

The upper urinary tract consists of the kidneys, their vasculature, and the renal parenchyma and its collecting system. The lower urinary tract is composed of the peristaltic ureters from each kidney, the bladder which receives and stores urine from each ureter, and the urethra which, upon bladder contraction, excretes the final urine. The excretory system as a whole begins with a plasma ultrafiltrate from renal cortical glomeruli, modified by the renal tubules of the nephron, and ends with the excretion of urinary water and solutes.

Disease can occur at any level of these functional structures with either no symptoms or signs (such as an incidental renal mass picked up on ultrasound); with nonspecific findings (such as fatigue); with signs highly specific for a syndrome of dysfunction referable to a structure, but not diagnostic of a particular disease (such as proteinuria); or with a finding highly characteristic of a specific diagnosis (such as polycystic kidney disease). Disorders of the kidney presenting without symptoms (such as invisible microhematuria or a stone) are often discovered by laboratory testing or imaging.

It is important to perform renal testing in patients with systemic disease (for example, routine screening for albuminuria in diabetes mellitus [DM]). Likewise, one should look at renal function when a patient's history includes known risk for renal or urinary tract complications (for example lithium for psychiatric treatment, occupational use of lead, or, in the case of bladder cancer, exposure to aniline dyes). This chapter will address an approach to patients with and without known history of kidney disease, as well as those who have one of a wide variety of systemic illnesses that involve the kidney or the lower urinary tract.

To begin with the evaluation of renal disorders, note that it is time-consuming and wasteful to do random testing prematurely,