

Antonio M. Esquinas
Editor

Noninvasive Mechanical Ventilation

Theory, Equipment, and
Clinical Applications

Second Edition

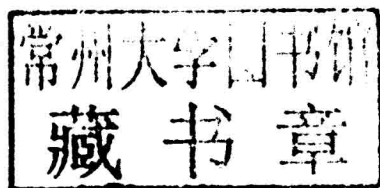
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Spain

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To my wife Rosario

Preface

Despite significant technological advances in medicine today, the reality of everyday practice continues to reveal that not everyone can apply and know the limits of the technologies used in the treatment of respiratory failure.

Nowadays, in the treatment of acute respiratory failure in various medical specialties, the use of noninvasive mechanical ventilation continues to show a positive end result. There are few hospitals that have the necessary equipment to make its implementation possible. However, as we will see in this second edition, there are still several points of controversy, and important advances continue to be made, not only in new indications but also in the equipment (mechanical ventilator, interfaces) and patient-ventilator interaction. This gives scope for improving our understanding and maintains a growing interest in new possibilities.

In this second edition, we have analyzed the impact of published studies on the effects of potential, new noninvasive ventilation treatments and clinical practice, described by well-known researchers as well as other emerging groups of young researchers.

Experience and new insights make this book a basic reference to understanding and encouraging new ideas.

Personally, I want to thank all authors for trusting and contributing their time and efforts in the development of this book. Finally, if I wanted to point out that we must not stop this research inertia on noninvasive mechanical ventilation, knowing communicate well their knowledge and limits, and never forget that our end reference points problems and circumstances that our patients during noninvasive mechanical ventilation raising to us day to day.

This technique is still a life-saving treatment, relieves pain for many patients, and gives encouragement. However, many aspects need to be reinvestigated and research is necessary to resolve open controversies which indicate the failures of noninvasive ventilation, methodology, and therapy. The question of what are the limits of noninvasive ventilation and where needs to be addressed.

As *Albert Einstein* said, “We cannot solve our problems with the same thinking we used when we created them.” We hope that this second edition becomes a useful reference that serves this modest reflection.

Murcia, Spain

Antonio M. Esquinas, MD, PhD, FCCP

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Part I

Rational, Interface, Equipment and Ventilatory Modes of Non Invasive Mechanical Ventilation

Nicolino Ambrosino

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1.1 Stable Hypercapnic Chronic Obstructive Pulmonary Disease

The hypothesized but not proven mechanisms of action of long-term noninvasive positive pressure ventilation (NPPV) in stable hypercapnic patients with chronic obstructive pulmonary disease (COPD) are

- 1. Reverting hypoventilation
- 2. Respiratory muscle unloading
- 3. Respiratory center reset
- 4. Cardiovascular effects

These mechanisms may work alone or in synergy.

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