



FIGURE 31-1 Common causes of acute kidney injury (AKI). AIN, Acute interstitial nephritis; ATN, acute tubular necrosis; CMV, cytomegalovirus; EBV, Epstein-Barr virus; GBM, glomerular basement membrane; GN, glomerulonephritis; GPA, granulomatosis with polyangiitis; H₂, histamine 2; HIV, human immunodeficiency virus; HUS, hemolytic uremic syndrome; MPA, microscopic polyangiitis; NSAIDs, nonsteroidal anti-inflammatory drugs; TTP, thrombotic thrombocytopenic purpura.

hyperplasia, patients with bladder dysfunction and certain malignancies. Intrinsic AKI may be due to a vascular process, glomerular disease, interstitial disease, or tubular injury. The most common intrinsic AKI is an entity known as *acute tubular necrosis* (ATN), or more recently *acute tubular injury* (ATI), which is histologically more accurate. This is a clinical syndrome characterized by an abrupt and sustained decline in GFR due to an acute ischemic injury, nephrotoxic insult, or a combination of both. The clinical recognition of ATN is based primarily on exclusion of prerenal and postrenal causes of AKI, as well as other causes of intrinsic AKI (glomerulonephritis [GN], acute interstitial nephritis [AIN], and vasculitis). Once other intrinsic causes of AKI are excluded, it is reasonable to conclude ATN is the cause or major contributor to AKI. Although the name *acute tubular necrosis* is not an entirely valid histologic description of the lesion,

the term will be utilized as it is part of the language of clinical medicine.

EPIDEMIOLOGY

AKI occurs more commonly in hospitalized patients as compared to the community setting. Community-acquired AKI defined by various step-wise increases in serum creatinine has an incidence of approximately 1%. Nearly half of the patients involve AKI superimposed on CKD. Prerenal AKI accounts for ~70% of cases, obstructive uropathy ~17%, and intrinsic AKI from various etiologies ~11% of the AKI cases. In contrast, hospital-acquired AKI has an incidence ranging from 4.9% to 7.2%. The incidence of AKI is higher in intensive care unit (ICU) admissions approximating 30%. CKD; older age and other co-morbidities are important risk factors for AKI. Prerenal AKI remains the most common