

Indian Academy of Pediatrics (IAP)



GUIDELINES FOR PARENTS

Normal Growth

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10 FAQs on NORMAL GROWTH

1. How do I know my child is growing well?
2. How can we monitor a child's growth?
3. My child is the shortest in his class. Can any supplements/tonics improve his growth?
4. Do boys and girls grow at different rates?
5. My 12-year-old daughter has just had her first periods. Will she stop growing? Till what age do children continue to gain height?
6. My 9-year-old son's penis appears very small and has hardly increased in size in the last few years. Does he require any investigations?
7. My son seemed to grow so fast when he was young, now it seems he is growing very slowly. Does the normal growth rate of children keep varying?
8. We are short but want our child to be taller. I have heard there are medicines and injections to increase height. Please advise.
9. My child was born premature and weighed much less than normal new-born babies. Will he/she always be smaller?
10. In what situations should we be concerned about our child's growth?

Under the Auspices of the IAP Action Plan 2020–2021

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Normal Growth

Q1

How do I know my child is growing well?

A child's growth is assessed by measuring his/her weight, length (for a child up to 2 years), and height (for a child >2 years age). To know if your child is growing well, your doctor will check your child's weight, length/height, and compare with that expected for age and gender of the child. To do this the doctor will use growth charts.

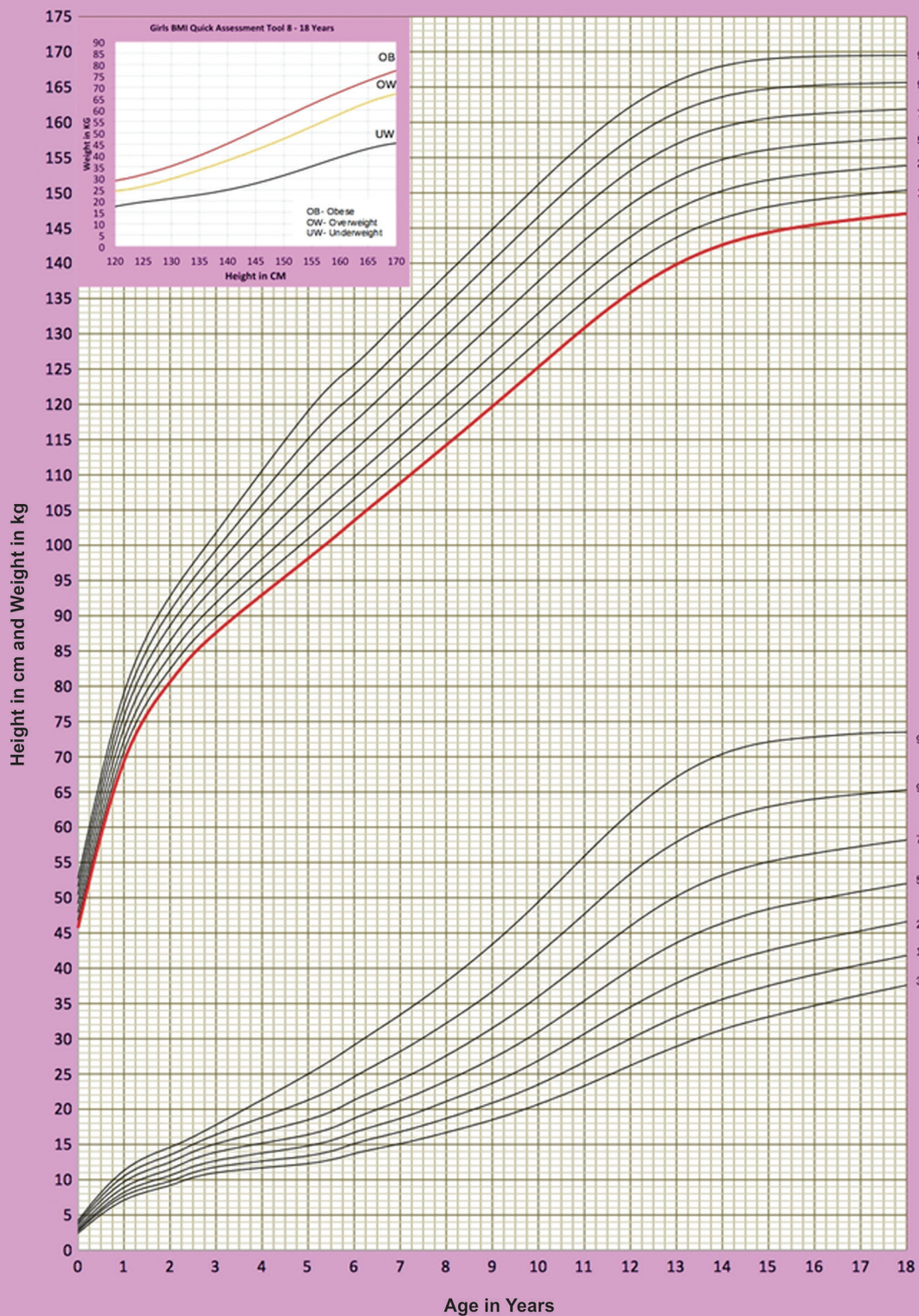
Growth Chart

A growth chart is a simple graph in which your child's body parameters are plotted at the age at which the measurement is done. The growth chart is utilized to maintain longitudinal record of a child's growth parameters. It helps to track the growth of children from birth through adolescence to adulthood. On the growth chart, curves of normal growth have been drawn based on measurements of thousands of normal children. As expected, there is variation in height and weight among normal children. Plotting on a growth chart helps us to decide if a child's growth parameters fall within the normal range or not.

A healthy child will have the growth parameters [weight, length/height, and body mass index (BMI)] within the highest and the lowest curve expected for the age and sex. If a child's parameter is above the 97th centile or below the 3rd centile line on the growth chart, it indicates that the child's parameter is below/beyond what is seen in nearly 94% children of his/her age. These children should be evaluated for a possible growth problem.

An even better assessment of your child's growth can be made by a serial recording of growth parameters (see answer to the next question). Your doctor can also assess and plot if the child's weight is appropriate for his height. This is done by plotting on a weight for height chart for children up to 5 years age, and on a BMI chart for older children (**Charts 1 to 4**).

WHO 2006 and IAP 2015 combined Girls Charts 0–18 Years



3 (Short below this line)

MPH percentile calculator

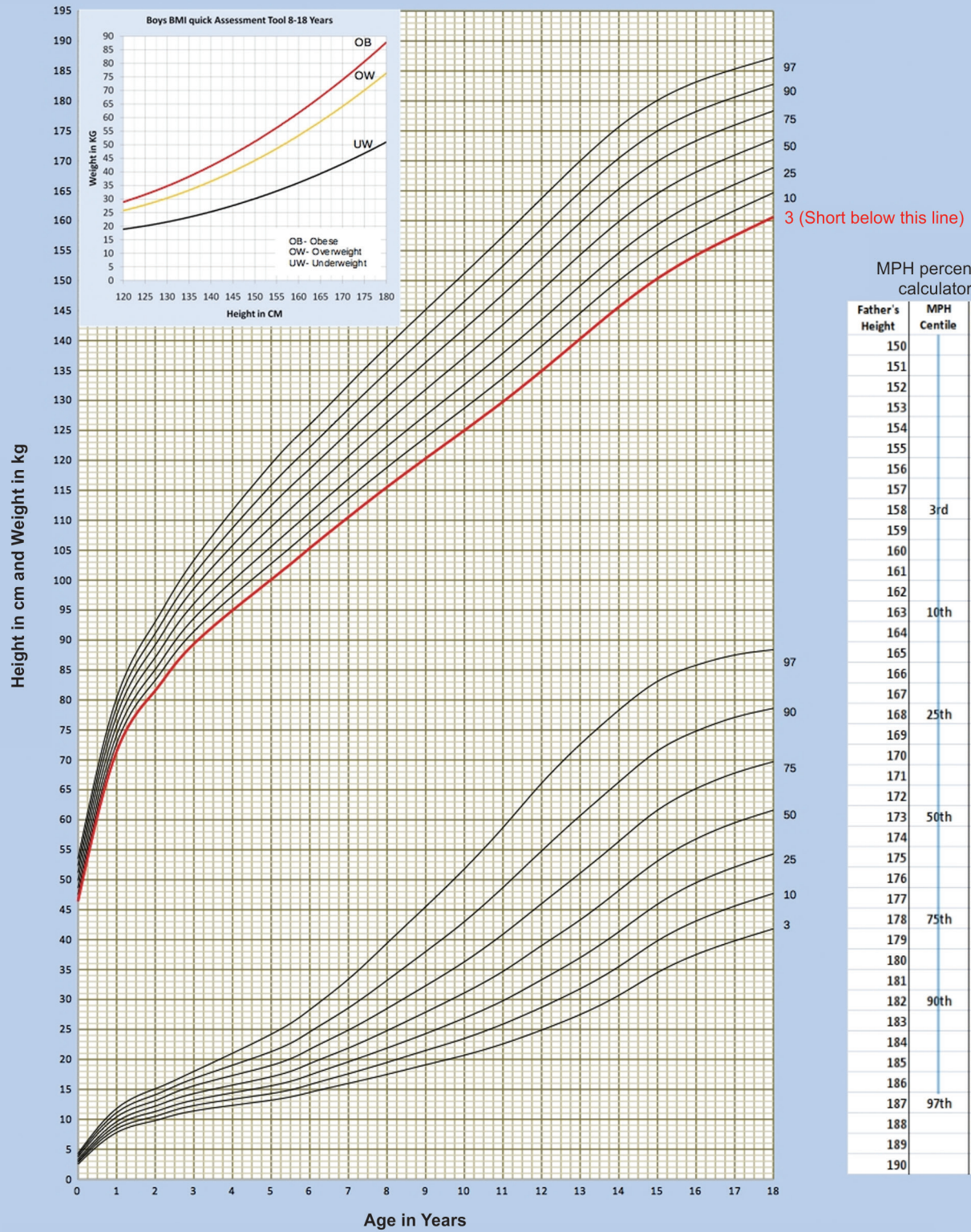
| Father's Height | MPH Centile | Mother's Height |
|-----------------|-------------|-----------------|
| 150 | | 137 |
| 151 | | 138 |
| 152 | | 139 |
| 153 | | 140 |
| 154 | | 141 |
| 155 | | 142 |
| 156 | | 143 |
| 157 | | 144 |
| 158 | | 145 |
| 159 | 3rd | 146 |
| 160 | | 147 |
| 161 | | 148 |
| 162 | | 149 |
| 163 | 10th | 150 |
| 164 | | 151 |
| 165 | | 152 |
| 166 | | 153 |
| 167 | 25th | 154 |
| 168 | | 155 |
| 169 | | 156 |
| 170 | | 157 |
| 171 | 50th | 158 |
| 172 | | 159 |
| 173 | | 160 |
| 174 | | 161 |
| 175 | 75th | 162 |
| 176 | | 163 |
| 177 | | 164 |
| 178 | | 165 |
| 179 | 90th | 166 |
| 180 | | 167 |
| 181 | | 168 |
| 182 | | 169 |
| 183 | 97th | 170 |
| 184 | | 171 |
| 185 | | 172 |
| 186 | | 173 |
| 187 | | 174 |
| 188 | | 175 |
| 189 | | 176 |
| 190 | | 177 |

Chart 1: World Health Organization (WHO) 2006 and Indian Academy of Pediatrics (IAP) 2015 combined girls charts 0–18 years.

Source: Modified from: 1. WHO MGRS (Multicentre Growth Reference Study) 2006.
 2. Revised IAP Growth Charts for Height, Weight and Body Mass Index for 5–18 year old Indian Children.
 V. Khadilkar et al, from Indian Academy of Pediatrics, Growth Chart Committee, Indian Pediatrics, Jan 2015, Vol 52
 3. Khadilkar V, Lohiya N, Chiploonkar S, Khadilkar A. Body Mass Index Quick Screen Tool for IAP 2015 Growth Charts. Indian Pediatr. 2020;904-6.

This is the **Chart 1** is helpful to check a girl child's measurements between the ages of 0–18 years.

WHO 2006 and IAP 2015 combined Boys Charts 0–18 Years



Normal Growth

Chart 2: World Health Organization (WHO) 2006 and Indian Academy of Pediatrics (IAP) 2015 combined boys charts 0–18 years.

Source: Modified from: 1. WHO MGRS (Multicentre Growth Reference Study), 2006.

2. Revised IAP Growth Charts for Height, Weight and Body Mass Index for 5–18 year old Indian Children.

V. Khadilkar et al, from Indian Academy of Pediatrics, Growth Chart Committee, Indian Pediatrics, Jan 2015, Vol 52

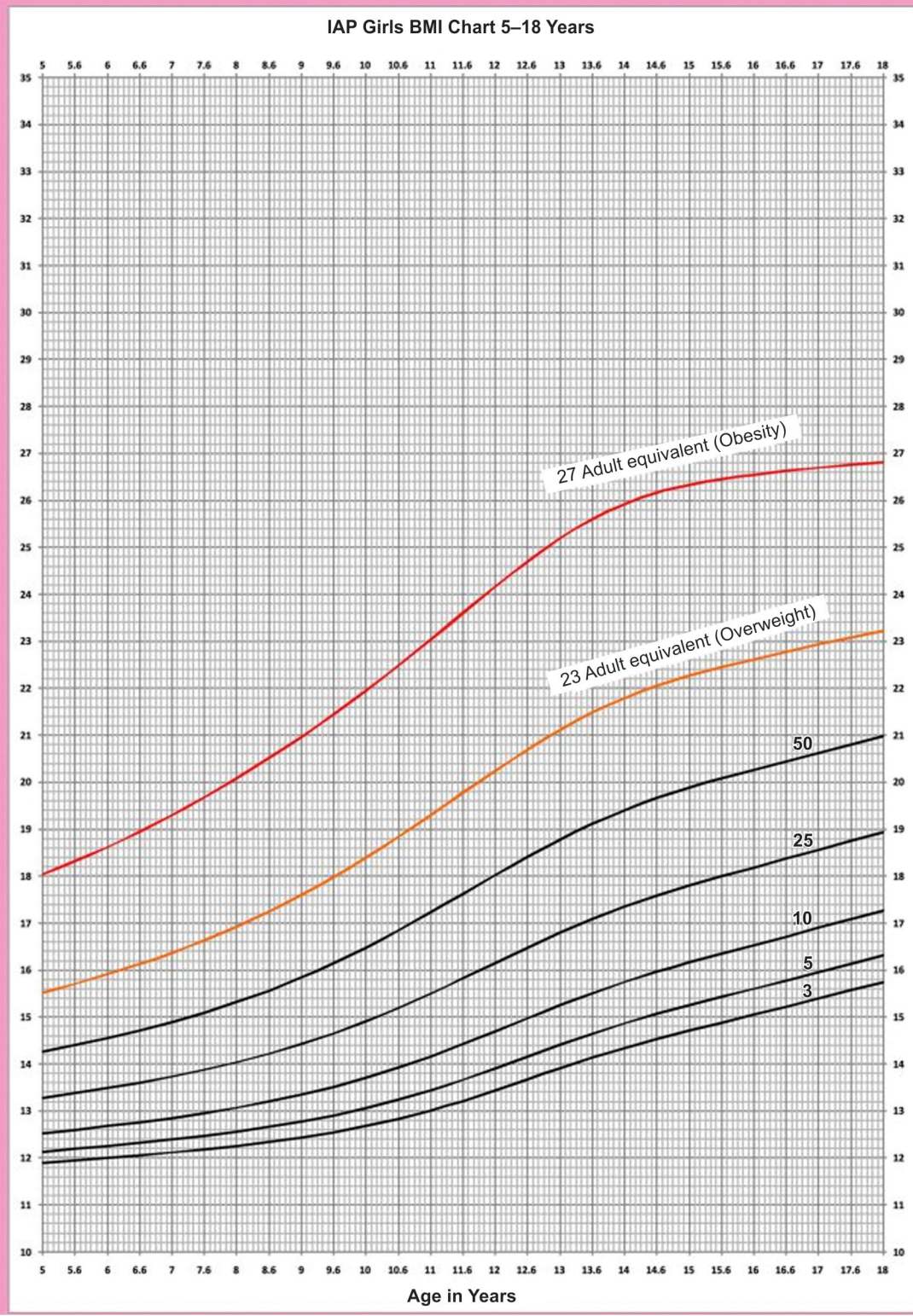
3. Khadilkar V, Lohiya N, Chiploonkar S, Khadilkar A. Body Mass Index Quick Screen Tool for IAP 2015 Growth Charts. Indian Pediatr. 2020;904-6.

Chart 2 is useful to check measurements of a boy child from the age of 0–18 years.

5 to 18 Years: IAP Girls Body Mass Index Charts

Name _____

DOB _____



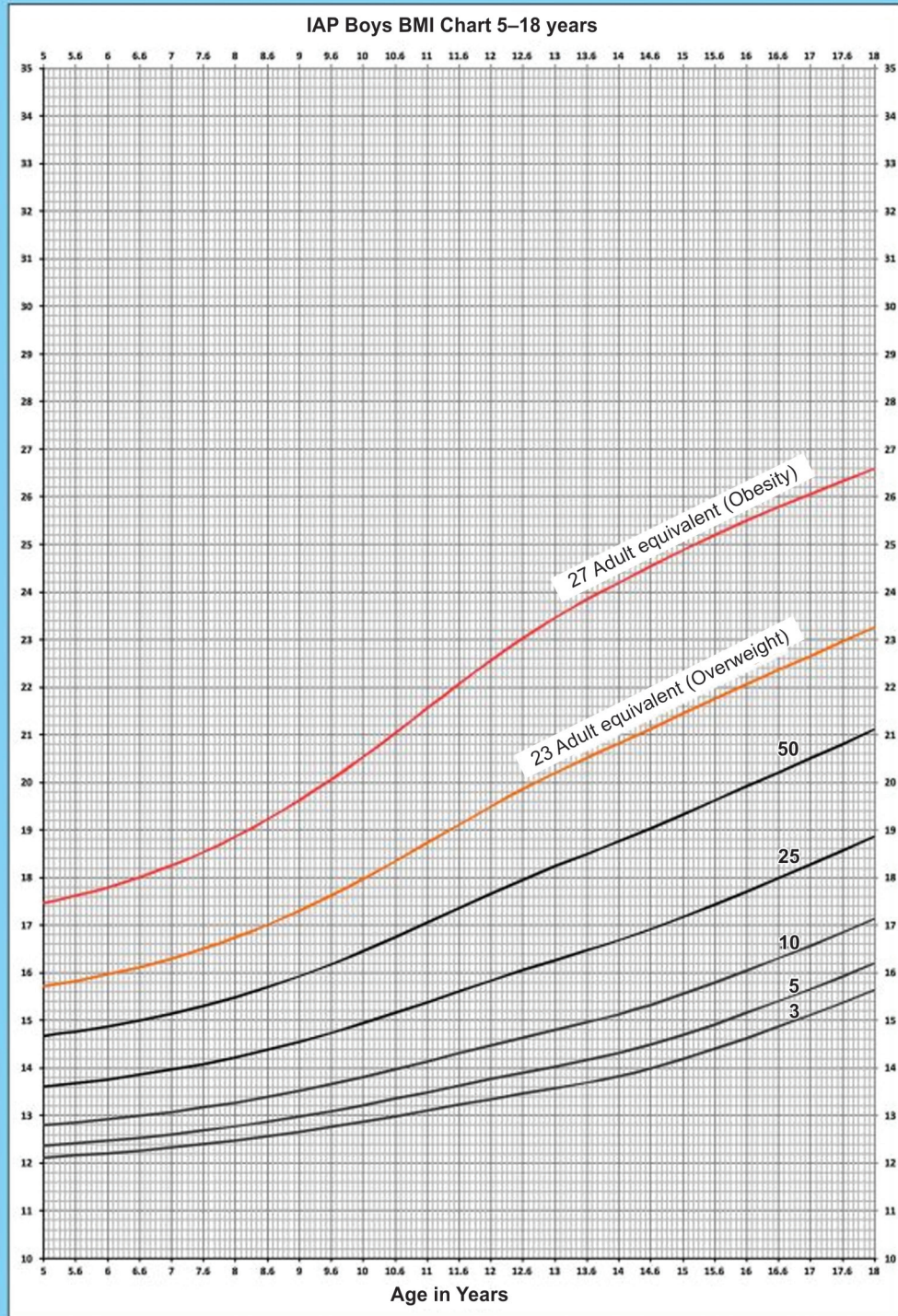
Normal Growth

Chart 3: Indian Academy of Pediatrics (IAP) girls body mass index charts (5-18 years).
 Source: Revised IAP Growth Charts for Height, Weight and Body Mass Index for 5 to year old Indian Children. V. Khadilkar et al, from Indian Academy of Pediatrics, Growth Chart Committee, Indian Pediatrics, Jan 2015, Vol 52.
Chart 3 is used to check body mass index of a girl child from 5-18 years of age.

5 to 18 Years : IAP Boys Body Mass Index Charts

Name _____

DOB _____



Normal Growth

Chart 4: Indian Academy of Pediatrics (IAP) boys body mass index charts (5–18 years).
 Source: Revised IAP Growth Charts for Height, Weight and Body Mass Index for 5–18 year old Indian Children. V. Khadilkar et al, from Indian Academy of Pediatrics, Growth Chart Committee, Indian Pediatrics, Jan 2015, Vol 52.
Chart 4 is used to check the body mass index of a boy between 5–18 years of age.

Q2

How can we monitor a child's growth?

Growth monitoring means following a child's growth over a period of time to see if the child is gaining height and weight as he/she normally should. To monitor your child's growth, your doctor will check your child's weight and height and plot it on the growth charts shown above earlier.

- In healthy children, a serial record of these parameters on a growth chart yields a curve parallel to the lines present on the chart.
- In a child older than 2 years, it is desirable that height and weight are recorded twice a year, and for children >9 years at least once a year.

Example

Shown below is the growth chart of a girl whose height is plotted at three different occasions serially. The points A, B, and C are within the 3rd and 97th centiles and the line joining them is parallel to the curves on the growth chart. This is a normal growth pattern. On the contrary, the growth pattern depicted by the line joining points A, D, and E indicates a slower than normal growth. A child with this growth pattern will require to be seen by a doctor (**Chart 5**).

WHO 2006 and IAP 2015 combined Girls Charts 0–18 Years

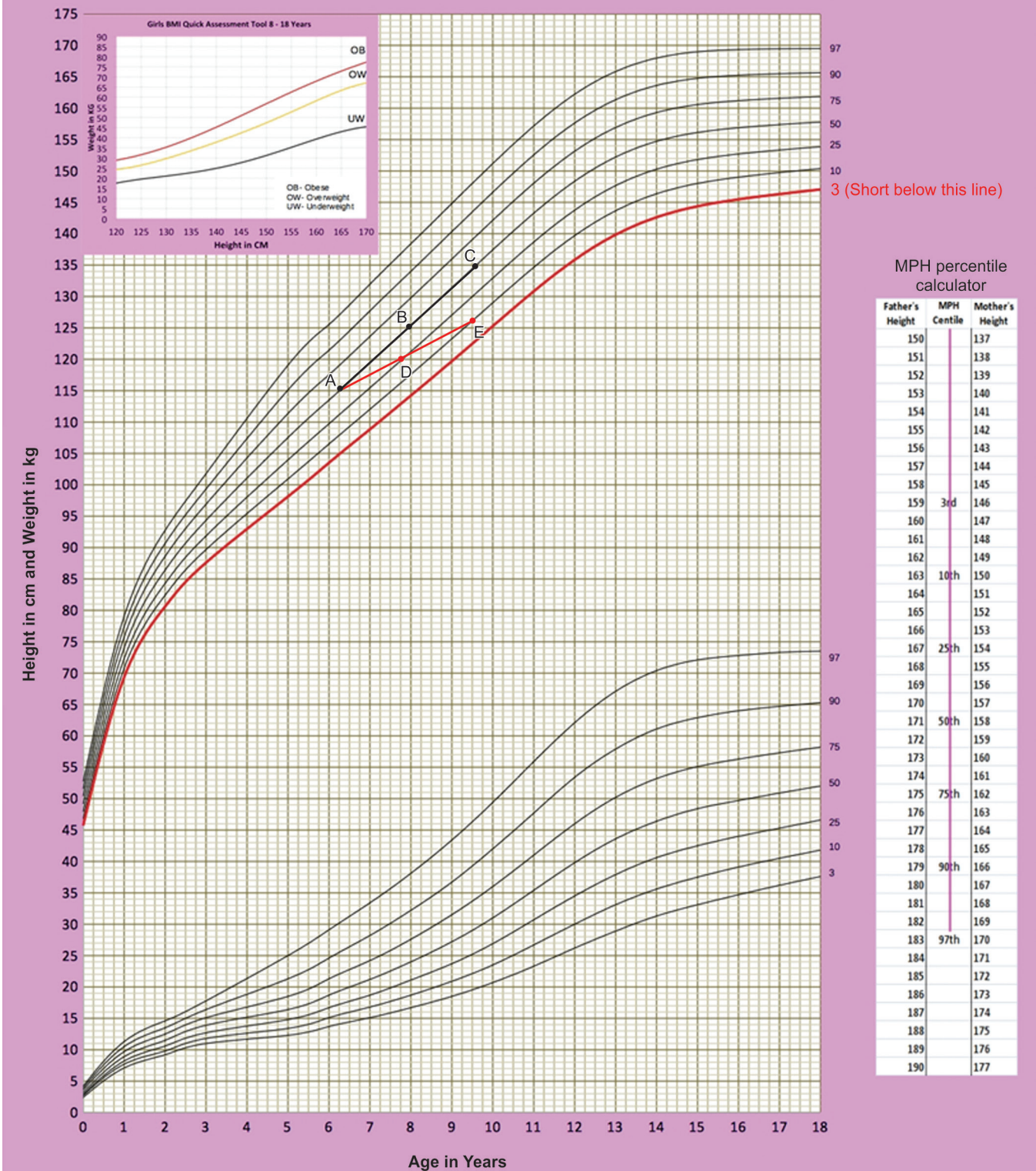


Chart 5: World Health Organization (WHO) 2006 and Indian Academy of Pediatrics (IAP) combined girls charts (0–18 years).
 Source: Modified from: 1. WHO MGRS (Multicentre Growth Reference Study) 2006.
 2. Revised IAP Growth Charts for Height, Weight and Body Mass Index for 5–18 year old Indian Children. V. Khadilkar et al, from Indian Academy of Pediatrics, Growth Chart Committee, Indian Pediatrics, Jan 2015, Vol 52.
 3. Khadilkar V, Lohiya N, Chiploonkar S, Khadilkar A. Body Mass Index Quick Screen Tool for IAP 2015 Growth Charts. Indian Pediatr. 2020;904-6.

Normal Growth

Q3

**My child is the shortest in his class.
Can any supplements/tonics improve
his growth?**

First of all, it has to be confirmed by the doctor that your child is really short. Your doctor can also check whether the child's height is comparable to the genetic potential that is the expected height taking into account the parent's height. If the child is short, the doctor will try to find out if there is an underlying condition, and treat it.

The ability of your child to gain his normal potential for height depends on availability of conducive environment and nutrition. Giving additional tonics/multivitamins does not offer additional benefit. Instead, you should ensure that you provide your child with a balanced diet, a good emotional environment, and plenty of opportunity to play and stay active.

Q4

**Do boys and girls grow at
different rates?**

Generally, the girls tend to be shorter than boys of same age. In children up to 10 years age, the rate of gain in height and weight is similar in boys and girls. During adolescence, both boys and girls gain height rapidly, but the growth spurt in girls appears earlier than the boys. However, the boys continue to gain height even after the girls stop growing. Eventually the boys gain more height than girls during adolescence and thus most boys are taller than girls in their final height.

Weight gain also follows a similar pattern in boys and girls. Children of both genders gain more weight in two major phases of growth, the first 2 years of life and in adolescence when they also develop secondary sexual characteristics.

Q5

My 12-year-old daughter has just had her first periods. Will she stop growing? Till what age do children continue to gain height?

Most girls gain height very rapidly around 10–11 years of age. This happens at a time when other body changes such as development of breast and appearance of underarm and pubic hair begins. At this time, they gain as much as 7–9 cm height/year. By the time the girls start having their periods, around 95% of the adult height has been achieved. Thereafter, the rate of height gain slows down, though they continue to grow and may gain an additional 5–7 cm till 16 years of age. Boys are relatively late in starting their adolescent growth spurt as compared to girls. However, they gain more height during adolescence than girls. They also continue to grow till 18 years of age.

Q6

My 9-year-old son's penis appears very small and has hardly increased in size in the last few years. Does he require any investigations?

The penis increases very slowly during childhood till about the age of 10 years. However, children keep gaining in height steadily during this period. Therefore, many parents feel that the size of penis is small, especially around the age of 9–10 years and more so in case of boys who are obese/overweight. In adolescence, boys experience a rapid increase in penile length along with enlargement of testes and appearance of other secondary sexual characteristics such as development of facial hair and deepening of voice. Further, there are some variations in the size of the penis among children owing to ethnic, geographical, genetic, and nutritional factors.

Therefore, a relatively small looking penis is not a source of concern at this age, if it is an isolated finding. Medical opinion should be sought if there is no penile growth beyond 14 years of age. Earlier medical opinion is also needed if it is felt that the child's testes are not placed in the scrotum or if his urethral opening, that is normally present on the tip of the penis, is not placed appropriately.

Q7

My son seemed to grow so fast when he was young, now it seems he is growing very slowly. Does the normal growth rate of children keep varying?

Growth occurs at different rates through the stages of infancy, childhood, and adolescence. During first 2 years and adolescence, the growth rate is rapid and there is significant increase in height in children. From 2 years till adolescence, the growth slows but children continue to grow with an average gain of around 5–6 cm height per year. Once a child enters adolescence, the rate of growth again increases till final adult height is achieved, when the growth stops. A good way to monitor whether a child is growing well is by maintaining a growth chart that records the height and weight twice a year and also shows what the child's growth is like as compared to other children of his/her age.

Q8

We are short but want our child to be taller. I have heard there are medicines and injections to increase height. Please advise.

The most important factor that determines a child's height is his/her genetic potential, that is, the height of both the parents. Most children of short parents tend to be short adults because of this reason. This is nonmodifiable. The other factors that influence height attainment are nutrition, hormones, and environment. There is no role of drugs and injections in increasing height of these children. However, every short child merits clinical evaluation to rule out any underlying illness. Also, parents should ensure that the child receives optimum nutrition, regular physical activity, and a nurturing environment, so that no other factors compromise for attainment of an optimum stature.

Q9

My child was born premature and weighed much less than normal new-born babies. Will he/she always be smaller?

Children born preterm may be inappropriately labeled as having growth failure if their growth parameters are not corrected for prematurity while interpreting them. This is done by subtracting the number of weeks the child was born preterm, from the child's age at the time of assessment. For example, if a child is born at 34 weeks, he is born 6 weeks before the expected date of delivery. His growth at the age of 6 months (26 weeks) should actually be interpreted as for a child who is 20 weeks old. It is expected that the growth pattern of this infant would be similar to that of babies born at full-term who are now at 20 weeks old, provided there is no additional illness, and the child is receiving adequate nutrition. Usually, this correction for prematurity while interpreting growth parameters is done till 2 years of age.

Q10

In what situations should we be concerned about our child's growth?

Conditions that warrant evaluation of a child for a possible growth-related problem are:

- Child is short with respect to other children of same age and gender, or in relation to the parents' height.
- Poor or excessive weight gain in the child
- A child whose growth chart shows a slower growth rate as compared to what is expected for his age and gender. Thus, regular monitoring of height and weight and maintaining its record a growth chart is warranted for all children during the immunization visit during earlier years, and twice a year thereafter.
- During adolescence, growth is linked to other physiological changes of sexual development. Hence, absence of onset of breast growth beyond 13 years in girls and failure of genital growth by 14 years in boys also needs evaluation. Similarly, premature or early development of breast before 8 years in girls and testicular and penile growth before 9 years in boys also need medical consultation.