

1. Record Nr.	UNINA9910552722803321
Titolo	Mechanical ventilation from pathophysiology to clinical evidence // Giacomo Bellani, editor
Pubbl/distr/stampa	Cham, Switzerland : , : Springer Nature Switzerland AG, , [2022] ©2022
ISBN	9783030934019 9783030934002
Descrizione fisica	1 online resource (422 pages)
Disciplina	614.8
Soggetti	Critical care medicine Artificial respiration Respirators (Medical equipment)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro -- Foreword -- Preface -- Contents -- Part I: Techniques -- 1: Basic Physiology of Respiratory System: Gas Exchange and Respiratory Mechanics -- 1.1 Gas Exchange -- 1.2 Respiratory Mechanics -- References -- 2: A Short History of Mechanical Ventilation -- 2.1 Respiration, Circulation, and Their Interaction -- 2.2 Oxygen, Combustion, Metabolism, Homeostasis -- 2.3 The Dawn of Mechanical Ventilation -- 2.4 Lessons Learned -- References -- 3: Airway Management in the Critically Ill -- 3.1 Introduction -- 3.2 Indications for Tracheal Intubation in ICU -- 3.3 Planning and Preparation for Tracheal Intubation -- 3.3.1 Clinical History and General Examination -- 3.3.2 Airway Assessment -- 3.3.3 Airway Cart and Checklists -- 3.3.4 Team Preparation -- 3.4 The Tracheal Intubation Procedure -- 3.4.1 Patient Positioning -- 3.4.2 Preoxygenation and Apnoeic Oxygenation -- 3.4.3 Induction of Anaesthesia -- 3.4.3.1 Propofol -- 3.4.3.2 Etomidate -- 3.4.3.3 Ketamine -- 3.4.4 Controversies in Rapid Sequence Intubation -- 3.4.4.1 Use of Neuromuscular Blockade or Spontaneous Ventilation -- 3.4.4.2 Use of Cricoid Pressure -- 3.4.4.3 Mask Ventilation During RSI -- 3.4.5 Haemodynamic Support During Tracheal Intubation -- 3.4.6

Device Selection for Tracheal Intubation -- 3.4.6.1 Use of a Videolaryngoscope -- 3.4.6.2 Use of a Bougie -- 3.4.6.3 Use of a Stylet -- 3.4.7 Confirmation of Tracheal Tube Position -- 3.5

Rescue Oxygenation -- 3.6 Care and Maintenance of the Tracheal Tube -- 3.7 Human Factors in Airway Management -- 3.8 Future Research -- 3.9 Conclusion -- References -- 4: Controlled Mechanical Ventilation: Modes and Monitoring -- 4.1 Pressure-Controlled Ventilation -- 4.2 Volume-Controlled Ventilation -- 4.3 Pressure-Regulated Volume-Guaranteed Ventilation -- 4.4 Physiological Features of Fully Controlled Modes.

4.4.1 Lung Protection -- 4.4.2 Alveolar Ventilation -- 4.5 Modes Particularities During Inspiratory Effort -- 4.6 Monitoring During Controlled Ventilation -- 4.6.1 Static Measurements of Inspiratory Resistance and Respiratory Compliance -- 4.6.2 Low-Flow Pressure-Volume (PV) Curves -- 4.6.3 Stress Index -- 4.7 Conclusion -- References -- 5: Assisted Ventilation: Pressure Support and Bilevel Ventilation Modes -- 5.1 Introduction -- 5.2 Pressure Support Ventilation -- 5.2.1 Epidemiology, Potential Advantages and Disadvantages -- 5.2.2 Principles of Operation and Physiological Consequences of PSV -- 5.2.2.1 Trigger Sensitivity, Inspiratory Rise Time, Pressure Support Level, and Cycling-Off Criteria -- 5.2.2.2 Determinants of Ventilation and Impact on Breathing Pattern -- 5.2.3 Potentially Injurious Patient-Ventilator Interactions During Pressure Support Ventilation -- 5.2.3.1 Over-Assistance with Ineffective Efforts and Apnea Events -- 5.2.3.2 Under-Assistance Leading to Flow Starvation and Double Triggering -- 5.2.4 How to Set the Level of Support to Prevent Over and Under-Assistance -- 5.3 Bilevel Ventilation Modes -- 5.3.1 Bilevel Vs. Other Pressure-Controlled Modes -- 5.3.2 Physiologic Effects of Differences in Inspiratory Synchronization -- 5.3.3 Setting Bilevel Ventilation During Assisted Mechanical Ventilation -- 5.3.4 Clinical Evidence of Bilevel Vs. Conventional Modes During Assisted Mechanical Ventilation -- 5.4 Conclusion -- References -- 6: Monitoring the Patient During Assisted Ventilation -- 6.1 Inspiratory Effort -- 6.1.1 Esophageal Pressure Derived Measurements -- 6.1.2 Tidal Volume and Respiratory Rate -- 6.1.3 p0.1 -- 6.1.4 Occlusion Pressure -- 6.1.5 Pressure Muscle Index -- 6.1.6 Diaphragm Electrical Activity -- 6.2 Total Pressure Distending the Respiratory System -- 6.3 Asynchronies.

6.4 Distribution of Ventilation and Pendelluft -- 6.5 Evaluation of Respiratory Muscles Activity by Ultrasound -- 6.6 Conclusion -- References -- 7: Neurally Adjusted Ventilatory Assist -- 7.1 Working Principles -- 7.1.1 EAdi Signal -- 7.1.2 NAVA Mode -- 7.1.2.1 Trigger Under NAVA -- 7.1.2.2 The Level of Assist -- 7.2 How to Set Ventilatory Assistance During NAVA -- 7.2.1 Airway Pressure Targets -- 7.2.2 Tidal Volume Response to NAVAlvel Titration -- 7.2.3 EAdi Response to NAVAlvel Titration -- 7.2.4 Neuro-Ventilatory Efficiency (NVE) -- 7.2.5 EAdi Derived Indices with NAVA -- 7.3 How to Set PEEP Under NAVA -- 7.4 How to Wean NAVA -- 7.5 Clinical Effects of NAVA -- 7.5.1 Effect on VT -- 7.5.2 Effects on Asynchrony -- 7.5.3 NAVA During Non-Invasive Ventilation or Tracheostomy -- 7.6 Limitation of NAVA -- 7.7 Conclusion -- References -- 8: Proportional Assist Ventilation -- 8.1 Introduction -- 8.2 Operation Principles -- 8.3 Advantages of PAV+ -- 8.3.1 Protection from Over- or Under-Assistance -- 8.3.2 Breathing Pattern and Patient-Ventilator Interaction -- 8.3.3 Clinical Outcomes -- 8.4 Limitations in PAV/PAV+ Use -- 8.5 Titration of Assistance in PAV+ -- 8.6 Conclusion -- References -- 9: Non-Invasive Ventilation: Indications and Caveats -- 9.1 Introduction -- 9.2 NIV Interfaces -- 9.3 Mode of Ventilation --

9.4 Physiological Effects of NIV -- 9.5 Indications for NIV -- 9.5.1 Hydrostatic Pulmonary Edema -- 9.5.2 Hypercapnic Respiratory Failure: Acute Exacerbation of COPD -- 9.5.3 De-Novo Acute Hypoxemic Respiratory Failure -- 9.5.3.1 Facemask NIV -- 9.5.3.2 Helmet NIV -- 9.5.4 Immunocompromised Patients -- 9.5.5 Pre-Oxygenation -- 9.5.6 After Invasive Mechanical Ventilation -- 9.5.6.1 Early Liberation -- 9.5.6.2 Pre-Emptive Strategy -- 9.5.6.3 Post-Extubation Acute Respiratory Failure Rescue.

9.5.7 Insufficient Data -- 9.6 The Importance of Monitoring of Patient with NIV -- 9.6.1 Monitoring the Patient with NIV -- 9.6.1.1 Predicting NIV Failure in the Setting of De-Novo AHRF -- 9.6.1.2 Predicting NIV Failure in the Setting of Hypercapnic ARF -- 9.7 Conclusions -- References -- 10: High Flow Nasal Oxygen: From Physiology to Clinical Practice -- 10.1 Introduction -- 10.2 Dead Space, Air Entrainment, and Washout -- 10.2.1 The Way Forward -- 10.3 Generation of PEEP (or Not) -- 10.3.1 The Way Forward -- 10.4 Work of Breathing (WOB) -- 10.4.1 Work of Breathing in Normal Adults and in Hypoxemic Respiratory Failure -- 10.4.2 Work of Breathing in Patients with Decompensated Chronic Obstructive Pulmonary Disease (COPD) -- 10.4.3 The Way Forward -- 10.5 Some Words of Caution -- 10.6 Conclusion -- References -- 11: Nursing of Mechanically Ventilated and ECMO Patient -- 11.1 Mechanical Ventilation -- 11.2 Prone Position -- 11.3 ECMO -- 11.4 Conclusions -- References -- 12: Closed-Loop Ventilation Modes -- 12.1 Introduction -- 12.2 Mandatory Minute Ventilation -- 12.3 Smartcare/PS -- 12.3.1 Principle of Operation -- 12.3.2 Monitoring -- 12.3.3 Evidence -- 12.4 Adaptive Support Ventilation -- 12.4.1 Principle of Operation -- 12.4.2 Settings and Monitoring -- 12.4.3 Weaning -- 12.4.4 Evidence -- 12.5 INTELLIVENT-ASV -- 12.5.1 Principle of Operation -- 12.5.2 Settings and Monitoring -- 12.5.3 Weaning -- 12.5.4 Evidence -- 12.6 Conclusion -- References -- 13: Airway Pressure Release Ventilation -- 13.1 Introduction -- 13.2 Physiology -- 13.3 Indications -- 13.4 Settings -- 13.4.1 PHigh -- 13.4.2 THigh -- 13.4.3 PLow -- 13.4.4 TLow -- 13.5 Spontaneous Breathing -- 13.6 Weaning -- 13.7 Conclusion -- References -- Part II: Clinical Scenarios.

14: Acute Hypoxaemic Respiratory Failure and Acute Respiratory Distress Syndrome -- 14.1 AHRF and ARDS: A Definition Problem -- 14.2 Epidemiology: Knowns and Unknowns -- 14.3 Pathophysiology: Insights and Gaps -- 14.4 Support of Gas Exchange -- 14.5 Invasive Mechanical Ventilation: From 'Protective' to 'Personalized' -- 14.6 Adjuncts to Ventilation -- 14.7 Specific Therapies for ARDS and AHRF -- 14.8 Outcomes -- 14.9 AHRF: Changing the Paradigm -- 14.10 Conclusions -- References -- 15: Ventilator-Induced Lung Injury and Lung Protective Ventilation -- 15.1 Mechanosensitivity of the Respiratory System -- 15.2 Pathophysiology of Ventilator-Induced Lung Injury -- 15.3 Bedside Assessment of VILI -- 15.4 Designing Lung Protective Strategies -- 15.5 Clinical Evidence on Protective Ventilation -- 15.6 Conclusion -- References -- 16: Mechanical Ventilation in the Healthy Lung: OR and ICU -- 16.1 Introduction -- 16.2 Tidal Volume -- 16.3 Tidal Volume in the Operating Room -- 16.3.1 Benefit of a Lower VT -- 16.3.2 Challenges of a Lower VT -- 16.3.3 Temporal Changes in the Size of VT -- 16.3.4 Current Recommendations -- 16.4 Tidal Volume in the Intensive Care Unit -- 16.4.1 Benefit of a Lower VT -- 16.4.2 Challenges of a Lower VT -- 16.4.3 Temporal Changes in the Size of VT -- 16.4.4 Current Recommendations -- 16.5 Positive End-Expiratory Pressure -- 16.6 PEEP in the Operating Room -- 16.6.1

Benefit of Higher PEEP -- 16.6.2 Challenges of Higher PEEP -- 16.6.3 Temporal Changes in PEEP -- 16.6.4 Current Recommendations -- 16.7 PEEP in the Intensive Care Unit -- 16.7.1 Benefit of Higher PEEP -- 16.7.2 Challenges of Higher PEEP -- 16.7.3 Temporal Changes in PEEP -- 16.7.4 Current Recommendations -- 16.8 Conclusions -- References -- 17: PEEP Setting in ARDS -- 17.1 Introduction -- 17.2 Pathophysiology: Beneficial Effects of PEEP.  
17.3 Pathophysiology: Harmful Effects of PEEP.

---