osmolality is >300 mosmol/L, a solute diuresis is clearly present and a search for the responsible solute(s) is mandatory.

Excessive filtration of a poorly reabsorbed solute such as glucose or mannitol can depress reabsorption of NaCl and water in the proximal tubule and lead to enhanced excretion in the urine. Poorly controlled diabetes mellitus with glucosuria is the most common cause of a solute diuresis, leading to volume depletion and serum hypertonicity. Since the urine sodium concentration is less than that of blood, more water than sodium is lost, causing hypernatremia and hypertonicity. Common iatrogenic solute diuresis occurs in association with mannitol administration, radiocontrast media, and high-protein feedings (enteral or parenteral), leading to increased urea production and excretion. Less commonly, excessive sodium loss may result from cystic renal diseases or Bartter's syndrome or may develop during a tubulointerstitial process (such as resolving ATN). In these so-called salt-wasting disorders, the tubule damage results in direct impairment of sodium reabsorption and indirectly reduces the responsiveness of the tubule to aldosterone. Usually, the sodium losses are mild, and the obligatory urine output is <2 L/d; resolving ATN and postobstructive diuresis are exceptions and may be associated with significant natriuresis and polyuria.

Formation of large volumes of dilute urine is usually due to polydipsic states or diabetes insipidus. Primary polydipsia can result from habit, psychiatric disorders, neurologic lesions, or medications. During deliberate polydipsia, extracellular fluid volume is normal or expanded and plasma vasopressin levels are reduced because serum osmolality tends to be near the lower limits of normal. Urine osmolality is also maximally dilute at 50 mosmol/L.

Central diabetes insipidus may be idiopathic in origin or secondary to a variety of conditions, including hypophysectomy, trauma, neoplastic, inflammatory, vascular, or infectious hypothalamic diseases. Idiopathic central diabetes insipidus is associated with selective destruction of the vasopressin-secreting neurons in the supraoptic and paraventricular nuclei and can either be inherited as an autosomal dominant trait or occur spontaneously. Nephrogenic diabetes insipidus can occur in a variety of clinical situations, as summarized in Fig. 61-4.

A plasma vasopressin level is recommended as the best method for distinguishing between central and nephrogenic diabetes insipidus. Alternatively, a water deprivation test plus exogenous vasopressin may distinguish primary polydipsia from central and nephrogenic diabetes insipidus. **For a detailed discussion, see Chap. 404.**