

(intravitreal injection) usually is successful in preserving vision. Aspirin therapy (up to 650 mg/d) does not appear to influence the natural history of diabetic retinopathy, and antiplatelet agents and anticoagulation may be continued in patients receiving intravitreal injections of anti-VEGF agents. Patients with severe proliferative retinopathy with vitreous hemorrhage and/or traction involving the macula often require surgical vitrectomy.

■ RENAL COMPLICATIONS OF DIABETES MELLITUS

Diabetic nephropathy is the leading cause of chronic kidney disease (CKD) and ESRD requiring renal replacement therapy. CKD in individuals with DM is associated with an increased risk of cardiovascular disease, and the prognosis of individuals with diabetes on dialysis is poor. Individuals with diabetic nephropathy commonly have diabetic retinopathy. The presence of CKD in individuals with DM and no retinopathy should prompt investigation for alternative causes of kidney disease.

Like other microvascular complications, the pathogenesis of diabetic nephropathy is related to chronic hyperglycemia. The mechanisms by which chronic hyperglycemia leads to diabetic nephropathy, although incompletely defined, involve the effects of soluble factors (growth factors, angiotensin II, endothelin, AGEs), hemodynamic alterations in the renal microcirculation (glomerular hyperfiltration or hyperperfusion, increased glomerular capillary pressure), and structural changes in the glomerulus (increased extracellular matrix, basement membrane thickening, mesangial expansion, fibrosis). Some of these effects may be mediated through angiotensin II and mineralocorticoid receptors. Smoking accelerates the decline in renal function. Because only 20–40% of patients with diabetes develop diabetic nephropathy, additional genetic or environmental susceptibility factors likely contribute. Known risk factors include a family history of diabetic nephropathy. Diabetic nephropathy and ESRD secondary to DM develop more commonly in blacks, Native Americans, and Hispanic individuals with diabetes.

The natural history of diabetic nephropathy is characterized by a sequence of events that was initially defined for individuals with type