

## Pubertal Development: Review Questions

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### QUESTIONS

Choose the single best answer for each question.

- Which of the following is the first physical change associated with puberty in girls?**
  - Areolar elevation
  - Breast budding
  - Height spurt
  - Menarche
  - Pubic hair development
- A 16-year-old girl visits her physician out of concern that she has not yet begun menstruating. Each of the following should be considered in the differential diagnosis EXCEPT:**
  - Constitutional delay
  - McCune-Albright syndrome
  - Pregnancy
  - Prolactinoma
  - Turner's syndrome
- A 13-year-old girl has light downy pubic hair along her labia. This finding is most consistent with which Tanner stage of puberty?**
  - I
  - II
  - III
  - IV
  - V
- Which of the following is the first physical change associated with puberty in boys?**
  - Height spurt
  - Penile lengthening
  - Pubic hair development
  - Spermarche
  - Testicular enlargement
- A 3-year-old girl has bilateral breast buds. Performing which of the following will be most useful in assessing this patient?**
  - Bone age determination
  - Breast biopsy
  - Karyotype analysis
  - Luteinizing hormone level measurement
  - Pelvic examination

*(turn page for answers)*

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### EXPLANATION OF ANSWERS

1. **(B) Breast budding.** Breast buds, which develop on average at age 11.2 years, are the first physical sign of puberty in approximately 90% of girls. Pubic hair development generally follows shortly thereafter, closely followed by a height spurt. Areolar elevation, which is the hallmark of Tanner stage IV breast development, and menarche are both late pubertal events.
2. **(B) McCune-Albright syndrome.** McCune-Albright syndrome is characterized by café au lait spots, polyostotic fibrous dysplasia, and recurrent ovarian cysts; affected patients often have premature, not delayed, onset of menses. The most common cause of delayed menarche (ie, occurring after age 16 years with previous development of other secondary sexual characteristics or after age 14 years without development of other secondary sexual characteristics) is constitutional delay. This is often associated with a family history of later onset of menses. Pregnancy should always be considered in the evaluation of an adolescent with amenorrhea, regardless of whether it is primary or secondary. Prolactin-secreting tumors, which may present with or without galactorrhea, more commonly cause amenorrhea than complete lack of pubertal development. Turner's syndrome should be considered in girls with other suggestive physical characteristics, especially short stature.
3. **(B) II.** Tanner stage I is marked by the absence of pubic hair. Tanner stage II is characterized by light downy hair along the labia. In Tanner stage III, pubic hair becomes coarser, darker, and curlier, extending away from the midline. A triangular adult distribution is present in Tanner stage IV, and Tanner stage V has a similar distribution with spread to the medial thighs.
4. **(E) Testicular enlargement.** Testicular enlargement, which begins on average at age 11.6 years, is the first physical sign of puberty in approximately 98% of

boys. Pubic hair development and then penile lengthening closely follow. The timing of spermarche is widely variable, but it occurs on average at Tanner stage II–III. In contrast to girls, in whom a height spurt is an early pubertal event, the height spurt in boys is a late pubertal event and generally lasts longer than in girls. For this reason, boys generally are shorter than girls early in development but catch up and ultimately surpass them in final adult height.

5. **(A) Bone age determination.** Premature thelarche, or the isolated onset of breast development, is most commonly seen before age 4 years in girls. Although this finding can represent the beginning of precocious puberty, puberty in most affected girls does not progress, and the remainder of pubertal development occurs at a normal age. Although the majority of cases are idiopathic, an assessment of whether the child has ingested any estrogen-containing medication can occasionally reveal a potential cause. A bone age determination will help rule out accelerated growth that may be associated with more serious conditions. Pelvic examination and breast biopsy are contraindicated—pelvic examination because of the potential trauma involved (pelvic ultrasound may be considered if indicated) and biopsy because of the potential damage to the breast bud which could prevent future breast development. Luteinizing hormone level is generally normal in these patients, although an elevated follicle-stimulating hormone level is occasionally seen. Karyotype analysis is not generally useful in determining the diagnosis.

### SUGGESTED READINGS

Emans SJH, Laufer MR, Goldstein DP, editors. *Pediatric and adolescent gynecology*. 4th ed. Philadelphia: Lippincott-Raven; 1998.

Neinstein LS, editor. *Adolescent health care: a practical guide*. 3rd ed. Baltimore: Williams & Wilkins; 1996.

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