



# ERS | handbook

## Self-Assessment in Respiratory Medicine

3rd Edition

Editors  
Konrad E. Bloch  
with Thomas Brack and  
Silvia Ulrich

114  
questions and  
comments



ERS | handbook

# Self-Assessment in Respiratory Medicine

Editors

Konrad E. Bloch

with Thomas Brack and

Silvia Ulrich

## **PUBLISHED BY THE EUROPEAN RESPIRATORY SOCIETY**

### **EDITORS**

Konrad E. Bloch  
with Thomas Brack and Silvia Ulrich

### **AUTHORS AND REVIEWERS**

Charlotte Berlier	Maria Kokosi	Winfried Randerath
Konrad E. Bloch	Gabor Kovacs	Anthony E. Redington
Thomas Brack	Lisette Kunz	Christine Rüegg
Dragos Bumbacea	Yvonne Nussbaumer	Szymon Skoczyski
Maged Hassan	Alexis Papadopoulos	Guillermo Suárez-Cuartín
Georgios Kaltsakas	Andriana Papaioannou	Silvia Ulrich

### **ERS STAFF**

Alice Bartlett, Rachel Gozzard, Jonathan Hansen, Aimée Hill, Catherine Pumphrey

© 2022 European Respiratory Society

Design by Clarissa Charles and Claire Marchant, ERS  
Typeset in India by TechSet  
Printed in the UK by Page Bros. Group Ltd

All material is copyright to the European Respiratory Society.  
It may not be reproduced in any way including electronically without the express permission of the society.

#### **CONTACT, PERMISSIONS AND SALES REQUESTS:**

European Respiratory Society, 442 Glossop Road, Sheffield, S10 2PX, UK  
Tel: +44 114 2672860 Fax: +44 114 2665064 e-mail: [books@ersnet.org](mailto:books@ersnet.org)

**ISBN 978-1-84984-160-3**



# Table of contents

<b>Contributors</b>	<b>ii</b>
<b>Introduction</b>	<b>iv</b>
<b>How to use this book</b>	<b>vi</b>
<b>List of abbreviations</b>	<b>vii</b>
<b>Multiple Choice Questions with explanations</b>	<b>1</b>
<b>Index: the HERMES Syllabus in Respiratory Medicine</b>	<b>251</b>
<b>Blueprint of HERMES examination</b>	<b>255</b>

# Contributors

## Editors

Konrad E. Bloch  
Department of Respiratory Medicine,  
University Hospital Zurich  
Zurich, Switzerland  
konrad.bloch@usz.ch

Thomas Brack  
Internal and Pulmonary Medicine,  
Kantonsspital  
Glarus, Switzerland  
thomas.brack@ksagl.ch

Silvia Ulrich  
Department of Pulmonology,  
University and University Hospital of Zurich  
Zurich, Switzerland  
silvia.ulrich@usz.ch

## Authors and reviewers

Charlotte Berlier  
Stadtspital Zürich Waid,  
Klinik für Innere Medizin,  
Abteilung Pneumologie  
Zurich, Switzerland  
charlotte.berlier@stadtspital.ch  
*Questions 56, 101 and 111*

Konrad E. Bloch  
Department of Respiratory Medicine,  
University Hospital Zurich  
Zurich, Switzerland  
konrad.bloch@usz.ch  
*Questions 16, 20, 35, 38, 59, 61, 65, 68, 82 and 85*

Thomas Brack  
Internal and Pulmonary Medicine,  
Kantonsspital  
Glarus, Switzerland  
thomas.brack@ksagl.ch  
*Questions 10, 11, 25, 27, 37, 10, 13, 44, 52, 53, 57, 74, 90,  
95 and 113*

Dragos Bumbacea  
Department of Pneumology and Acute  
Respiratory Care, University of Medicine and  
Pharmacy "Carol Davila"  
Bucharest, Romania  
dragos.bumbacea@umfcd.ro  
*Questions 13, 32, 46, 47, 87, 97, 104 and 106*

Maged Hassan  
Chest Diseases Department,  
Alexandria University Faculty of Medicine  
Alexandria, Egypt  
magedhmf@gmail.com  
*Questions 5, 30, 51, 58, 62 and 88*

Georgios Kaltsakas  
Lane Fox Respiratory Service,  
Guy's and St Thomas' NHS Foundation Trust,  
and Centre of Human and Applied Physiological  
Sciences, Faculty of Life Sciences and Medicine  
King's College London, London, UK.  
Georgios.kaltsakas@gstt.nhs.uk  
*Questions 18, 77 and 103*

Maria Kokosi  
Interstitial Lung Disease Unit,  
Royal Brompton Hospital, Guy's and St Thomas'  
NHS Trust  
London, UK  
m.kokosi@rbht.nhs.uk  
*Questions 28, 36, 45 and 67*

Gabor Kovacs  
University Clinic for Internal Medicine,  
Medical University of Graz,  
Division of Pulmonology  
Graz, Austria  
Gabor.Kovacs@uniklinikum.kages.at  
*Question 109*

Lisette Kunz  
Haaglanden Medical Center  
The Hague, The Netherlands  
l.kunz@haaglandenmc.nl  
*Questions 24, 29, 41, 96 and 114*

Yvonne Nussbaumer  
Department of Internal Medicine and  
Pulmonary Medicine, Spitäler Schaffhausen  
Schaffhausen, Switzerland  
yvonne.nussbaumer@spitaeler-sh.ch  
*Questions 26, 34, 71, 75, 80 and 89*

Alexis Papadopoulos  
MedCare Clinic  
Nicosia, Cyprus  
drpapadopoulosa@gmail.com  
*Questions 31, 84, 110 and 112*

Andriana I. Papaioannou  
1st Respiratory Medicine Department,  
National and Kapodistrian University of  
Athens, Sotiria Chest Hospital  
Athens, Greece  
papaioannouandriana@gmail.com  
*Questions 15, 21, 49, 93 and 103*

Winfried Randerath  
Bethanien Hospital, Clinic of Pneumology  
and Allergology, Center for Sleep Medicine  
and Respiratory Care, and Institute of  
Pneumologie at the University of Cologne  
Cologne, Germany  
randerath@klinik-bethanien.de  
*Questions 2, 12, 22, 48, 54, 64, 69, 72, 107*

Anthony E. Redington  
East and North Hertfordshire NHS Trust,  
Lister Hospital  
Stevenage, UK  
redingtonae@gmail.com  
*Questions 1, 55, 66 and 78*

Christine Rüegg  
Department of Internal Medicine and  
Pulmonary Medicine, Spitäler Schaffhausen  
Schaffhausen, Switzerland  
Christine.Rueegg@usz.ch  
*Questions 7, 9, 33, 39, 60, 76, 92, 99, 105 and 108*

Szymon Skoczyński  
Department of Pneumology, Faculty of  
Medical Sciences in Katowice,  
Medical University of Silesia  
Katowice, Poland  
simon.mds@poczta.fm  
*Question 3*

Guillermo Suárez-Cuartín  
Respiratory Department, Bellvitge  
University Hospital and Bellvitge Biomedical  
Research Institute  
Barcelona, Spain  
gsuarezc@bellvitgehospital.cat  
*Questions 4, 6, 8, 17, 50, 70, 79, 81, 86 and 95*

Silvia Ulrich  
Department of Pulmonology, University and  
University Hospital of Zurich  
Zurich, Switzerland  
silvia.ulrich@usz.ch  
*Questions 14, 19, 23, 42, 63, 73, 83, 91, 98 and 110*

# Introduction

In recognition of the increasing demand for education and revalidation in respiratory medicine, the European Respiratory Society has initiated the 'Harmonised Education in Respiratory Medicine for European Specialists' (HERMES) project. It promotes highest standards of practice in the specialty and contributes to harmonisation of training across European countries and worldwide. The HERMES project has been implemented by the European Respiratory Society through a task force coordinating inputs from representatives of more than 52 countries. The knowledge and skills a European Respiratory Specialist should have (see the index to this book)<sup>1</sup> have been delineated<sup>2,3</sup> and updated<sup>4</sup>. Moreover, assessments and accreditation of training centres have been implemented<sup>5,6</sup>.

The European Examination in Adult Respiratory Medicine is a knowledge-based test based on multiple choice questions (MCQs) evaluating topics outlined in the European syllabus<sup>4</sup>. The MCQs are created by a panel of authors from various countries and settings, *i.e.* from academic centres, community hospitals and specialist practice. The authors undergo special training in order to produce valid questions. The HERMES examination committee evaluates each MCQ during workshops and selects those meeting high standards in terms of clinical relevance, unambiguous scientific accuracy and formal aspects. Only questions passing this evaluation are subsequently incorporated into examinations.

*Self-Assessment in Respiratory Medicine* is a collection of MCQs with answers and comments intended to be a companion to the ERS Handbook of Respiratory Medicine<sup>7</sup>, which contains a systematic and detailed discussion of topics relevant for the specialist in adult respiratory medicine. We are fully aware that many respiratory professionals at all levels from senior specialists to junior trainees wish to test their knowledge personally without necessarily embarking on the HERMES examination. The MCQ handbook meets that need in a constructive, didactic way. The broad range of topics is selected from the syllabus and the relative representation reflects the weights attributed by the examination committee to the different topics, according to clinical relevance and importance in specialist education as listed in the 'blueprint' (see appendix).

The current, third edition of the *Self-Assessment in Respiratory Medicine* contains a completely new selection of questions that have been prepared by experienced authors and have undergone a rigorous evaluation according to the principles outlined above. The majority of questions are introduced by a case vignette describing a clinical problem to be solved. The purpose is not merely to test the knowledge of facts (which could be looked-up in a text book or in the internet), but rather to evaluate the ability of a candidate to apply knowledge and critically weigh different options in a clinical context. Accordingly, the choice of answers often contains more than one reasonable alternative, from which the candidate has to select the most appropriate one. As a welcome change, other, short questions without vignette are interspersed to test specific knowledge in selected areas. The structured comments to each question discuss evidence in favour and against the various answers. Current literature references are provided for further reading.

We hope that all readers of this handbook will enjoy solving the problems presented in the case vignettes and questions, and benefit from assessing and refreshing their knowledge in respiratory medicine.

Konrad E. Bloch	Thomas Brack	Silvia Ulrich
Past Chair,	Past Member,	Past Chair,
ERS HERMES	ERS HERMES	ERS HERMES
Examination Committee	Examination Committee	Examination Committee

## References

1. Loddenkemper R, *et al.* HERMES: a European core syllabus in respiratory medicine. *Breathe* 2006; 3: 59–69.
2. Loddenkemper R, *et al.* European curriculum recommendations for training in adult respiratory medicine: crossing boundaries with HERMES. *Eur Respir J* 2008; 32: 538–540.
3. Loddenkemper R, *et al.* European curriculum recommendations for training in adult respiratory medicine. *Breathe* 2008; 5: 80–120.
4. Tabin N, *et al.* Update of the ERS international Adult Respiratory Medicine syllabus for postgraduate training. *Breathe* 2018; 14: 19–28.
5. Loddenkemper R, *et al.* Adult HERMES: criteria for accreditation of ERS European training centres in adult respiratory medicine. *Breathe* 2010; 7: 171–188.
6. Loddenkemper R, *et al.* Multiple choice and the only answer: the HERMES examination. *Breathe* 2008; 4: 244–246.
7. Palange P, *et al.* eds. ERS Handbook of Respiratory Medicine. 3rd Edn. Sheffield, European Respiratory Society, 2019.



# How to use this book

This handbook may be used in several ways: for self-assessment; to identify areas of strengths and weaknesses as a guide for further studies; and to refresh and update your knowledge in respiratory medicine. Those who wish to experience how it feels to undergo the HERMES examination may set themselves the challenge of solving 90 of the multiple-choice questions (MCQs) collected in this book within 3 hours. The answers should be recorded on a separate sheet of paper without looking up the comments on the back of each question page. Another way of using the book is to solve the MCQs step by step, reading the comments at your convenience. The literature references listed with the comments on the reverse of each MCQ allow further reading to obtain more in-depth information. Still another approach is to use the index to locate and solve MCQs according to a particular syllabus topic of interest in order to test and consolidate knowledge in a specific area.

The MCQs in this handbook are presented according to two different formats: In the single-choice MCQ, the reader is asked to select the only correct answer, or the most appropriate answer, from 5 options (alternatively, in negatively formulated questions, the only exception or incorrect statement or the least appropriate of 5 answers has to be selected). In the HERMES examination, a correct answer to this type of MCQ is awarded with 1 point. If more than one answer is marked on the answer sheet, 0 points are given. In the second format of MCQ, 4 answers or statements are listed and the reader must decide whether each one is correct (true) or incorrect (false). In the HERMES examination, 4 correct true/false decisions are awarded with 1 point, 3 correct true/false decisions are awarded with 0.5 points and fewer than 3 with 0 points.

# List of abbreviations

<b>AHI</b>	apnoea-hypopnoea index
<b>BMI</b>	body mass index
<b>COPD</b>	chronic obstructive pulmonary disease
<b>COVID-19</b>	coronavirus disease 2019
<b>CPAP</b>	continuous positive airway pressure
<b>CT</b>	computed tomography
<b>ECG</b>	electrocardiography
<b>FEV<sub>1</sub></b>	forced expiratory volume in 1 s
<b>FVC</b>	forced vital capacity
<b>HRCT</b>	high-resolution computed tomography
<b>Hb</b>	haemoglobin
<b><math>K_{CO}</math></b>	transfer coefficient of the lung for carbon monoxide (normalised for alveolar volume)
<b>MRI</b>	magnetic resonance imaging
<b>NIV</b>	noninvasive ventilation
<b>OSA(S)</b>	obstructive sleep apnoea (syndrome)
<b><math>P_{aCO_2}</math></b>	arterial carbon dioxide tension
<b><math>P_{aO_2}</math></b>	arterial oxygen tension
<b><math>P_{tcCO_2}</math></b>	transcutaneous carbon dioxide tension
<b><math>S_{aO_2}</math></b>	arterial oxygen saturation
<b>SARS-CoV-2</b>	severe acute respiratory syndrome coronavirus 2
<b><math>S_{pO_2}</math></b>	arterial oxygen saturation measured by pulse oximetry
<b>TLC</b>	total lung capacity
<b><math>T_{LCO}</math></b>	transfer factor of the lung for carbon monoxide
<b><math>V'_E</math></b>	minute ventilation