

Indian Academy of Pediatrics (IAP)



GUIDELINES FOR PARENTS

Attainment of Puberty

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10 FAQs on ATTAINMENT OF PUBERTY

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2. My 8-year-old son has started developing a moustache? What should I do?
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Under the Auspices of the IAP Action Plan 2020–2021

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Attainment of Puberty

Q1

My daughter is 7 years old and has started breast development. Is this a cause of concern?

Puberty usually starts around 10 years in a girl (range 8–13 years). Breast enlargement is the first sign of puberty, followed by pubic hair growth (**Table 1 and Fig. 1**). Any development before the age of 8 years is, therefore, significant. Please visit the doctor who would assess her for growth, pubertal status, and order the required tests such as bone age assessment, hormones, and ultrasound of pelvis.

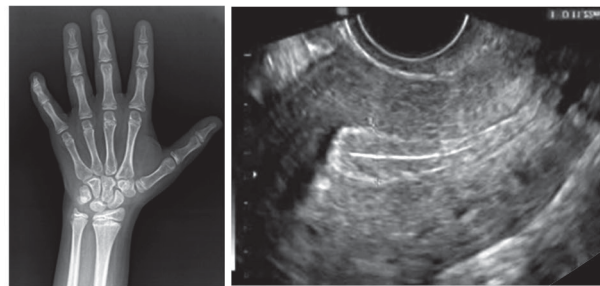
TABLE 1: Time frame of pubertal development.

Category	Normal	Early	Late
Breast development	10–11.5 years	8 years	13 years
Pubic hair growth	10–11.5 years	8 years	13 years
Periods	11–13 years	9.5 years	15 years
Testicular enlargement	11–13 years	9 years	14 years

- The main concern in the girl is likelihood of early periods, along with height and psychosocial effects.
 - Periods usually occur 2 years after breast development but may occur earlier in precocious puberty. Some girls with early puberty might have a longer gap between breast development and periods and may not need treatment.



Growth Acceleration



Bone Age Advancement

Ultrasound

Fig. 1: Pointers of early puberty in girls.

- Girls with early puberty are tall for age but have disproportionately greater bone age. A girl stops growing after a bone age of 14 years. Precocious puberty thus causes premature epiphyseal closure affecting height.
- Girls with early puberty may be emotionally and socially immature, causing confusion, awkwardness, and embarrassment. This affects their behavior causing low self-esteem and making them vulnerable to exploitation.
- The tests are guided by the age and rapidity of pubertal progress. An X-ray of the left hand and wrist to assess bone age determine the rate of pubertal advancement. If bone age is advanced as per the age, an extensive evaluation is not required. A close follow-up will, however, remain essential.

Q2

**My 8-year-old son has started developing a moustache?
What should I do?**

Puberty in boys usually starts around 12 years of age with a range of 9.5–14 years. An increase in the testis size is the first sign, followed by pubic and facial hair growth (**Fig. 2**). Any development before 9.5 years is significant and requires evaluation.

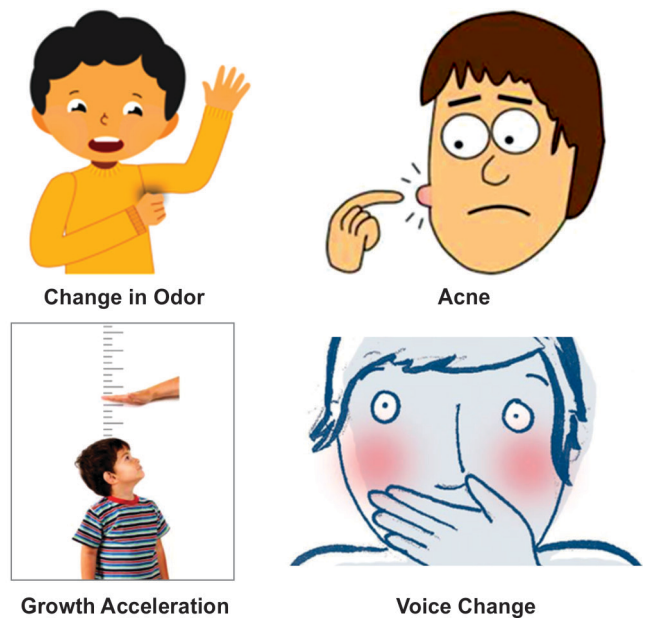


Fig. 2: Pointers of early puberty in boys.

- The main concerns of early puberty in boys include the risk of a severe underlying disease, growth, and psychosocial problems. Boys have more advanced puberty with a greater effect on the height than girls.

Q3

What are the causes of early puberty? How is it managed?

- Increased hormonal production by the pituitary or gonads (testis and ovaries) causes early puberty. Most girls with precocious puberty (over 90%) have a trigger of puberty without a disorder. Rarely, they may have some brain involvement issue, ovarian cysts, or thyroid disorders. The chance of disease is higher in boys (50%) and includes the brain, adrenal, and testicular disorders. Brain tumors are rare causes of early puberty but should be considered, if there are headaches and vomiting.
- The most critical aspect of evaluation is confirmation of early puberty. This is especially important in overweight girls, as increased fat gives an appearance of breast development (lipomastia). After the confirmation of puberty, the doctor would order a bone age X-ray and blood tests to find the cause. MRI of the brain, along with CT/ultrasound of the abdomen, may also be needed in some.
- The treatment is given to withhold puberty to slow bone age progression and increase final height. Safe and effective injections are available for central precocious puberty that are given 4 or 12 weekly till 10–11 years in girls and 11–12 years in boys.

Q4

My daughter is 16 years old but has not shown any physical development? What should I do?

- Lack of breast development by 13 years of age (or periods by 16 years) should prompt evaluation.
- Delayed puberty in girls may be due to defects in the pituitary or ovaries, poor nutrition, or systemic diseases.
 - The most common cause of delayed puberty in girls is a constitutional delay in growth and puberty (30%) due to the immaturity of the puberty center. These girls achieve normal development over time.
 - Defects in the pituitary brain center (hypothalamus and pituitary, tumor, infection, injury, and radiation) or ovaries (Turner's syndrome, radiation, and immune cause) may also cause delayed puberty in girls.
 - Undernutrition and systemic illness (celiac disease, kidney, heart, and liver failure) are also important causes of delayed puberty in girls.
- Delayed puberty has a significant impact on bone growth and psychosocial adaptation.
 - Girls with delayed puberty are short, leading to school bullying. Lack of hormone affects reduced bone formation causing low bone mass and osteoporosis in adulthood.
 - Delayed puberty affects interpersonal relationships, disturbing psychological adjustment.
 - Delayed or suboptimal treatment of delayed puberty may affect fertility.

Q5

My son is now 18 years old with no beard? What to do?

- No pubertal development (testicular or pubic hair growth) after 14 years of age suggests delayed puberty and needs evaluation by a doctor.
- Delayed puberty in boys can be due to problems in the brain and testis. Any long-standing disease may also delay puberty.
 - The most common cause of delayed puberty in boys is a constitutional delay in growth and puberty (70%). The development is slow and associated with short height. Delayed growth in father and late-onset of shaving is characteristic.
 - Defects in the pituitary (tumor, infection, injury, and radiation) and testis (Klinefelter syndrome, trauma, testicular torsion, radiation, and immune cause) may also cause delayed puberty in boys.
- Delayed puberty affects growth, bone, psychological development, and fertility. Psychological effects include anxiety, feelings of isolation or withdrawal, bullying, weakening peer relationships, poor body image, loss of self-esteem, depression, anxiety, and social and developmental opportunities.

Q6

My son is 8 years old and his penis appears very small? What to do?

- Small penis size may be due to a defect in the pituitary or testis. Most boys with complaints of a small penis have a normal size on examination. Buried penis in obese boys gives an appearance of small size.
- Penile growth is controlled by testosterone with maximum growth in the uterus and during the first year of life. After this, the growth is limited till the onset of puberty. A small penis after 1 year of age is significant and needs evaluation.
- The doctor would confirm small penile size by accurate measurement and comparison with charts. Most boys presenting with small penile size have normal size at this stage. Blood work-up and other investigations (rarely MRI head) may be needed. The doctor would then decide about the need for monitoring overtime or hormone injections. All boys with small penis size should be seen by the doctor again at the age of 13–14 years to confirm the onset of puberty.

Q7

How is delayed puberty managed?

- The critical issues in the management of delayed puberty are its confirmation, evaluation of cause, and treatment decision.
- The doctors would confirm delayed puberty followed by blood tests, bone age, and rarely magnetic resonance imaging (MRI) of the brain.
- The treatment aims to replicate normal pubertal development. Treatment is generally started after the age of 13 years in girls and 14 years in boys.
- Girls are started with a low-dose (one-tenth of adult dose) estrogen with build up over 2 years to allow normal breast development and periods. A short-term treatment (3–6 months) is sufficient in constitutional delay.
- The treatment of boys involves low-dose testosterone injections increased to adult dose over 2 years. A 3- to 6-month course is sufficient to induce puberty in constitutional delay with long-term treatment in permanent forms.
- If any fertility issues arise later, then they may need to be addressed.

Q8

My son is 13 years old and has developed swelling in the chest? His friends tease him. What should I do?

- Around 40–75% of boys develop breast enlargement (gynecomastia) during puberty due to an imbalance between estrogen and testosterone. It improves spontaneously in most over 2 years. Excessive fat tissue in the breast (lipomastia) may give a false appearance of gynecomastia. Gynecomastia may rarely be due to pubertal, systemic disorders (liver and kidney), or medicines. A medical consultation helps to confirm the typical pattern, allay parental concern, and remove childhood anxiety.
- The most important part of the evaluation is the confirmation of gynecomastia, exclusion of disease, and treatment plan. Lipomastia suggests the need for weight loss. The doctor assesses pubertal status along with a detailed breast examination. Blood tests and ultrasound may be needed in some cases.
- Most boys with gynecomastia improve over time. Surgery is rarely needed after 18 years of age.

Q9

My daughter is 15 years old and has developed hair on the face? What is wrong with her? What to do?

- Pubertal development is associated with a mild increase in facial hair. Significant hair growth in the face, chin, chest, and abdomen indicates hormonal disorder. Fine, light hair throughout the body (hypertrichosis) does not suggest a hormonal defect and may be due to familial effect.
- A medical evaluation is essential for rapid hair growth, period irregularity, and darkening of the skin. Rapid hair growth with an increase in muscle mass and change in voice is highly significant and suggests the need for urgent evaluation.
- Increased hair growth may be due to problems in the ovaries (polycystic ovarian syndrome, tumor, and ovulatory problems), adrenal gland (congenital disorders, rarely tumors), obesity, or drugs.

Q10

How is hirsutism managed?

- The critical aspects of evaluating a girl with hirsutism include its confirmation, identification of the cause, and treatment decision.
- The doctor would examine your daughter for the extent and distribution of hair growth, pubertal features, and blood pressure. The investigations include blood tests, ultrasound of uterus and ovaries, and rarely a CT scan.
- The need for treatment depends on the age and severity of the disease. Weight loss is essential in obese girls. Girls with polycystic ovarian disease (PCOD) require oral hormone treatment for at least 1 year. These treatments take time to affect hair growth, which involves cosmetic treatment [waxing, light amplification by stimulated emission of radiation (LASER), or local measures].