## CONTENTS

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>xv</td>
</tr>
<tr>
<td>Ajay K. Singh</td>
<td></td>
</tr>
<tr>
<td><strong>Epidemiology and Risk Factors for Chronic Kidney Disease</strong></td>
<td>419</td>
</tr>
<tr>
<td>William M. McClellan</td>
<td></td>
</tr>
<tr>
<td>Groups at high risk for increased prevalence of chronic kidney disease (CKD) include individuals with a family history of end-stage renal disease, diabetes, hypertension, and cardiovascular disease. Therapeutic interventions that delay or prevent progressive kidney disease are well established and incorporated into widely disseminated clinical practice guidelines. These interventions also reduce the risk of cardiovascular disease and should be regarded as essential components of care of CKD. Achieving high levels of medically appropriate care of CKD patients and reduction in risk of progression to end-stage renal disease may be delayed by barriers created by individual and regional poverty.</td>
<td></td>
</tr>
<tr>
<td><strong>The Familial Clustering of Renal Disease and Related Phenotypes</strong></td>
<td>447</td>
</tr>
<tr>
<td>Scott G. Satko and Barry I. Freedman</td>
<td></td>
</tr>
<tr>
<td>This article reviews the familial aggregation of chronic kidney diseases including end-stage renal disease and albuminuria, along with variation in glomerular filtration rate. In addition to environmental influences on the progression of nephropathy, epidemiologic evidence in support of the existence of renal failure susceptibility genes is presented.</td>
<td></td>
</tr>
<tr>
<td><strong>Measurement of Kidney Function</strong></td>
<td>457</td>
</tr>
<tr>
<td>Lesley A. Stevens and Andrew S. Levey</td>
<td></td>
</tr>
<tr>
<td>Accurate estimation of kidney function is central to the detection, evaluation, and treatment of chronic kidney disease (CKD). Glomerular filtration rate (GFR) is widely accepted as the best</td>
<td></td>
</tr>
</tbody>
</table>
overall measure of kidney function and as such it forms the basis of the definition and classification system for CKD. GFR cannot be measured directly in clinical practice and multiple methods are used to estimate GFR, all of which have their strengths and limitations. The current recommended method is to use estimating equations based on serum creatinine and which incorporate demographic and clinical variables.

Racial Disparities in the Optimal Delivery of Chronic Kidney Disease Care
Neil R. Powe and Michal L. Melamed

Ethnic minorities make up a disproportionate share of the end-stage renal disease (ESRD) population in the United States. The reasons for this include a concentration of biologic-clinical, sociodemographic, and behavioral risk factors for chronic kidney disease among certain racial and ethnic minorities. Behavioral factors including patient and provider interactions are not yet fully explored and may be central to the delivery of optimal care and prevention of ESRD in racial and ethnic minorities. More attention to understanding the clustering and reduction of these risk factors may help to arrest the continuing epidemic of ESRD in racial and ethnic minorities in the United States.

Strategies to Retard the Progression of Chronic Kidney Disease
Kambiz Zandi-Nejad and Barry M. Brenner

Chronic kidney disease (CKD) is a common and, in advanced cases, highly morbid disorder. The most severe form of CKD is end-stage renal disease (ESRD), in which the patient requires some form of renal replacement therapy to survive. The increasing incidence, prevalence, and costs of ESRD are major national health care concerns; interventions that may prevent or slow the progression of CKD toward ESRD are extremely important and the focus of this article.

Multiple Risk Factor Intervention in Chronic Kidney Disease: Management of Cardiac Disease in Chronic Kidney Disease Patients
Bryan M. Curtis, Adeera Levin, and Patrick S. Parfrey

This article describes the prevalence of chronic kidney disease (CKD), cardiovascular disease (CVD), and the relationship between CKD and CVD from both pathophysiologic and epidemiologic perspectives. Also explored are the management of CVD in patients with CKD, and the evidence base that supports the implementation of targeted multiple risk factors for CVD in CKD patients.
Etiology and Management of Hypertension in Chronic Kidney Disease
Martin J. Andersen and Rajiv Agarwal

The kidneys are vital in the pathogenesis of hypertension and are also pathologically affected by the presence of hypertension. The prevalence of hypertension in chronic kidney disease (CKD) depends on age, the severity of renal failure, and proteinuria. The intricate and inextricable relationship between CKD and hypertension seems to cause cardiovascular disease that has assumed epidemic proportions. This article discusses the etiology and treatment of hypertension in CKD so that it can be better controlled.

Complications of Chronic Kidney Disease: Anemia, Mineral Metabolism, and Cardiovascular Disease
Shona Pendse and Ajay K. Singh

This article focuses on the importance of three major complications of chronic kidney disease: (1) anemia, (2) calcium-phosphorous regulation and bone disease, and (3) cardiovascular risk profiling and treatment. The arguments for early and effective intervention have been amply made with respect to these three complications. Substantive trial data are sorely needed to provide the definitive evidence that effective treatment of these complications results in better outcomes.

Treatment of Acute Coronary Syndromes in Patients Who Have Chronic Kidney Disease
Rory O’Hanlon and Donal N. Reddan

Morbidity and mortality of chronic kidney disease (CKD) populations with acute coronary syndromes (ACS) remain high, yet best evidence with regard to management of ACS has typically excluded CKD populations. The authors have reviewed the literature with regard to each aspect of ACS management in patients with CKD and make some recommendations for management changes. More trials need to be performed that include CKD patients to determine best practice in this group.

Traditional and Nontraditional Cardiovascular Risk Factors in Chronic Kidney Disease
Panagiotis T. Vlagopoulos and Mark J. Sarnak

Chronic kidney disease (CKD) is a public health problem, with as many as 20 million individuals affected in the United States. Patients with CKD should be considered in the highest-risk group for development of cardiovascular disease, and aggressive treatment of traditional and nontraditional risk factors should be instituted. Additional randomized controlled trials are urgently needed to evaluate potential treatments in this population. This article
focuses attention on the major modifiable cardiovascular risk factors in CKD.

**Gender Differences in Hypertension and Kidney Disease** 613
Daisy Reyes, Susie Q. Lew, and Paul L. Kimmel

Gender differences in physiologic states and in disease are being investigated to understand the pathogenesis and pathophysiology of hypertension and nephropathy, which in turn may affect management and outcomes. This article reviews differences between the genders in hypertension, renal function, prevalence of renal disease, progression of renal disease, and end-stage renal disease, including renal transplantation.

**Calcium and Phosphorus Metabolism in Patients Who Have Chronic Kidney Disease** 631
William G. Goodman

Disturbances in calcium and phosphorus metabolism are almost invariable consequences of chronic kidney disease (CKD). Because the capacity to regulate calcium and phosphorus metabolism becomes compromised progressively as kidney function declines, calcium and phosphorus homeostasis is disrupted and serum calcium or phosphorus levels are perturbed in many patients with CKD. The level of interest in, and concerns about, abnormalities in calcium and phosphorus metabolism among patients with CKD has increased substantially in recent years. Strategies for clinical management are being revised, and recent recommendations differ substantially from those used previously with a renewed emphasis on safety.

**Drug Dosing in Chronic Kidney Disease** 649
Steven Gabardi and Stuart Abramson

Patients with chronic kidney disease (CKD) are at high risk for adverse drug reactions and drug-drug interactions. Renal dysfunction-induced changes in human pathophysiology regularly result in altered pharmacodynamics and medication handling of a number of pharmacologic agents. This article reviews these observed changes and discusses strategies for appropriate drug dosing in patients with renal insufficiency. Specific recommendations for drug dosing in CKD are also included for the following classes of medications: anticoagulants, antihypertensives, cardiac medications, hypoglycemics, analgesics, antimicrobials, and miscellaneous agents.

**Dyslipidemias in Patients Who Have Chronic Kidney Disease** 689
Kambiz Farbakhsh and Bertram L. Kasiske

Patients with chronic kidney disease (CKD) are at high risk for developing cardiovascular disease. Guidelines for managing
dyslipidemia suggest that CKD patients with low-density lipoprotein greater than or equal to 100 mg/dL (2.59 mmol/L) should be treated with diet and a statin. The guidelines also make it clear, however, that the evidence supporting treatment in CKD populations is lacking, and that additional placebo-controlled trials are needed. The high incidence of cardiovascular disease makes intensive monitoring and treatment of dyslipidemias in patients with CKD a reasonable clinical approach.

Executing Change in the Management of Chronic Kidney Disease: Perspectives on Guidelines and Practice 701
Adeera Levin and Lesley A. Stevens

New guidelines have been developed for the diagnosis, classification, and evaluation of chronic kidney disease (CKD). The challenge is to ensure that these recent advances in formalization of the classification system for CKD can be translated into actual changes in management of patients with CKD. There are multiple challenges that hinder the ability to change the management of CKD. This article identifies those challenges so that successful strategies to impact the care of this growing patient group can be developed.

Index 711