Labeau RN MNSc
Faculty of Healthcare Vesalius
University College Ghent
Ghent, Belgium

Stijn I Blot MNSc PhD
Faculty of Healthcare Vesalius
University College Ghent
and
Faculty of Medicine and Health Sciences
Ghent University
and
Department of Infectious Diseases
Ghent University Hospital
Ghent, Belgium

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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.

Chapter 10 deals with regulations and guidelines, to minimize methodological pitfalls commonly reported by the Food and Drug Administration in nonclinical laboratory studies.

Overall, I found the content very informative and well organized. Phalen keeps a consistent tone and style throughout the textbook, which helps tremendously in the reading of detailed information. Although the title may lead some readers in the respiratory care community to believe that aerosol medicine will be a good chunk of the book, the emphasis is on inhalation toxicology and the study of animal subjects. This textbook is primarily intended for active researchers and graduate students in inhalation toxicology. In fact, the subject subheadings used at its publisher's Web site includes terms such as asphyxiating, poisonous, toxicology, and air pollution. However, there is no question that professionals in medicine, engineering, and environment regulation certainly could benefit from some sections. Its applicability to respiratory therapy is limited to content in few chapters that classic textbooks already include.

Ruben D Restrepo MD RRT FAARC

Department of Respiratory Care
The University of Texas Health Sciences
Center at San Antonio
San Antonio, Texas

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Medical and Health Science Statistics Made Easy, 2nd edition. Michael Harris and Gordon Taylor. Sudbury, Massachusetts: Jones & Bartlett. 2009. Soft cover, 115 pages, \$29.95.

Reading the medical literature is a key component of the daily practice of most clinicians. Appraisal of medical research articles is essential to guiding medical decisions with the best evidence, and requires a basic understanding of statistics. However, basic statistical terminology and tests is a small proportion, if present at all, of the

formal training of health-care professionals, and has little reinforcement during continuing medical education. Yet there is an ever-increasing assembly of complex statistical tests used in observational studies, randomized trials, and meta-analyses, which challenge the reader.

Addressing the need for a concise handbook of medical statistics, **Medical and Health Science Statistics Made Easy**, 2nd edition, is an updated version of the first edition published in 2003. The original authors performed this revision; one is a general practitioner with a specialty in medical education, and the other, a statistician with advanced training. This practical and concise overview of statistical tests and terminology is a paperback volume with 91 pages of text. Prefacing the body of the text is an instructional section titled "How to Use This Book." Seven sections compose the body of the text, and review 19 statistical topics grouped by category. The final section, "Statistics at Work," gives examples of statistics from the medical literature. The index and glossary are thorough. Throughout the text, the figures and tables are large enough to read and illustrate difficult statistical concepts. As clearly stated in the preface, the intended audience is health-care professionals in training, who seek a basic knowledge of medical statistics.

The first section describes how the book is structured. For each of the 19 topics, "thumbs up" symbols grade the difficulty, and stars quantify the importance. The authors studied 4 major journals (*New England Journal of Medicine*, *Journal of the American Medical Association*, *Lancet*, and *British Medical Journal*) to see how often various statistical concepts are used, which informed the number of stars for each topic. This section also explains the "Watch Out For..." paragraphs, which describe common pitfalls and tips for each topic. This section also offers a road map of topics for readers who are preparing for an exam, or in a hurry, or daunted by statistics, or desire a complete course.

The body of the text begins with "Statistics That Describe Data," an overview of the most commonly used statistical devices such as percentages, mode, mean, and standard deviation. This is a useful and thorough review of straightforward topics that many readers take for granted. As in subsequent sections, graphs and figures are provided to illustrate the use of these statistics in the literature, as well as the calculations

from which these summary statistics are derived.

The second and third sections review statistical tests for confidence and differences between groups (eg, *t* test, confidence interval, *P* value). These are more difficult concepts, and the authors provide more detail about the derivation and theory. Tests of differences come in many varieties, with specific applications, and the authors highlight the various terms and appropriate applications.

The fourth and fifth sections review statistical tests of risk and relationships, such as odds ratios, relative risk, regression, and correlation. These topics are closely related and appropriately grouped. The "Watch Out For..." sections for relative risk and correlation are extensive, and require more time to review. Of note, the authors neglected to explain how tests of inference can be used in regression, despite the common presentation of *P* values with corresponding regression coefficients. Although more advanced than some material covered in this handbook, the basic assumptions of regression models, such as independence of observations, are not mentioned. However, the focus on the difference between regression and correlation is well highlighted, with explanations such as, "Regression and correlation are easily confused. Correlation measures the strength of the association between variables. Regression quantifies the association."

The sixth section addresses survival analysis with Kaplan-Meier estimates and Cox regression. These topics are briefly explained, with illustrations that are easy to read and supported by additional examples in the "Statistics at Work" section at the conclusion of the book. Little redundancy is present between this discussion of Cox regression and the earlier mention in section 5.

The seventh section is a review of sensitivity and specificity, statistical tests employed in clinical investigations and screening. This important topic is covered in the longest section of the text (5 pages), which includes useful and easily located definitions. A brief discussion of the kappa statistic concludes this section. Next, bulleted paragraphs reviewing prevalence, incidence, multiple testing, and 1-tailed and 2-tailed tests are provided, as they are important concepts that did not logically fit into the other sections.

The book concludes with 5 detailed examples of the use of statistics in major med-

ical journals, demonstrating correct application of the concepts of relative risk, odds ratio, correlation, regression, survival analysis, and sensitivity/specificity. These examples provide useful perspective. This section requires more time to read, but it has clearly labeled section headings for quick retrieval.

Overall, this handbook is an easy-to-read, brief overview of statistical analyses in medical research. When appraising the value of this handbook, the critic must recall the intended audience. Without question, prior knowledge of statistics will make this handbook seem rudimentary. The authors claim that a read from start to finish will provide a complete course in commonly used medical statistics, which may be an overstatement. Yet the health-care professional in-training without prior knowledge of statistics will find the simple language, user-friendly symbols, and examples very helpful. In fact, the “What to Watch Out For” paragraphs often provide the most insightful messages.

One disappointment was the brevity of the review of incidence and prevalence. The authors acknowledge that these 2 topics, which are fundamental to descriptive epidemiology, are very often used in the literature, but they provide only a brief paragraph of explanation, in the final section. As well, compared to other “handbooks,” the dimensions of the volume are larger than expected for the amount of text per page. This may limit the ease with which trainees can transport this reference in the coat pocket.

In summary, this well constructed handbook provides a simple and concise overview of basic statistical topics. Unnecessary statistical jargon is avoided, user-friendly symbols help guide the reader, and real-world examples illustrate the concepts chosen by the authors. I recommend this text as a quick reference and introduction to statis-

tical terms and tests for trainees. When appraising the medical literature, readers will appreciate the ease with which this handbook informs their interpretation of medical statistics.

Christopher W Seymour MD

Division of Pulmonary and
Critical Care Medicine
University of Washington
Seattle, Washington

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Pulmonary Rehabilitation: Guidelines to Success, 4th edition. John E Hodgkin MD, Bartolome R Celli MD, and Gerilynn L Connors RRT. St Louis: Mosby/Elsevier. 2009. Hard cover, illustrated, 592 pages, \$69.95.

This book provides an extensive review of the literature relating to various aspects of pulmonary rehabilitation. It seeks a scientific basis for pulmonary rehabilitation and brings together a variety of authors with relevant clinical and scientific experience.

The authors’ writing styles are clear, concise, and coherent, thus making the book easy to read and very informative. Each chapter begins with a brief summary of the main topics that will be covered, which makes it easy to follow the topics.

The 34 chapters are grouped into 6 sections, each covering one topic in pulmonary rehabilitation. Section 1 gives a brief but interesting summary of the history of pulmonary rehabilitation and concludes that it is more widely accepted now than it was in 1984, when the first edition of this book was published.

The authors are very authoritative in section 2, in which they describe the principal concepts of the field of pulmonary rehabilitation. Their discussion goes from pulmonary-rehabilitation patient-selection criteria (based on physiologic and functional pa-

rameters) to the physiopathology of chronic obstructive pulmonary disease and why it is a systemic disease. In my opinion, this section provides essential basic information for non-specialists in this field.

Likewise in section 3, the authors concisely and instructively bring together the main pulmonary rehabilitation therapies, covering pharmacologic and oxygen therapy; physical, nutritional, and psychological training; smoking; sexuality; and new preventive strategies for patients with chronic lung disease. In my opinion this is the most interesting part of the book.

Sections 4 and 5 describe new approaches to pulmonary rehabilitation in special situations, such as lung transplantation, sleep disorders, pulmonary hypertension, and pediatric patients with chronic lung diseases.

Finally, section 6 brilliantly describes the benefits already achieved and the future of pulmonary rehabilitation. Paraphrasing the author, “Pulmonary rehabilitation has evolved from criticism in the 1970s to the standard of care for patients with chronic lung disease.”

The bibliography seems very pertinent and up to date; all the papers and publications I knew of, and many more, are cited.

I congratulate the authors and conclude that this book is an important tool for pulmonary rehabilitation professionals-in-training, as well as a consultative source for pulmonary rehabilitation professionals. I highly recommend it to everyone with professional activities related to pulmonary rehabilitation.

Silvia R Valderramas PT PhD

Division of Respiratory Rehabilitation
Department of Physiotherapy
Evangelical University of Paraná
Dom Bosco University
Curitiba, Paraná, Brazil

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