WHO Growth Charts:
Use, Interpretation & Implications for Breastfed Children

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ABSTRACT

The new growth charts from the World Health Organization have now become the international standard for measuring infants everywhere. Now that the Centers for Disease Control has adopted the 0-24 months charts for use here in the United States, can you use these new charts? How will you interpret their meaning to parents? Especially for exclusively breastfed infants, how will the data look different than it looked on the old charts, and how will you explain that to parents? The goal of this learning program is to correctly use and interpret the new World Health Organization growth charts for breastfed infants and children. Exam-like questions, similar to those found on certification exams, will be included.

Verbatim quote from the literature:

"Because the CDC charts are currently in use in clinical settings to assess growth of children, use of the WHO charts for children aged <24 months will require **training of health-care providers** and others who measure and assess child growth. **Training should focus on** how to interpret growth on the charts, differences between references and standards, the characteristics of the WHO cohort (especially regarding socioeconomic status, infant feeding patterns, and maternal lack of smoking), the disjunction created by switching from the WHO to the CDC curves at age 2 years, growth patterns of children who breastfeed compared with those who formula feed, and the potential contribution of education and support programs for breastfeeding and complementary feeding." From Grummer-Strawn LM, Reinold C, Krebs NF. Use of World Health Organization and CDC growth charts for children aged 0-59 months in the United States. *MMWR Recomm Rep.* 2010;59(RR-9):1-15.

Objectives

- ➤ Compare and contrast "old" growth charts with the "new" growth charts
- ➤ Describe 6 steps for how to use and interpret the new WHO growth charts
- ➤ Given a real-life scenario, complete the required information for a 5 month old boy on the new growth chart.
- ➤ Given the same real-life scenario, compare and contrast how the i "looks" when plotted on the new growth chart the old chart.
- ➤ Given two real-life scenarios, interpret the clinical implications of t percentiles.

Instructions

See the ReadMeFirst document in your account.

Materials and Resources

Audio learning program
Post-test items that are similar to those found on a certification exam.

Criteria for Earning Credits

See the *ReadMeFirst* document in your account.

Accreditation

See the *ReadMeFirst* document in your account.

Faculty

Marie Biancuzzo has achieved national recognition for her expertise in maternal-child nursing, breastfeeding, and continuing education. Her profile is on LinkedIn.

Questions for the Author/Presenter:

Write your questions here!

1.

2.

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Email us at info@breastfeedingoutlook.com if you have questions. Telephone is not as efficient, but you are welcome to call us at 703-787-9894.

II. Introduction

A. What's the History of Weight Charts?

1. WHO growth curves for children are based on data from the study conducted during 1997-2003

2. Data from:

    (1) Brazil
    (2) Ghana
    (3) India
    (4) Norway
    (5) Oman
    (6) California

3. Now used in the United States: Only the charts up to 2 years old

    a. In 2010, the charts for ages 0-24 months were adopted by the Centers for Disease Control in the United States

    b. The American Academy of Pediatrics is now mandating their use by American pediatricians.

4. Which Charts?

    a. Weight for age

    b. Length for age

    c. Head circumference for age

    d. Weight for length

B. Locate What's What!

1. Title

2. Length scale

3. Weight scale (note kilograms vs pounds/ounces

4. Lines representing 1 month, 3 months

C. How are the new charts different?

1. Measure how children *should* grow rather than how children *do* grow.

    a. All children (breastfed and bottle-fed

    b. Ideal circumstances

2. International

3. Established breastfeeding as the ideal.

4. Download the new growth charts here:

D.   Compare the Old and the New Growth Charts

	Old Growth Charts	New Growth Charts
Properly termed	NCHS	MGRS (Multicenter Growth Reference Study)
Year	1977	2000
Distributed by	Ross Laboratories	Centers for Disease Control
What is measured	How children *do* growth	How children *should* grow, under ideal circumstances
This constitutes a…	Norm	*Standard*
Breastfeeding	Breastfeeding is not a factor	Breastfeeding is considered optimal and is established as the norm.
Created and published by	National Center for Health Statistics (NCHS)	World Health Organization
Percentiles	From 3% to 97%	From 2% to 98%

III.   How to Use and Interpret New Growth   Charts

A.   Step 1: Accuracy
1.   Obtain accurate weights and measures

B.   Step 2: Select appropriate growth chart
1.   Boys and girls are different

2.   CDC adopted ONLY the 0-2 years weight charts from the WHO, not the other kids.

3.   Note the different types:

    a.   Head circumference

    b.   Stature for age

C.   Step 3: Record the data

D.   Step 4: Plot the data
1.   Percentiles

    a.   The higher the percentile number, the bigger a child is compared with others of the same age and gender.

    b.   Example: a two month old boy's weight is in the 10th percentile.

        (1)   10% of boys that age weigh less than he does

        (2)   90% of two month old boys weigh more

    c.   Another way to put it: 2-month-old boy is in the 75th percentile for weight, it means that

(1)   75 percent of the 2-month-old boys in the United States weigh the same or less than your this by, and

(2)   25 percent weigh more.

E.   Step 5: Interpret the plotted measurements

1.   Curved lines show selected percentiles that indicate rank of the child's measurement.

F.   Step 6: Determine the percentile rank

1.   Determine if the percentile rank suggests that anthropometric index is indicative of nutritional risk based on percentile cutoff value.

    a.   If there is more than a 25% change in a small amount of time like 6 months.

    b.   If they drop a percentile line.

    c.   "Constitutional growth delay" is for a toddler.

    d.   To some degree you are comparing the child to himself/herself.

2.   Excellent resource:

    a.   http://www.who.int/childgrowth/training/en/

    b.

IV. Practice Scenarios

A.   Easy Questions

1.   Baby Jared is in the 95th percentile at birth. This means that Jared:

    a.   Is 95% overweight

    b.   Weighs 95% of what a normal newborn should weigh

    c.   Weighs less than 5% of newborns at birth.

2.   Jared was in the 95th percentile when he was born. At 9 months, his weight chart shows that he is in the 90th percentile. Jared's mother is concerned, and asks you what this means. You explain that:

    a.   He is unlikely to grow up to be an obese adult.

    b.   It is likely he has a low intake of milk.

    c.   Jared is 5% underweight.

    d.   This is a normal variation during early infancy.

3.   When plotted on the old weight charts, a bottle-fed baby's weight falls on the 50th percentile. When the same baby is plotted on the new weight chart, his weight will be on a:

    a.   Higher percentile

    b.   Lower percentile

    c.   The same percentile

4.   The current weight charts created by the World Health Organization could be best described as being used:

    a.   Only for breastfed babies.
    b.   Only for children in industrialized countries.
    c.   A standard for how all children should grow.
    d.   A norm for breastfed and bottle-fed children.

B.   Jonathan Scenario: "Old" and "New" for Jonathan!

1.   Jonathan was exclusively breastfed for the 6 months of life. Here are Jonathan's weights (table at right.)

2.   On the **old** chart, what percentile is Jonathan on at:

    a.   Birth
    b.   1 month
    c.   4 months
    d.   9 months
    e.   12 months
    f.   15 months

3.   Plot Jonathan's weight on the new growth charts. What percentile is Jonathan on at:

    a.   Birth
    b.   1 month
    c.   4 months
    d.   9 months
    e.   12 months
    f.   15 months

4.   What do you conclude about how a baby "looks" on the old chart, versus the new charts?

5.   Clinical Implications

    a.   What other history, if any, would you like to know about this infant or his mother?
    b.   What other data would you want to collect about him or his mother? (Physical exam, observe breastfeeding, interview, etc.)
    c.   What would you tell the mother about this child's weight-for-age percentile?
    d.   Julianne's mother wants to know if she should continue to exclusively breastfeed. Would you recommend she do so? Or supplement? Or wean completely?

Birth	9 lb 6 oz
2 wk	
1 mo	11 lb 1 oz
4 mo	17 lb 8 oz
6 mo	
9 mo	22 lb 7 oz
12 mo	24 lb 4 oz
15 mo	25 lb 9 oz

  e. Is there anything else you should do in terms of parent education, anticipatory guidance, interaction(s) with other healthcare professionals?

C. Julianne Scenario

 1. History

  a. Julianne's mother is 32 year old, G1 P1
  b. Mother and father average stature
  c. Mother and father hold college degrees
  d. Mother has quit job to stay at home

 2. Birth

  a. C/S for failure to progress
  b. Apgar scores 8/9
  c. Weight 6 lb 3 oz
  d. Plot Julianne's weight

 3. Julianne at 2 weeks

  a. Feeding

   (1) Exclusive breastfeeding
   (2) Went for pediatrician visit
  b. Weight 6 lb 7 oz
  c. Plot Julianne's weight

 4. Julianne at 3 weeks

  a. Has not had a stool in 7 days
  b. Mother calls pediatrician
  c. Pediatrician orders a glycerin suppository

 5. Julianne at 4 weeks

  a. Visits the pediatrician
  b. Mother reports that Julianne has not had a stool in 7 days
  c. Pediatrician orders Milk of Magnesia.
  d. Weight: 8 lb
  e. Plot Julianne's weight

 6. Julianne at 4 months

  a. Visits the pediatrician
  b. Has not had a stool in 10 days.
  c. Milk of Magnesia continued per doctor
  d. Weight: 11 lb
  e. Mother has milk.
  f. Father is worried.
  g. Plot Julianne's weight

7. Clinical Implications
    a. What other history, if any, would you like to know about this infant or her mother?
    b. What other data would you want to collect about her or her mother? (Physical exam, observe breastfeeding, interview, etc.)
    c. What would you tell the mother about this infant's weight-for-age percentile?
    d. Is there anything else you should do in terms of parent education, anticipatory guidance, interaction(s) with other healthcare professionals?

V.   Summary

The growth charts for children ages 0-2 years were released by the World Health Organization in 2006 and adopted by the CDC for use by the United States in 2010. In 2012, the American Academy of Pediatrics endorsed their use, but many healthcare professionals are still unfamiliar with how to use them, and are uncertain of what they really mean. Through multi-media and active learning strategies, this learning program will help learners to correctly use and interpret results and plan care for breastfed infants

Abridged List of References

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