FIGURE 308-3 Nephrotic syndrome. Different pathologic syndromes broken down into the idiopathic and secondary causes. 70% of primary membranous nephropathy (MN) is associated with antibodies to the integral subepithelial basement membrane antigen phospholipase A_2 receptor (PLA_2R). The former term for primary membrano-proliferative GN has been replaced by pathologic syndromes involving complement deposition (C3 glomerulopathy and dense-deposit disease in children). AL amyloid is the form of amyloidosis secondary to lambda light-chain deposition and SAA is the protein (serum amyloid A) associated with chronic inflammatory diseases such as rheumatoid arthritis, familial Mediterranean fever, and tuberculosis.

NS is a hypercatabolic state with negative nitrogen balance due to proximal tubule absorption and lysosomal catabolism exceeding hepatic albumin synthesis. A characteristic finding of rapid-onset hypoalbuminemia in NS is horizontal linear white lines in the nail bed, known as Muehrcke's lines. When NS in the adult occurs abruptly, with severe elevation of cholesterol, one must consider glomerular epithelial injury (podocytopathy), which may be idiopathic minimal change disease (MCD), a name historically based on the appearance of renal tissue on light microscopy and often preceded by an upper respiratory infection, allergies, or immunization. Secondary causes of MCD are Hodgkin's lymphoma or other lymphoproliferative disorders. MCD can occur at any age and in the adult may present with AKI as well, primarily because of the underlying vascular disease and hypoalbuminemia.

Age is important in the onset of NS, in that young children <6 years of age frequently have MCD. Several gene mutations encoding for proteins of the podocyte, such as nephrin (*NPHS1*) and podocin (*NPHS2*) in the slit diaphragm, have been shown to be responsible for most cases of hereditary nephrotic syndrome (see **Table 308-2**).

TABLE 308-2 Hereditary and Congenital Diseases