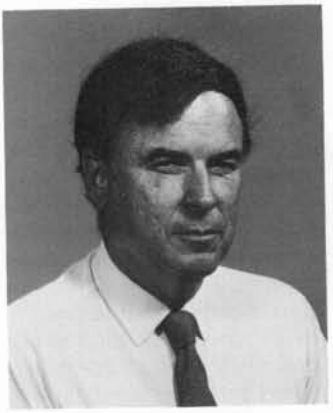
PREFACE



HARRY G. PREUSS, MD
Guest Editor

It is generally recognized that properly functioning kidneys are necessary for the well-being of humans and many other life forms. Without them, life, as we now know it, could never have existed. For life to have left the friendly confines of the sea from which many believe it originated, the hypothesis has been made that organisms had to develop kidneys in order to maintain their own internal sea through homeostatic regulation and urinary excretion. Accordingly, the functions of the kidneys include *regulation* of the interior milieu and *excretion* of toxic metabolites that arise from endogenous and exogenous sources. Many renal processes, which depend greatly on anatomic structure and physiologic principles, maintain tonicity, volume, acid-base balance, and chemical composition of the extracellular fluid. Last but not least, kidneys are also endocrine organs and provide an active form of vitamin D, erythropoietin, renin, and other vascular regulators, such as prostaglandins and kinins. The physician assessing renal function often uses all three parameters (regulatory, excretory, and hormonal) for evaluation.

Kidneys are unique in some respects compared with many other organs. First, because they are paired, there is great functional reserve. It follows that because only one is necessary for maintaining adequate functions, the possibility for a productive life continues even with the loss of significant functioning mass. Second, the production of urine with its ready accessibility often allows for assessment without the use of excessively intrusive examinations. Thus, evaluation of renal function can be based on many varied procedures, such as urinalysis, clearance, blood chemistries, imaging, and biopsy.

An attempt has been made to keep this text somewhat unique. Many texts approach nephrologic disorders from the disease process to the symptoms. This is in contrast to the practical approach, which reasons from the signs and symptoms to the disease. For the most part, the approach of this book confronts problems and their laboratory evaluation.

This volume covers a spectrum of nephrologic assessment. After a brief introduction to basic renal anatomy and physiology, the evaluation of urinalysis and urinary sediment by Geyer and proteinuria by Moore and Carome are discussed. This is followed by an article by Duarte and Preuss on estimating

renal function through blood analysis, with a concise discussion of clearance principles. Aside from the classic clearance procedures, quantitation of renal functions using radioisotope techniques is described by O'Malley and Zeissman. This is followed by an assessment of serologic evaluation of renal problems by McPherson. Nephrologists are well aware that it is often difficult to differentiate acute and chronic renal failure. Because the handling of each entity can differ, the article dealing with the differentiation is important. This effort is by Espinel who did much of the pioneer work on this subject. Zenser, Davis, DaVita, Michelis, Latta, Hisano, Chan, Bourke, Delaney, Yanagawa, Quamme, and myself have contributed articles covering various aspects of acid-base, mineral, and electrolyte balance. These articles include examining perturbations of H+, water, Na, K, Ca, P, and Mg. Specific topics, such as renal tubular acidosis by Lash and Arruda and renal stones by Zabetakis and DeVita, are included in this volume. Memon et al discuss prostaglandins, kinins, and Pb as they relate to renal function. Hurley and Lindeman have written unique articles on the assessment of renal function in pediatric and geriatric patients, respectively. Saito has described evaluation of the prostate. Because the kidneys are greatly involved in blood pressure regulation, an evaluation of elevated blood pressure by DiPette and Townsend is appropriately included. These overviews should give the reader a fairly complete reference text for evaluating many aspects of renal integrity.

During my stewardship of this volume, I received help in many forms. The guest editor wishes to acknowledge the aid of Ms. Susan Colaiezzi Short and Ms. Helaine Barron in developing this edition of the *Clinics in Laboratory Medicine*. I would also like to acknowledge the many authors who participated in the writing of the volume. Without their encouragement and cooperation, *Renal Functions* could not have been written.

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