

phallus. Fusion of the labia produces a saclike structure resembling the scrotum without testes. However, no abnormal changes occur in the internal sexual organs, although the vaginal orifice is usually closed by the fused labia. The label *ambiguous genitalia* should be applied to any infant with hypospadias or micropenis and no palpable gonads, and a diagnostic evaluation for CAH should be contemplated ([Gardner and Shoback, 2011](#)).

Increased pigmentation of skin creases and genitalia caused by increased ACTH may be a subtle sign of adrenal insufficiency. A salt-wasting crisis frequently occurs, usually within the first few weeks of life ([White, 2016a](#)). Infants fail to gain weight, and hyponatremia and hyperkalemia may be significant. Cardiac arrest can occur.

Untreated CAH results in early sexual maturation, with enlargement of the external sexual organs; development of axillary, pubic, and facial hair; deepening of the voice; acne; and a marked increase in musculature with changes toward an adult male physique. However, in contrast to precocious puberty, breasts do not develop in girls, and they remain amenorrheic and infertile. In boys, the testes remain small, and spermatogenesis does not occur. In both sexes, linear growth is accelerated, and epiphyseal closure is premature, resulting in short stature by the end of puberty.

Diagnostic Evaluation

Clinical diagnosis is initially based on congenital abnormalities that lead to difficulty in assigning sex to the newborn and on signs and symptoms of adrenal insufficiency. Newborn screening is currently done in all 50 states by measurement of the cortisol precursor 17-hydroxyprogesterone. Definitive diagnosis is confirmed by evidence of increased 17-ketosteroid levels in most types of CAH ([Kaye, Committee on Genetics, Accurso, et al, 2006](#)). In complete 21-hydroxylase deficiency, blood electrolytes demonstrate loss of sodium and chloride and elevation of potassium. In older children, bone age is advanced, and linear growth is increased. Deoxyribonucleic acid (DNA) analysis for positive sex determination and to rule out any other genetic abnormality (e.g., Turner syndrome) is always done in any case of ambiguous genitalia.

Another test that can be used to visualize the presence of pelvic