

# Table of contents

<b>Contributors</b>	<b>xiv</b>
<b>Preface</b>	<b>xxix</b>
<b>List of abbreviations</b>	<b>xxx</b>
<b>1 - Structure and function of the respiratory system</b>	
Anatomy of the respiratory system Pallav L. Shah	1
Cytology of the lung Venerino Poletti, Giovanni Poletti and Marco Chilosi	7
Immunology and defence mechanisms Antonino Di Stefano and Bruno Balbi	20
<b>2 - Physiology and pulmonary function testing</b>	
Respiratory physiology Susan A. Ward	28
Control of ventilation Brian J. Whipp and Susan A. Ward	41
Respiratory mechanics Daniel Navajas and Ramon Farré	48
Gas transfer J. Mike Hughes	54
Arterial blood gas assessment Paolo Palange and Alessandro Ferrazza	60
Exercise testing Paolo Palange and Paolo Onorati	70
Bronchial provocation testing Frans de Jongh	77



Static and dynamic lung volumes 83  
 Riccardo Pellegrino, Andrea Antonelli and Frans de Jongh

Assessment for anaesthesia/surgery 90  
 Macé M. Schuurmans, Carolin Steinack and Markus Solèr

### 3 - Diagnostic approach

Dyspnoea 97  
 Pierantonio Laveneziana

Chest pain 108  
 Matthew Hind

Cough 110  
 Alyn H. Morice

Physical examination 117  
 Martyn R. Partridge

### 4 - Diagnostic procedures

Bronchoscopy 124  
 Pallav L. Shah

Interventional pulmonology 132  
 Hervé Dutau and David Breen

Bronchoalveolar lavage 138  
 Ulrich Costabel, Francesco Bonella and Josune Guzman

Medical thoracoscopy/pleuroscopy 145  
 Philippe Astoul

Thoracentesis 151  
 Emilio Canalis

Chest radiography and fluoroscopy 154  
 Walter De Wever



Transthoracic ultrasound 160  
Jane A. Shaw, Florian von Groote-Bidlingmaier and  
Coenraad F.N. Koegelenberg

Lung CT and MRI 169  
Johny A. Verschakelen

HRCT of the chest 175  
Johny A. Verschakelen

Nuclear medicine of the lung 181  
Antonio Palla and Duccio Volterrani

Sputum and exhaled breath analysis 187  
Patrizia Pignatti, Dina Visca, Elisiana Carpagnano, Francesca Cherubino  
and Antonio Spanevello

Microbiology testing and interpretation 194  
Margareta Ieven and Veerle Matheussen

Laboratory diagnosis of mycobacterial infections 201  
Claudio Piersimoni

Biopsy 207  
Stefano Gasparini

## **5 - General principles of treatment modalities and prevention measures**

Inhaled drug therapy 210  
Omar S. Usmani

Systemic pharmacotherapy 215  
Mario Cazzola, Paola Rogliani and Maria Gabriella Matera

Allergen-specific immunotherapy 223  
Christian Taube

Immunotherapies in lung cancer 227  
Niels Reinmuth



Respiratory physiotherapy Thierry Troosters and Julia Bott	232
Pulmonary rehabilitation Thierry Troosters, Wim Janssens, Daniel Langer and Heleen Demeyer	239
Palliative care Sylvia Hartl	249
Oxygen therapy Anita K. Simonds	253
Smoking-related diseases Linnea Hedman	257
Treatment of tobacco dependence Charlotta Pisinger	261
Long-term ventilation Anita K. Simonds	266
Pleural infection and lung abscess Amelia Clive, William Falconer, Clare Hooper and Nick Maskell	273
Endoscopic lung volume reduction Ralf Eberhardt and Maren Schuhmann	282
Lung transplantation Geert M. Verleden	288

## **6 - Respiratory emergencies**

Respiratory emergencies Maxens Decavèle, Suela Demiri and Alexandre Demoule	293
Lung injury and acute respiratory distress syndrome Bernd Schönhofer and Christian Karagiannidis	299

## **7 - Airway diseases**

Upper airway disease Claus Bachert	304
---------------------------------------	-----



Asthma 308  
Bianca Beghé, Leonardo M. Fabbri and Paul M. O'Byrne

Bronchitis 320  
Koliarne Tong and Peter Wark

COPD and emphysema 324  
Emma Burke and John R. Hurst

Exacerbations of COPD 332  
Marc Miravittles

Extrapulmonary effects of COPD 339  
Yvonne Nussbaumer-Ochsner and Klaus F. Rabe

Pharmacology of asthma and COPD 344  
Peter J. Barnes

Bronchiectasis 353  
James D. Chalmers

Rare airway diseases 358  
Mouhamad Nasser and Vincent Cottin

Congenital airway disease 364  
Ernst Eber

## **8 - Respiratory infections**

Upper respiratory tract infections 372  
Gernot Rohde

Pneumonia 377  
Gernot Rohde and Mark Woodhead

Hospital-acquired pneumonia 383  
Francesco Blasi, Andrea Gramegna and Marta Di Pasquale

Pneumonia in the immunocompromised host 388  
Santiago Ewig



Influenza, pandemics and SARS 393  
Wei Shen Lim

Opportunistic infections in the immunocompromised host 400  
Thomas Fuehner, Diana Ernst, Mark Greer, Jens Gottlieb and Tobias Welte

Aspiration pneumonitis 411  
John MacSharry and Desmond M. Murphy

## **9 - Mycobacterial diseases**

Pulmonary tuberculosis 416  
Giovanni Sotgiu and Giovanni Battista Migliori

Tuberculosis in immunocompromised patients 429  
Martina Sester

Extrapulmonary tuberculosis 433  
Demosthenes Bouros and Argyrios Tzouveleakis

Latent tuberculosis 438  
Jean-Pierre Zellweger

Nontuberculous mycobacterial disease 442  
Claudio Piersimoni

## **10 - Thoracic tumours**

Pathology and molecular biology of lung cancer 447  
Verena Tischler, Sylvie Lantuejoul, Lénaïg Mescam-Mancini,  
Barbara Burrioni and Anne McLeer-Florin

Lung cancer: diagnosis and staging 453  
Johan Vansteenkiste, Griet Deslypere and Dorothee Gullentops



Chemotherapy and molecular biological therapy 463  
Amanda Tufman and Rudolf M. Huber

Surgical treatment for lung cancer 472  
Gilbert Massard, Anne Olland and Pierre-Emmanuel Falcoz

Radiotherapy for lung cancer 481  
Luigi Moretti and Paul Van Houtte

Other lung tumours 490  
Andrew Cheng and Matthew Evison

Metastatic tumours 495  
Elisabeth Quoix

Pulmonary nodules 501  
David R. Baldwin

Pleural and chest wall tumours 506  
Amaud Scherpereel

Mediastinal tumours 514  
Lawek Berzenji, Laurens Carp, Jeroen M. Hendriks, Patrick Lauwers and  
Paul E. Van Schil

## 11 - Sleep and control of breathing disorders

Obstructive sleep apnoea-hypopnoea syndrome 522  
Wilfried De Backer

Central sleep apnoea 529  
Konrad E. Bloch and Thomas Brack

Hypoventilation syndromes 535  
Andrea Aliverti



## 12 - Respiratory failure

- Respiratory failure 541  
Nicolino Ambrosino and Fabio Guarracino
- NIV in acute respiratory failure 546  
Anita K. Simonds

## 13 - Diffuse parenchymal lung diseases

- Idiopathic pulmonary fibrosis 553  
Pier-Valerio Mari, Athol Wells and Luca Richeldi
- Hypersensitivity pneumonitis 557  
Torben Sigsgaard and Anna Rask-Andersen
- Sarcoidosis 563  
Ulrich Costabel
- Idiopathic interstitial pneumonias 568  
Marina Aiello, Alberto Fantin, Panayota Tzani, Sara Chiesa and Dario Olivieri
- Adult pulmonary Langerhans cell histiocytosis 581  
Vincent Cottin, Mouhamad Nasser, Claudia Valenzuela and Romain Lazor
- Lymphangioliomyomatosis 585  
Vincent Cottin, Romain Lazor, Claudia Valenzuela and Paolo Spagnolo
- Pulmonary alveolar proteinosis 589  
Paolo Palange and Francesco Vaccaro
- Amyloidosis 592  
Helen J. Lachmann



Drug-induced and iatrogenic respiratory disease 595  
Philippe Camus and Philippe Bonniaud

Radiation-induced lung disease 612  
Peter van Luijk and Robert P. Coppes

Eosinophilic diseases 615  
Claire McBrien and Andrew Menzies-Gow

#### **14 - Pulmonary vascular diseases**

Pulmonary embolism 620  
Mariaelena Occhipinti and Massimo Pistolesi

Pulmonary hypertension 628  
Jason Weatherald and Marc Humbert

Pulmonary vasculitis 637  
George A. Margaritopoulos and Athol U. Wells

Arteriovenous malformations 646  
Camilla Poggi, Sara Mantovani, Daniele Diso, Jacopo Vannucci,  
Federico Venuta and Marco Anile

#### **15 - Diseases of the chest wall and respiratory muscles**

Chest wall disorders 649  
Pierre-Emmanuel Falcoz, Nicola Santelmo, Anne Olland and  
Gilbert Massard

Neuromuscular disorders and the diaphragm 653  
Michael I. Polkey and Anita K. Simonds



## **16 - Pleural and mediastinal diseases**

- Pleural effusion 660  
Robert Loddenkemper and Julius Janssen
- Pneumothorax and pneumomediastinum 666  
Julius Janssen
- Mediastinitis 671  
Pierre-Emmanuel Falcoz, Nicola Santelmo, Anne Olland and  
Gilbert Massard

## **17 - Respiratory consequences of systemic/extrapulmonary conditions**

- Pulmonary diseases in primary immunodeficiency syndromes 675  
Federica Pulvirenti, Cinzia Milito and Isabella Quinti
- HIV-related disease 681  
Marc C.I. Lipman and Robert F. Miller
- Cardiac disease 692  
Enrico Clini, Sara Roversi, Bianca Beghé and Leonardo M. Fabbri
- Gastrointestinal and liver disease 701  
Harald Farnik and Gernot Rohde
- Haematological diseases 707  
Anna Paola Iori
- Obesity 716  
Frits M.E. Franssen
- Connective tissue diseases 722  
Edoardo Rosato



**18 - Genetic disorders**

- Cystic fibrosis 727  
Marcello Di Paolo, Joseph Stuart Elborn and Paolo Palange
- Primary ciliary dyskinesia 740  
Jane S. Lucas and Woolf T. Walker
- $\alpha_1$ -antitrypsin deficiency 744  
Robert A. Stockley

**19 - Occupational diseases**

- Occupational diseases 748  
Johanna Feary and Paul Cullinan

**20 - Epidemiology, environment and lifestyle**

- Measuring the occurrence and causation of respiratory diseases 753  
Isabella Annesi-Maesano and Riccardo Pistelli
- Indoor and outdoor pollution 771  
Giovanni Viegi, Marzia Simoni, Sara Maio and Sandra Baldacci
- High altitude and diving-related diseases 779  
Yvonne Nussbaumer and Konrad E. Bloch