Book report

# Mechanical ventilation: physiological and clinical applications

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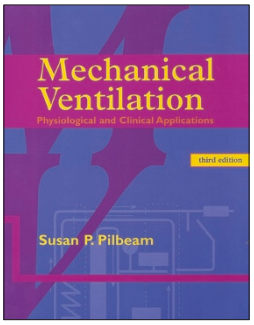


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Pilbeam SP: *Mechanical Ventilation: Physiological and Clinical Applications*, 3rd edition. St Louis, MO: Mosby Inc; 1998. 460 pp. ISBN 0-8151-2600-X

*Mechanical Ventilation* provides a comprehensive theoretical background and practical approach to mechanical ventilation. It is written primarily for respiratory therapists, but critical care and respiratory physicians and nurses will find many aspects of the book invaluable, particularly the clear and concise descriptions of the different modes of mechanical ventilation, their advantages and disadvantages, and a practical approach to common problems encountered during mechanical ventilation.

The book is divided into five sections. The first encompasses basic aspects of mechanical ventilation, including the history of resuscitation and mechanical ventilation, arterial blood gas interpretation, basic terminology and concepts of mechanical ventilation, ventilator graphic displays, and the physical aspects of mechanical ventilators. I found this latter section particularly useful as it provides an explanation of the 'nuts and bolts' of mechanical ventilation in a lucid and easily understandable manner. As the authors themselves bemuse, sometimes there is a bewildering display of graphic information on newer microprocessor-controlled ventilators that can be overwhelming to the uninitiated. This section demystifies this aspect of mechanical ventilators by explaining key concepts in a readily understandable manner. In addition, the section on the history of mechanical ventilation was informative and entertaining, and it helps one appreciate how rapidly this field has progressed in the past 50 years.

The second section of the book pertains to monitoring in mechanical ventilation, and discusses additional aspects of arterial blood gas analysis, calametry, and respiratory system mechanics. Hemodynamic monitoring of the ventilated patient is discussed, with particular emphasis on the effects of mechanical ventilation on these parameters. While the section provides a good basic discussion of key issues, the reader is referred to textbooks of critical care medicine for a more in-depth discussion of this area.

The third section covers the physiological and pathological pulmonary and nonpulmonary effects of mechanical ventilation, including cardiovascular, renal, and central nervous system effects. The section on pulmonary effects of mechanical ventilation includes a clear discussion of barotrauma and volutrauma, of ventilator-associated pneumonia, of oxygen toxicity, and of complications of the artificial airway. There have been many developments in this area in the past 5 years, making this section slightly out of date. The next edition of the book will no doubt be updated and expanded in this important area.

The fourth section discusses physiological aspects of acute respiratory failure and the criteria for establishment of mechanical ventilation, a practical approach to initiation of mechanical ventilation, practical aspects of ventilator set-up (including sensitivity, fraction of inspired oxygen, humidification, and alarms), assessment of the initial settings of mechanical ventilation and practical suggestions for adjusting these, use of positive end-expiratory pressure and CPAP, changing ventilator circuits, patient positioning, sedation and paralysis, and finally weaning and discontinuation of mechanical ventilation, including extubation.

The final section of the book discusses newer modes of mechanical ventilation, including high-frequency ventilation, ventilation of the pediatric patient, home ventilation, liquid ventilation, extracorporeal gas exchange, tracheal gas insufflation, and the use of nitric oxide and HeliOx. I found this to be a good introduction to a complex and evolving area

but, again, slightly out of date given the rapid evolution of the field of high-frequency ventilation and liquid ventilation.

As can be appreciated, this book presents a comprehensive approach to mechanical ventilation in a straightforward (but not simplistic) manner. The textbook is well organized and provides learning objectives at the beginning of each chapter, as well as questions and answers that are particularly useful for reinforcing the concepts and for self-assessment. There are many pictures, diagrams, and tables in each section that are well thought out and assist in understanding difficult concepts. The style of writing is relaxed, which makes the book easy to read. There are many anecdotes, especially in the first section, that had me chuckling.

As for any textbook, there are limitations. First and foremost is the fact that this book is now at least 5 years old, making several of the sections slightly dated. Second, the book is written by respiratory therapists for respiratory therapists, and several of the sections (e.g. on the basics of physiology, gas exchange, and mechanics) are not at a level required for respiratory physicians or critical care physicians. This is not viewed as a major limitation, however, and the book provides easily understandable explanations of many difficult concepts in a way that I have not found in other textbooks.

In summary, this is a comprehensive and easily understandable book on mechanical ventilation that will represent a valuable textbook for students and practitioners of respiratory therapy, and that will provide a valuable resource for other health professionals. I would recommend this book highly, and await eagerly the next edition.

## Competing interests

None declared.