

## **MALE PUBERTY**

**Secondary sexual development in boys which occurs at a mean age of 12 yrs:**

**a testicular volume of 4 ml or a longitudinal diameter greater than or equal to 2.5 cm and a slight progressive increase in scrotal folds and pigmentation constitute the first signs of puberty**

. Puberty is considered precocious when typical sex secondary characteristics occur prior to 9 yrs of age.

HH nel maschio: inizio ritardato della puberta' o progressione assente o stentata

Presenza di microfallo o criptorchidismo

# Normal Pubertal Milestones

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## **Females:**

**Breasts: age 9-11**

**Pubic hair: 8-9**

**Growth spurt: 12**

**Menses: age 12**

## **Males:**

**Testes: age 10-11**

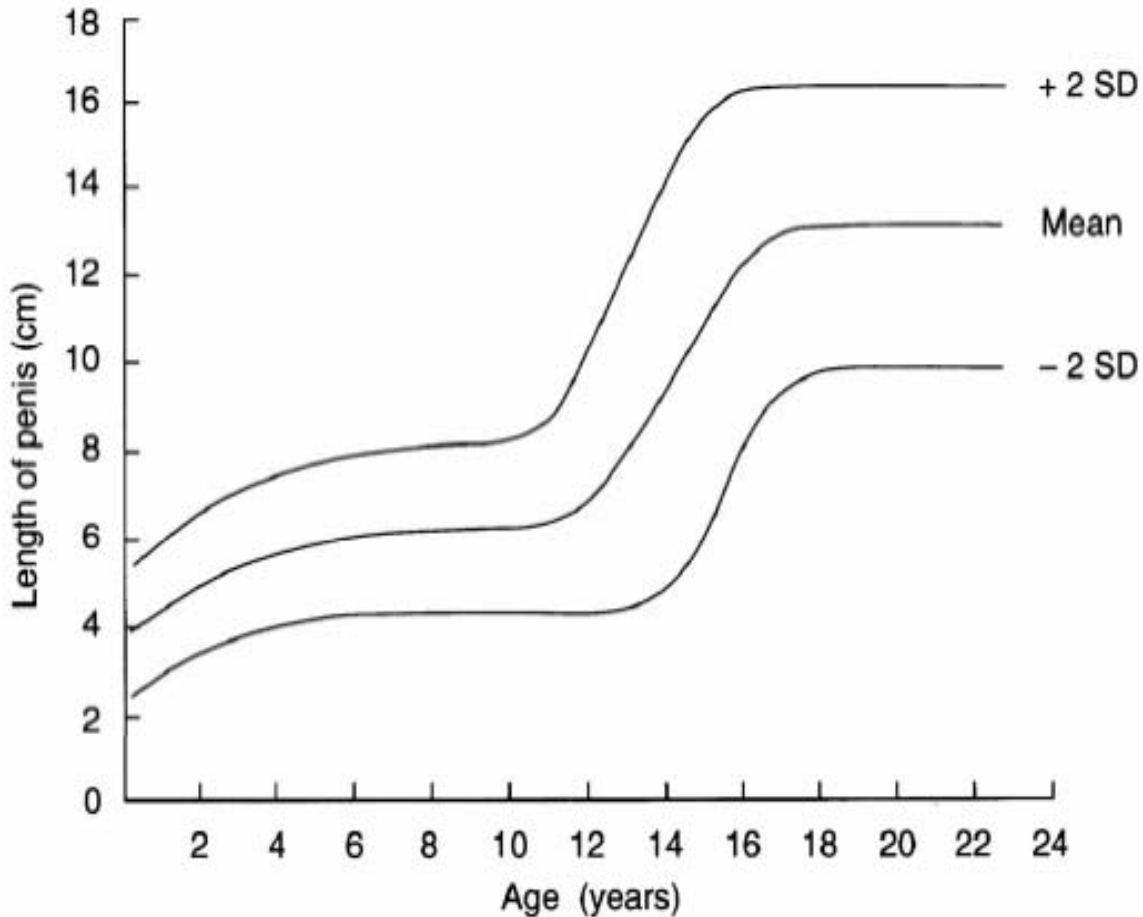
**Pubic hair: 10-11**

**Penile growth: 13**

**Growth spurt: 14**

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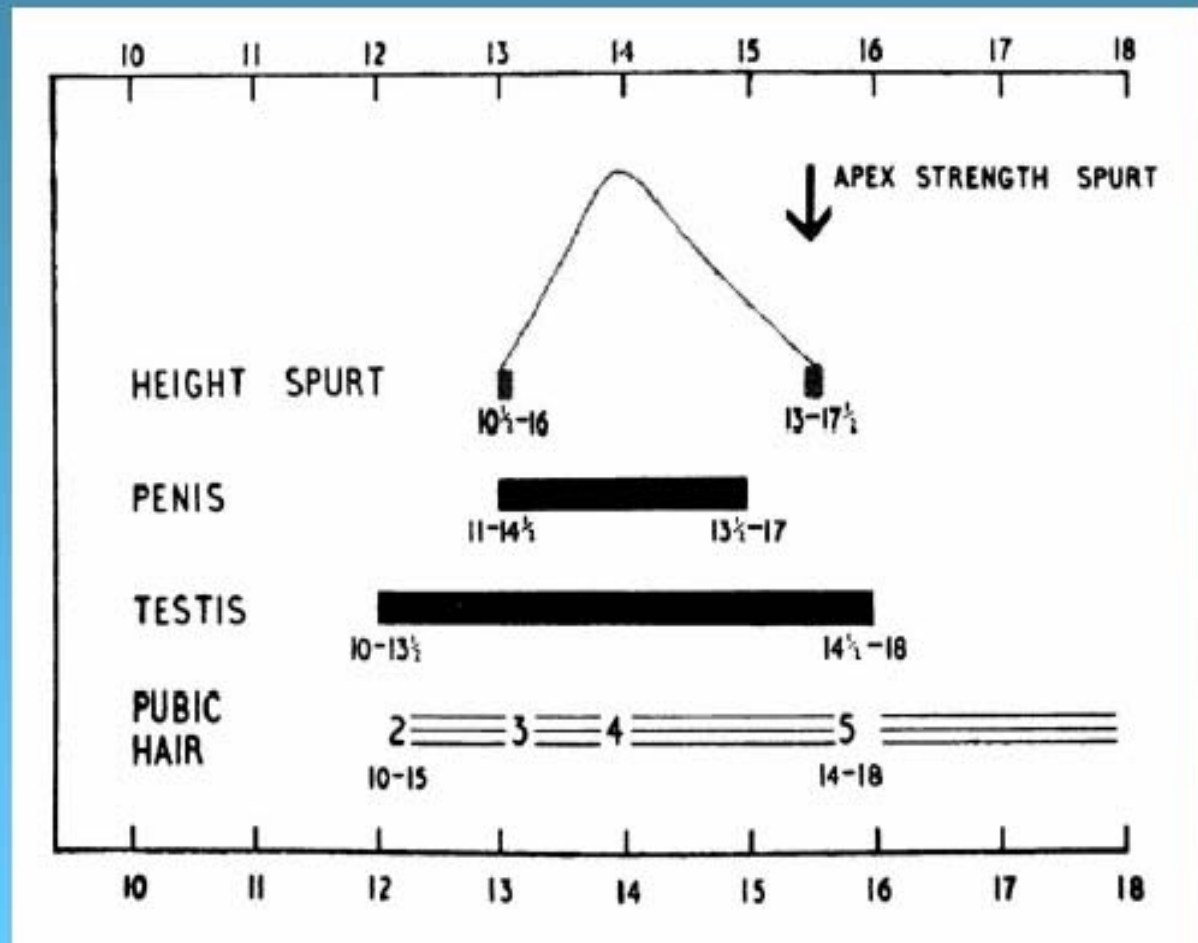
# PENILE GROWTH



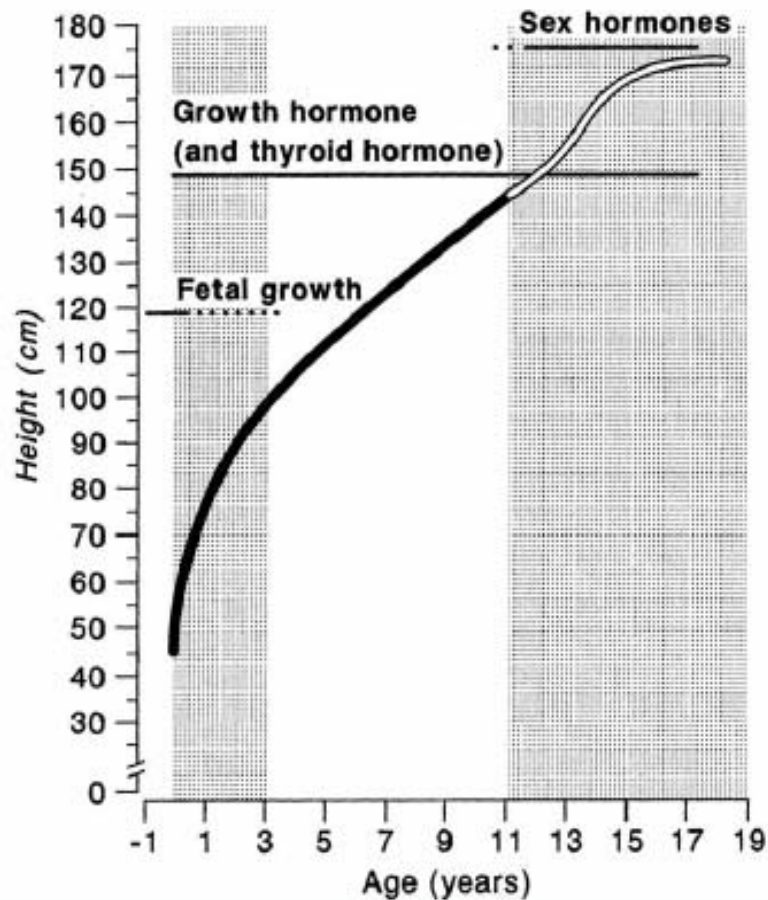
From Schonfeld WA. Am J Dis Child 1943.

# SECONDARY SEX CHARACTERISTICS

Male



# PUBERTAL GROWTH SPURT



From Grumbach MM et al.  
Williams Textbook of  
Endocrinology 10th  
edition.



# HORMONAL CHANGES:

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## Gonadotropins 3

In **boys**, a significant increase in both plasma FSH and LH is also found from the onset of puberty (stage P2), closely linked to the rapid increase in testicular size characteristic of this pubertal stage. A further significant increase in circulating gonadotropins is also observed at late puberty (stages P4 and P5).

# HORMONAL CHANGES:

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## Adrenal Steroids 2

In **boys**, DHEA and DHEAS increase as early as 8 to 9 years of age, followed by androstenedione 1 to 2 years later. Adrenarche begins before the rise in gonadotropin secretion. The adrenal androgens are responsible for the appearance of axillary hair and, in part, for the appearance of pubic hair in the adolescent; however they do not appear to play a decisive role in determining the initiation of puberty.



# HORMONAL CHANGES

