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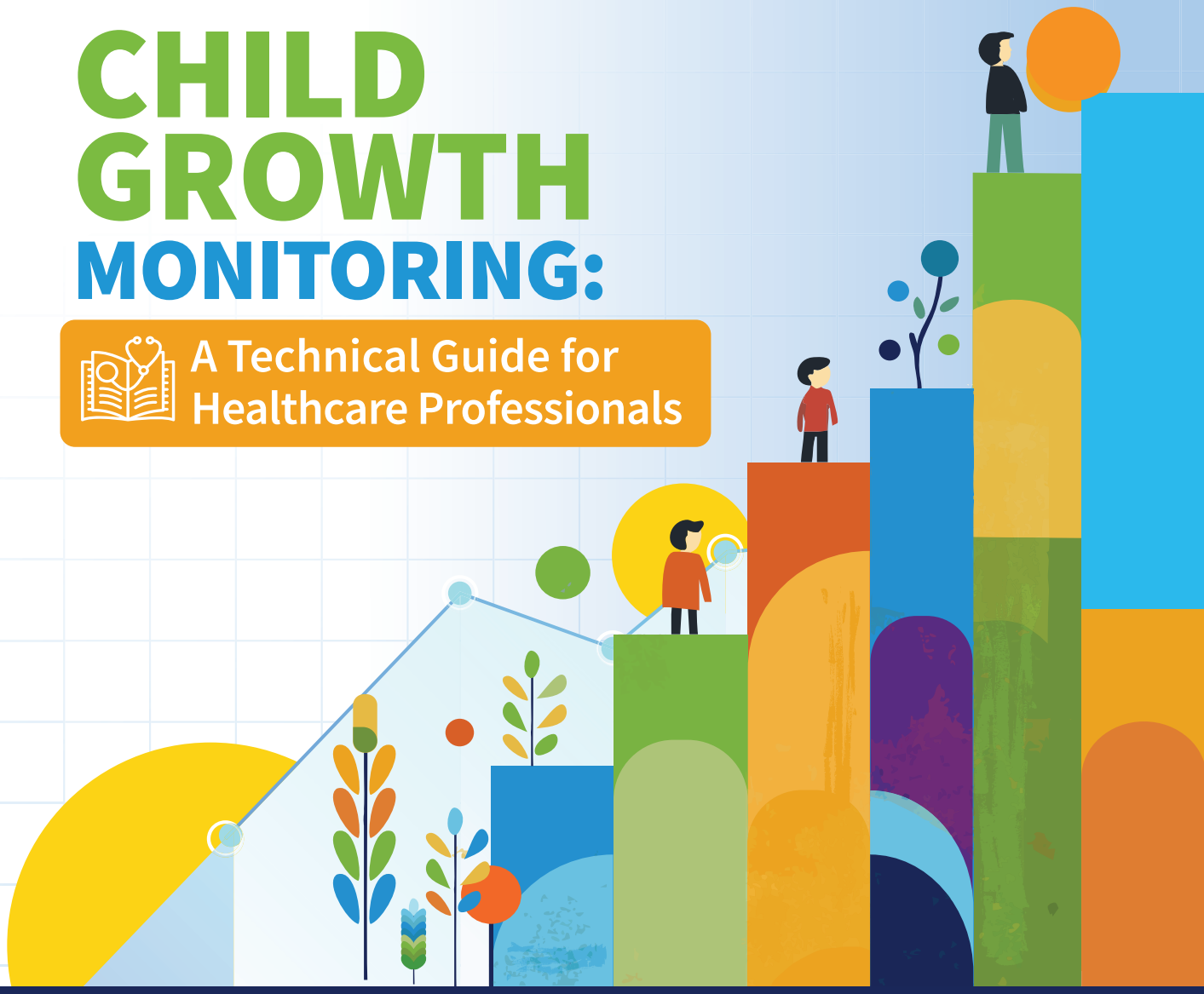
CHILD GROWTH MONITORING:

A Technical Guide for Healthcare Professionals



CHILD GROWTH MONITORING:

A Technical Guide for Healthcare Professionals

Leila Cheikh Ismail, PHD, Associate professor, Department of Clinical Nutrition and Dietetics, College of Health Sciences, University of Sharjah, Sharjah, UAE

Ayoub Al-Jawaldeh, PHD, Regional Adviser, Nutrition, World Health Organization, Regional Office for the Eastern Mediterranean, Egypt

Ayesha S. Al Dhaheri, PHD, Professor, Department of Public Health Institute, College of Medicine and Health Sciences, United Arab Emirates University, Al Ain, UAE

***Corresponding author: Leila Cheikh Ismail; email: lcheikhismail@sharjah.ac.ae**

TABLE OF CONTENTS

GROWTH MONITORING

The process of following the growth rate of a child in comparison to a standard by periodic anthropometric measurements in order to assess growth adequacy and identify faltering at early stages.

IMPORTANCE OF GROWTH MONITORING

Health Indicator and Early Detection: Growth monitoring provides critical indicators of a child's health by measuring physical attributes like weight and height. It helps identify deviations from normal growth patterns, signaling potential health or nutritional problems, and allows for early diagnosis and timely intervention.

Promt Action: By comparing a child's growth pattern to established standard and reference curves, growth faltering can be detected early, prompting necessary actions such as dietary evaluation and nutritional counseling to address any concerns.

Consistent Healthcare Engagement: Regular growth monitoring encourages consistent engagement with primary healthcare services, ensuring early detection of growth concerns and facilitating prompt intervention to support optimal growth and development.

HOW TO MONITOR GROWTH EFFECTIVELY?

Following protocol

Using appropriate equipment

Following protocol tools

MEASURE

Taking measurements in a standardized way (Ex: Weight, height)

INDEX

Using appropriate indices (Ex: BMI)

REFERENCES

Using references for comparison (Ex: Growth charts)

GROWTH MONITORING INTEGRATION IN PRIMARY HEALTHCARE SYSTEM

Why it matters?

Early Intervention: Routine checks on height, weight, and BMI help catch health or nutrition issues early, allowing for prompt treatment.

What are the key benefits?

Detailed Health Tracking: Ongoing monitoring provides a comprehensive view of a child's health, helping to spot and address emerging issues.

How can challenges be addressed?

Continuous training for healthcare professionals.

Strengthening interactions between healthcare providers and caregivers.

What is the overall impact?

Promoting early detection, consistent care, and a holistic approach to child health, laying a solid foundation for their future well-being.

AIM OF THIS GUIDE

Building Institutional Capacity:

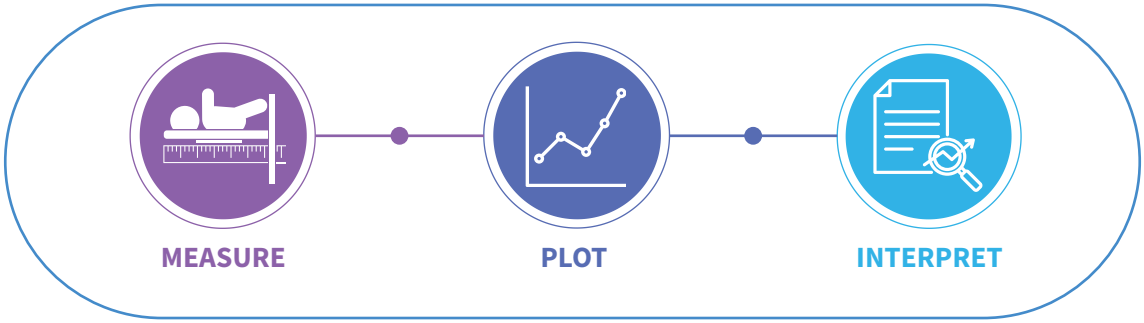
This guide aims to enhance institutional capacity to utilize the WHO Growth Standards/ References effectively.

Empowering Healthcare Professionals:

It provides essential knowledge and practical guidance to empower healthcare professionals in conducting growth monitoring.

Guiding the Process:

Healthcare professionals will be supported in measuring child growth, plotting measurements on growth charts, and interpreting growth indicators systematically.

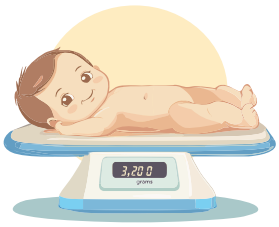


MEASURING CHILD GROWTH

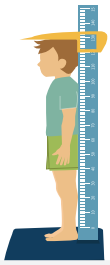
STEP 1: MEASURE

Anthropometric assessment is the most effective method for tracking infant and child physical growth and identifying growth problems such as underweight, overweight, stunting, and wasting.

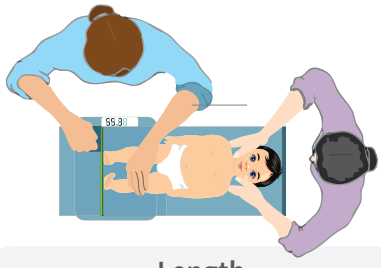
Common Anthropometric Measurements



Weight



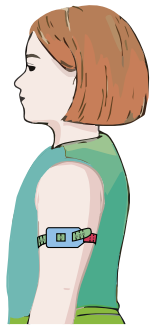
Height



Length

Head Circumference

Waist circumference



Mid-upper arm circumference

Accurate measurement depends on

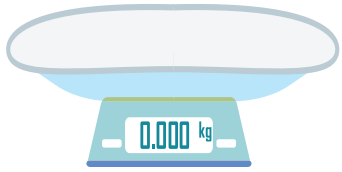
- Technicians need to be trained in a standardized manner.
- Using good quality and calibrated equipment.
- Taking the measurement more than once.
- Using appropriate indices and references.

WEIGHT MEASUREMENT: <2 YEARS OF AGE

Equipment needed

Digital weight scales that allow tared weighing placed on a flat surface.

Digital floor scale



Infant scale

Preparing for measurement

- Remove all clothing, including diapers if possible. If this is not possible, the infant can be weighed with a clean diaper on, and the weight of a similar diaper should be subtracted from the total weight.

Procedure

If you have an infant scale:

1. Lay a light towel or a lightweight baby blanket on the scale and tare it before beginning the weighing process.
2. Place the baby on their back in a lying position.
3. Record the child's weight to the nearest gram.

Procedure for infant weight measurement using infant scale

If you have an adult digital scale:

1. Ask the mother to stand in the middle of the scale, feet slightly apart, and remain still.

2. Tare the scale and gently hand the naked baby to the mother.

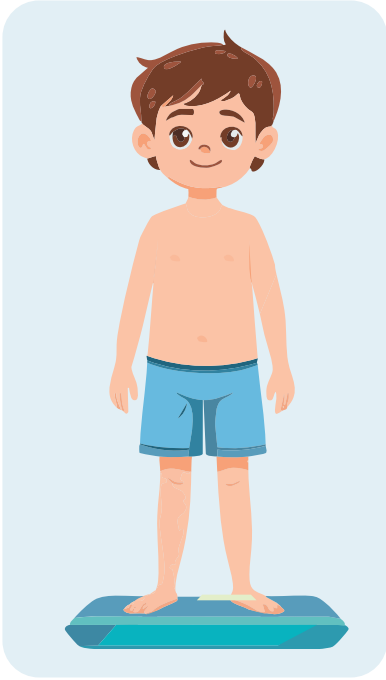
3. Record the child's weight to the nearest gram.

WEIGHT MEASUREMENT: >2 YEARS OF AGE

Procedure

1. Turn on the scale (if electronic) and ensure it reads ‹0.00›.
2. Place the child in the middle of the scale, with feet slightly apart.
3. Wait for the child to stop moving. If the child is restless, ask for the mother's assistance.

▶ Once the child is still, record their weight as shown on the scale.



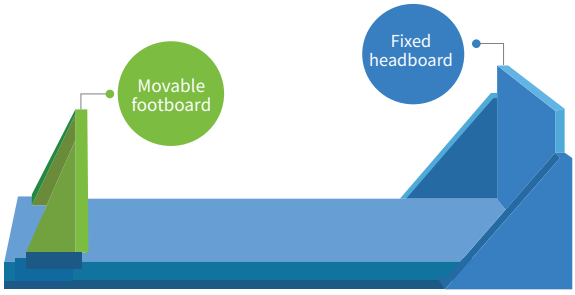
Procedure for infant weight measurement for children >2 years

LENGTH MEASUREMENT: <2 YEARS OF AGE

Equipment needed

- Infantometer or length board on a table or flat surface.

Infantometer



Length board

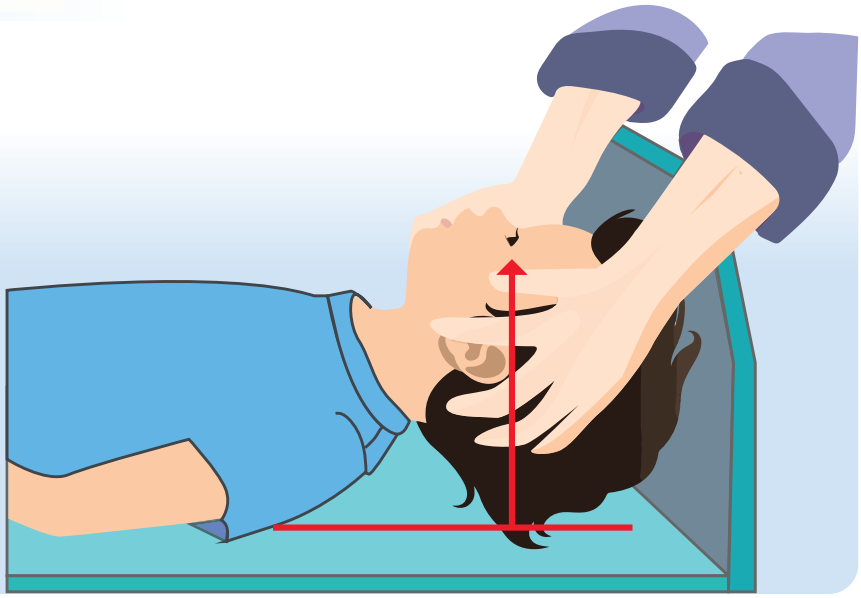
Preparing for measurement

- Any hair ornaments should be removed.
- It is best to remove diapers as they increase the difficulty of holding the infant's legs together and straightening them out.
- Cover the length board with a thin cloth or soft paper for hygiene and for the baby's comfort.

Procedure

1. Ask the mother to lay the child on their back with their head against the fixed headboard, gently compressing the hair.

2. Quickly adjust the head so that an imaginary vertical line from the ear canal to the lower border of the eye socket is perpendicular to the board, ensuring the child's eyes are looking straight up. Instruct the mother to hold the head in this position from behind the headboard.

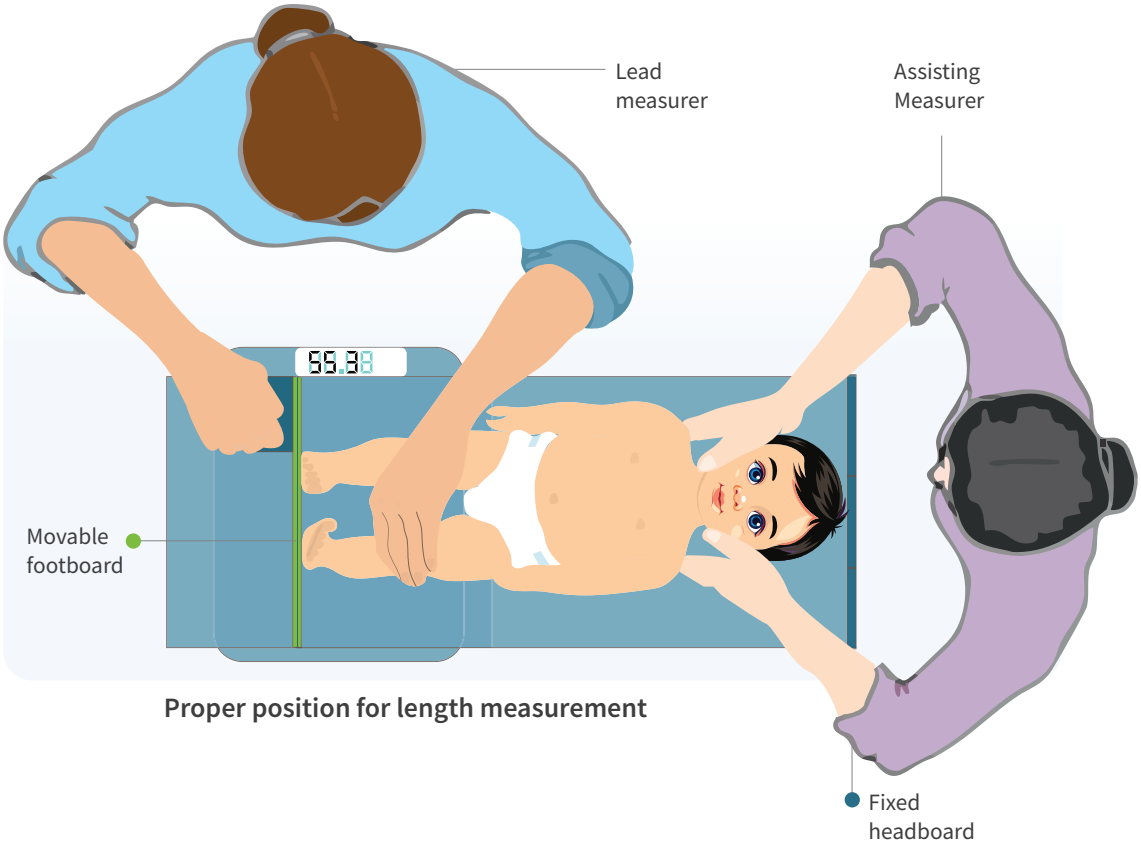


Proper head positioning

3. Ensure the child lies straight along the board without changing position, with shoulders touching the board and the spine not arched.

4. With one hand, gently hold down the child's legs while using the other hand to move the footboard.

5. While holding the knees, pull the footboard against the child's feet so that the soles are flat against it and the toes point upwards.



Proper position for length measurement

Here is an illustration featuring a section of a measuring tape. The numerals and longer lines represent centimeter markings, while the shorter lines denote millimeters. The shaded box highlights where the footboard is positioned during a length measurement.

Example for reading measuring tape

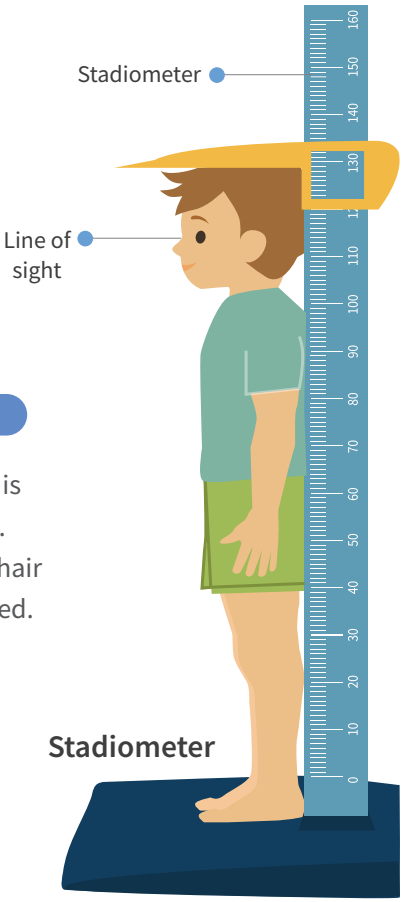
HEIGHT MEASUREMENT: >2 YEARS OF AGE

Equipment needed

- Stadiometer on a flat surface.

Preparing for measurement

- Ensure that the height board is on flat surface on the ground.
- Check that shoes, socks and hair ornaments have been removed.



Stadiometer

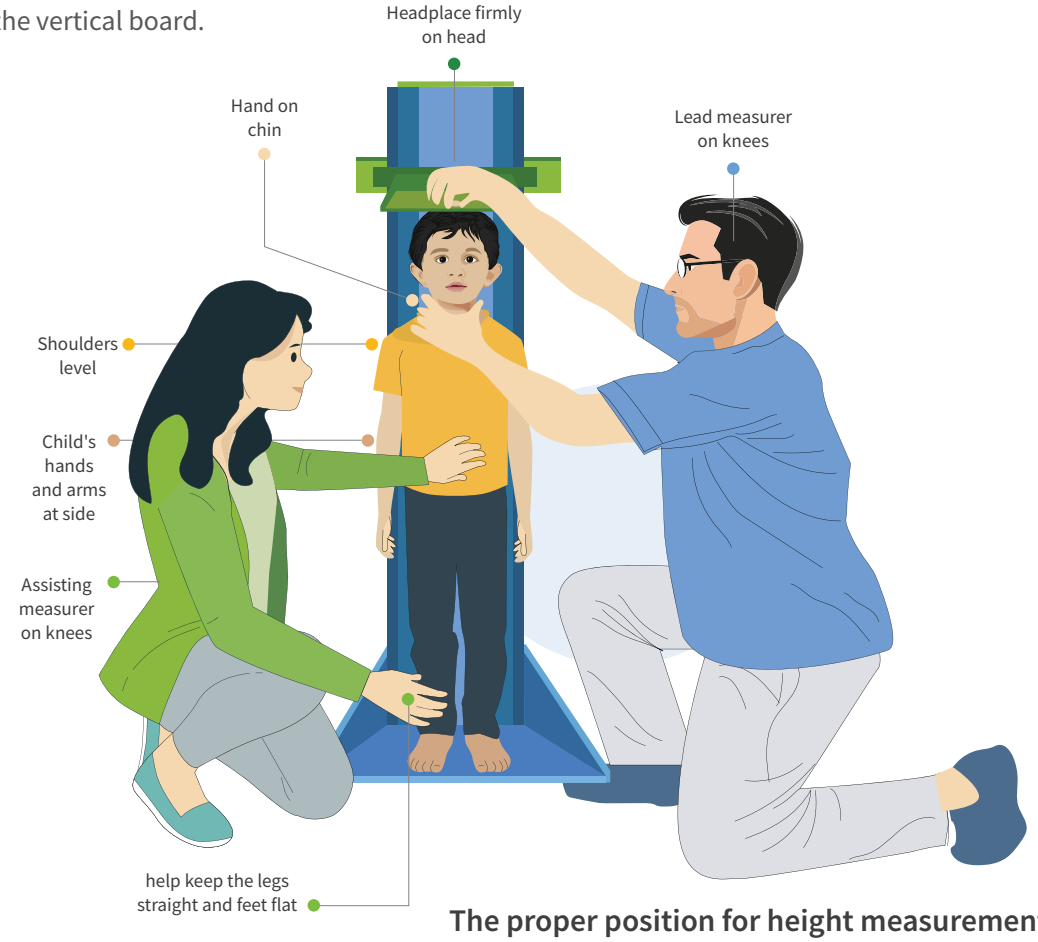
Procedure

1. Assist the child in standing on the baseboard with feet slightly apart, ensuring alignment against the vertical board. The back of the head, shoulder blades, buttocks, calves, and heels should all touch the vertical board.

2. Ask the mother to help keep the legs straight and feet flat while soothing the child and ensuring they stay still.

3. Position the child's head parallel to the baseboard, and gently press the tummy if needed for full height.

4. Pull down the headboard to rest firmly on the head, compressing the hair.



The proper position for height measurement

HEAD CIRCUMFERENCEMEASUREMENT:

Equipment needed

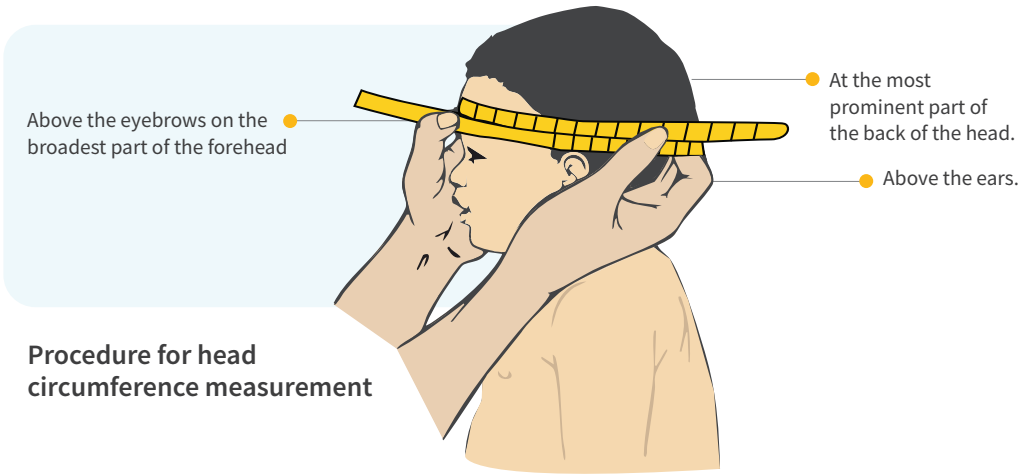
- Measuring tape (non-strechable).

Preparing for measurement

- Check that all hair ornaments have been removed.

Procedure

- Securely wrap the tape around the head at its widest point.



Procedure for head circumference measurement

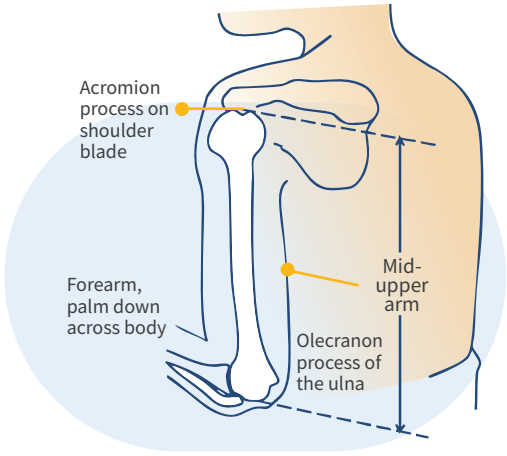
MID UPPER ARM CIRCUMFERENCE (MUAC)

Equipment needed

- Measuring tape (non-stretchable)

Preparing for measurement

- The mid-upper arm point is half the distance between the acromion process and the olecranon.
- The upper arm midpoint needs to be located for the measurement of MUAC when the elbow is bent at 90°.
- The measurer should have a ‘pen’ to mark the measuring site on the child’s skin. A hypoallergenic cosmetic pencil (e.g., eyeliner) works well and is generally acceptable to the caregiver.



Locating upper arm midpoint

BMI DETERMINATION

BMI is a numerical measure associating an individual's weight with height or length.BMI is a valuable growth indicator when plotted against a child's age on a graph.

OBTAINED USING THE FOLLOWING FORMULA:

$$BMI = \frac{weight}{(height * height)}$$

The BMI has a dimension of kg/m^2, which means that the weight should be in kilograms (kg) and the height in meters (m). If height has been measured or recorded in cm, it should be converted into meters before calculating the BMI. To convert a measurement from cm to m, divide the value by 100 or move the position of the decimal separator two positions to the left. For example, 120 cm is 1.2 m.

If you have no calculator, use a BMI table

L or H (cm)	Body Mass Index (BMI)																			L or H (cm)
	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
42	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.6	2.8	3.0	3.2	3.4	3.5	3.7	3.9	4.1	4.2	4.4	4.6	42
43	1.5	1.7	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.4	4.6	4.8	43
44	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.6	4.8	5.0	44
45	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.1	4.3	4.5	4.7	4.9	5.1	5.3	45
46	1.7	1.9	2.1	2.3	2.5	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.7	4.9	5.1	5.3	5.5	46
47	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.6	4.9	5.1	5.3	5.5	5.7	47
48	1.8	2.1	2.3	2.5	2.8	3.0	3.2	3.5	3.7	3.9	4.1	4.4	4.6	4.8	5.1	5.3	5.5	5.8	6.0	48
49	1.9	2.2	2.4	2.6	2.9	3.1	3.4	3.6	3.8	4.1	4.3	4.6	4.8	5.0	5.3	5.5	5.8	6.0	6.2	49
50	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.0	4.3	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.3	6.5	50
51	2.1	2.3	2.6	2.9	3.1	3.4	3.6	3.9	4.2	4.4	4.7	4.9	5.2	5.5	5.7	6.0	6.2	6.5	6.8	51
52	2.2	2.4	2.7	3.0	3.2	3.5	3.8	4.1	4.3	4.6	4.9	5.1	5.4	5.7	5.9	6.2	6.5	6.8	7.0	52

Example 1 Omar is a one-month-old newborn. His **length is 47.2 cm**, and his **weight is 2.3**. **To determine his BMI, using the BMI table:**

- Look for the closest value for his length in the far left column (47 cm).
- Omar's weight is 2.3 kg. his weight on the row for his length falls between 2.2 and 2.4 kg.
- Tracing a finger upward from Omar's weight, you find that his BMI (on the top row of the table) is 10.5.

L or H (cm)	Body Mass Index (BMI)																		L or H (cm)
	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
42	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.6	2.8	3.0	3.2	3.4	3.5	3.7	3.9	4.1	4.2	4.4	4.6	42
43	1.5	1.7	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.4	4.6	4.8	43
44	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	4.3	4.5	4.6	4.8	5.0	44
45	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.1	4.3	4.5	4.7	4.9	5.1	5.3	45
46	1.7	1.9	2.1	2.3	2.5	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.7	4.9	5.1	5.3	5.5	46
47	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.6	4.9	5.1	5.3	5.5	5.7	47
48	1.8	2.1	2.3	2.5	2.8	3.0	3.2	3.5	3.7	3.9	4.1	4.4	4.6	4.8	5.1	5.3	5.5	5.8	6.0	48
49	1.9	2.2	2.4	2.6	2.9	3.1	3.4	3.6	3.8	4.1	4.3	4.6	4.8	5.0	5.3	5.5	5.8	6.0	6.2	49
50	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.0	4.3	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.3	6.5	50
51	2.1	2.3	2.6	2.9	3.1	3.4	3.6	3.9	4.2	4.4	4.7	4.9	5.2	5.5	5.7	6.0	6.2	6.5	6.8	51
52	2.2	2.4	2.7	3.0	3.2	3.5	3.8	4.1	4.3	4.6	4.9	5.1	5.4	5.7	5.9	6.2	6.5	6.8	7.0	52

Example 2: Asma is a 3 years and 2 months old girl. Asma'a **height is 89.1 cm**, and her **weight is 12.6 kg. To determine his BMI, using the BMI table:**

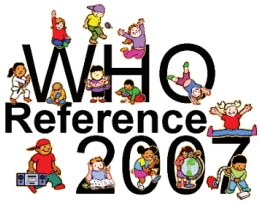
- The closest height in the far left column of the table is 89 cm.
- Asma's weight is 12.6 kg. The closest weight on the row for her height is 12.7 kg.
- Tracing a finger upward from her weight, you find that her BMI (on the top row of the table) is 16.

L or H (cm)	Body Mass Index (BMI)												
	8	9	10	11	12	13	14	15	16	17	18	19	20
84	5.6	6.4	7.1	7.8	8.5	9.2	9.9	10.6	11.3	12.0	12.7	13.4	14.1
85	5.8	6.5	7.2	7.9	8.7	9.4	10.1	10.8	11.6	12.3	13.0	13.7	14.5
86	5.9	6.7	7.4	8.1	8.9	9.6	10.4	11.1	11.8	12.6	13.3	14.1	14.8
87	6.1	6.8	7.6	8.3	9.1	9.8	10.6	11.4	12.1	12.9	13.6	14.4	15.1
88	6.2	7.0	7.7	8.5	9.3	10.1	10.8	11.6	12.4	13.2	13.9	14.7	15.5
89	6.3	7.1	7.9	8.7	9.5	10.3	11.1	11.9	12.7	13.5	14.3	15.0	15.8
90	6.5	7.3	8.1	8.9	9.7	10.5	11.3	12.2	13.0	13.8	14.6	15.4	16.2
91	6.6	2.5	8.3	9.1	9.9	10.8	11.6	12.4	13.2	14.1	14.9	15.7	16.6
92	6.8	2.6	8.5	9.3	10.2	11.0	11.8	12.7	13.5	14.4	15.2	16.0	16.9

GROWTH MONITORING TOOLS

AVAILABLE TOOLS

1 WHO Child Growth Standards (0-5 years)



2 WHO Child Growth References (5-19 years)

3 Intergrowth-21st Standards and References

1 WHO Child Growth Standards (0-5 years)

Example of available charts (0-60 months):

- Length/height-for-age
- Weight-for-age
- Weight-for-length/height
- BMI-for-age
- Head circumference-for-age
- Arm circumference-for-age

2 WHO Child Growth References (5-19 years)

To monitor growth from 5 to 19 years

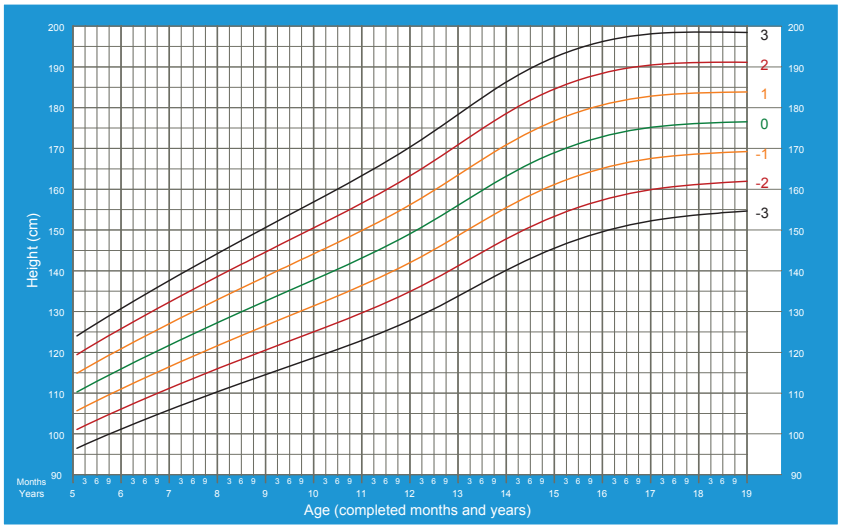
Available charts:

- Weight-for-age (5-10 years)
- Height-for-age (5-19 years)
- BMI-for-age (5-19 years)

Height-for-age BOYS

5 to 19 years (z-scores)

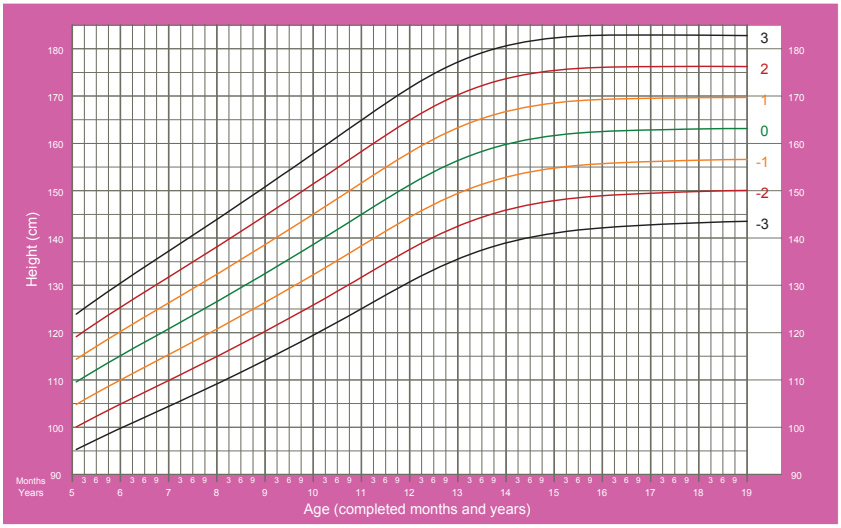
World Health Organization



Height-for-age GIRLS

5 to 19 years (z-scores)

World Health Organization



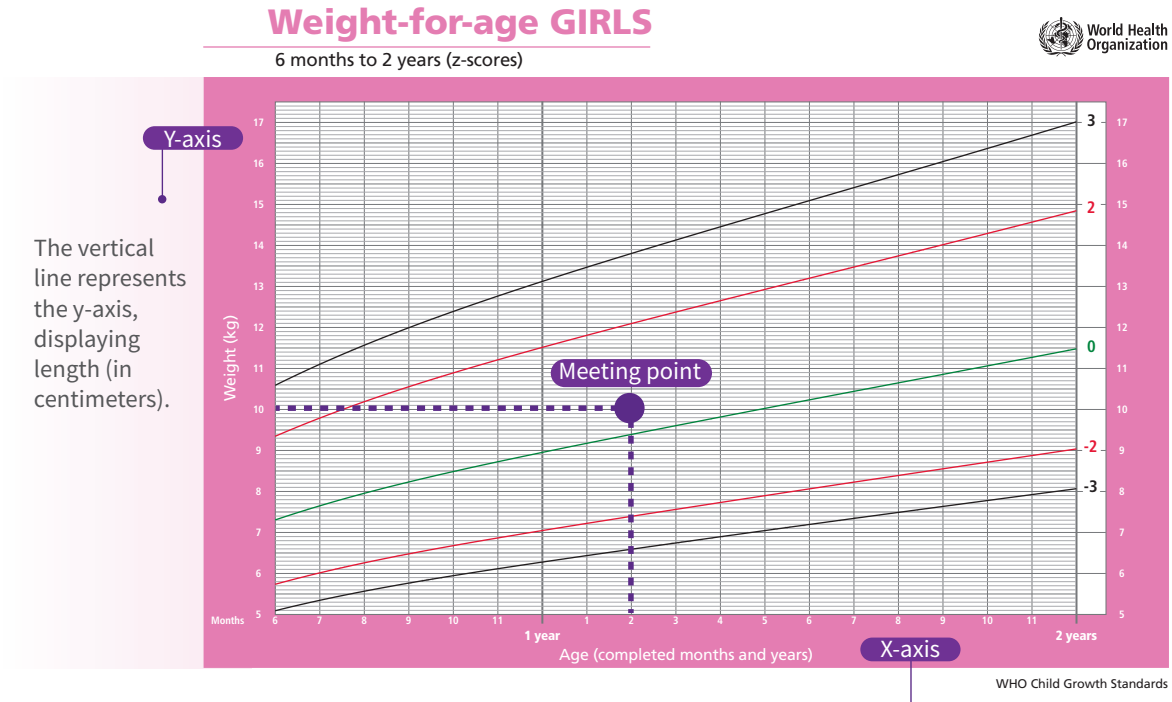
3 Intergrowth-21st Standards and References

Products of the intergrowth-21st project:

- Growth during pregnancy
- Size at birth by GA
- Postnatal growth of preterm infants

PLOTTING ON GROWTH CHARTS

After completing the child's measurements, it is important to identify trends or patterns of growth. This can be done by plotting the measurements accurately on appropriate growth charts.



The vertical line represents the y-axis, displaying length (in centimeters).

The horizontal line at the bottom of the graph is known as the x-axis, depicting age (in completed months and years).

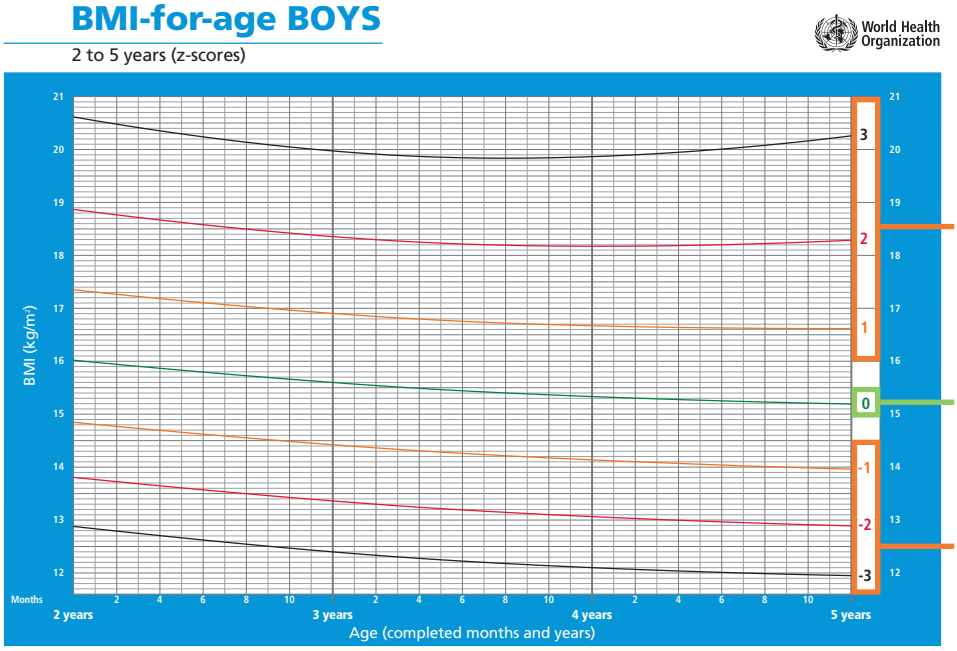
INTERPRETING GROWTH INDICATORS AND TRENDS

1. Instead of analyzing a single measurement in isolation, comparing it to other measures like height or age is crucial to derive meaningful insights.

2. Common indices include weight-for-age, weight-for-length/height, length/height-for-age, and head circumference-for-age. These indices are typically represented as percentiles or z-scores.

3. It is important to plot measurements on sex-specific charts since sex can influence infant growth in terms of body size, composition, and growth patterns.

INTERPRET PLOTTED POINTS FORGROWTH INDICATORS



WHO Child Growth Standards

Z-score lines on the growth charts are numbered **positively** (1, 2, 3) may represent a **growth problem**

The line labeled 0 on each chart represents the median (average)

Z-score lines on the growth charts are numbered **negatively** (−1, −2, −3) may represent a **growth problem**

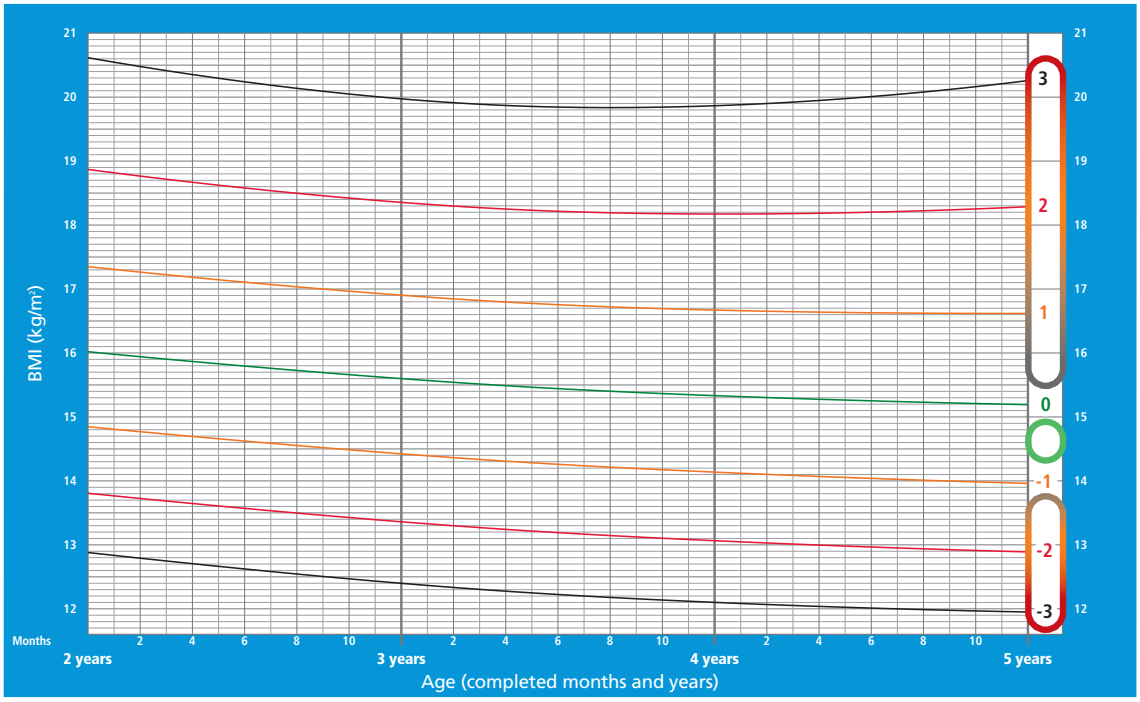
A plotted point that is close to the median indicates normal growth

A plotted point that is close to the median indicates normal growth

BMI-for-age BOYS

2 to 5 years (z-scores)

World Health Organization



WHO Child Growth Standards

Make sure to read the plotted points as follows:

A point between the z score lines -2 and -3 is “below -2”

A point between the zscore lines 2 and 3 is “above 2”

Cut-of	Interpretation
Between and including -1 and +1	Normal
< -1 and ≤ -2 or > +1 and ≤+2	Should raise alert and be monitored
< -2 or > +2	Should raise alert and be treated
< -3 or > +3	Show increased severity

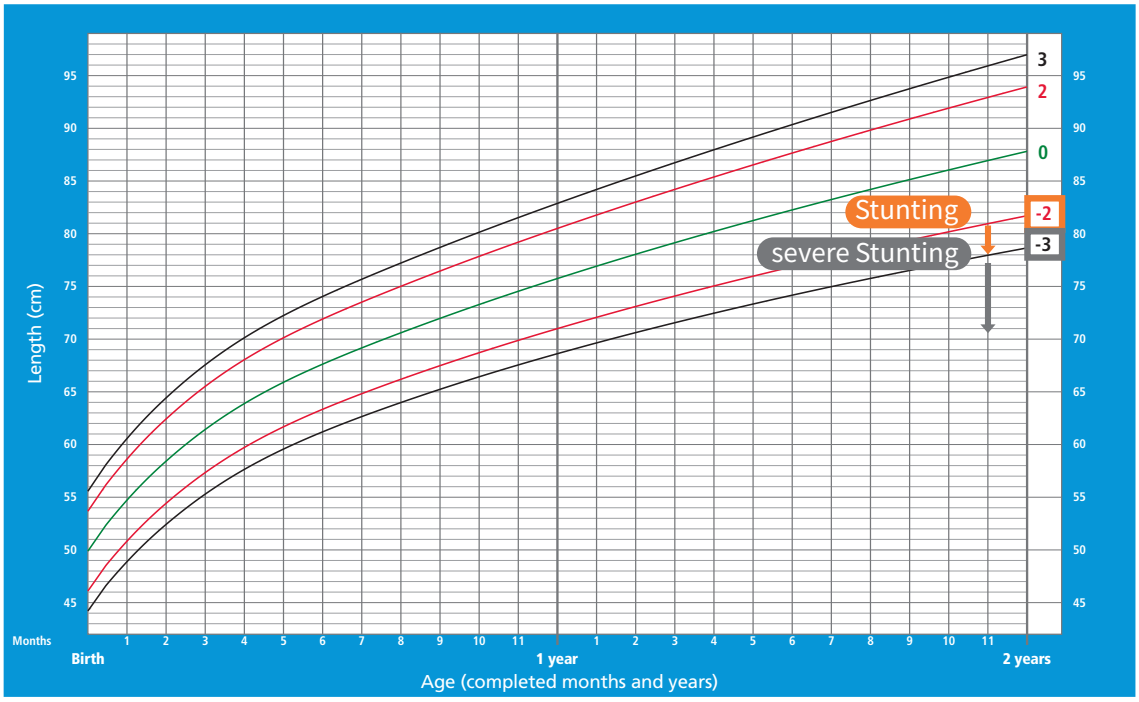
GROWTH PROBLEMS (0-5 YEARS)

Z-score	Height-for-age	Weight-for-age	Weight-for-length/height	BMI-for-age
Above 3	Tallness	Better to use BMI-for-age	Obese	Obese
Above 2	Normal	Better to use BMI-for-age	Overweight	Overweight
Above 1	Normal	Better to use BMI-for-age	Risk of Overweight	Risk of Overweight
0 (median)	Normal	Normal	Normal	Normal
Below -1	Normal	Normal	Normal	Normal
Below -2	Stunted	Underweight	Wasting	Wasting
Below -3	Severely stunted	Severely underweight	Severe wasting	Severe wasting

Length-for-age BOYS

Birth to 2 years (z-scores)

World Health Organization

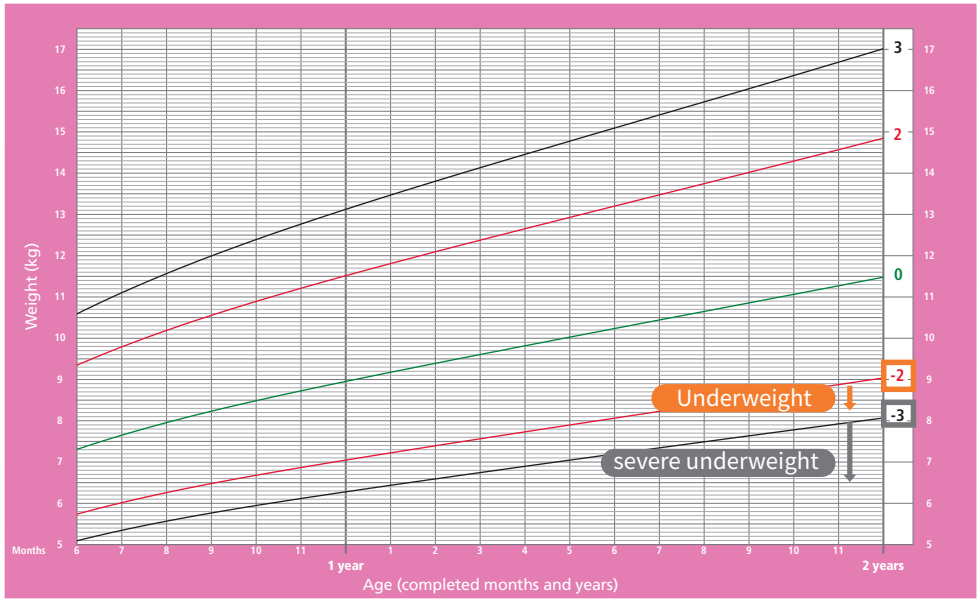


WHO Child Growth Standards

Weight-for-age GIRLS

6 months to 2 years (z-scores)

World Health Organization

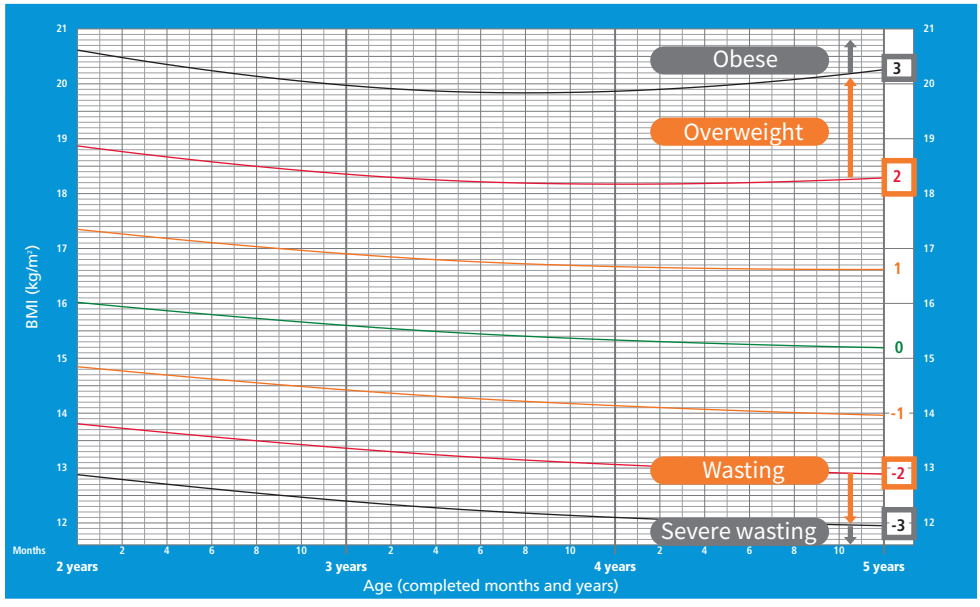


WHO Child Growth Standards

BMI-for-age BOYS

2 to 5 years (z-scores)

World Health Organization

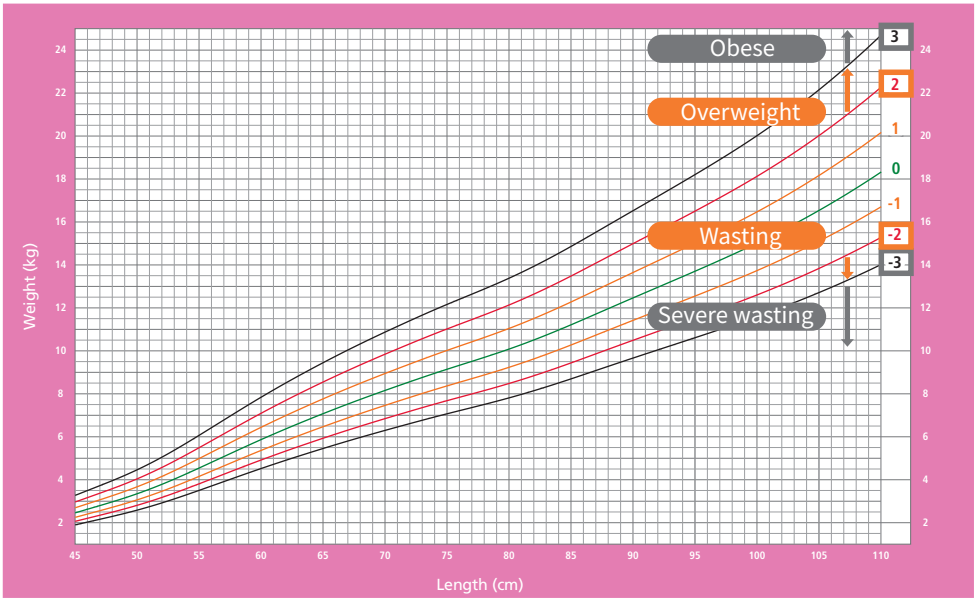


WHO Child Growth Standards

Weight-for-length GIRLS

Birth to 2 years (z-scores)

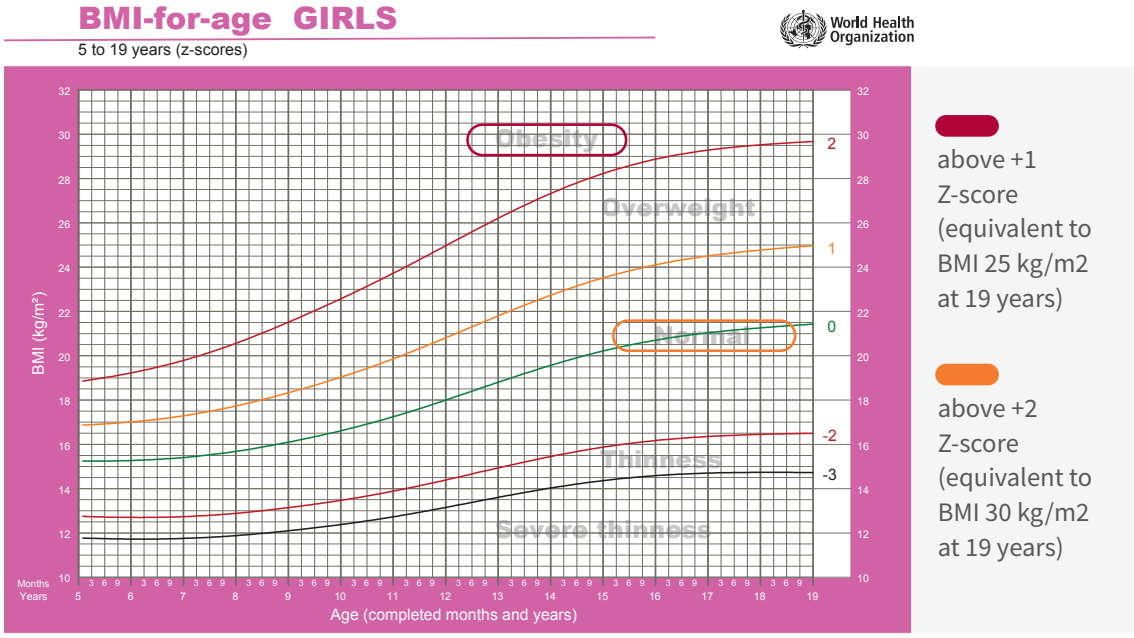
World Health Organization



WHO Child Growth Standards

GROWTH PROBLEMS (5-19 YEARS)

Z-score	Height-for-age	Weight-for-age	BMI-for-age
Above 3	Tallness	Better to use BMI-for-age	Obese
Above 2	Normal	Better to use BMI-for-age	Obese
Above 1	Normal	Better to use BMI-for-age	Overweight
0 (median)	Normal	Normal	Normal
Below -1	Normal	Normal	Normal
Below -2	Stunted	Underweight	Thinness
Below -3	Severely stunted	Severely underweight	Severe thinness



INTERPRETING TRENDS ON GROWTH CHARTS

It's crucial to understand that a single plotted point is inadequate for making a diagnosis. Instead, multiple points are plotted over time to illustrate trends and ascertain whether growth aligns with the standards or deviates from it.

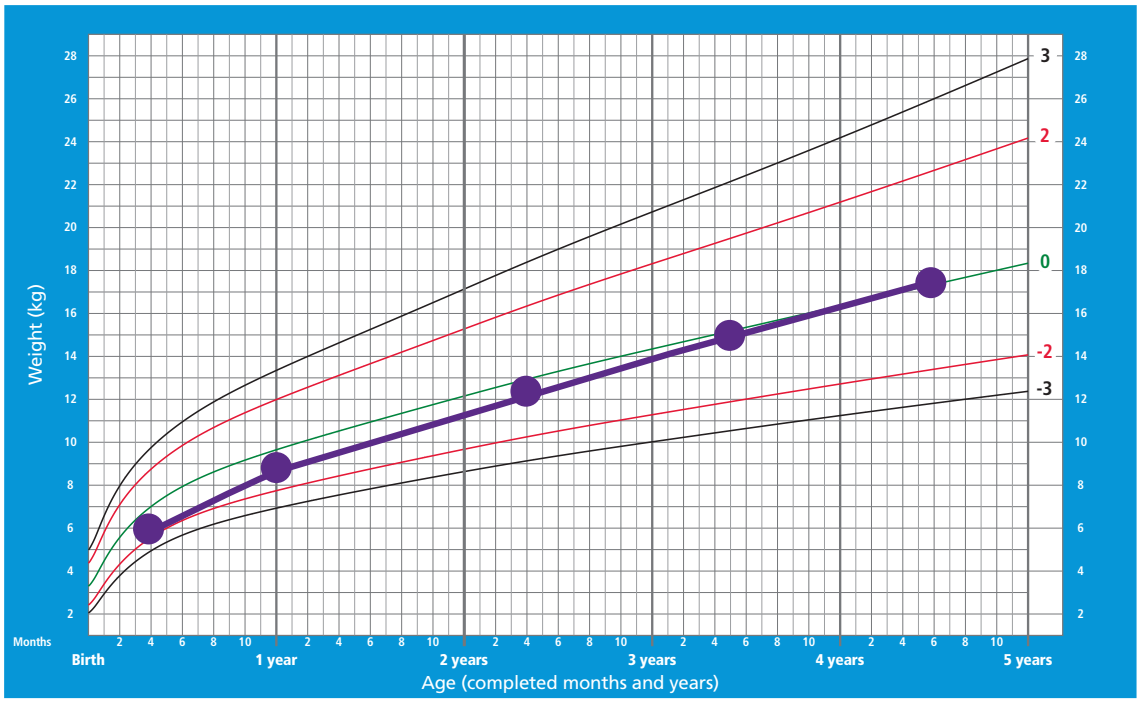
To interpret trends in a child's growth:

1. Observe the plotted points for growth indicators across multiple visits.
2. These trends can signify consistent and healthy growth or indicate potential growth issues requiring further assessment

Weight-for-age BOYS

Birth to 5 years (z-scores)

World Health Organization



WHO Child Growth Standards

- Typically, children who are growing **"normally"** will follow trends that run **parallel to the median** and z-score lines.
- Their growth trend line can be either above or below the median and roughly parallel to it.

When interpreting growth charts, it's essential to watch out for the following scenarios, which may suggest a problem or indicate potential risk:

The child's growth line crosses a z-score line.

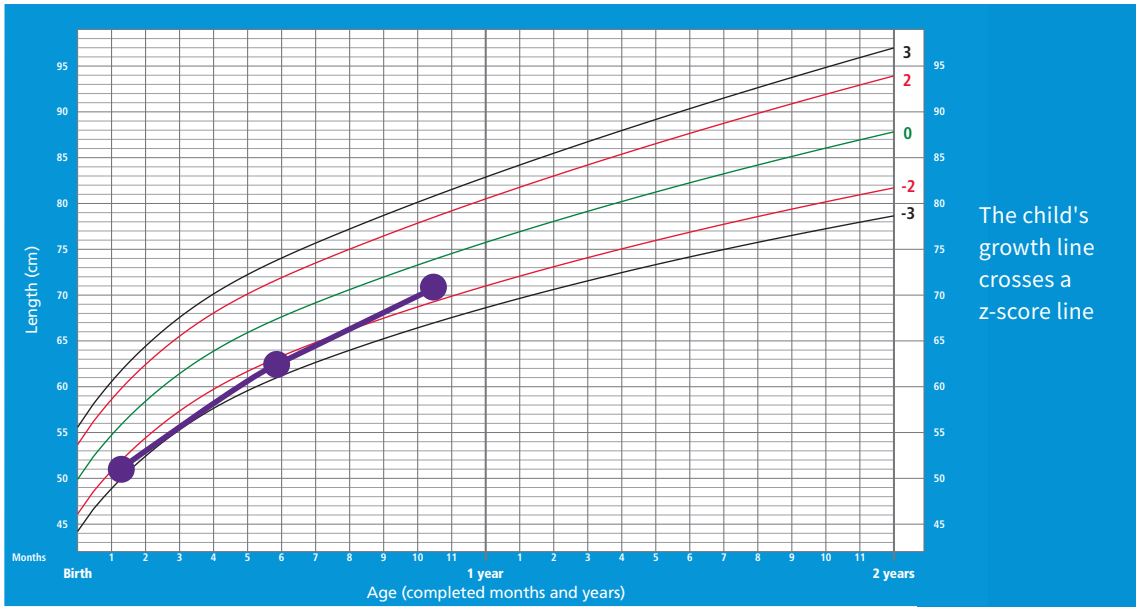
There is a significant upward or downward trend in the child's growth line.

The child's growth line remains stagnant, showing no increases over time.

Length-for-age BOYS

Birth to 2 years (z-scores)

World Health Organization



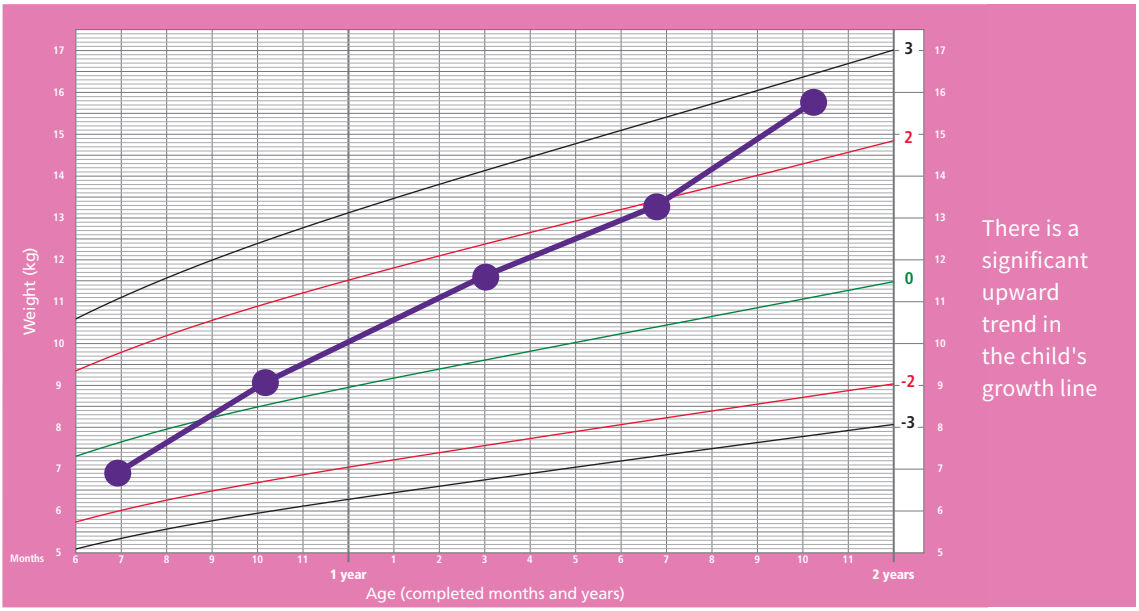
The child's growth line crosses a z-score line

WHO Child Growth Standards

Weight-for-age GIRLS

6 months to 2 years (z-scores)

World Health Organization



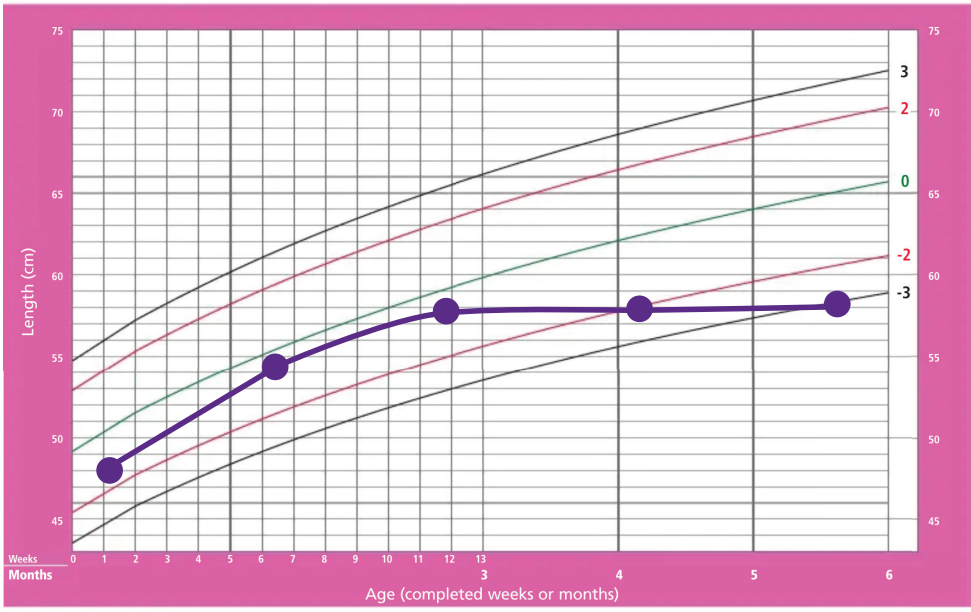
There is a significant upward trend in the child's growth line

WHO Child Growth Standards

Length-for-age GIRLS

Birth to 6 months (z-scores)

World Health Organization



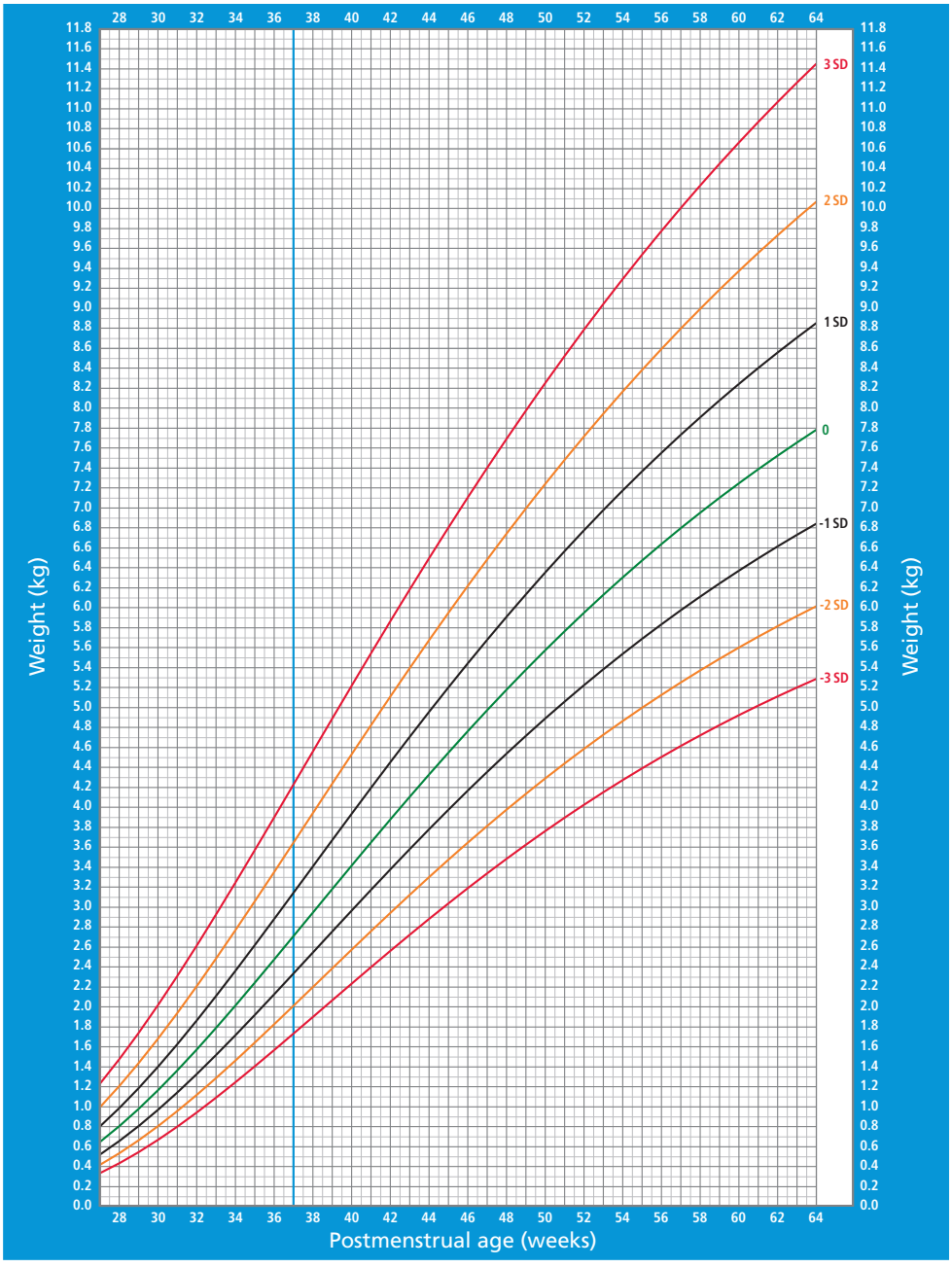
The child's growth line remains stagnant, showing no increases over time

WHO Child Growth Standards

UNIVERSITY OF OXFORD

International Postnatal Growth Standards for Preterm Infants (Boys)

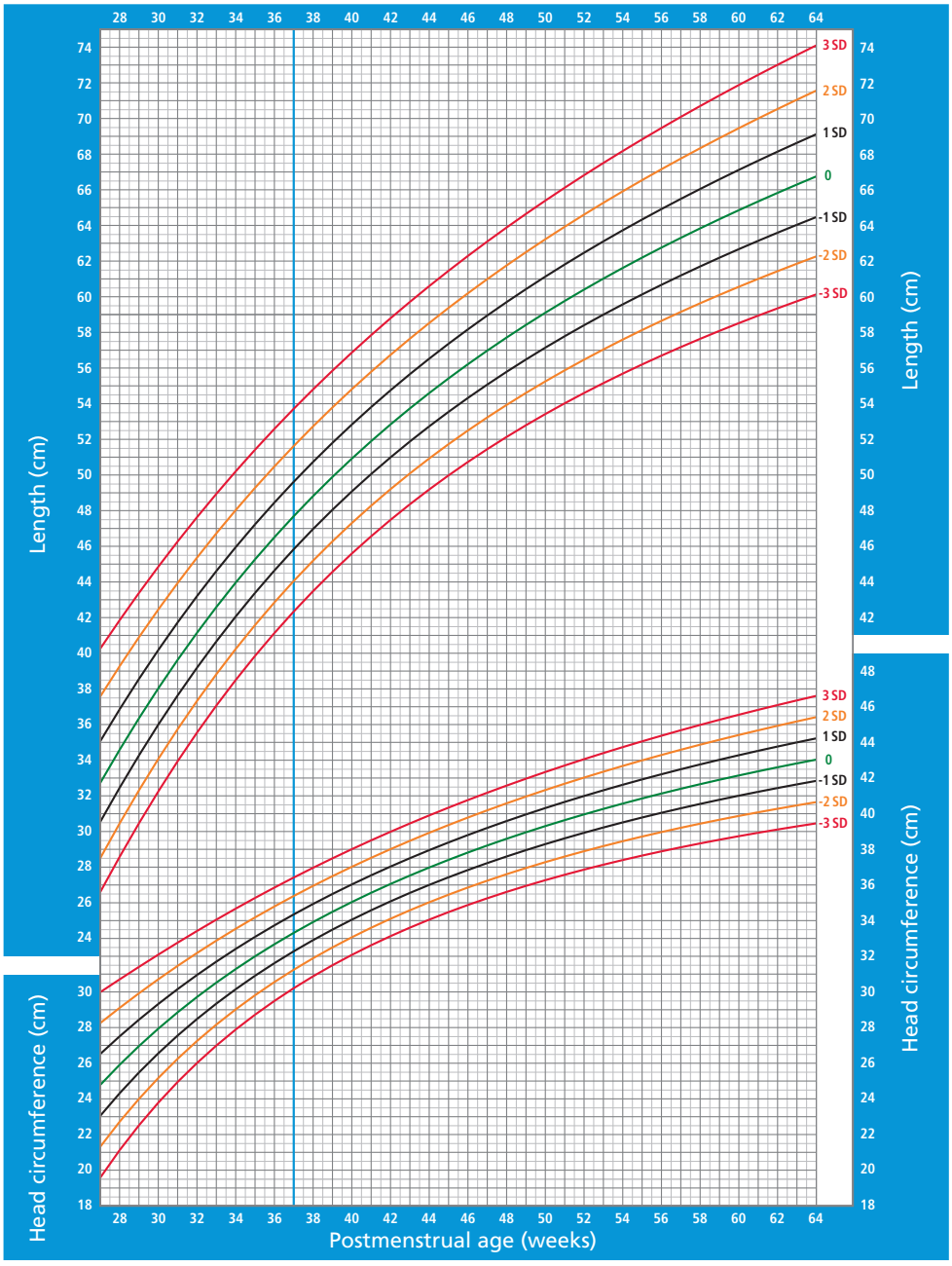
INTERGROWTH-21st



UNIVERSITY OF OXFORD

International Postnatal Growth Standards for Preterm Infants (Boys)

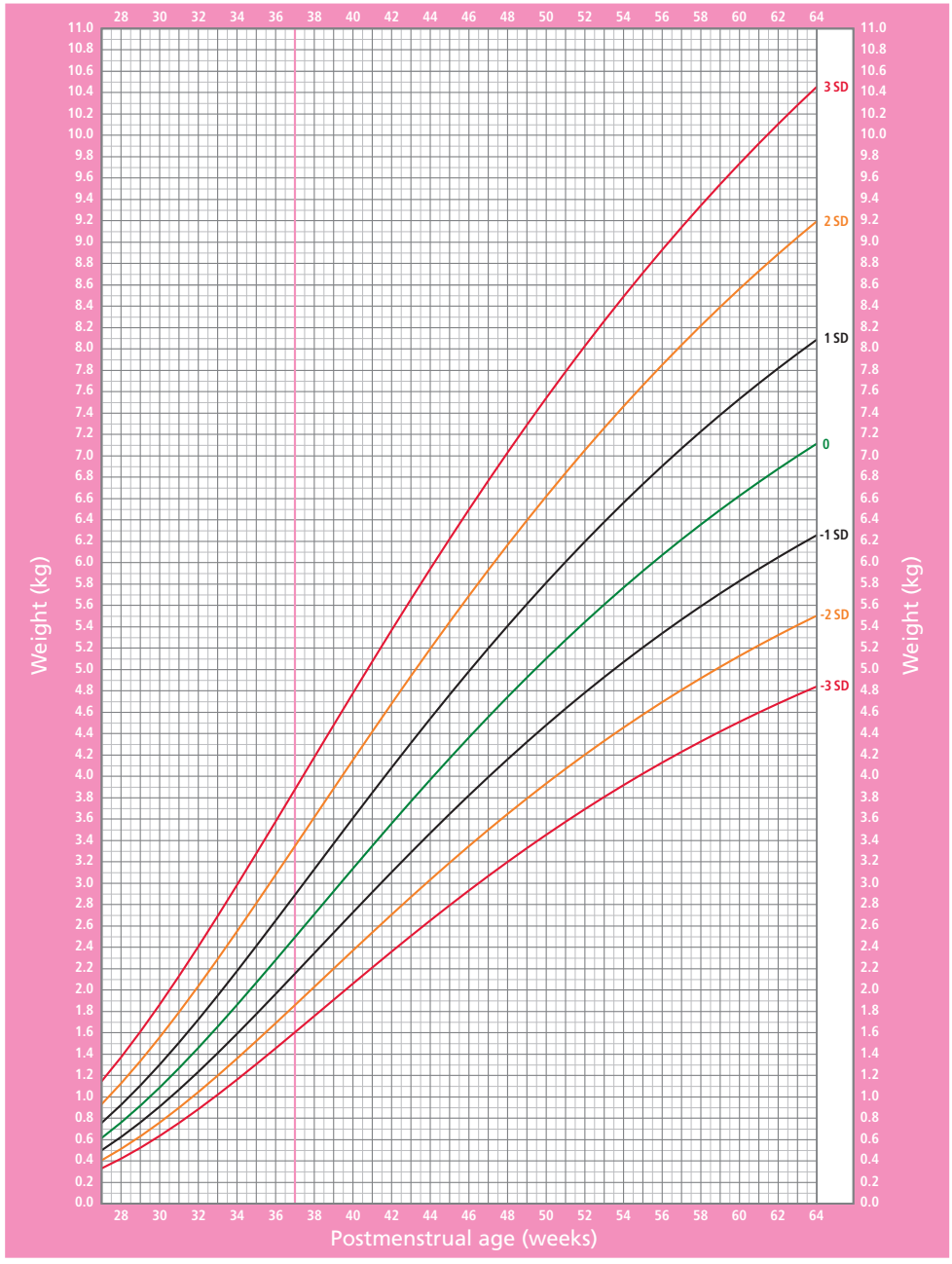
INTERGROWTH-21st



UNIVERSITY OF OXFORD

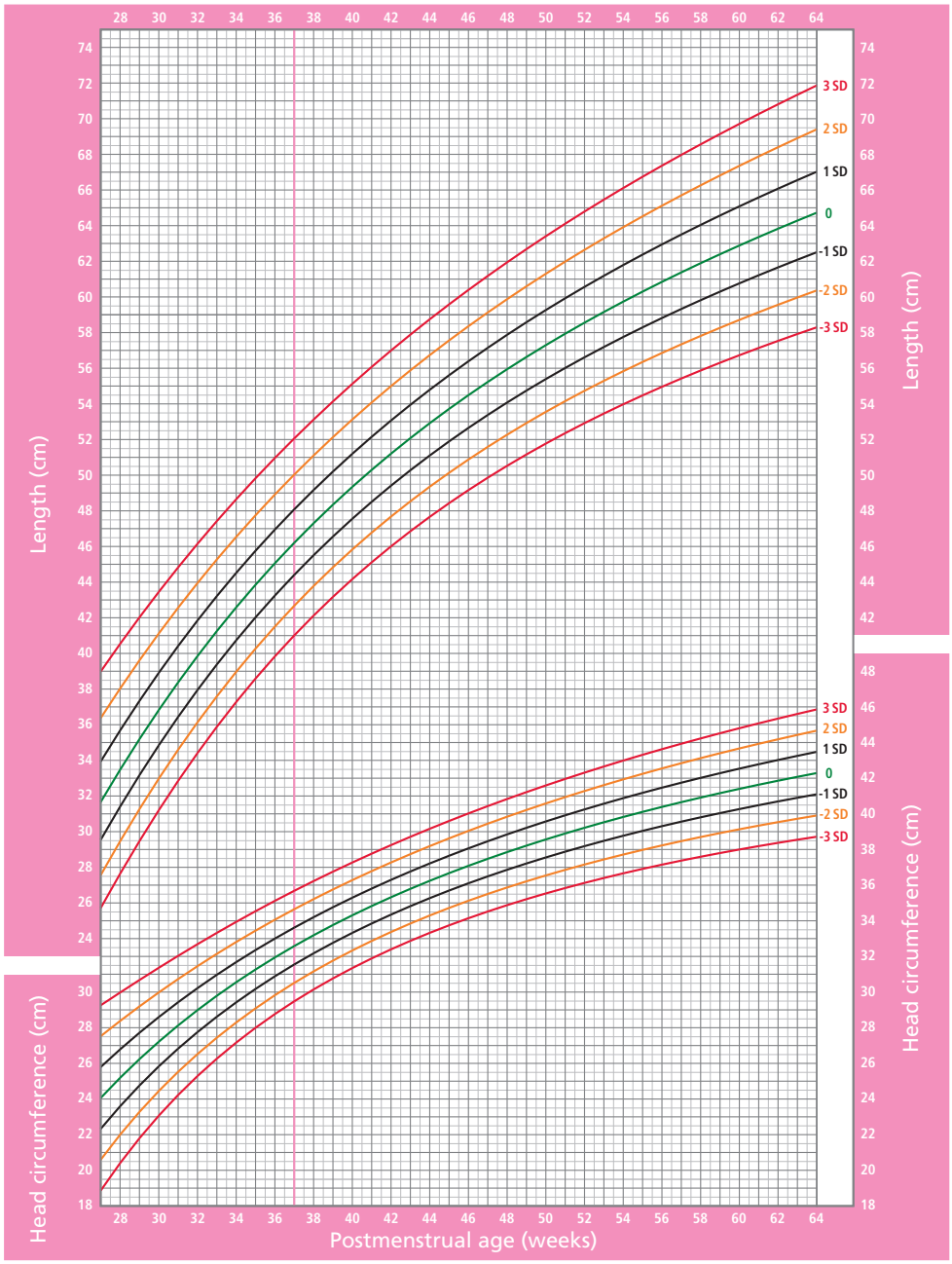
International Postnatal Growth Standards for Preterm Infants (Girls)

INTERGROWTH-21st



International Postnatal Growth Standards for Preterm Infants (Girls)

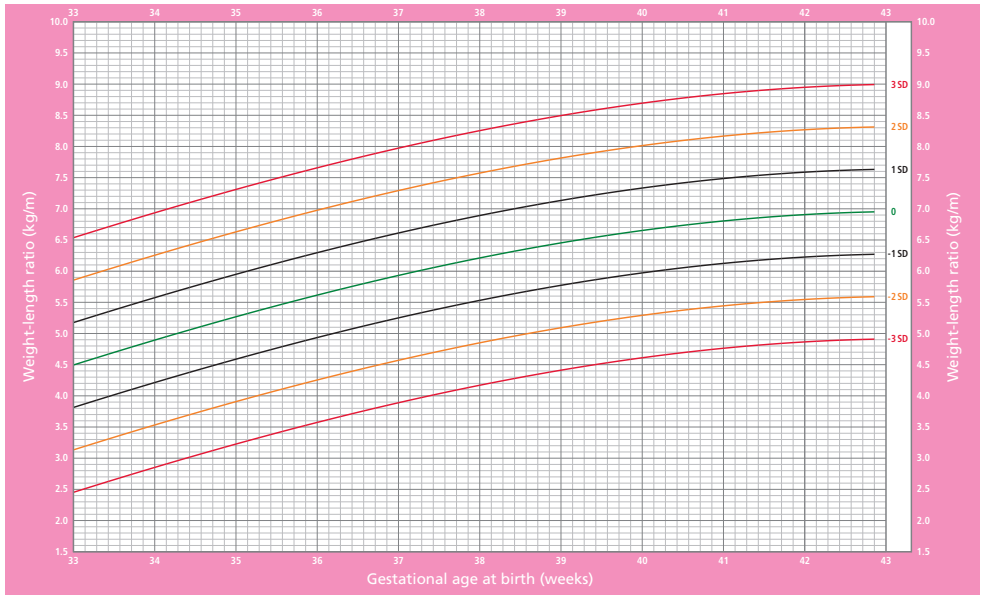
INTERGROWTH-21st



POSTNATAL GROWTH OF PRETERM INFANTS

International Newborn Size Standards
Weight-Length Ratio (Girls)

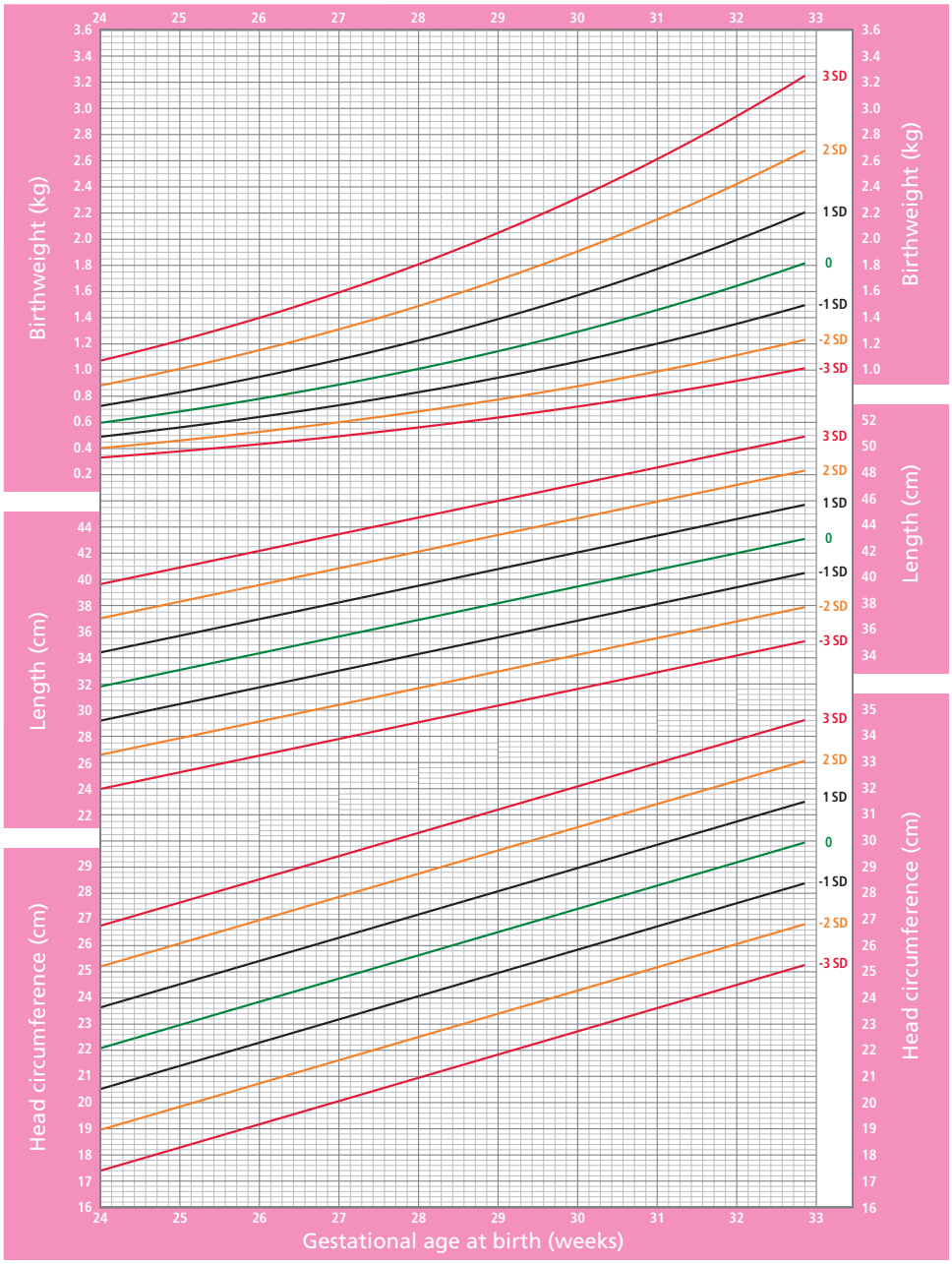
INTERGROWTH-21st



Villar et al. *Pediatr Res* 2017

International Newborn Size Reference Charts for Very Preterm Infants (Girls)

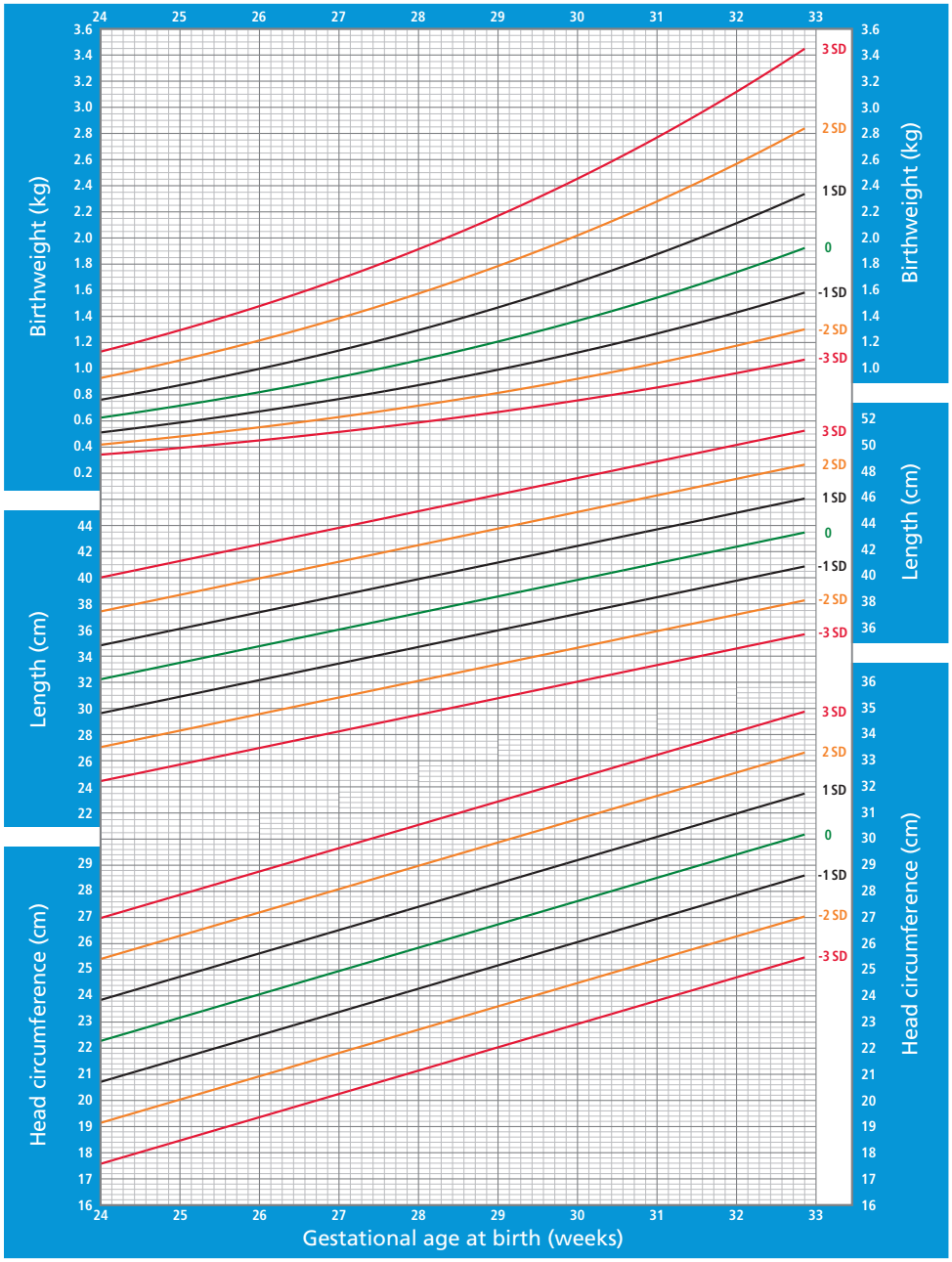
INTERGROWTH-21st



UNIVERSITY OF OXFORD

International Newborn Size Reference Charts for Very Preterm Infants (Boys)

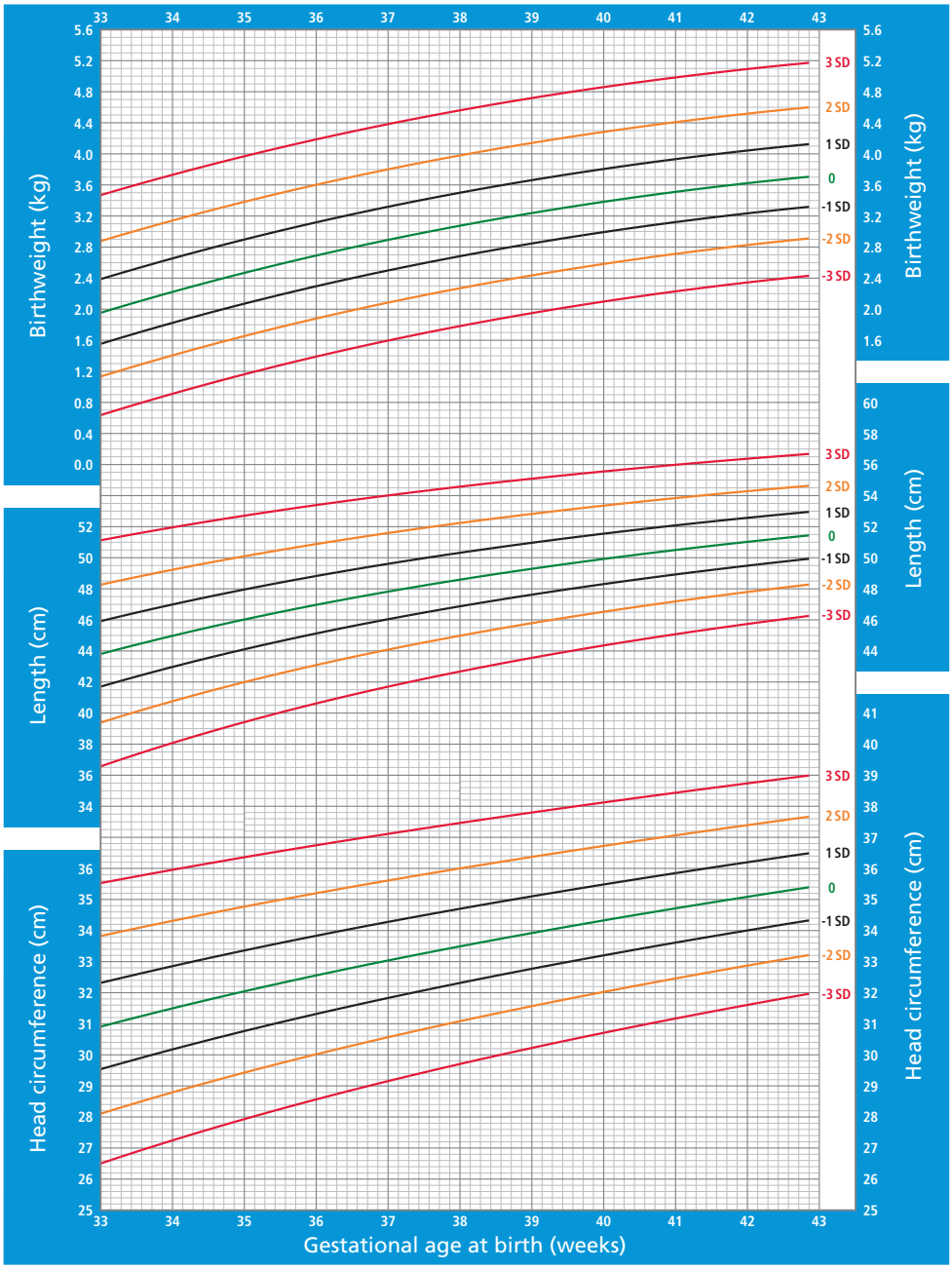
INTERGROWTH-21st



UNIVERSITY OF OXFORD

International Newborn Size Standards (Boys)

INTERGROWTH-21st



CASE STUDIES

Case Study 1

The following table presents the measurements for two girls (X) and (o).

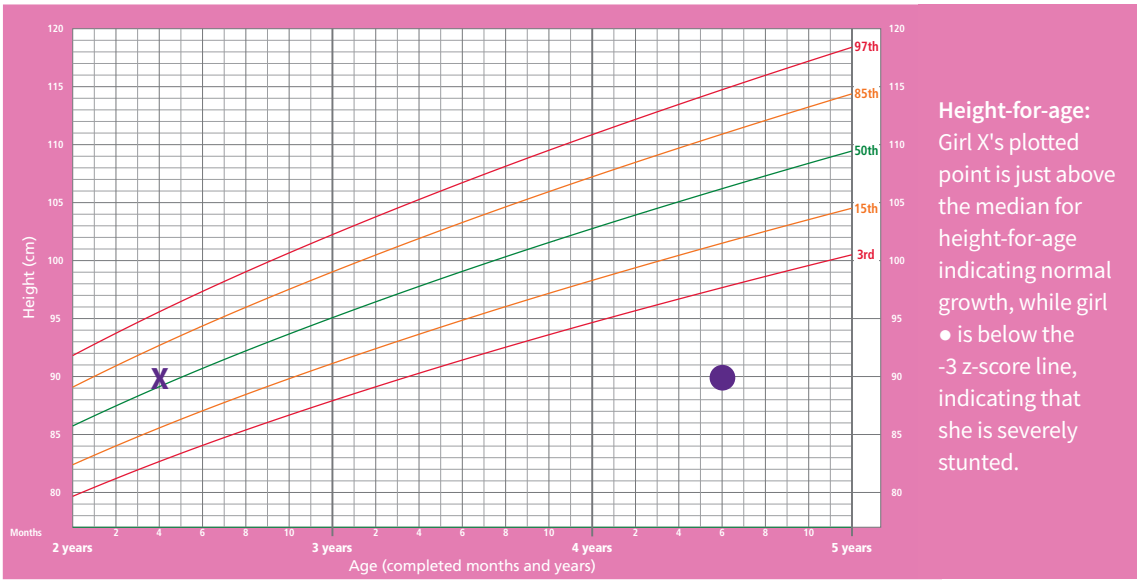
Girl	Age	Weight (kg)	Length/height (cm)	BMI
X	2 years 4 months	12	90	14.8
●	4 years 6 months	12	90	14.8

The girls measurements are plotted on four different charts: weight-for-age, height-for-age, weight-for-height, and BMI-for-age.

Height-for-age GIRLS

2 to 5 years (percentiles)

World Health Organization



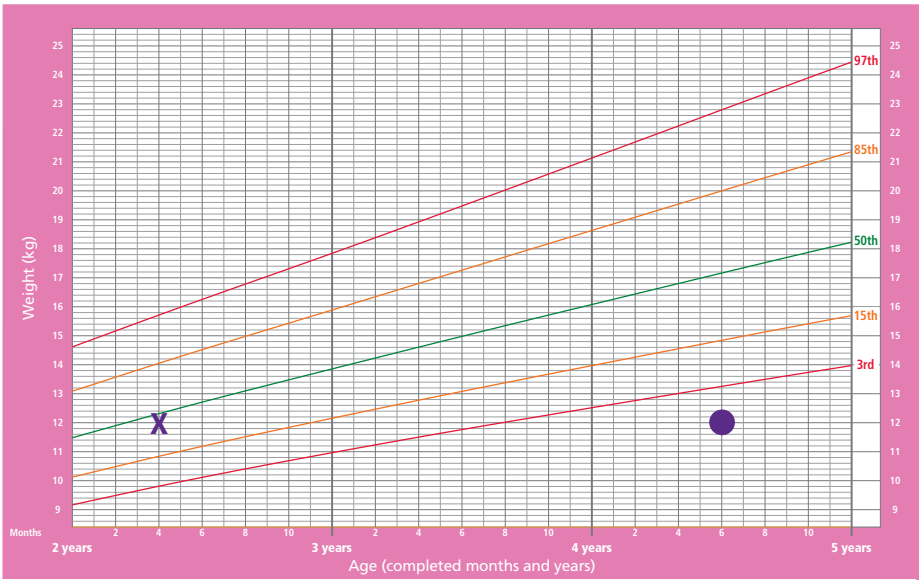
Height-for-age: Girl X's plotted point is just above the median for height-for-age indicating normal growth, while girl ● is below the -3 z-score line, indicating that she is severely stunted.

WHO Child Growth Standards

Weight-for-age GIRLS

2 to 5 years (percentiles)

World Health Organization

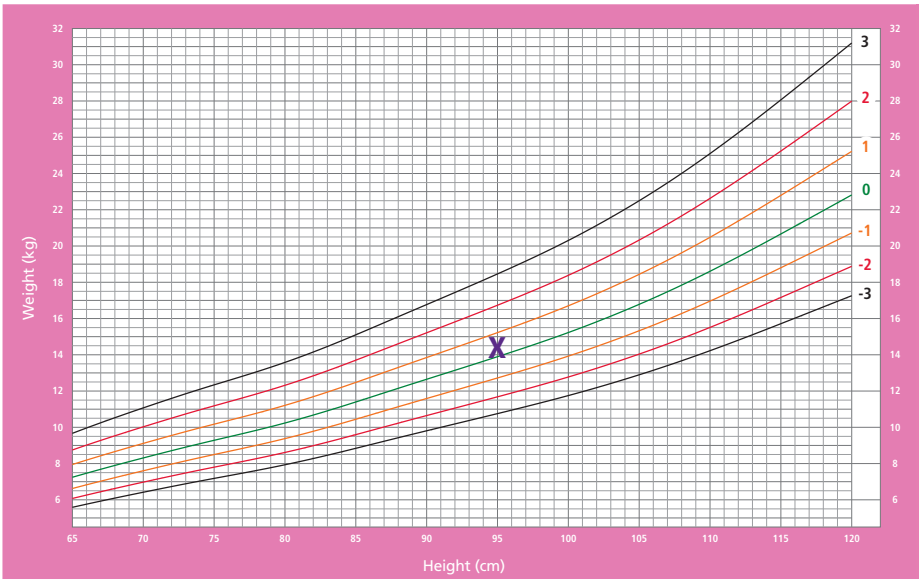


Weight-for-age: Girl X's plotted point is on the median indicating normal growth, while girl ● is below the -2 z-score line, indicating that she is underweight.

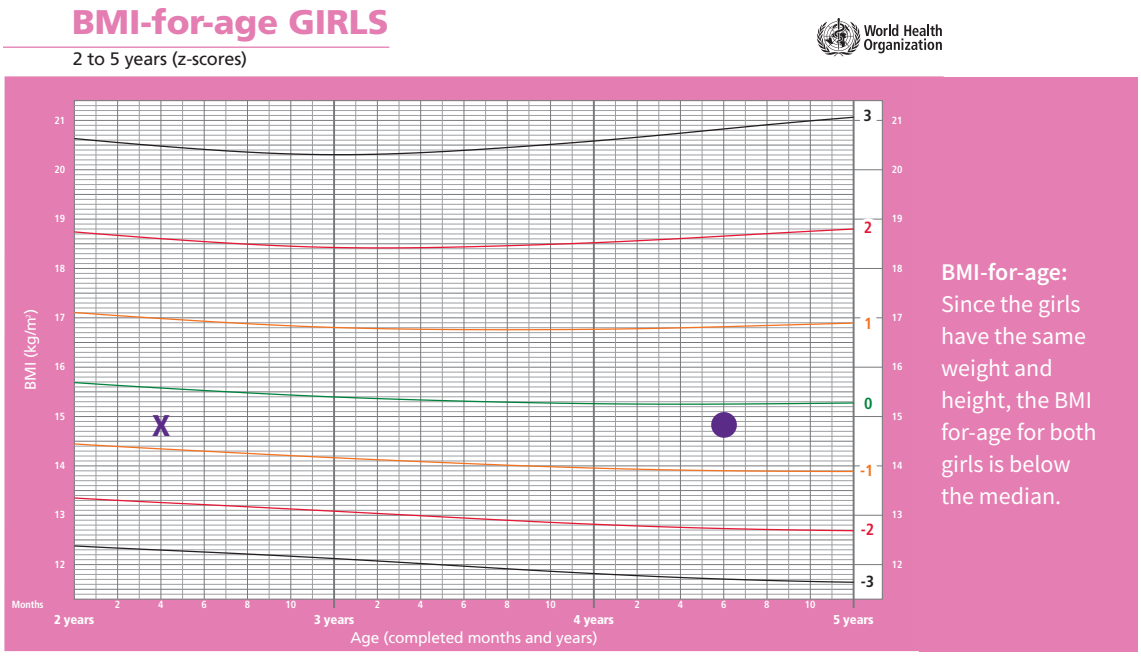
Weight-for-Height GIRLS

2 to 5 years (z-scores)

World Health Organization



Weight-for-height: Both girls have the same weight and height falling just below the median.



In conclusion, interpreting growth patterns solely based on one growth chart may not provide a comprehensive understanding of a child's overall growth and development. For example, comparing Girl X and Girl ●, even though they have the same height and weight, the different positions of their plotted measurements on the height-for-age and weight-for-age charts show that Girl ● is shorter and lighter for her age. However, when we look at their BMI-for-age, it suggests they both have a healthy weight for their height.

This highlights the importance of looking at different growth charts to fully understand a child's growth. Relying on just one chart might miss important signs of growth problems or nutritional issues.

Case Study 2

Fadi was born on 21 January 2023. He was a single, term birth (39 weeks of pregnancy). According to his birth record, his weight was 3.2 kg and length was 51.1 cm. Fadi is the only child born to his mother. He was breastfed exclusively till 6 months of age. There have been no unusual adverse events in his life so far.

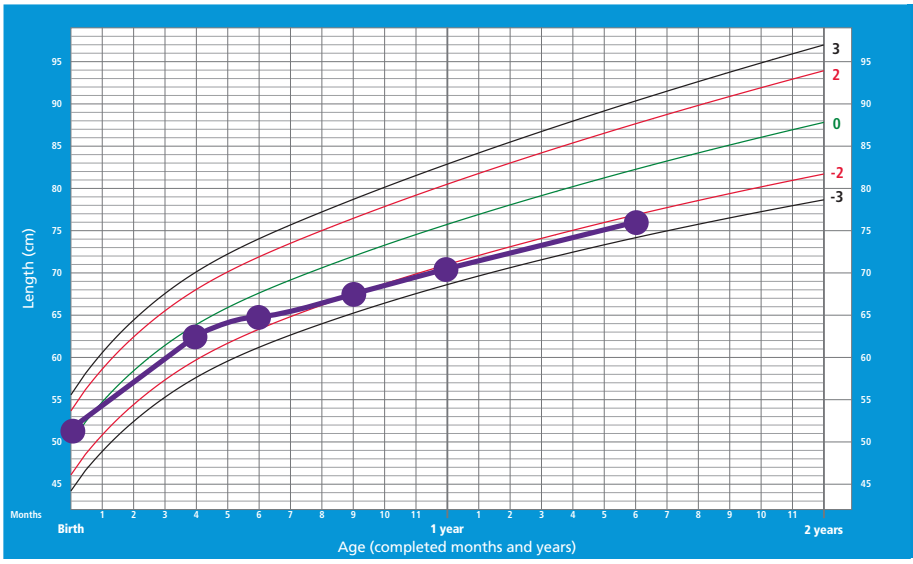
The table below includes Fadi's measurements from different visits.

Visit	Age	Weight (kg)	Length/height (cm)	BMI
1	4 months	6.5	62.3	16.7
2	6 months	7.3	64.3	17.7
3	9 months	8.6	66.9	19.2
4	12 months	10.1	70.0	20.7
5	18 months	12.0	75.1	21.3

Length-for-age BOYS

Birth to 2 years (z-scores)

World Health Organization

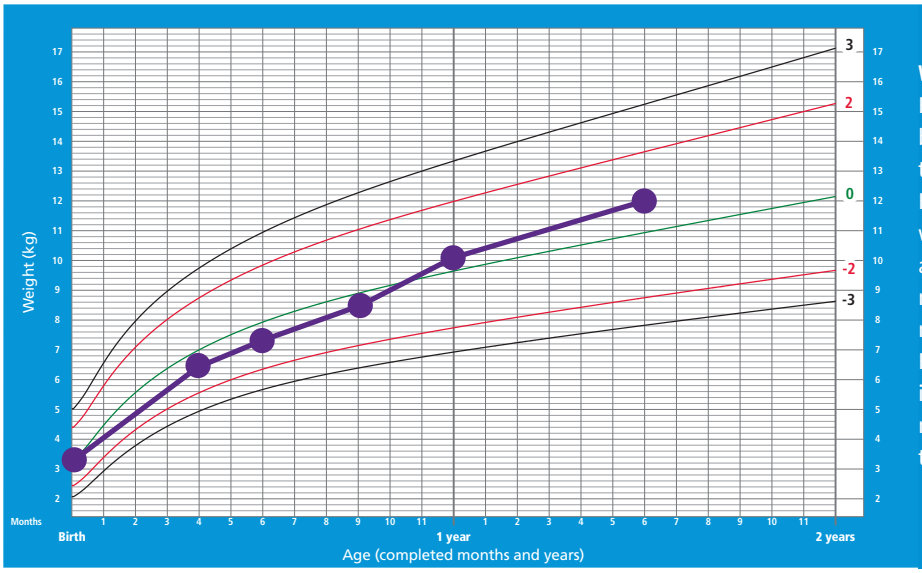


Length-for-age: Fadi was of average length at birth, but his growth trend has shown periods of slow growth. Over a period of 18 months, his length-for-age has dropped from the median at birth to below -2 z-score. At 18 months, Fadi is identified as stunted based on his length-for-age chart.

Weight-for-age BOYS

Birth to 2 years (z-scores)

World Health Organization

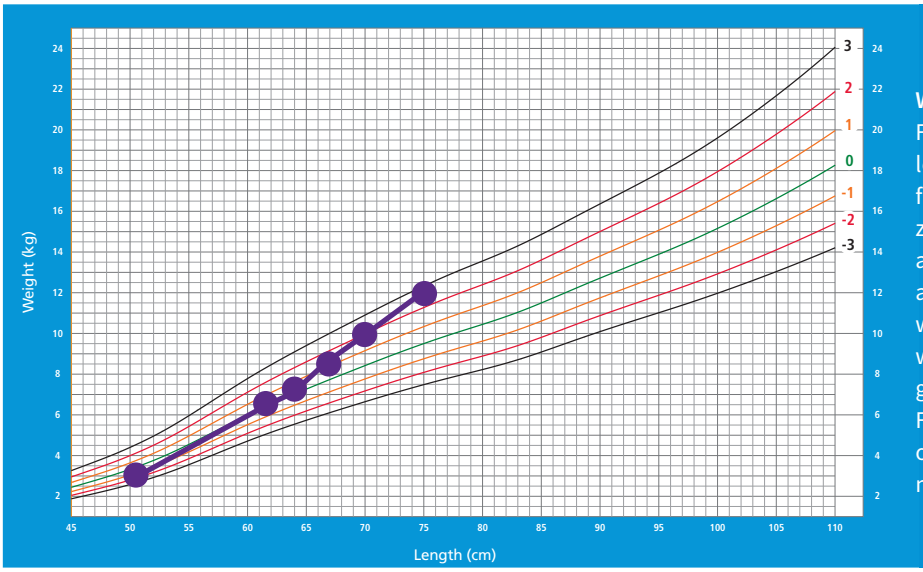


Weight-for-age: Fadi's weight at birth was close to the median. He was gaining weight steadily and around the median until 18 months of age. Fadi's weight is identified as normal based on this chart.

Weight-for-length BOYS

Birth to 2 years (z-scores)

World Health Organization

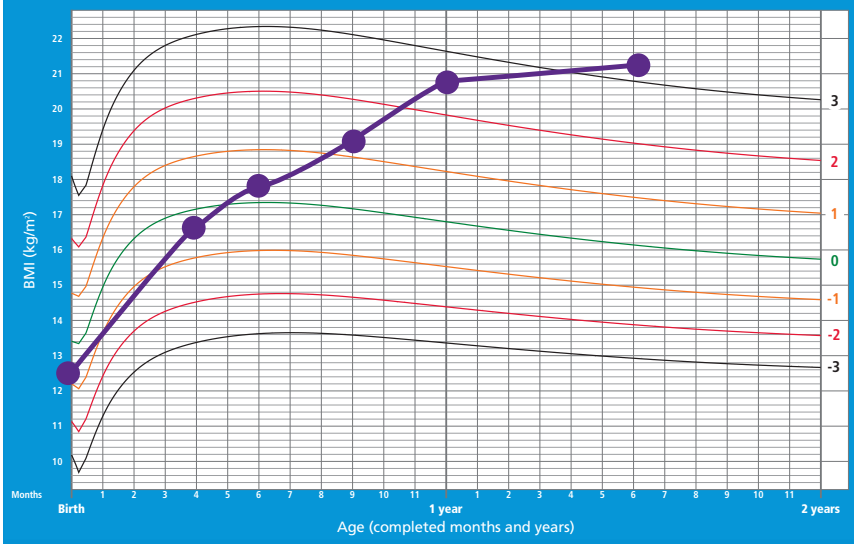


Weight-for-length: Fadi's weight-for-length has moved from around -1 z-score at birth to above +2 z-score at 18 months as he was gaining weight while his length gains were slow. Fadi is identified as overweight at 18 months of age.

BMI-for-age BOYS

Birth to 2 years (z-scores)

World Health Organization



BMI-for-age: Fadi's BMI at birth was normal and around the median. In his subsequent visits, Fadi's BMI was significantly increased and crossed multiple z-score lines. At 9 months, Fadi's BMI was above the +1 z-score indicating overweight. This trend continued as he crossed the +2 z-score at 12 months reaching above the +3 z-score at 18 months. Fadi's BMI for age indicates that he is obese at 18 months of age as the point is above +3.

While Fadi started with average length at birth, his growth trajectory has taken a concerning turn. By 18 months, he has become stunted, with his length-for-age dropping below -2 z-score. This decline is compounded by his rapid weight gain, resulting in being identified as overweight based on the weight-for-length chart and ultimately obese based on the BMI-for-age chart. Despite his weight appearing appropriate for his age, as indicated by the weight-for-age chart, his stunted growth has resulted in him gaining weight disproportionally with his lengths leading to him becoming obese at 18 months. This highlights the importance of plotting children's growth on different charts and examining different indicators to obtain a full picture and an accurate assessment of their nutritional status.

This highlights the importance of plotting children's growth on different charts and examining different indicators to obtain a full picture and an accurate assessment of their nutritional status.

Use Age-Appropriate Growth Charts for Boys and Girls

Utilize growth charts appropriate for the age range of the child being monitored.

Regularly Update Growth Charts

Update growth charts at every well-child visit to track changes over time accurately. Consistent monitoring allows for early detection of growth deviations and timely interventions.

Engage Parents/Guardians

Encourage parents/guardians to actively participate in growth monitoring by providing them with understandable explanations of growth parameters and involving them in discussions about their child's growth trajectory.

Monitor Growth Velocity

Pay attention to growth velocity, especially during critical periods of growth, such as infancy, puberty, and adolescence. Sudden changes in growth velocity may indicate underlying health issues that require further evaluation.

Consider Developmental Milestones

Integrate assessment of developmental milestones with growth monitoring to provide a comprehensive evaluation of a child's overall health and well-being.

Collaborate with Specialists

Collaborate with other healthcare professionals, such as pediatric endocrinologists, nutritionists, and psychologists, for multidisciplinary evaluation and management of complex growth issues.

Document Growth Data

Maintain accurate and detailed documentation of growth data in the patient's medical record, including measurements, growth charts, and any relevant observations or discussions during consultations.

Stay Informed

Stay updated on the latest research, guidelines, and best practices in growth monitoring through continuing education, professional development opportunities, and participation in relevant conferences or workshops.

Ongoing Training and Standardization

Conduct ongoing training and standardization to ensure accurate and consistent measurements.

Equipment Maintenance and Care

Ensure regular maintenance, calibration, and proper storage of measurement equipment to maintain accuracy, prevent damage, and extend its lifespan.

CONCLUSION

GROWTH MONITORING: THE KEYSTONE OF PEDIATRIC CARE

Growth monitoring is a cornerstone of pediatric healthcare, playing a vital role in spotting growth issues that could affect a child's health and development. By closely tracking a child's growth, healthcare professionals gain valuable insights into their growth patterns, enabling timely interventions when deviations arise.

THE POWER OF ACCURATE DATA

The success of growth monitoring hinges on precise data collection and the use of reliable tools. Ensuring accuracy in these processes is crucial for effective monitoring practices. With precise data, healthcare providers can better support children and their families, addressing immediate health concerns and promoting long-term physical and cognitive development.

A HOLISTIC APPROACH

Integrating growth monitoring into comprehensive pediatric care allows for a holistic approach to a child's health. This proactive strategy emphasizes the importance of regular monitoring and early intervention, contributing to the overall well-being of children.

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World Health Organization

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