

CONTENTS

Volume 1

SECTION I

Normal Renal Function: Molecular, Cellular, Structural and Physiological Principles 1

CHAPTER 1

Embryology of the Kidney 3

Susan E. Quaggin • Jordan Kreidberg

CHAPTER 2

Anatomy of the Kidney 25

Kirsten M. Madsen • Søren Nielsen • C. Craig Tisher

CHAPTER 3

The Renal Circulations and Glomerular

Ultrafiltration 91

Rujun Gong • Lance D. Dworkin • Barry M. Brenner • David A. Maddox

CHAPTER 4

Metabolic Basis of Solute Transport 130

Bruce C. Kone

CHAPTER 5

Transport of Inorganic Solutes: Sodium, Chloride, Potassium, Magnesium, Calcium, and Phosphate 156

David B. Mount • Alan S. L. Yu

CHAPTER 6

Renal Handling of Organic Solutes 214

Orson W. Moe • Stephen H. Wright • Manuel Palacín

CHAPTER 7

Renal Acidification 248

L. Lee Hamm • Nazih L. Nakhoul

CHAPTER 8

Cell Biology of Vasopressin Action 280

Dennis Brown • Søren Nielsen

CHAPTER 9

Urine Concentration and Dilution 308

Mark A. Knepper • Jason D. Hoffert • Randall K. Packer • Robert A. Fenton

SECTION II

Integrated Control of Body Fluid Volume and Composition 331

CHAPTER 10

Vasoactive Peptides and the Kidney 333

Riccardo Candido • Louise M. Burrell •

Karin A. M. Jandeleit-Dahm • Mark E. Cooper

CHAPTER 11

Arachidonic Acid Metabolites and the Kidney 363

Raymond C. Harris, Jr. • Matthew D. Breyer

CHAPTER 12

Extracellular Fluid and Edema Formation 398

Karl L. Skorecki • Joseph Winaver • Zaid A. Abassi

CHAPTER 13

Disorders of Water Balance 459

Joseph G. Verbalis • Tomas Berl

CHAPTER 14

Disorders of Acid-Base Balance 505

Thomas D. DuBose, Jr.

CHAPTER 15

Disorders of Potassium Balance 547

David B. Mount • Kambiz Zandi-Nejad

CHAPTER 16

Disorders of Calcium, Magnesium, and Phosphate Balance 588

Martin R. Pollak • Alan S. L. Yu • Eric N. Taylor

SECTION III

Epidemiology and Risk Factors in Kidney Disease 613

CHAPTER 17

Epidemiology of Kidney Disease 615

Josef Coresh • Joseph A. Eustace

CHAPTER 18

Risk Factors and Kidney Disease 633

Vandana Menon • Mark J. Sarnak • Andrew S. Levey

CHAPTER 19

Nephron Endowment 654

Valerie A. Luyckx • Barry M. Brenner

CHAPTER 20

Gender and Kidney Disease 674

Joel Neugarten • Sharon R. Silbiger • Ladan Golestaneh

CHAPTER 21

Aging and Kidney Disease 681

Devasmita Choudhury • Moshe Levi

SECTION IV

Pathogenesis of Renal Disease 703

CHAPTER 22

Approach to the Patient with Kidney Disease 705

Ramesh Saxena • Robert D. Toto

CHAPTER 23

Laboratory Assessment of Kidney Disease: Clearance, Urinalysis, and Kidney Biopsy 724

Ajay K. Israni • Bertram L. Kasiske

CHAPTER 24

Interpretation of Electrolyte and Acid-Base Parameters in Blood and Urine 757

K. S. Kamel • M. R. Davids • S. H. Lin •
M. L. Halperin

CHAPTER 25

Adaptation to Nephron Loss 783

Maarten W. Taal • Barry M. Brenner

CHAPTER 26

Renal and Systemic Manifestations of Glomerular Disease 820

Sharon Anderson • Radko Komers •
Barry M. Brenner

CHAPTER 27

Diagnostic Kidney Imaging 839

William D. Boswell, Jr. • Hossein Jadvar •
Suzanne L. Palmer

CHAPTER 28

Interventional Nephrology 915

Ivan D. Maya • Michael Allon •
Souheil Saddekni • David G. Warnock

Disorders of Kidney Function 941

CHAPTER 29

Acute Kidney Injury 943

Michael R. Clarkson • John J. Friedewald •
Joseph A. Eustace • Hamid Rabb

CHAPTER 30

Primary Glomerular Disease 987

Patrick H. Nachman • J. Charles Jennette •
Ronald J. Falk

CHAPTER 31

Secondary Glomerular Disease 1067

Gerald B. Appel • Jai Radhakrishnan •
Vivette D'Agati

Volume 2

CHAPTER 32

Microvascular and Macrovascular Diseases of the Kidney 1147

Abbas A. Kanso • Nada M. Abou Hassan •
Kamal F. Badr

CHAPTER 33

Tubulointerstitial Diseases 1174

Giuseppe Remuzzi • Norberto Perico •
Marc E. De Broe

CHAPTER 34

Urinary Tract Infection, Pyelonephritis, and Reflux Nephropathy 1203

Nina E. Tolkoff-Rubin • Ramzi S. Cotran •
Robert H. Rubin

CHAPTER 35

Urinary Tract Obstruction 1239

Jørgen Frøkjaer • Mark L. Zeidel

CHAPTER 36

Diabetic Nephropathy 1265

Hans-Henrik Parving • Michael Mauer •
Eberhard Ritz

CHAPTER 37

Nephrolithiasis 1299

David A. Bushinsky • Fredric L. Coe •
Orson W. Moe

CHAPTER 38

Renal Neoplasia 1350

Eric Jonasch • Christopher G. Wood •
Michael B. Atkins

SECTION VI

Genetic Basis of Kidney Disease 1377

CHAPTER 39

Inherited Disorders of Podocyte Function 1379

Jochen Reiser • Martin R. Pollak

CHAPTER 40

Inherited Disorders of the Renal Tubule 1390

Alain Bonnardeaux • Daniel G. Bichet

CHAPTER 41

Cystic Diseases of the Kidney 1428

Vicente E. Torres • Jared J. Grantham

SECTION VII

Hypertension and the Kidney 1463

CHAPTER 42

Primary and Secondary Hypertension 1465

Jon D. Blumenfeld • John H. Laragh

CHAPTER 43

Renovascular Hypertension and Ischemic Nephropathy 1528

Stephen C. Textor

CHAPTER 44

Hypertension and Kidney Disease in Pregnancy 1567

Sharon E. Maynard • S. Ananth Karumanchi • Ravi Thadhani

CHAPTER 45

Antihypertensive Drugs 1596

Matthew R. Weir • Donna S. Hanes • David K. Klassen

CHAPTER 46

Diuretics 1646

David H. Ellison • Christopher S. Wilcox

SECTION VIII

The Consequences of Renal Failure 1679

CHAPTER 47

Pathophysiology of Uremia 1681

Timothy W. Meyer • Thomas H. Hostetter

CHAPTER 48

Cardiovascular Aspects of Chronic Kidney Disease 1697

Lawrence P. McMahon • Patrick S. Parfrey

CHAPTER 49

Hematologic Aspects of Kidney Disease 1728

Steven Fishbane

CHAPTER 50

Endocrine Aspects of Kidney Disease 1744

Ajay K. Singh • Jean Mulder • Biff F. Palmer

CHAPTER 51

Neurologic Aspects of Kidney Disease 1757

Allen I. Arieff

CHAPTER 52

Mineral Bone Disorders in Chronic Kidney Disease 1784

Sharon M. Moe • Stuart M. Sprague

SECTION IX

Conservative and Pharmacologic Management of Kidney Disease 1815

CHAPTER 53

Diet and Kidney Disease 1817

Gary C. Curhan • William E. Mitch

CHAPTER 54

Specific Pharmacologic Approaches to Clinical Renoprotection 1848

Gerjan Navis • Paul E. de Jong • Dick de Zeeuw

CHAPTER 55
Erythropoietin Therapy in Renal Disease and Renal Failure 1884

John C. Stivelman • Steven Fishbane •
Allen R. Nissenson

CHAPTER 56
Vitamin D, Calcimimetics, and Phosphate-Binders 1904
William G. Goodman • L. Darryl Quarles

CHAPTER 57
Prescribing Drugs in Kidney Disease 1930
Christopher W. McIntyre • Paul J. Owen

Invasive Therapy of Renal Failure 1955

CHAPTER 58
Hemodialysis 1957
Jonathan Himmelfarb • Peale Chuang •
Gerald Schulman

CHAPTER 59
Peritoneal Dialysis 2007
Ajay Sharma • Peter G. Blake

CHAPTER 60
Intensive Care Nephrology 2037
Matthew Dollins • Michael A. Kraus •
Bruce A. Molitoris

CHAPTER 61
Plasmapheresis 2071
Ernesto Sabath • Bradley M. Denker

CHAPTER 62
Extracorporeal Treatment of Poisoning 2081
James P. Smith • Ingrid J. Chang

SECTION XI

Renal Transplantation 2101

CHAPTER 63
Transplantation Immunobiology 2103
Anil Chandraker • John J. Iacomini •
Mohamed H. Sayegh

CHAPTER 64
Donor and Recipient Issues 2126
Hassan N. Ibrahim • Bertram L. Kasiske

CHAPTER 65
Clinical Management 2138
Colm C. Magee • Mohammed Javeed Ansari •
Edgar L. Milford

SECTION XII

Frontiers in Nephrology 2169

CHAPTER 66
Attaining Immunologic Tolerance in the Clinic 2171
Alan D. Salama • Mohamed H. Sayegh

CHAPTER 67

Xenotransplantation 2183

David H. Sachs • Jay A. Fishman

CHAPTER 68

Tissue Engineering and Regeneration 2199

Marc R. Hammerman

CHAPTER 69

Stem Cells in Renal Biology and

Medicine 2215

Israel Zelikovic • Karl L. Skorecki • Daniella Magen

CHAPTER 70

Genomics and Proteomics in

Nephrology 2228

Joseph V. Bonventre • Stephen I-Hong Hsu •

Bernardo C. Vidal, Jr. • Asher D. Schachter

Index i–Ixix