



Definition: Premature onset of secondary sexual characteristics

- Males: < 9 years of age
- Females: < 8 years of age

Central Precocious Puberty (CPP) – **GnRH dependent**

Peripheral Precocious Puberty (PPP) – **GnRH independent**

PRESENTATION

HISTORY

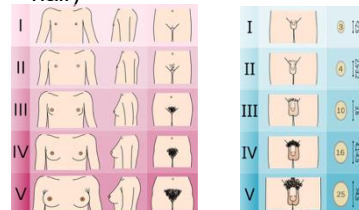
- Age of onset
- Progression and rate of pubertal changes
- Family history (including parents' timing of puberty and heights)
- Exogenous hormones

- Rapid growth rate: **CPP/PPP (increased sex steroids)**
- Early menarche: **CPP, ovarian lesion**
- Neurologic symptoms: **CNS lesion**

PHYSICAL EXAM

Sexual Maturity Rating 2+

- Thelarche in girls
- Testicular volume >3mL in boys
- Adrenarche (pubic hair, axillary hair)



INVESTIGATIONS

- Mid-parental height
- Bone age (typically advanced in pathologic causes)
- LH/FSH (gonadotropin dependent vs independent)
- Estradiol/Testosterone
- GnRH stimulation test (for CPP)
- Pelvic/testes US (for tumors, cysts, etc.)
- Brain MRI (for CNS lesions causing CPP)
- Serum DHEAS, 17-OH progesterone (rule out adrenal causes – CAH, adrenal tumors)

Brain MRI in CPP for all boys, girls <6 years, CNS symptoms



BENIGN MIMICS

- **Benign premature thelarche** (before 2 years of age, self-resolving)
- **Benign premature adrenarche** (pubic hair and/or axillary hair development, mature body odour; *can be associated with PCOS, insulin resistance)
- **Isolated premature menarche** (with absent or minimal breast development – vaginal foreign bodies, tumors of genital tract, ovarian cysts; *be aware this can also be associated with *potential sexual abuse*)



Central Precocious Puberty

↑ LH/FSH



Peripheral Precocious Puberty

↓ LH/FSH



DIFFERENTIAL DIAGNOSIS

- Idiopathic (most common cause in **girls**)
- CNS lesions (most common cause in **boys**)
 - E.g., hypothalamic hamartoma, hydrocephalus



- Excessive androgen production – **congenital adrenal hyperplasia (CAH)**, androgen producing tumors (adrenal/gonadal)
- Ovarian cyst, ovarian tumor
- McCune-Albright syndrome, Testotoxicosis
- Exogenous estrogen/androgen exposure

MANAGEMENT

- If idiopathic and slowly progressive – observation
- Rapid progression can result in short adult stature – consider GnRH agonists to suppress puberty
- Lesion management (surgery, radiation, etc.)
- Manage psychosocial concerns

- GnRH agonists will not be effective – must treat underlying cause (i.e., glucocorticoids for CAH, surgical resection/radiation for masses, removing exogenous exposures)
- Manage psychosocial concerns

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