

Growth Charts: Topic of the Month

SEPTEMBER 6, 2023

Growth charts are percentile curves that show the distribution of a child's body measurements including weight and length/height. The charts are used at WIC, by pediatricians, nurses, and parents to monitor the growth of infants and children. This topic of the month will focus on what we should know about using growth charts during our WIC appointments and how to interpret growth charts for parents.

WIC & Growth Charts for Children

Growth charts were created in 1977 by the *National Center for Health Statistics (NCHS)* as a clinical tool to be used by health professionals to assess physical growth. WIC uses the **Center for Disease Control and Prevention (CDC) 2000 growth chart** for children age 2 and over, measured while standing, to plot growth at specific times as part of the nutrition assessment process. The CDC chart illustrates how a child's growth in weight and height compares to other children of the same age and gender.

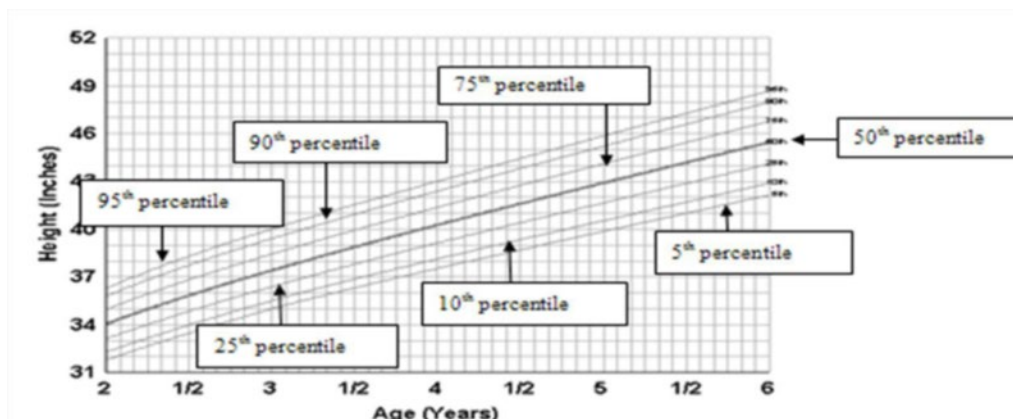
Risk Codes Implications: For children ≥ 2 years of age measured in the standing position and plotted on the CDC 2000 growth chart, the WIC Information System will assign anthropometric risk codes.

WIC uses the **World Health Organization (WHO) 2006 growth charts for children 0- 59 months** of age to plot children's growth when less than 2 years of age. The WHO chart represents a standard growth for children of a certain age and gender raised in "ideal" environments and illustrates how an individual infant is "supposed" to grow.

Risk Codes Implications: For children < 2 years of age plotted on the WHO 2006 chart, the WIC information system will assign anthropometric risk codes.

Reading a Growth Chart

On each chart, the growth percentiles are indicated by lines. The 50th percentile is the mean; the top percentile shown is the 95th, and the lowest percentile displayed is the 5th percentile. Children with measurements that are about average will plot near the mean. For children who are larger than average, their measurements will be plotted above the mean, and smaller children's measurements will be below the mean.



It is important that WIC staff use good quality, well maintained equipment and follow correct procedures when measuring weight, length, or height in WIC clinics as outlined in MOM [Sections 5.3: Nutrition Risk Assessment](#).

Growth Chart & BMI

Body Mass Index (BMI) is a measurement tool that was created to determine an individual's weight status by comparing it as relative to their height. On the CDC growth charts, BMI is used for children 2 years and above to compare a child's BMI to a large reference population of children of the same age and gender. In the WIC setting, we use BMI to evaluate **consistency** of the individual's growth. In population-based studies, BMI tells us something about the health of the general population but is not a perfect tool to assess individual health.

Assessing the Growth Chart

Growth charts can help us assess health and nutritional status, assign risk codes, inform nutrition education, and determine what referrals/resources a family may need. Growth charts are not intended to be used as a definitive diagnostic instrument; they are tools that provide (or "it is a tool that provides") us with one piece of the picture when assessing a child's growth.

- It is desirable to have a series of measurements to monitor a child's growth pattern over time.
- When looking at the trajectory of growth, look to determine if there is any significant movement up or down in the child's rate of growth.
- Deviation from the curve may signal further investigation and critical thinking must be done before determining if there truly is a concern.
- Asking clarifying questions can help evaluate any deviations from expected growth. This is also true if there is just one measurement for a child.

Evaluating Growth

Growth is influenced by genetic potential. The growth percentiles of one child may be around the 10th percentile and another may always be at the 90th percentile. If a child is growing steadily along their own trajectory of growth and is healthy, those growth rates are normal and likely to be healthy. Discussion of growth charts can be brief in those cases. Assure the parent/caregiver the child is growing steadily or well. It is not necessary to share the actual percentile numbers or provide lots of detail about the child's growth compared to other children the same age, unless asked.

Occasionally, a child may deviate from their normal growth with accelerated or slowed growth rates. Those cases warrant some additional assessment of the situation.

First, consider these factors when evaluating a child's growth:

- **Inaccurate data:** Incorrect measuring techniques or errors in recording measurements can dramatically impact the growth chart results. When a significant variation is noted on the charts, remeasure if possible. Consider accuracy of previous measurements.
- **Normal growth patterns of children:** Children do not grow in a continuous, smooth pattern. They experience times of "growth spurts" and growth-free intervals.
- **Single measurement:** One measurement is of limited usefulness. A child's normal growth pattern may be at the high or low end of the growth charts. If there are additional factors related to health and eating that may be concerning, refer to the physician and/or remeasure the child in a few months for a better assessment of their growth.

Second, assess other factors that may affect growth and make referrals as needed:

- **Use the Nutrition Assessment process** to evaluate other influences that may be affecting the child's growth, including the child's general diet, physical activity patterns, and lifestyle factors (such as the living situation, food security, coexisting medical conditions, medications used). Use ([WIC Nutrition Assessment Tools](#)) to clarify any areas of concern.
- **Based on your evaluation** of the child's growth and other factors related to growth, determine whether a referral to the health care provider or other resources may be necessary.

When we have one-on-one conversations about growth, a paradigm shift in how we talk to participants about it can help. It is important to look at the nutrition assessment as a whole and avoid explaining an individual's weight or BMI in a way that creates a feeling of weight shame. Encourage participants to see that being in the higher percentile or BMI doesn't necessarily mean that they aren't or cannot be healthy or achieve a healthy lifestyle. There are many factors to consider when evaluating one's growth, and the measurements are just the beginning.

Using Open-Ended Questions about Growth

For a child with a potential growth concern, use open-ended questions to help assess the situation. Using open-ended questions ([Open-Ended Questions: Sixth in a Series \(PDF\)](#)) allows

GROWTH CHARTS: TOPIC OF THE MONTH

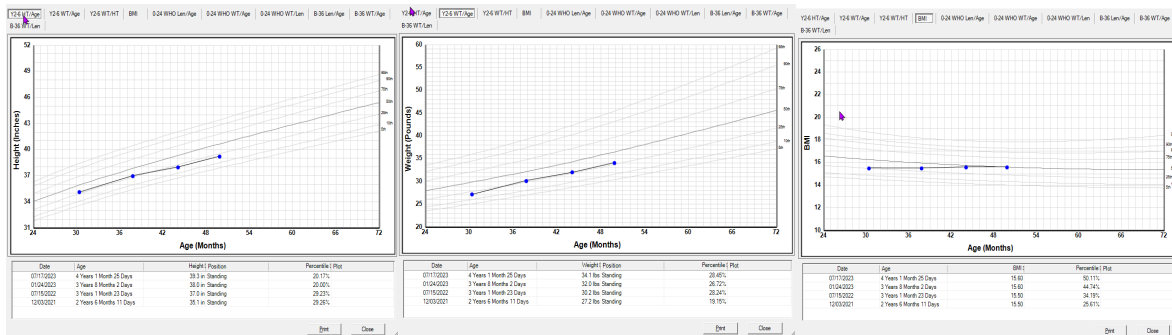
you to gather some basic information about the participant and their experiences and sets the stage for deeper questions. Below are some examples of questions that may be used when discussing a child's growth during a nutrition assessment.

- “How do you feel about Frieda’s growth?” or “What have you noticed about Frieda’s growth since your last visit?”
- “What has Hamza’s doctor said about his growth? or “At your last well-child check, what did Hamza’s pediatrician share about his growth?”
- “We only have one measurement to look at today; what is more important is how this looks over time. What are your thoughts on Jack’s overall growth? ”
- “The [growth/weight grid] is only one piece of the puzzle when it comes to nutrition. I would like to hear more about how [your/your child’s] appetite is.”

Growth Chart Examples

Example 1:

Assessment: This 4-year-old boy’s growth trends around the 20th percentile height/age, 28th percentile weight/age, and is currently at the 50th percentile for BMI.

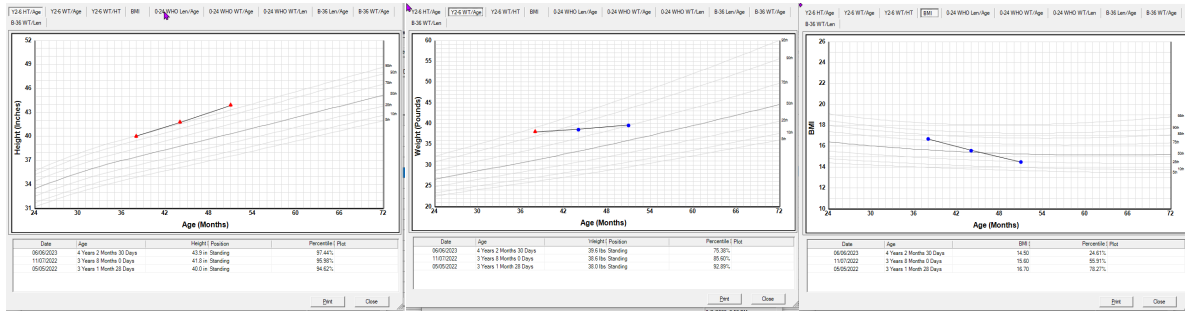


Explanation: In this case, it is not necessary to mention the child is shorter than most boys his age or the actual percentile numbers. Rather, state that “he is growing steadily”. Share additional information if requested by the parent/caregiver.

Example 2:

Assessment: This 4-year-old girl gained about 1 ½ pounds in the last year and is trending downward in BMI and weight/age. The child’s BMI is still within a normal range at 25th percentile and the height growth is steady. Is the downward trajectory of weight a concern?

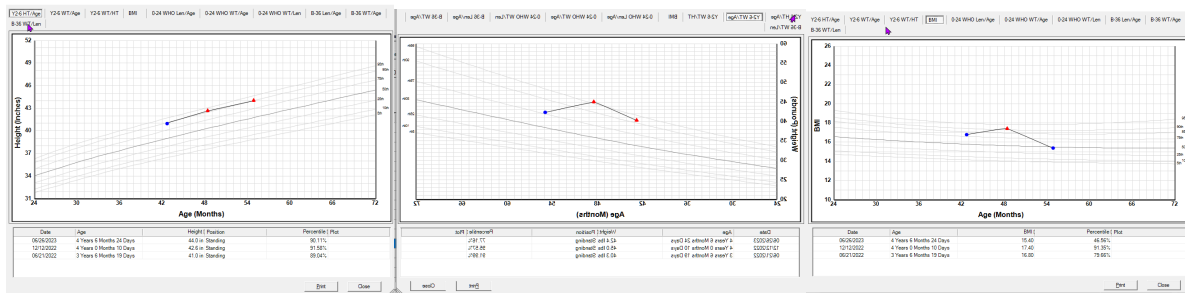
GROWTH CHARTS: TOPIC OF THE MONTH



Explanation: In this case, the CPA asked some clarifying questions to determine whether there may be contributing factors to this growth change. While discussing the child’s health and eating, the mother shared with the CPA that the child has a very poor appetite and complains of stomach aches after meals. The mom thinks it may be pain from constipation and it is affecting the child’s willingness to eat. The plan was to schedule a medical appointment for the child for an evaluation of the stomach pain and constipation.

Example 3:

Assessment: This 4 ½ year old boy was measured on 6/26/2023 and had a weight loss of 2 ½ pounds in the last six months, after a large weight gain recorded on 12/12/2022 at the medical clinic. The child is healthy and active with no eating concerns. Parent shared that the child was uncooperative at the December medical clinic appointment and was weighed with his boots and winter coat! The CPA reasoned the measurements on 12/12/2022 were inaccurate or documented incorrectly.

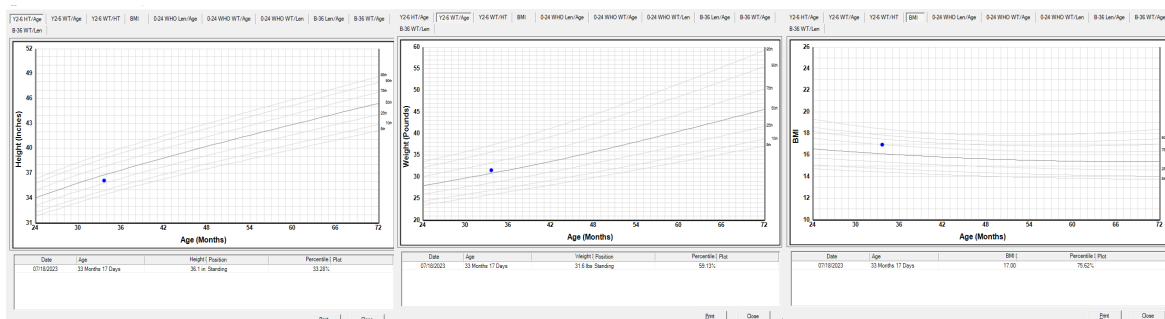


Explanation: In this case, the CPA let the family know that the previous measurements appeared to be inaccurate and encouraged the family to continue with regular well child checkups (Child is aging out of WIC).

Example 4:

Assessment: This 2 year 10-month-old boy’s growth tracks around the 33rd percentile height/age, 59th percentile weight/age, and is currently at the 75th percentile for BMI.

GROWTH CHARTS: TOPIC OF THE MONTH



Explanation: In this case, it is not necessary to mention the child is slightly shorter than most boys his age or the actual percentile numbers. Rather, share that he appears to be at a healthy weight and height for his age. Ask if the parent has had any concerns about growth, health, or eating. Let the parent know that we will check the child’s measurements at future WIC visits and will be able to see how he grows over time. Share additional information if requested by parent/caregiver.

Next month, we will cover how to use a weight inclusive lens when discussing growth.

Have suggestions for future topics? Email them to Carole.Kelnhofer@state.mn.us.

Staff Tools

[Anthropometrics Module - 60 minutes](#) (MDH WIC)

[Anthropometric Manual \(PDF\)](#) (MDH WIC)

Resources

[Assessment of Abnormal Growth Charts](#) (Am Fam Physicians, 1998)

[BMI and Beyond: Considering Context in Measuring Obesity and its Applications: Proceedings of a Workshop—in Brief](#) (National Academies of Sciences, Engineering, and Medicine, 2023)

[Body Mass Index \(BMI\)](#) (CDC, 2022)

[Clinical Growth Charts](#) (CDC, 2017)

[CDC Growth Charts: United States](#) (CDC, 2009)

[WHO Growth Standards Are Recommended for Use in the U.S. for Infants and Children 0 to 2 Years of Age](#) (CDC, 2010)

Reference – Complete Listing of Hyperlinks:

[Sections 5.3: Nutrition Risk Assessment](#)

(https://www.health.state.mn.us/docs/people/wic/localagency/program/mom/chsctns/ch5/sctn5_3_1.pdf)

[WIC Nutrition Assessment Tools](#)

(<https://www.health.state.mn.us/people/wic/localagency/training/na.html#NaN>)

GROWTH CHARTS: TOPIC OF THE MONTH

Open-Ended Questions: Sixth in a Series

(<https://www.health.state.mn.us/docs/people/wic/localagency/wedupdate/2021/topic/1215nutassess.pdf>)

Anthropometrics Module

(<https://www.health.state.mn.us/training/cfh/wic/nutrition/anthropometric/story.html>)

Anthropometric Manual

(<https://www.health.state.mn.us/docs/people/wic/localagency/training/nutrition/nst/anthro.pdf>)

Assessment of Abnormal Growth Charts

(<https://www.aafp.org/pubs/afp/issues/1998/0701/p153.html>)

BMI and Beyond: Considering Context in Measuring Obesity and its Applications: Proceedings of a Workshop—in Brief (<https://nap.nationalacademies.org/read/27185/chapter/1>)

Body Mass Index (BMI) (<https://www.aafp.org/pubs/afp/issues/1998/0701/p153.html>)

Clinical Growth Charts (https://www.cdc.gov/growthcharts/clinical_charts.htm)

CDC Growth Charts: United States

(<https://www.cdc.gov/growthcharts/background.htm#:~:text=The%201977%20growth%20charts%20were,Health%20Organization%20for%20international%20use>)

WHO Growth Standards Are Recommended for Use in the U.S. for Infants and Children 0 to 2 Years of Age

(https://www.cdc.gov/growthcharts/who_charts.htm#The%20WHO%20Growth%20Charts)

Minnesota Department of Health - WIC Program, 625 Robert St N, PO BOX 64975, ST PAUL MN 55164-0975; 1-800-657-3942, health.wic@state.mn.us, www.health.state.mn.us; to obtain this information in a different format, call: 1-800-657-3942.

This institution is an equal opportunity provider.