

The first pubescent changes in boys are testicular enlargement accompanied by thinning, reddening, and increased looseness of the scrotum (Fig. 15-3). These events usually occur between $9\frac{1}{2}$ and 14 years old. Early puberty is also characterized by the initial appearance of pubic hair. Penile enlargement begins, and testicular enlargement and pubic hair growth continue throughout mid-puberty. During this period, there is also increasing muscularity, early voice changes, and development of early facial hair. Temporary breast enlargement and tenderness, **gynecomastia**, are common during early to mid-puberty, occurring in up to 70% of boys (Ali and Donohoue, 2016). The spurts in height and weight occur concurrently toward the end of mid-puberty. For most boys, breast enlargement disappears within 2 years; however, gynecomastia may persist in obese individuals. By late puberty, there is a definite increase in the length and width of the penis, testicular enlargement continues, and first ejaculation occurs. Axillary hair develops, and facial hair extends to cover the anterior neck. Final voice changes occur secondary to the growth of the larynx. Concerns about **pubertal delay** should be considered for boys who exhibit no enlargement of the testes or scrotal changes by 14 years old (Villanueva and Argente, 2014).

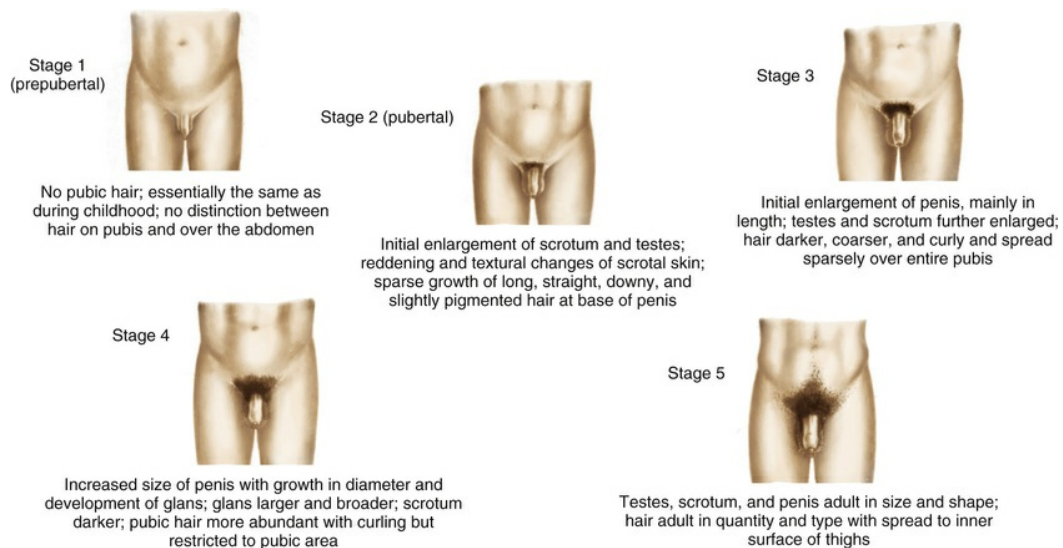


FIG 15-3 Developmental stages of secondary sex characteristics and genital development in boys. (Modified

from Marshall WA, Tanner JM: Variations in pattern of pubertal changes in boys, *Arch Dis Child* 45[239]:13-23, 1970; and Daniel WA, Paulshock BZ: A physician's