

Contents

Section I Humidification and Physiology

- 1 Physiology Humidification: Basic Concepts** 3
Jens Geiseler and Julia Fresenius
- 2 Airways: Humidification and Filtration Functions.....** 11
Maire Shelly and Craig Spencer

Section II Humidification and Devices

- 3 Heated Humidifier.....** 17
Varun Gupta and Surendra K. Sharma
- 4 Heat and Moisture Exchangers (HME)** 27
Jean-Damien Ricard, Alexandre Boyer, and Didier Dreyfuss
- 5 Heat and Moisture Exchangers and the Booster® System:
Technology and Clinical Implications** 33
Fabrice Michel, Marc Leone, and Claude Martin
- 6 Active Versus Passive Humidification: Efficiency Comparison
Between the Methods** 41
Jens Geiseler, Julia Fresenius, and Ortrud Karg
- 7 Main Techniques for Evaluating the Performances
of Humidification Devices Used for Mechanical Ventilation.....** 49
François Lellouche

Section III Humidification and High-Flow Oxygen Therapy

- 8 Main Topic Related with Humidification: Discomfort Associated
with Underhumidified High-Flow Oxygen Therapy in
Critically Ill Patients.....** 67
Gerald Chanques and Samir Jaber

Section IV Humidification and Noninvasive Ventilation

9 The Humidification During Noninvasive Ventilation.....	75
David Chiumello, Antonella Marino, and Elisabetta Gallazzi	
10 Behavior of Hygrometry During Noninvasive Mechanical Ventilation.....	81
Antonio Matías Esquinas and Ahmed S. BaHammam	
11 Practice of Humidification During Noninvasive Mechanical Ventilation (NIV): Determinants of Humidification Strategies.....	93
Antonio Matías Esquinas, Suhaila E. Al-Jawder, and Ahmed S. BaHammam	
12 Indications and Contraindications in Home Care	103
Antonio Costa and Ricardo Reis	
13 Pros and Cons of Humidification for CPAP Therapy in the Treatment of Sleep Apnea.....	109
Arschang Valipour	

Section V Humidification and Invasive Mechanical Ventilation

14 Humidification in Intensive Care Medicine: General Approach to Selected Humidification Devices and Complications of Mechanical Ventilation.....	117
Pedro F. Lucero, David W. Park, and Dara D. Regn	
15 Effect of Airway Humidification Devices on Tidal Volume.....	123
Michael J. Morris	
16 Humidification During Invasive Mechanical Ventilation: Selection of Device and Replacement	131
Jean-Damien Ricard	
17 Humidification During Invasive Mechanical Ventilation: Hygrometric Performances and Cost of Humidification Systems.....	137
François Lellouche	
18 Postoperative Mechanical Ventilation-Humidification.....	157
Leonardo Lorente	
19 Humidification During Laparoscopy Procedures: Key Topics Technologic and Clinical Implication.....	163
Guniz Meyanci Koksall and Emre Erbabacan	

Section VI Humidification and Ventilator Associated Pneumonia

- 20 Respiratory Filters and Ventilator-Associated Pneumonia: Composition, Efficacy Tests and Advantages and Disadvantages 171**
Leonardo Lorente
- 21 Efficacy of Heat and Moist Exchangers in Preventing Ventilator-Associated Pneumonia (VAP): Clinical Key Topics..... 179**
Patrick F. Allan
- 22 Humidifier Type and Prevention of Ventilator-Associated Pneumonia: Chronological Overview of Recommendations..... 187**
Sonia Labeau and Stijn Blot
- 23 Humidification on the Incidence of Ventilator-Associated Pneumonia: Evidence and Guidelines on the Prevention of VAP for the Use of HME or HH 193**
Leonardo Lorente
- 24 Humidification Devices and Ventilator-Associated Pneumonia: Current Recommendations on Respiratory Equipment 199**
Jean-Damien Ricard, Alexandre Boyer, and Didier Dreyfuss

Section VII Humidification Tracheostomy

- 25 A Portable Trachea Spray for Lower Airway Humidification in Patients After Tracheostomy 211**
Tilman Keck and Ajnacska Rozsasi

Section VIII Humidification, Mucus Transport and Secretion Clearance

- 26 Humidification and Mucus Transport in Critical Patients: Clinical and Therapeutic Implications..... 217**
Naomi Kondo Nakagawa, Juliana Araújo Nascimento, Marina Lazzari Nicola, and Paulo Hilário Nascimento Saldiva
- 27 Secretion in Patients with Neuromuscular Diseases. Key Major Topics, Technology and Clinical Implications 227**
Jens Geiseler, Julia Fresenius, and Ortrud Karg
- 28 Automated Airway Secretion Clearance in the ICU by In-line Inexsufflation: Clinical Implications and Technology 237**
Eliezer Be'eri
- 29 Effect of Humidification on Lung Mucociliary Clearance in Patients with Bronchiectasis 245**
Amir Hasani and Roy E. Smith

Section IX Humidification in Critically Ill Neonates

30	Physiology of Humidification in Critically Ill Neonates	253
	Alan de Klerk	
31	Measurement of Inspired Gas Temperature in the Ventilated Neonate	267
	Luke Anthony Jardine, David Cartwright, Kimble Robert Dunster, and Mark William Davies	
32	Humidification During Noninvasive Respiratory Support of the Newborn: Continuous Positive Airway Pressure, Nasal Intermittent Positive Pressure Ventilation, and Humidified High-Flow Nasal Cannula	271
	Alan de Klerk	
Index		285