airway remodeling? With the ongoing advances of genetic research, we are now more capable than ever of discovering the complex answers to these basic questions.

This book provides easy-to-read reviews, with chapters that are relevant to diverse groups, from basic researchers to epidemiologists to clinicians. It introduces what we understand today about the genetics of asthma and COPD. This general appeal may stimulate and foster further collaboration and cross-pollination of ideas between researchers who have focused on asthma or COPD, but not both. Advances in genetics research have substantially advanced our understanding of these conditions and will improve management and prevention.

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Exacerbations of Asthma. Sebastian L Johnston MBBS PhD FRCP, and Paul M O'Byrne MB FRCPI FRCP (C) FRCPE, editors. Boca Raton: Informa Healthcare. 2007. Hard cover, illustrated, 354 pages, $169.95.

Exacerbations of Asthma is a comprehensive book edited by 2 seasoned writers. With contributions from 38 renowned asthma experts, the editors provide a global view of asthma and its impact on morbidity and mortality. The book has 20 chapters and 6 sections, on epidemiology of asthma exacerbations, pathophysiology, in vitro and in vivo experimentation models of asthma, treatment, prevention, and delivery of care to patients with asthma. Each chapter includes an overview and a concisely written conclusion.

This book is written for a variety of readers. Most chapters are written for health care providers such as asthma educators, respiratory therapists, physicians, and nurses. The information is clearly written and most of the chapters are easily understood, but the chapters on in vivo, in vitro, and murine models for asthma, although well written, require a solid understanding of microbiology, immunology, and biochemistry.

One of this book's strengths is that the chapters are well referenced and have ample discussion of pertinent clinical studies. Most of the studies cited are recent, but a few chapters refer to data from as far back as the 1960s, which weakens their arguments with outdated statistics.

I had 2 major disappointments about the book. First, the cover art includes a large photograph of a woman using a metered-dose inhaler with the closed-mouth technique and no spacer. Of course, one should never judge a book by its cover, but this photograph illustrates the least effective aerosol delivery method, which would discourage me from purchasing it. I question the editor's intent in using that photograph. My other disappointment is the absence of a chapter on aerosol delivery methods. The pivotal point in asthma management is effective delivery of medications. An evidence-based review of delivery systems and techniques is greatly needed to balance out the topics in this book and provide important information. If I came across this book in a health sciences book store and glanced at the cover and noted the lack of a chapter on aerosol delivery, I would not purchase the book. However, after reading and reviewing it, despite these flaws, I would recommend its purchase.

Chapter 1 clearly defines the nature of asthma exacerbations and their morbidity. Numerous studies are cited on asthma exacerbation frequency, severity, frequency of associated hospital and clinic visits, and financial burden. Unique to this chapter is a discussion on the relationship between thunderstorms and asthma—a concept well supported by studies but not discussed in other books, to my knowledge.

Chapter 1, like several other chapters in the book, contains figures that are confusing and difficult to interpret. For example, Figure 1.1 plots 2 variables at different times of the day: the percent drop in peak expiratory flow, and asthma score. But nowhere does the text or figure legend explain the method for interpreting the 0.0–2.0 range on the Y axis, or define the asthma score. Four graphs plot the effects of 4 different medications on these 2 variables. The legend for the 4 graphs is difficult to discern from the text. The X axis is labeled with a continuum of time, using negative to positive numbers. For example, 15 days prior to the day of asthma exacerbation (which is labeled day 0) is listed as −15 days, and 15 days following the exacerbation is labeled 15. Using a North American orientation for interpreting graphs, this is a nonconventional and difficult approach to present data. Several other chapters also include graphics that are difficult to interpret, lack explanation of certain variables, symbols, and data points, and are "busy." These deficits weaken the graphs' and tables' clarity and value. The legend for Table 1.1, which lists data regarding asthma exacerbation rates from 10 studies, does not explain one column of numbers, which rendered the table useless to me.

Chapter 2 differentiates between asthma exacerbation and poorly controlled asthma. This is a clinically important distinction, and this chapter explains the concept well and describes how the pathophysiology of the 2 conditions differ. Tools for diagnosing exacerbations and the use of β agonists and corticosteroids during exacerbations are discussed. This chapter provides an in-depth discussion of the clinical use and limitations of peak flow monitoring. The heart of this chapter is the argument that during an exacerbation the clinician should assess the patient by looking at the differences from the patient's baseline, rather than absolute change, in variables such as peak flow, β agonist use, and symptoms.

Figure 2.10 contains 10 graphs that plot the use of oral corticosteroids, changes in peak flow, symptom score, β agonist use, and inhaled corticosteroid use during exacerbations. As in Chapter 1, the "symptom score" is not defined. The 0–10 scale on the Y axis of the oral steroid graph is not explained. The lack of explanations, along with the graph being printed too small, rendered this figure useless to me.

Chapter 3 addresses the socioeconomic impact of asthma exacerbation. This is discussed in global terms, with emphasis on North America and the European Union. Direct and indirect costs are discussed. This chapter clearly identifies the need for health care providers and decision-makers to identify cost-effective interventions to treat asthma exacerbations.

Chapter 4 discusses the factors that influence the seasonal patterns of asthma exacerbation, such as air pollution, climate, pollen, and viral infections. There is a comprehensive review of studies that have documented global causes of seasonal asthma. The importance of recognizing seasonal asthma risk factors and developing an asthma management plan are highlighted in this well-written chapter. One section on seasonality of respiratory viral infections is discussed with a graph that plots data from 1963–1966. Although this graph illustrates a typical pattern of increased incidence of

viral-induced asthma in September and October, the data are dated.

Chapter 5 provides a good and well-referenced discussion of the differences between childhood and adult asthma exacerbations, the wheezing phenotypes in infants and children, the effects of viral infections on lung development and asthma in children, and the causes of wheezing in older children, such as infection, sinusitis, allergens, and pollution. The emphasis on the uniqueness of the causes and pathophysiology of asthma exacerbation in children makes this a key chapter.

Chapter 6 discusses the etiology of asthma exacerbation in adults and how its causes and pathology differ from that in children. The chapter describes age-specific patterns of exacerbations that require hospital admission. This chapter discusses the trend of increased asthma exacerbation, which began in the 1960s, eventually reached a plateau, and recently began to decline. The causes of this decline are discussed. The role viral infection plays in asthma is discussed at length. The chapter states that some patients with asthma may have an impaired acquired immune response to rhinovirus infections. Every chapter in this book discusses the role of viral infection in asthma, but each chapter has its own focus on that relationship. Other causes of adult asthma, such as pollution, allergens, stress, cigarette smoke, food, aspirin, pregnancy, and gastroesophageal reflux, are discussed.

Chapter 6 also contains several difficult-to-interpret graphs and figures. Figure 6.3 uses 7 shades of gray to illustrate the distribution of viruses and atypical bacteria during single, dual, and triple infections in children. Each shade of gray corresponds to a particular virus, but it is difficult to discern some of the shades in the legend, which makes the graph difficult to interpret. Similar problematic shading compromises some graphs in other chapters.

Chapter 7 discusses the modes of transmission of respiratory viral infections. This chapter cites numerous studies on virus transmission, with emphasis on respiratory syncytial virus, human rhinovirus, and human influenza virus.

Chapter 8 addresses the mechanisms of asthma exacerbation. Detailed discussion covers the normal airway epithelium and the role of mediators and mast cells in inflammation. Discussed at length are how cellular inflammation, airway smooth muscle, pulmonary vasculature, and mucous cells are altered in asthma. This chapter clearly illustrates the complex pathophysiology of asthma.

Chapter 9 focuses on viral induction of neurogenic inflammation and airway responsiveness. The first section focuses on the receptors and enzymes involved with regulation of the biological response to inflammatory neuropeptides in the respiratory tract, their distribution, function, and biological effects. The second section of this chapter takes the central theme of viral-infection-induced asthma and looks at the effects of viruses on the sensory innervations of the airway. It also discusses the associated pathophysiologic manifestations of these effects on the bronchial wall and pulmonary vasculature during and after an infection. This is one of the more difficult chapters in this book. Topics such as inflammatory neuropeptides and neurogenic airway inflammation are discussed in depth. Also discussed is post-viral inflammation, which is a key concept in adult-onset asthma. The chapter concludes with a comprehensive discussion on therapeutic strategies for treating viral-induced asthma.

Chapter 10 tackles antiviral immunity and protection against asthma exacerbations. Antiviral defenses are discussed, along with explanation of the innate immune response. Although this chapter is well-written and includes 155 references, I found it difficult to understand, due to my limited knowledge of immunology.

Chapter 11 addresses the pathophysiology of bronchiolitis in infants due to respiratory syncytial virus. The causes of wheezing in infants are well-referenced and explained. This chapter discusses the association between bronchiolitis and wheezing in early childhood, with a focus on cause and pathophysiology. The role of active and passive immunization as protection against bronchiolitis is also discussed.

Chapters 12 and 13 focus on in vitro models of bronchial epithelial cell infection and macrophage infection. These are the most difficult chapters in the book. To comprehend the information at the depth these topics are presented, the reader should be well-grounded in microbiology, immunology, biology, and biochemistry. The role of rhinoviruses and macrophages in asthma are the foundation of this chapter.

Chapter 14 discusses murine models of allergen exposure and virus infection. Support is provided for the use of murine models to study airway allergen response. The chapter describes murine models as ideal for determining the role of T cells in allergic response and understanding mediators' roles in asthma exacerbations. In addition the chapter presents murine models to study the association between viral infection and asthma exacerbation. This thorough and in-depth chapter makes the point that murine models offer unique opportunities to identify potential therapeutic approaches, based on cellular and molecular mechanisms.

Chapter 15 explores lessons learned from human experiments with rhinovirus infection in conjunction with exposure to allergens. The chapter expands on the synergy between viral infection and inhaled allergens. It is reported in this chapter that atopic individuals are more susceptible to viral-induced asthma. Emphasis is placed on further exploration of that relationship. This chapter includes several figures that, again, are difficult to interpret. Figure 15.6 contains 6 small graphics with no explanation of the variables on the X axis. The graphs show data from a very limited number of subjects. Even after careful consideration of the data presented, I was unable to see the point of the graphs.

Chapter 16 presents data on leukotriene antagonists in the treatment and prevention of asthma exacerbations. Studies support the use of leukotriene antagonists in asthma. This is a well-referenced chapter on a controversial topic. Though montelukast is experimental in the United States, the chapter discusses several European studies that found intravenous montelukast effective for asthma exacerbation. The chapter concludes that adding leukotriene antagonists may benefit patients who do not respond to other asthma exacerbation therapies.

Chapter 17 addresses the key issue of the role of corticosteroids in preventing asthma exacerbations. This chapter supports the use of high-dose inhaled corticosteroids with the onset of an upper-airway infection. The use of low-dose inhaled corticosteroids in children with airway infection is also discussed. The authors make a good argument for low-dose corticosteroids for preventing asthma exacerbations. This chapter is well-written and thorough.

Chapter 18 looks at the combination of inhaled corticoidsteroids and long-acting β_2 agonists. This chapter is written by one of the book's editors (O'Byrne, who is well known for his expertise in asthma), who expands on the importance of adding a long-

acting β agonist to inhaled corticoidsteroids. This chapter is well-written and concise.

Chapter 19 explores the importance of self-management in minimizing asthma exacerbations and the use of asthma action plans. The pros and cons of having the patient self-adjust therapy are presented. I think this chapter will be extremely valuable to asthma educators. This chapter contains several figures that, despite my grounding in statistics, I could not interpret. In particular, Figures 19.3 and 19.4 are comparison graphs for which no explanation is provided in the text or legend. I presented Figures 19.5 and 19.6 to our campus statistician, and she also had difficulty interpreting their intent.

The book concludes with a chapter on psychosocial issues associated with asthma, which is a topic not well-documented in the literature. This chapter does a good job identifying the psychological issues experienced by patients with chronic asthma. Most clinicians who treat patients with asthma tend not to recognize how these factors affect patients. This chapter emphasizes the need to evaluate the psychological, social, and behavioral problems associated with chronic asthma. I think this is a pivotal chapter for understanding how psychosocial issues influence the management of patients with asthma.

In summary, I found **Exacerbations of Asthma** to be a well-referenced book that deals with a broad list of asthma topics. Overall the writing is clear, thorough, and well-organized. The content is timely and accurate. The weaknesses discussed above should be addressed in a subsequent edition.

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