# Table of Contents

## Section A: Manual

1 **Introduction** ........................... 3  
   The Role of Medical Thoracoscopy/Pleuroscopy in Respiratory Medicine  3  
   History and Development of Thoracoscopy/ Pleuroscopy  4  
   Artificial Pneumothorax  4  
   Pleural Drainage  5  
   Introduction of Thoracoscopy as a Diagnostic Method  5  
   Use of Thoracoscopy for Diagnostic Purposes  7  
   Thoracoscopy as a Therapeutic Procedure in Tuberculosis (Jacobaeus Operation)  7  
   Thoracoscopy as a Therapeutic Tool in Nontuberculous Disease  10  
   Further Development of Thoracoscopy as an Important Diagnostic Tool  11  
   Development of Thoracoscopy for Minimally Invasive Thoracic Surgery (“Surgical Thoracoscopy”)  14

2 **Differences between Medical Thoracoscopy/ Pleuroscopy and Surgical Thoracoscopy/ Video-assisted Thoracic Surgery**  16  
   Video-assisted Thoracic Surgery (VATS)  16  
   General Approach to VATS Procedures  17  
   Anesthesia  18  
   Indications and Contraindications  18  
   Lung Procedures Performed with VATS  18  
   Lung Biopsy  18  
   Wedge Resection  18  
   Pulmonary Metastases  18  
   Lobectomy  19  
   Lung Volume Reduction Surgery  19  
   Pleural Procedures Performed with VATS  19  
   Treatment of Pneumothorax  19  
   Decortication  20  
   Esophageal Procedures Performed with VATS  20  
   Excision of Cysts and Benign Tumors  20  
   Anti-reflux Procedures  20  
   Esophagectomy  20  
   Mediastinal Procedures  20  
   Thymectomy  20  
   Thoracic Duct Ligation  20  
   Pericardial Window  20  
   Sympathectomy  21  
   Thoracic Lymphadenectomy  21  
   Cervical Mediastinoscopy versus VATS  21  
   Anterior Mediastinotomy versus VATS  21  
   Summary  21

3 **Indications for and Results of Medical Thoracoscopy/Pleuroscopy**  22  
   Management of Pleural Effusions  23  
   Diagnostic Approach  23  
   Malignant Pleural Effusions  25  
   Tuberculous Pleural Effusions  29  
   Parapneumonic Effusions and Pleural Empyema  31  
   Effusions of Other Origin  32  
   “Idiopathic” Pleural Effusions  33  
   Options in the Local Treatment of Pleural Effusions Including Thorascopic Talc Pleurodesis  35  
   The Place of Medical Thoracoscopy/Pleuroscopy in the Management of Pneumothorax  41  
   Primary Spontaneous Pneumothorax  42  
   Secondary Spontaneous Pneumothorax  44  
   Catamenial Pneumothorax  45  
   The Place of Medical Thoracoscopy/Pleuroscopy in the Diagnosis of Diffuse Lung Diseases  46  
   Medical Thoracoscopy/Pleuroscopy in Other Indications  48  
   Medical Thoracoscopic Sympathectomy  48  
   Splanchnicectomy  50  
   Pericardial Fenestration  50  
   Solitary Lung Lesions  51  
   Diseases in the Region of the Chest Wall, Diaphragm, and Thoracic Spine  51  
   Mediastinal Tumors  51  
   Postoperative Cavities  51

4 **Medical Thoracoscopy/Pleuroscopy in Children**  53

5 **Medical Thoracoscopy/Pleuroscopy in Animals**  54  
   Use for Diagnosis and Treatment in Animals  54  
   Use for Research in Animals  54  
   Use for Teaching of the Technique  54
6 Medical Thoracoscopy/Pleuroscopy in Research ........................... 56
Future Areas of Research .................................... 56

7 Clinical Prerequisites for Medical Thoracoscopy/Pleuroscopy ............. 57

8 Contraindications ........................................... 58

9 Complications and Their Prevention ................................ 60
Prethoracoscopic/Prepleuroscopic Complications ......................... 60
Air Embolism .................................................. 60
Hypersensitivity Reaction to Local Anesthetic .......................... 61
Complications during Medical Thoracoscopy/Pleuroscopy .................. 61
Pain ............................................................. 61
Hypoxemia ..................................................... 61
Hypoventilation ............................................... 61
Cardiac Arrhythmias .......................................... 61
Hypotension .................................................... 61
Hemorrhage .................................................... 61
Injury to Lung or Other Organs .................................. 61
Postthoracoscopic/Postpleuroscopic Complications ......................... 62
Reexpansion Pulmonary Edema .................................... 62
Pain ............................................................. 62
Postoperative Fever .......................................... 62
Wound Infection ............................................... 62
Empyema ......................................................... 62
Subcutaneous Emphysema ....................................... 62
Persisting Pneumothorax ........................................ 62
Prolonged Air Leakage ......................................... 62
Continuing Pleural Fluid Production/ Pleurodesis Failure ................. 63
Early Complications after Talc Pleurodesis ............................. 63
Late Complications after Talc Pleurodesis ............................... 63
Seeding of Chest Wall by Tumor Cells/ Implantation of Tumor Cells .. 63
Mortality .......................................................... 63
Summary .......................................................... 64

10 Knowledge and Skills Required ...................................... 65
Knowledge of Respiratory Diseases .................................. 65
Knowledge of Thoracic Anatomy ................................... 65
Knowledge of the Pathophysiology of the Pleura .......................... 67
Skills ............................................................... 67

11 Techniques of Medical Thoracoscopy/ Pleuroscopy .......................... 69
Endoscopy Room ............................................... 69
Sterile Conditions ............................................. 70
Patient Monitoring during the Procedure ................................ 71
Personnel ........................................................ 71
Equipment ....................................................... 71
Rigid Thoracoscopes .......................................... 72
The Semirigid (Semiflexible) Pleuroscope ................................ 73
Phases of Medical Thoracoscopy/Pleuroscopy ............................ 76
Patient Positioning ............................................. 76
Selecting the Point of Entry ..................................... 78
Point of Entry for Specific Localized Lesions .......................... 78
Techniques for Introduction of the Endoscope in Pleural Effusion, Pneumothorax, and Other Conditions ................................. 78
Access to the Pleural Space ..................................... 78
Anesthesia for Medical Thoracoscopy/ Pleuroscopy ....................... 84
Technique of Local Anesthesia ................................... 84
Additional Technical Suggestions .................................. 86
Performance of Rigid Thoracoscopy .................................. 86
Direct and Video-Controlled Inspection ................................ 88
Biopsy Techniques .............................................. 89
Stapled Wedge Resection ........................................ 91
Performance of Semirigid (Semiflexible) Pleuroscopy ..................... 92
Comparison of the Rigid and Semirigid Techniques ....................... 92
Evaluation of Specimens ........................................ 93
Technique of Thoracoscopic Talc Pleurodesis .......................... 93
Chest Tube Care .................................................. 95
Drainage Systems ............................................... 95
Assessment of Chest Tube Function .................................. 96
Chest Tube Removal ............................................. 98

12 Documentation ................................................ 99

13 Teaching Methods .............................................. 100
Suggestions for Learning the Technique ................................ 100
Section B: Atlas

14 Malignant Pleural Effusions due to Lung Cancer .......................... 103
15 Pleural Effusions due to Diffuse Malignant Mesothelioma and Asbestos-related Pleural Diseases ..................... 108
16 Malignant Pleural Effusions Secondary to Metastatic Neoplasms .............. 115
17 Pleural Effusions due to Malignant Lymphoma/Myeloproliferative Neoplasm ... 122
18 Tuberculous Pleural Effusions .......... 124
19 Pleural Effusions of Other Origin ........ 130
20 Pneumothorax .......................... 137
21 Diffuse Lung Diseases ............... 143
22 Other Indications ..................... 150
References .................................. 156
Subject Index ............................ 171