Peritoneal Dialysis – From Basic Concepts to Clinical Excellence
Contributions to Nephrology

Vol. 163

Series Editor

Claudio Ronco  Vicenza
Peritoneal Dialysis – From Basic Concepts to Clinical Excellence

Volume Editors

Claudio Ronco  Vicenza
Carlo Crepaldi  Vicenza
Dinna N. Cruz  Vicenza

22 figures and 32 tables, 2009
Contents

XI Preface
Ronco, C.; Crepaldi, C.; Cruz, D.N. (Vicenza)

Body Composition Monitoring in Peritoneal Dialysis

1 Application of Body Composition Monitoring to Peritoneal Dialysis Patients
Crepaldi, C.; Soni, S.; Chionh, C.Y. (Vicenza); Wabel, P. (Bad Homburg); Cruz, D.N.; Ronco, C. (Vicenza)

Fundamentals of Peritoneal Dialysis

7 Peritoneal Ultrafiltration: Physiology and Failure
Flessner, M.F. (Jackson, Miss.)

15 Long-Term Changes in Solute and Water Transport
Mushahar, L.; Lambie, M.; Tan, K.; John, B.; Davies, S.J. (Stoke on Trent)

22 Fluid Transport with Time on Peritoneal Dialysis: The Contribution of Free Water Transport and Solute Coupled Water Transport
Coester, A.M. (Amsterdam); Smit, W.; Struijk, D.G. (Amsterdam/Utrecht); Krediet, R.T. (Amsterdam)
## Biology of Peritoneal Membrane

### 27 Peritoneal Dialysis: A Biological Membrane with a Nonbiological Fluid
Witowski, J.; Jörres, A. (Berlin/Poznań)

### 35 Mechanisms of Cell Death during Peritoneal Dialysis
A Role for Osmotic and Oxidative Stress
Gotloib, L. (Afula)

### 45 Different Aspects of Peritoneal Damage: Fibrosis and Sclerosis
Garosi, G. (Siena)

### 54 Biological Markers in the Peritoneal Dialysate Effluent: Are They Useful

### Peritoneal Dialysis Solutions

### 60 Peritoneal Angiogenesis in Response to Dialysis Fluid
Rippe, B. (Lund)

### 67 Tailoring Peritoneal Dialysis Fluid for Optimal Acid-Base Targets
Feriani, M. (Mestre-Venezia)

### 74 Preservation and Modulation of Peritoneal Function
A Potential Role of Pyruvate and Betaine
Gotloib, L. (Afula)

### 82 How to Assess Peritoneal Transport: Which Test Should We Use?
Heimbürger, O. (Stockholm)

### Cardiovascular Aspects of Dialysis

### 90 Dry Body Weight and Ultrafiltration Targets in Peritoneal Dialysis
Krediet, R.T.; Smit, W.; Coester, A.M.; Struijk, D.G. (Amsterdam)

### 96 Acute Central Hemodynamic Effects of Peritoneal Dialysis
Van Biesen, W.; Pletinck, A.; Verbeke, F.; Vanholder, R. (Ghent)

### 102 Cardiovascular Complications in Peritoneal Dialysis Patients
Piraino, B. (Pittsburgh, Pa.)

### 110 Brain Natriuretic Peptide in Peritoneal Dialysis Patients
Haapio, M.; Honkanen, E. (Helsinki); Ronco, C. (Vicenza)
Inflammation and Nutrition

117 Metabolic Impact of Peritoneal Dialysis
Proença de Moraes, T.; Pecoits-Filho, R. (Curitiba)

124 Is Obesity Associated with a Survival Advantage in Patients Starting Peritoneal Dialysis?
de Mutsert, R.; Grootendorst, D.C.; Boeschoten, E.W.; Dekker, F.W.; Krediet, R.T. (Leiden)

132 Systemic and Local Inflammation in Peritoneal Dialysis: Mechanisms, Biomarkers and Effects on Outcome
Cordeiro, A.C. (Stockholm/Sao Paulo); Carrero, J.J. (Stockholm); Abensur, H. (Sao Paulo); Lindholm, B.; Stenvinkel, P. (Stockholm)

Adequacy in Peritoneal Dialysis: Kt/V and Beyond

140 How Should We Measure Peritoneal Dialysis Adequacy in the Clinic
Heimbürger, O. (Stockholm)

147 Adequacy of Peritoneal Dialysis: Beyond Small Solute Clearance
Goldberg, R.; Yalavarthy, R.; Teitelbaum, I. (Aurora, Colo.)

155 Importance of Residual Renal Function and Peritoneal Dialysis in Anuric Patients
Carvalho, M.J.; Rodrigues, A. (Porto)

Complications of Peritoneal Dialysis and Their Management

161 Insights on Peritoneal Dialysis-Related Infections
Piraino, B. (Pittsburgh, Pa.)

169 New Treatment Options and Protocols for Peritoneal Dialysis-Related Peritonitis
Furgeson, S.B.; Teitelbaum, I. (Aurora, Colo.)

177 Lipid Disorders, Statins and the Peritoneal Membrane
Heimbürger, O. (Stockholm)

183 Complications of the Peritoneal Access and Their Management
Campos, R.P.; Chula, D.C. (Curitiba); Riella, M.C. (Curitiba/Paraná)
Phosphate Balance in Peritoneal Dialysis Patients: Role of Ultrafiltration
Granja, C.A.; Juergensen, P.; Finkelstein, F.O. (New Haven, Conn.)

The Physiology of Vitamin D Receptor Activation
Valdivielso, J.M. (Lleida)

Importance of Vitamin D Receptor Activation in Clinical Practice

New Acquisitions in Therapy of Secondary Hyperparathyroidism in Chronic Kidney Disease and Peritoneal Dialysis Patients: Role of Vitamin D Receptor Activators

What Can We Learn from Registry Data on Peritoneal Dialysis Outcomes?
Lameire, N.; Van Biesen, W. (Ghent)

How to Persuade Peritoneal Dialysis – Skeptical Hemodialysis Fans
Rodrigues, A. (Porto)

How to Make Peritoneal Dialysis Affordable in Developing Countries
Abraham, G.; Khanna, P.; Mathew, M.; Pushpkala, P.; Mehotra, A.; Sairam, A.; Ali, A.A.M. (Chennai)

Peritoneal Dialysis and Renal Transplantation

Peritoneal Dialysis in Special Settings

Decision Making around Dialysis Options
Mooney, A. (Leeds)

Unplanned Start on Assisted Peritoneal Dialysis
Povlsen, J.V. (Aarhus N)
264 Peritoneal Dialysis in the Elderly
Brown, E.A. (London)

270 Peritoneal Dialysis in Developing Countries
Nayak, K.S.; Prabhu, M.V.; Sinoj, K.A.; Subhramanyam, S.V.; Sridhar, G. (Hyderabad)

278 Peritoneal Dialysis for Acute Kidney Injury: Techniques and Dose
Chionh, C.Y. (Vicenza/Singapore); Soni, S. (Vicenza/Hyderabad); Cruz, D.N.; Ronco, C. (Vicenza)

285 Cost Benefits of Peritoneal Dialysis in Specific Groups of Patients
Rodrigues, A. (Porto)

The Present and Future of Peritoneal Dialysis

292 Continuous Ambulatory Peritoneal Dialysis and Automated Peritoneal Dialysis: Are There Differences in Outcome?
Dell’Aquila, R.; Berlingò, G.; Pellanda, M.V.; Contestabile, A. (Bassano del Grappa)

300 The Wearable Artificial Kidney: Is Peritoneal Dialysis the Solution?
Ronco, C. (Vicenza)

306 What Will Be the Role of Industry in the Future?
Rutherford, P. (Zurich/Wrexham)

311 Role of the International Society for Peritoneal Dialysis (ISPD) in the Future of Peritoneal Dialysis
Lo, W.K. (Hong Kong)

320 Author Index
322 Subject Index
After more than 25 years the International Course on Peritoneal Dialysis of Vicenza has become a classic appointment for beginners and experts in the field of peritoneal dialysis. In 2009, the 18th edition is to be held once more in Vicenza with the classic format including basic principles as well as advanced studies and cutting-edge experimental reports. All these pieces of knowledge are included in this volume that, according to our tradition, is published in time for the conference.

Peritoneal dialysis represents more than ever an important approach to the therapy of chronic kidney disease. Its integration with other techniques in the therapy of uremia represents an important step in the optimization of the whole program of renal replacement therapy. Today’s clinical practice and basic research in the field of peritoneal dialysis seem to proceed in parallel, leading to a true translational research program for peritoneal dialysis. Clinical results from multicenter studies and physiological findings from experimental studies both contribute to a significant progress in the knowledge and to the safe and adequate application of peritoneal dialysis. All these aspects are discussed by leading experts in the field and their contributions in this volume will represent an important tool for the reader to become familiar with today’s art of peritoneal dialysis. Our thanks go to the authors for their efforts to convey their knowledge in a concise but complete text, and to Karger publishers for the efficient and competent publication of the present volume. This book, in conjunction with the previous volumes published in the series *Contribution to Nephrology*, represents an important source of
information for beginners and experts, basic scientists and clinical physicians, and students and investigators who want to have a true update on the current research and clinical practice in peritoneal dialysis.

Claudio Ronco, Vicenza  
Carlo Crepaldi, Vicenza  
Dinna N. Cruz, Vicenza