ITCA WIC TRAINING PROGRAM

Module 04:

Anthropometric Procedures
Weighing, Measuring and Interpreting

March 2013
ITCA WIC Knowledge Modules

Table of Contents

Instructions

To complete each competency units complete the following steps:

1. Read the introduction.

2. Read each section.

3. Complete the Self-Evaluation at the end of each section.

4. If you have trouble answering the questions, read the section again or ask your director for more information.

5. Make arrangements with your director at the Skill Checks to demonstrate your ability to apply your knowledge in the clinic.

6. After you complete all of the Self-Evaluations and Skill Checks, make arrangements with your director to complete the Unit Assessment.

7. Submit the original Unit Assessment and Skill Checks to ITCA. Copies should be kept at the local agency.

4 – 1   Introduction to Anthropometry

After completing this section, you will be able to:
- ✓ List four reasons for assessing weight and height of WIC applicants and clients.
- ✓ List three factors that influence the weight gain of women during pregnancy and the growth of infants and children.
- ✓ Identify at least three reasons why it is important to take accurate measurements.

Overview

This section will give you an introduction to measuring weight, height and length. You will learn how these measurements are used in the WIC clinic, when they need to be taken and what growth is affected by.

Anthropometry

Anthropometry means the study of body measurements. In WIC, anthropometry refers to the measurements of height or length and weight that are taken on each client.

The Length/Height and Weight Measurements of WIC Applicants and Clients Help Us:

- ✓ Identify nutrition risks of women, infants and children.
- ✓ Monitor the growth and development of infants and children.
- ✓ Monitor fetal growth in pregnant women.
- ✓ Evaluate the effectiveness of the nutrition services that WIC provides.

Growth and Development are affected by:

- ◈ <u>Environmental Factors</u> – things in a person's surroundings that may affect the individual's growth such as the nutritional quality of the diet, housing and illnesses.

- ◈ <u>Genetic Factors</u> – inherited family characteristics, such as being tall or short.

- ◈ <u>Behavioral Factors</u> – actions taken by a person that may affect the individual's growth, such as how often a person exercises, whether or not he/she smokes, drinks alcohol, etc.

- ◈ <u>Hormonal Factors</u> – may also affect growth. The morning sickness commonly experienced by women in early pregnancy is thought to be partly caused by hormonal changes and can result in poor weight gain of the mother.

Use of Anthropometrics

Proper anthropometric techniques and procedures are important, so that accurate results will be obtained, recorded and compared with appropriate growth references for the following reasons:

- ◈ <u>Program Eligibility</u> – measurements are used to determine nutritional risk, which can determine whether or not someone is eligible for the program.

◈ Counseling – Errors in measurements can dramatically change the interpretation of the child's growth causing inaccurate information to be provided during counseling.

◈ Reporting – ITCA participates in the USDA Participant Characteristics (PC) data collection. Information that is entered into the STARS system is sent to the USDA. ITCA uses this information for program planning and evaluation. In addition, the data is used nationally for healthy statistics, nutrition services planning and to demonstrate the effectiveness of the WIC services we provide.

When to take Anthropometric Measurements

Certification Visits:

✓ Children require heights/lengths and weights at each certification visit. Certifications occur in six-month intervals.

✓ Breastfeeding, Postpartum and Pregnant women require height and weight at the certification.

✓ Infants require a length and weight be taken at certification, between two and four months of age, at mid-certification (between six and eight months of age) and at Health Assessment (between nine and twelve months of age).

Additional Visits:

✓ Infants who are identified as high risk who have not had or have missed an RD appointment are required to bring the infant to be measured at the next appointment and each additional appointment until see by the RD.

✓ Children with heights/lengths and weights of irregular growth patterns (such as underweight, overweight or inconsistent growth) should be measured as indicated

✓ Pregnant women are weighed each time they come into the clinic for any appointment type. This includes check pickup, nutrition education, classes, etc.

Summary Table:

Category:	When Measurements are Taken:
Infants	Certification 2 to 4 months of age Mid-Certification (6-8 months of age) Health Assessment (9-12 months of age) At each appointment if identified as HR and has not been seen by the RD.
Children	Each Certification
Pregnant Women	Certification Each clinic visit
Postpartum Women	Certification
Breastfeeding Women	Certification
Special Needs / High Risk (underweight, overweight, failure to thrive, etc)	As recommended by local agency policies or RD.

☑ *Self-Evaluation*

1. Name the four factors that determine an individual's growth pattern.

2. List three reasons why we take height/length and weight measurements in WIC.

3. Why is it important to obtain accurate measurement?

4. When should the following clients be measured? Be sure to include any requirement from your local agency policies not included in this unit.

    Pregnant Woman:

    Child:

    Infant:

    Underweight Child:

4 – 2   Measuring Height and Length

Objectives

After completing this section, you will be able to:
- ✓ Follow proper procedures when measuring the recumbent length of infants and children.
- ✓ List at least three common errors in taking recumbent lengths that may result in inaccurate measurements.
- ✓ Follow proper procedures when measuring the standing height of women and children.
- ✓ List at least three common errors in taking standing heights that may result in inaccurate measurements

Overview

Length and height are two different types of measurement that determine how tall someone is. Length is a lying down measure, while height is a standing measure. These measurements require different procedures and equipment. Each clinic has the appropriate equipment to take the length or height of each client. The measurement that will be used (height or length) will depend upon the age and physical development of the child. You will learn how to take measurements accurately and which type of measure to take on each client.

Measuring Recumbent Length

Recumbent length refers to measurements taken while lying down. Recumbent length is always used for infants and children less than 24 months of age. Recumbent length is also used for children 24 to 36 months of age who have difficulty standing.

Equipment Required:

◈ Recumbent measuring board
- o Fixed perpendicular headpiece and sliding foot piece constructed of a durable material, such as wood or Plexiglas.
- o Foot piece must be a 90° angle with the measurement surface.
- o All edges must be smooth and finished.

◈ Two people
- o Parent or caregiver can assist in the measurement.
- o Enough room provided for parent/caregiver to stand behind the back of the head of the infant or child

◈ Secure table to place board.

◈ Measuring tape alone should not be used to measure infant. It may result in inaccurate measurements.

Procedures for Taking Recumbent Length:

1. Cover the board with paper.

2. Ask the caregiver to remove child's hats, barrettes, ponytails and shoes. "Big" hairstyles will need to be flattened as much as possible.

3. Provide a brief training to the caregiver on how to hold the child's head.

4. Place the sliding foot piece at the end of the measuring board and check to see that it is sliding freely.

5. Ask the caregiver to lay the child down on his/her back on the measuring board and stand directly behind the child's head (Arrow 2 of illustration).

6. Position yourself on the right side of the child so you can hold the foot piece with your right hand (Arrow 3 of illustration).

   _____

   Note:
   While the infant is on the measuring board, you must hold and control the child so that he/she will not roll off or hit his/her head on the board.
   _____

7. Ask the caregiver to cup her hands over the child's ears. The child's head should be held securely, yet comfortably (Arrows 4 and 5).

8. Ask the caregiver to place the child's head against the headpiece (Arrow 4).

9. If the head is not against the headpiece, hold the child at the waist and lift or slide the child towards the headpiece. The caregiver should hold the child's head at all times and guide the head into position.

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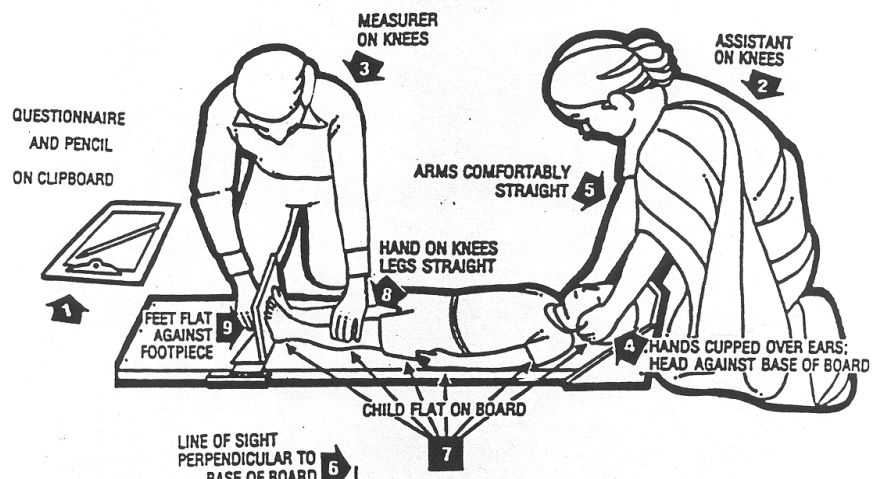
10. Check to be sure that the child's head is in the correct position. The line from the hole in the ear to the bottom of the eve socket should be perpendicular to the board or table (See below).

11. Ask the caregiver to place her head directly above the child's head and watch the position of the child's head during the entire measurement. Ask her to make certain that the child's chin is not tucked in against his/her chest or stretched too far back.

12. Position the child's body so that the shoulders, back and buttocks are flat along the center of the board (Arrow 7).

13. Place your left hand on the child's knees (Arrow 8). Hold the movable foot piece (Arrow 9) with your right hand and firmly place it against the child's heels. A child's legs and feet can be very strong. You may have to straighten them with your hands.

14. Check the child's position: head against the headpiece with eyes looking straight up, body and legs straight and flat in the center of the measuring board, heels and feet firmly against the foot piece.

15. When the child's position is correct, read and call out the length measurement to the nearest 1/8".

16. Record the measurement on the Measurement Post-it Note.

17. If there were any unusual problems, such as braids in the way or difficulty measuring the child, enter this in the notes sections on the measurements tab in STARS.
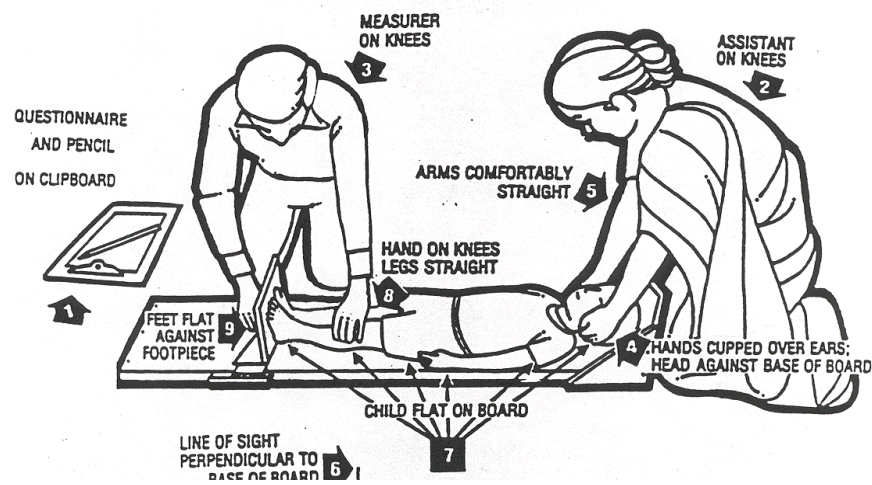
Common Errors in Measuring Recumbent Length:

- ✓ Only one leg is extended, rather than both legs.
- ✓ Heels or legs are not flat against the recumbent board.
- ✓ Heels are not flat against the footboard.
- ✓ Legs are not straightened or properly positioned.
- ✓ Child's head is not against the headpiece.
- ✓ Child's head is not in the correct position.
- ✓ Shoes, sandals, hat, hair barrettes and/or "big" hairdos are not removed.
- ✓ Improper equipment is used.

Measuring Standing Height

Standing height is used to measure children who are more than two years old who can stand without assistance and for adults.

Equipment Required:

◈ Measuring board
- o Either wall mounted or portable.
- o Right angle headpiece.

◈ Two people
- o Parent or caregiver can assist in the measurement of a child.
- o The adult being measured can be instructed on the procedure.

◈ Step stool or short stepladder for the staff to stand on to read the height of an adult who is taller than the WIC staff person.

◈ The movable measuring rod on beam scales should not be used for measuring height. The rod is too narrow, unsteady and can bend easily.
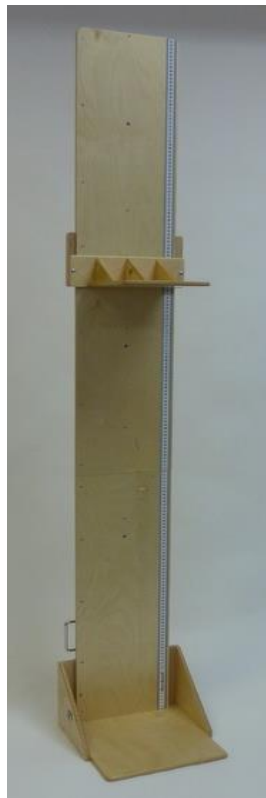
Procedures for Taking Standing Height:

The directions below are for a child, but they should be followed for the adult except the adult can be instructed on how to position the body and head and does not require anyone to hold the knees and ankles.

1. Cover the footboard/floor where the client will be standing with paper.

2. Ask the caregiver to remove shoes, barrettes, braids, etc from the child that might interfere with the measurement

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Note:
If hairdo is difficult to do, such as many small braids, these maybe left in, but note this in the notes section on the measurement tab in STARS.

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3. Ask the caregiver to walk the child to the board and kneel on the right side of the body (Illustration, Arrow 2).

4. Place the child's feet flat and either the knees or feet together in the center of the measuring board.

5. Ask the caregiver to place her right hand just above the child's ankles, on the skins (Arrow 4) and place her left hand on the child's knees (Arrow 5) and push against the board. Make sure that the child's legs are straight.
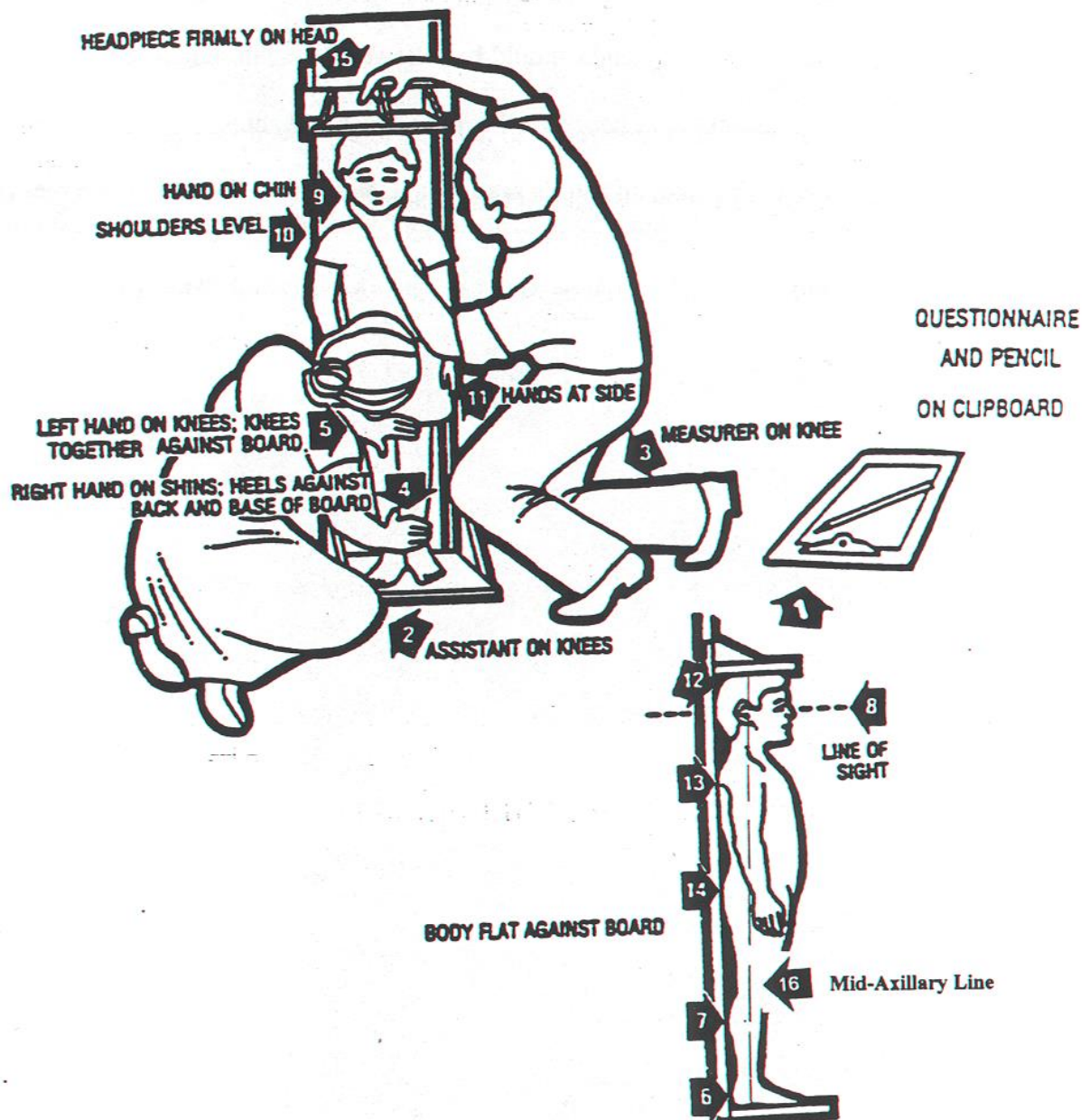

Note:
The position of the legs is important. The line that bisects the body from the side is called the "mid-axillary line" Make sure the mid-axillary line is perpendicular to the base of the board (Arrow 16). This may mean that the child's feet may not touch the back of the measuring board, particularly in overweight or obese children.

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6. Tell the child to look straight ahead. Make sure the child's line of sight is level with the floor (Arrow 8). Place your open left hand on the child's chin. Gradually close your hand (Arrow 9). Do not cover the child's mouth or ears. Do not rest your left hand on the child's chest. Make sure that the child's shoulders are level (Arrow 10), their hands are at their side (Arrow 11) and their head, shoulder blades and buttocks are against the board, if appropriate (Arrows 12, 13 and 14). With your right hand, lower the headpiece on top of the child's head. Make sure that you push down on the child's hair (Arrow 15).

7. When the child's position is correct, read and call out the measurement to the nearest 1/8 inch.

8. Record the measurement on the Measurement Post-it Note.

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9. If there are any unusual problems, such as braids in the way or difficulty measuring the child, enter this in the notes sections on the measurements tab in STARS.

ILLUSTRATION #2 *
Standing Height

HEADPIECE FIRMLY ON HEAD

HAND ON CHIN

SHOULDERS LEVEL

QUESTIONNAIRE
AND PENCIL
ON CLIPBOARD

HANDS AT SIDE

LEFT HAND ON KNEES; KNEES TOGETHER AGAINST BOARD

MEASURER ON KNEE

RIGHT HAND ON SHINS; HEELS AGAINST BACK AND BASE OF BOARD

ASSISTANT ON KNEES

LINE OF SIGHT

BODY FLAT AGAINST BOARD

Mid-Axillary Line

Common Errors in Measuring Standing Height:

- ✓ Measurement is not read at eye level.
- ✓ Footwear, bulky outer clothing, hats or hair barrettes are not removed.
- ✓ Head is not in proper position.
- ✓ Knees are bent.
- ✓ Feet are not flat on floor.
- ✓ Equipment is not properly installed.
- ✓ Improper equipment is used.

☑ *Self-Evaluation*

1. The recumbent length of infants and children _____ months of age
    should be taken to the closest _____ inch.

    The standing height of women and children _____ years of age
    should be taken to the closest _____ inch.

2. Describe the correct positioning of a child when taking a standing height.

3. List at least three possible errors that may result in inaccurate measurements
    when taking recumbent length and standing height.

    Recumbent length:

    Standing Height:

☑ *Skill Check*

1. Observe another staff member measuring the length/height of women, infants and children.

2. Have the director or nutritionist observe you measuring the length/height of at least one woman, infant and child.

Item	Score	Max Pts	Comments
STATURE			
• Positioned properly (shoes or hair clips/braids removed, knees straight, heels touching wall)		3	
• Standardized measuring board		3	
• Measurement taken to closest 1/8"		1	
• Measurement recorded correctly on paper		1	
Total		/ 8	
STATURE			
• Positioned properly (shoes or hair clips/braids removed, knees straight, heels touching wall)		3	
• Standardized measuring board		3	
• Measurement taken to closest 1/8"		1	
• Measurement recorded correctly on paper		1	
Total		/ 8	
LENGTH			
• Positioned properly (shoes or hair clips/braids removed, both legs grasped and straightened, head against head piece, 2 people measured)		3	
• Standardized measuring board		3	
• Measurement taken to closest 1/8"		1	
• Measurement recorded correctly on paper		1	
• Paper used on recombinant board and changed between clients		1	
Total		/ 9	
LENGTH			
• Positioned properly (shoes or hair clips/braids removed, both legs grasped and straightened, head against head piece, 2 people measured)		3	
• Standardized measuring board		3	
• Measurement taken to closest 1/8"		1	
• Measurement recorded correctly on paper		1	
• Paper used on recombinant board and changed between clients		1	
Total		/ 9	

4 – 3   Measuring Weight

After completing this section, you will be able to:
- ✔ Follow proper procedures when measuring the weight of infants and young children
- ✔ List at least three common errors in taking weights of infants and young children that may result in inaccurate measurements.
- ✔ Follow proper procedures when measuring the standing weight of women and children.
- ✔ List at least three common errors in taking standing weights that may result in inaccurate measurements.

Overview

There are two different ways to measure the weight of a client. The measurements are taken either laying/sitting down or standing. These measurements require different procedures and equipment. Each clinic has the appropriate equipment to take both types of weight measurements. The way to measure that will be used will depend upon the age and physical development of the child. You will learn how to take measurements accurately and which way to measure each client.

An infant scale is always used for infants and children less than 24 months of age. An infant scale is also used for children 24 to 36 months of age who have difficulty standing.

Equipment Required:

◈ Digital Infant Scale
  o Display of measurements in ounces
  o Automatically zeros

◈ Sturdy table or counter to place scale on.

Procedures for Weighing Infants and Young Children:

1. Cover the scale with paper.

2. Activate the scale by turning it on. Zeros will appear on the display panel. Make sure the scale is on 'lb' rather than 'kg'.

3. Ask the caregiver to remove all clothing of an infant (up to 12 months of age) and heavy outer clothing of a child (12 – 36 months). Infant should be weighed in a dry diaper.

4. Ask the caregiver to place the infant/child either on his/her back or sitting in the tray of the scale.

5. The weight will appear on the display panel. When the scale has finished the reading, a peep is usually heard. Write the weight on the Measure Post-It Note.

Common Errors in Measuring Weight:

- ✓ Caregiver is touching the infant or child.
- ✓ Infant or child is not placed in the center of the tray.
- ✓ Necessary clothing is not removed.
- ✓ The scale is not properly zeroed.
- ✓ Improper equipment is being used.

Measuring a Child or Adult's Weight

Adults and children greater than 24 months who can stand without assistance should be weighed on an adult digital scale.

Equipment Required:

❖ Digital Adult Scale
  - o Display of measurements in ounces or 1/10 of a pound.
  - o Automatically zeros.

❖ Firm, uncarpeted floor to place scale.

❖ Bathroom type scales should not be used. These types of scales are not accurate.

❖ Balance beam scales should not be used. These are difficult to zero and are not as precise.

Procedures for Weighing Children (> 24 months) and Adults:

1. Cover the scale with paper.

2. Activate the scale by turning it on. Zeros will appear on the display panel. Make sure the scale is on 'lb' rather than 'kg'.

3. Ask the woman or caregiver for the child to remove shoes and any heavy outer clothing, such as jackets, sweatshirts, etc.

4. Ask the woman or child to step onto the scale. Make sure the woman or child is centered on the platform and their arms are at their side.

5. The weight will appear on the display panel. When the scale has finished the reading, write the weight on the Measure Post-It Note.

Common Errors in Measuring Weight:

- ✔ Child is not remaining still on the scale.
- ✔ Child is holding onto the caregiver or the scale.
- ✔ The woman or child is not properly centered on the platform.
- ✔ Footwear and heavy outer clothing are not removed.
- ✔ The scale is not properly zeroed.
- ✔ Improper equipment is used.

1. Infants and children _____months of age and younger must be weighed on a _____ scale.

   Children ages _____ years and older should be weighed on a _____ scale.

2. Describe the correct positioning of a 4-year-old child when taking a weight.

3. List at least three possible errors that may result in inaccurate measurements when taking an infant/young child's and adult's weight

   Infant and young child's weight:

   Adult's weight:

☑ *Skill Check*

1. Observe another staff member measuring the weight of women, infants and children.

2. Have the director or nutritionist observe you measuring the weight of at least one woman, infant and child.

Category:

Item	Score	Max Pts	Comments
WEIGHT			
• Zero Scale (with or without paper)		1	
• Removed clothing, outer clothing, shoes, in dry diaper etc.		3	
• Center of scale		1	
• Measured to the nearest ounce		1	
• Measurement recorded on paper correctly		1	
• Used paper and changed between clients		1	
Total	/	8	

Category:

Item	Score	Max Pts	Comments
WEIGHT			
• Zero Scale (with or without paper)		1	
• Removed clothing, outer clothing, shoes, in dry diaper etc.		3	
• Center of scale		1	
• Measured to the nearest ounce		1	
• Measurement recorded on paper correctly		1	
• Used paper and changed between clients		1	
Total	/	8	

Category:

Item	Score	Max Pts	Comments
WEIGHT			
• Zero Scale (with or without paper)		1	
• Removed clothing, outer clothing, shoes, in dry diaper etc.		3	
• Center of scale		1	
• Measured to the nearest ounce		1	
• Measurement recorded on paper correctly		1	
• Used paper and changed between clients		1	
Total	/	8	

4 – 4 Reading and Recording Measurements

Objectives

After completing this section, you will be able to:
- ✓ Correctly read the measurements for both height and weight.
- ✓ Correctly record the measurements for both height and weight.
- ✓ List at least three possible sources of errors in reading and recording measurements.

Overview

One of the greatest errors in taking measurements is in the reading and recording. In this section, you will learn how to correctly read measurements, particularly when taking lengths and heights. You will learn how to convert decimals into ounces and ¼'s and ½'s into 1/8's. This will allow the accurate recording of measurements into STARS.

Reading and Recording Measurements

Taking accurate measurements does not stop with following the correct procedures for weighing or measuring a woman, infant or child. One of the greatest errors in taking anthropometric measurements takes place during the reading and recording of a measurement. If the height or weight is read incorrectly or an error is made when recording the measurement, the result will be inaccurate. Therefore, it is important to use care in reading and recording measurements and follow the guidelines that are discussed in this activity.

Procedures for Reading the Height/Length Measurement:

Measurements can be difficult to read. The reading area of the measuring tape on most height measuring boards is usually in English units (inches). Some measuring instruments may have both English and metric units. Read the English units only.

1. Each inch on the measuring board is divided into eighths (1/8) using small vertical lines. There are longer lines at each ¼ inch and slightly longer lines at ½ inch. There is a large number at each inch.
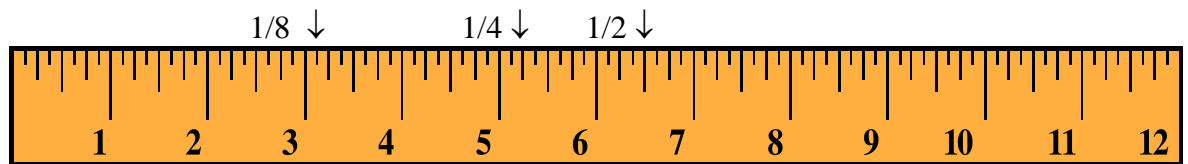
2. Be careful to read the tape from the left to the right for recumbent measurements and in an upward direction for a standing height. For example, the reading of arrow 1 of the tape below is 5 and 3/8 not 6 and 5/8.
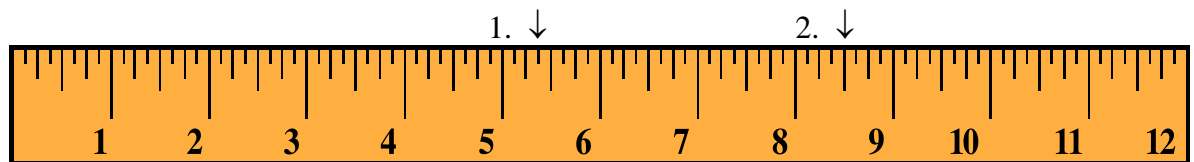
3. When measuring, you need to measure to the nearest 1/8 inch for both recumbent and standing heights. Count the number of 1/8 inch lines when you read the tape. The reading of arrow 2 on the tape above is 8 and 4/8 or 8 and ½.

4. If the measurement falls between two 1/8 inch lines, record the nearest 1/8 number.

5. If the measurement falls exactly between two 1/8 inch lines, randomly select either the higher or lower 1/8 inch number.

6. Immediately record the measurement on the Measurement Post-It Note after it is read. Call out the measurement continuously until you have recorded the measurement.

Recording Measurements in the STARS System

The measurements that are on the Measurement Post-It Notes will be entered into the STARS System.

Procedures for Recording Measurement:

1. The stature measurements are entered as eighths. For example, 22 1/2 is entered as 22 4/8. The following is a conversion chart:

If measurement is:	Record as:
1/8	1/8
1/4	2/8
3/8	3/8
1/2	4/8
5/8	5/8
3/4	6/8
7/8	7/8

2. The weight measurements are recorded to the closest ounce. If you are using a digital scale that reads in decimal places, use the following conversions.

If measurement is:	Record as:
.1	2
.2	3
.3	5
.4	6
.5	8
.6	10
.7	11
.8	13
.9	14

3. Record any special circumstances, such as 'arm in cast', braids in hair', child uncooperative' in the note section of the Anthropometric Screen.

4.

Accuracy and Errors

Sometimes errors can occur in the measurement, reading or recording procedures. If you notice a sharp increase or decrease in growth, you should recheck the recorded measurements. If the measurements match to what was entered into the system, redo the measurement. This will rule out a measuring error.

Possible Errors in Reading and Recording Measurements:

- ✔ Reading the increments incorrectly on the length/height boards.

- ✔ Not converting decimals into ounces.

- ✔ Writing down an incorrect measurement at the time of the measurement.

- ✔ Entering the measurements incorrectly into the STARS system.

Measuring or plotting errors can cause incorrect nutritional recommendations to be given to the client during the counseling sessions. Consider the following examples of a recording error.

Henry Apple, a 4 1/2 year old boy is weighed and measured. He weighs 34 pounds and is 42 inches tall. When the information is entered into STARS, the numbers for his weight are transposed (entered as 43 pounds instead of 34 pounds). The incorrect data is plotted on a growth chart and his BMI-for-age appears to be at the 90th percentile. In reality, Henry's BMI-for-age is at the l0th percentile. A common error such as this distorts the picture of the child's growth and subsequent counseling may be inappropriate.

☑ *Self-Evaluation*

1. Convert the following weight measures into pounds and ounces.

   A) _22.8_   _____
   B) _145.3_ _____
   C) _36.7__ _____
   D) _106.1_ _____

2. Common errors in measuring the standing weight of a 3 year child include all of the following except:

   A) Child not remaining still on the scale.
   B) Not undressing the child
   C) Improper equipment used
   D) Leaving shoes on
   E) None of the above

3. Know your clinic's scales. Circle the correct answer.
   The adult scale at your main client weighs in ounces or decimals?
   The adult scale for your satellite clinic weighs in ounces or decimals?

☑ *Skill Check*

1. Have the director or dietitian observe you reading and recording the weight and length/height of at least one woman, infant and child.

Category:

Item	Score	Max Pts	Comments
WEIGHT			
• Measurement recorded on paper correctly		1	
• Measurement recorded in the computer correctly		1	
Total	/	2	
HEIGHT/LENGTH			
• Measurement recorded on paper correctly		1	
• Measurement recorded in the computer correctly		1	
Total	/	2	

Category:

Item	Score	Max Pts	Comments
WEIGHT			
• Measurement recorded on paper correctly		1	
• Measurement recorded in the computer correctly		1	
Total	/	2	
HEIGHT/LENGTH			
• Measurement recorded on paper correctly		1	
• Measurement recorded in the computer correctly		1	
Total	/	2	

Category:

Item	Score	Max Pts	Comments
WEIGHT			
• Measurement recorded on paper correctly		1	
• Measurement recorded in the computer correctly		1	
Total	/	2	
HEIGHT/LENGTH			
• Measurement recorded on paper correctly		1	
• Measurement recorded in the computer correctly		1	
Total	/	2	

4 – 5   What Growth Charts Tell Us

Objectives

After completing this section, you will be able to:
- ✔ Explain a child's growth to a caregiver.
- ✔ Identify children as underweight, overweight and short stature.
- ✔ List the reasons a child may have an abnormal growth pattern.

Overview

Growth charts can tell us not only how a child compares to other children, but more importantly, how an individual child is growing over time. A child's growth should follow a path on the growth curve, large fluctuations are not normal. Generally, measurements between the 10th and 85th percentile are considered normal growth.

In this section, you will learn when growth is considered not normal, the risks associated with the growth charts, when to refer to the nutritionist, which graphs to use and how to discuss the graphs with the caregiver.

What CDC/NCHS Growth Charts Tell Us

One measurement of height and weight tells us how a child ranks in size compared to other children of the same sex and age at one point in time. Although this information is useful to determine whether a child qualifies for the WIC program, one measurement does not give us enough information to assess a child's growth.

Several measurements over time at different ages give better information about how the child is growing. Most children stay in approximately the same percentile during growth. Large fluctuations in percentiles are not normal, but growth spurts are. The pattern of growth over time is more sensitive in detecting abnormalities than one measurement. The pattern should follow the general shape of the growth curve.

Great care should be used to interpret the measurements plotted on the growth charts. Additional medical, nutritional or social information may be important in making the proper assessment of growth.

What is "Normal Growth"?

Measurements between the 10th and 85th percentiles usually represent normal growth. However, each child must be considered individually. Measurements between the 10th and 85th percentiles may or may not be normal, depending on other measurements, genetic and environmental factors.

For example, if a child is growing along the 50th percentile for the first three years of life and suddenly drops to the 10th percentile, there may be a problem. However, a child that grows consistently at the 10th or 85th percentile over a period of time is probably normal for that child.

Breastfed versus Formula-fed Infants

Research has shown that the growth patterns of breastfed infants differ from those of formula fed infants. Generally, formula fed infants gain weight slower in the first three months and then more rapidly after about three months.

The 0-23 month growth grids are based on growth under optimal conditions where breastfeeding is the norm.

What is Body Mass Index (BMI)?

Body Mass Index (BMI) is an anthropometric index of weight and height that is defined by weight (pounds) divided by height (inches) squared x 703. BMI is the commonly accepted index for classifying body fat in adults and children. BMI is a screening tool used to identify individuals who are underweight and overweight.

Using the Growth Charts in the WIC Program

There are two different sets of growth charts, one for infants and children ≤23 months and one for children 24 months and older.

Infants and Children < 24 Months
The WIC program considers measurements for infants and children 23 months and younger at or below the 5th percentile and at or above the 97.7^{th} percentile to be a reason of concern. The table below shows the definitions that WIC uses for risk determination.

Measurement	Percentile	Definition for WIC
Length-for-Age	>2.3rd - 5th percentile	At Risk of Short Stature
Length-for-Age	≤ 2.3rd percentile	Short Stature
Weight-for-Age	N/A	Not used in WIC*
Weight-for-Length	>2.3rd - 5th percentile	At Risk of Underweight
Weight-for-Length	≤ 2.3rd percentile	Underweight
Weight-for-Length	≥97.7th percentile	High Weight-for-Length

*If a client sees the printed grid or the screen with weight-for-age grid, explain to the client that it is not generally used in WIC since it does not take the length into consideration.

Children ≥ 24 Months

The WIC program considers measurements for children 24 months and older at or below the 10th percentile and at or above the 85th percentile to be reason of concern. The table below shows the definitions that WIC uses for risk determination.

Measurement	Percentile	Definition for WIC
Height-for-Age	>5th – 10th percentile	At Risk of Short Stature
Height-for-Age	≤ 5th percentile	Short Stature
Weight-for-Age	N/A	Not used in WIC*
Weight-for-Height	N/A	Not used in WIC
BMI-for-age	>5th –10th percentile	At Risk of Underweight
BMI-for-age	≤ 5th percentile	Underweight
BMI-for-age	≥85th – 95th percentile	Overweight
BMI-for-age	≥95th percentile	Obese

*If a client sees the printed grid or the screen with weight-for-age grid, explain to the client that it is not generally used in WIC since it does not take the length into consideration.

Underweight:

Underweight means that the infant or child under two has a weight-for-length less than or equal to the 2.3^{rd} percentile and a child two and older has BMI-for-age less than or equal to the 5th percentile. At Risk of Underweight means that the infant or child under two has a weight-for-length greater the 2.3^{rd} and less than or equal to the 5th percentile and a child two and older has a BMI-for-age greater than the 5th and less than or equal to the 10th percentile. A low weight-for-length or BMI-for-age may be caused by a variety of problems.

❖ Medical Problems – Diseases such as cancer, gastrointestinal problems, metabolic diseases, etc. can cause a child to have a poor nutritional status and become underweight.

❖ Environmental Problems – The conditions under which a child lives may cause the child to be underweight. For example, children living with substance abusing parents may be neglected and thus underfed.

❖ Socio-economic Status – The amount of income in a household can influence both the amount and the quality of the food a child eats. Children that do not get enough food to eat may be underweight. In addition, children

that are not getting the right amount of nutrients from the foods they eat may also be underweight.

◈ Infants and children who are determined to be underweight or at risk of underweight must be referred the nutritionist for high-risk counseling.

Overweight:

Obese for children ≥24 months is a BMI-for-age greater than or equal to the 95th percentile. Overweight is greater than or equal to the 85th and less than the 95th percentile. High Weight-for-length for infants and children <24 months is greater than or equal to the 97.7^{th} percentile. Weight loss for children should never be recommended. Instead, the focus of counseling sessions should be on slowing down the weight gain while the child grows in height. Children may be overweight for a variety of reasons.
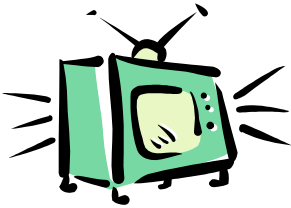
◈ Overfeeding – Children that are given too much food for their body size may become overweight. Even though these children are overweight, they may not be getting enough of certain nutrients because of inappropriate food items being consumed in high quantities, such as high fat and high sugar foods. It is important to remember that even an overweight child may be malnourished.

◈ Inactivity – Children that are inactive may also become overweight because they are not using enough energy. Most of the inactivity in children today is attributed to high amounts of television and video games.

◈ Inconsistent Food Availability – Children that do not get enough food consistently may also become overweight. This may sound strange, but the following theory may help to explain it. When a child's body does not get enough food, all the systems in the child's body slow down to conserve energy. This helps them stay alive during periods of starvation. When food is available, the child probably eats a lot more that he normally would because he is very hungry. Now he has a lot of energy available. But his body does not need much to run on because it has slowed down. Now there is extra energy available that is stored as fat. After a period of time, the child becomes overweight.

Short Stature:

Short Stature means that the infant or child under two has a length-for-age less than or equal to the 2.3^{rd} percentile and a child two and older has a height-for-age less than or equal to the 5th percentile. At Risk of Short Stature means that the infant or child under two has a length-for-age greater than the 2.3^{rd} and less than or equal to the 5th percentile and a child two and older has a height-for-age greater than the 5.0^{th} and less than or equal to the 10th percentile. Short stature

is usually associated with relatively long-term illness, nutritional deficiency or genetic factors. If a child's diet is poor enough and continues long enough, his growth in height will be stunted and may even stop.

However, short stature is common among children whose parents are also shorter than average. It is good practice to record parental height in the Notes section of the Anthropometric screen of children with short stature. If a child's parents are short and the child grows consistently at the 10th percentile (over a period of a year or more), his growth pattern is probably normal for him and, therefore, no cause for concern.

Discussing Growth Charts with Caregivers

After measurements and percentiles have been determined, it is important to explain and discuss the child's growth chart with the caregiver. When explaining a child's growth, always use simple words that the caregiver can understand.

It is also important not to alarm or offend the caregiver concerning the child's growth or eating habits. There are three key things to tell the caregiver about the growth chart.

1. Explain what the growth chart is.
   You will need to be able to explain what the growth chart tells us about children's growth and nutritional status. Make sure the caregiver understands that growth charts:
   - Look at a child's growth over time in comparison to other children.
   - Help identify problems.

2. Explain the height/length-for-age chart.
   - Explain that the chart looks at how tall a child is compared to other children the same age.
   - Use the example of 100 children lined up according to how tall they are.
   - Explain the child's growth in height over time.
   - Express any abnormalities as concerns.

3. Explain the length-for-weight or BMI-for-age chart.
   - Explain that these charts look at how a child's weight compares to other children of the same height. In other words, length-for-weight charts tell us how heavy or thin a child is compared to other children as tall as him/her. BMI tells us how heavy or thin a child is compared to other children of the same height and age.
   - Use the example of 100 children of the same height lined up according to weight.
   - Explain the child's growth in weight over time.
   - Express any abnormalities as concerns.

Example Conversation:

CNW: Today I weighed and measured Michael and these measures were plotted on a growth chart. Have you ever seen one of these before?

Maria: Yes at the doctor, but I don't know what it is.

CNW: Growth charts help us look at how your child is growing over time.

Maria: Oh.

CNW: Let me show you. This chart looks at how Michael is growing in height. These dots are the measurements we have taken over the past few years. He looks like he is continuing to grow well since he started coming to WIC at 6 months old.

Maria: Uh huh.

CNW: Now let's look at how his weight compares to his height. This tells us how heavy or thin he is. If you look at Michael's chart, you can see that he started out in the middle of the curves and has been moving up each time we weighed him. This means that we may need to look at what and how much Michael is eating. We may also want to look at how active Michael is. He will be on the WIC program for the overweight risk. This doesn't mean that he needs to go on a diet. We want to slow down his weight gain while he grows in height, so that he stays healthy. What do you think about Michael's weight right now?

☑ *Self-Evaluation*

1. Mark the following statements true or false.

   A) _____ The pattern of growth over time reveals more about a child's nutritional status than one measurement.
   B) _____ Short stature (low height/length-for-age) is always caused by long-term nutritional deficiencies or illness.
   C) _____ Height-for-weight graphs are used for children ≥ 24 months of age.
   D) _____ WIC does not use the weight-for-age graph to access a child's weight.

2. Fill in the blanks with the appropriate percentiles.
   A) Growth between the _____ and _____ percentiles is usually not a concern for children 2 and older.

   B) Measurements less than or equal to the _____ percentile weight-for-length and less than or equal to the _____percentile BMI-for-age indicate Underweight, whereas measurements between the _____ and _____ percentiles for infants and children ≤ 23 months and measurements between the _____ and _____ percentiles for children ≥ 24 months indicates At Risk of Underweight.

   C) Measurements greater than or equal to the _____ percentile BMI-for-age indicate Obese, whereas measurements between the _____ and _____ percentiles indicate Overweight.

☑ *Skill Check*

1. Observe the dietitian/WIC Director explaining a growth chart to a caregiver.

2. Have the director or dietitian observe you explaining a growth chart to a caregiver. Have the director/nutritionist discuss the observation.

Item	Score	Max Pts	Comments
GROWTH GRIDS			
• Appropriately explained the growth grids (reason for use, how they are used, etc.)		1	
• Adequately explained the child/infant's height/length growth using the height/length-for-age chart		3	
• Adequately explained the child/infant's weight growth using the length-for-weight or BMI-for-age chart		3	
Total	/	**7**	

	Score	Max Pts	Comments
GROWTH GRIDS			
• Appropriately explained the growth grids (reason for use, how they are used, etc.)		1	
• Adequately explained the child/infant's height/length growth using the height/length-for-age chart		3	
• Adequately explained the child/infant's weight growth using the length-for-weight or BMI-for-age chart		3	
Total	/	**7**	

	Score	Max Pts	Comments
GROWTH GRIDS			
• Appropriately explained the growth grids (reason for use, how they are used, etc.)		1	
• Adequately explained the child/infant's height/length growth using the height/length-for-age chart		3	
• Adequately explained the child/infant's weight growth using the length-for-weight or BMI-for-age chart		3	
Total	/	**7**	

4 – 6 Prenatal Weight Gain

Objectives

After completing this section, you will be able to:
- ✓ Identify inadequate, normal and excessive weight gain in pregnant clients.
- ✓ Explain the Prenatal Weight Gain grid to pregnant clients.

Overview

The prenatal weight gain grid gives you information on how a pregnant woman's weight gain is at that point in time, whereas several measurements can give a picture of how a woman is gaining over time. In this section, you will learn how much weight gain is appropriate for each pregnant client, how to explain the grid and how to counsel a client based on how her weight gain is progressing.

Determining Pregnancy Weight Gain

Weight gain during pregnancy is an important component of prenatal care. The weight that a woman gains during pregnancy is made up of the fetus, placenta, extra fluid, blood and fat stores that will be used for making breastmilk.

Studies have shown that weight gain during pregnancy is associated with the birth weight of the infant. Standards of weight gain have been developed that help us determine whether a woman is gaining too much weight, too little weight or just the right amount of weight.

Assessing BMI in Women

You already learned how to obtain current height and weight measurements for all women. This information is used to calculate BMI and compare it to standards to determine whether women should be classified as underweight, normal weight or overweight. A woman's BMI can help us to determine what type of nutritional counseling she needs for a healthy diet. Her weight status is also used to determine whether she is gaining enough weight during her pregnancy. Optimal weight gain during pregnancy has been shown to produce healthy weight infants at birth.

Determining Weight Category:

Assessing BMI in adults is different than assessing BMI in children. In children, the recommended BMI range changes depending on the child's age. This is due to the fact that the amount of body fat children needs changes at different stages of growth. Therefore, the BMI for children must be plotted on a graph and percentiles must be used to determine weight-related risks. The recommended BMI range for adults stays the same and so percentiles are not used for adults.

The computer will automatically determine whether a woman is underweight, normal weight or overweight based on her pre-pregnancy BMI.

Assessing a Woman's Weight Gain

One weight plotted at one point in time gives us only one small piece of information about how that woman is gaining. It is much more useful to look at several measurements to give us a picture of how the woman is gaining over time.

The STARS system plots on the prenatal growth grid based on information entered on the Anthropometric screen. There are four different grids based on pre-pregnancy weight and height: Normal, Overweight, Obese and Underweight. Only the grid for that pre-pregnancy weight status will appear when STARS plots the weight gain. The woman should gain in-between the two drawn lines; this is the recommended weight gain area. The placements of the lines vary, depending upon pre-pregnancy weight status.
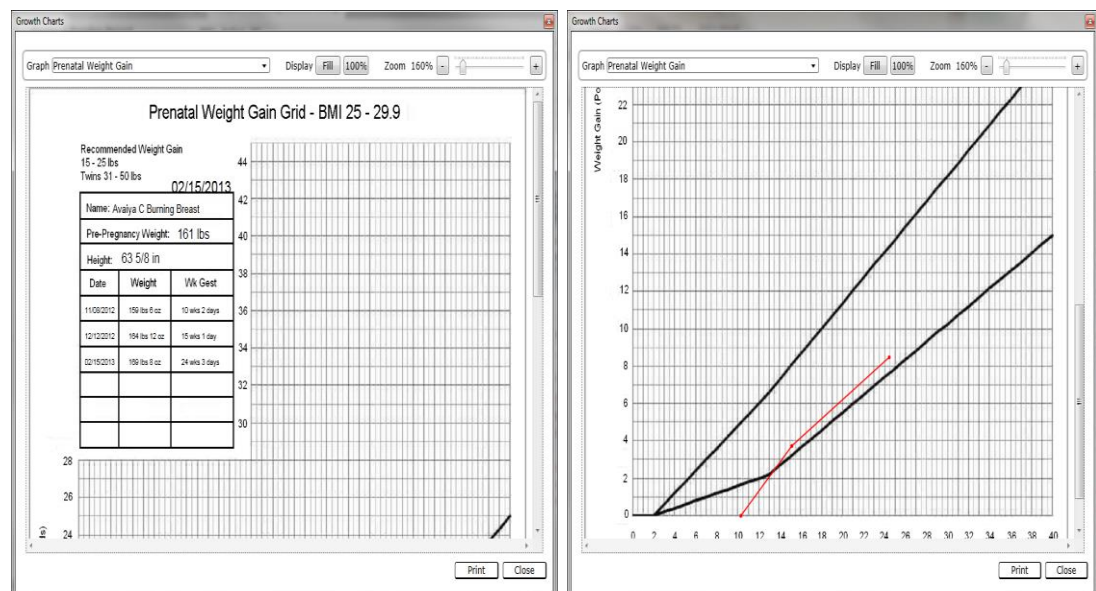
Example: Overweight pregnant woman

Notice that the recommended weight gain during the first three months (first trimester) is quite small, only about 2-6 pounds, depending on pre-pregnancy weight status. The majority of weight gain should occur during the second and third trimesters when the fetus is growing larger and the mother is adding blood, fluid and fat tissues.

_____

Note: A trimester is a period of three months. The nine months of pregnancy are divided into three trimesters and are commonly referred to as the 1st trimester (0-13 weeks gestation), the 2nd trimester (14-26 weeks gestation) and the 3rd or last trimester (27-40 weeks gestation).

_____

Once you have the woman's weight gain plotted, you can determine whether she is gaining weight too quickly, too slowly or at a good rate. These three situations are discussed below.

Gaining Too Quickly:

A woman who is gaining too quickly will have plots on the grid that are above the recommended area.

What do you do?
Women who are gaining weight too quickly may be eating too much or may be gaining fluid weight. It is important that the woman not lose or maintain her current weight, but should continue to gain weight, only at a slower rate. Encouraging a variety of nutritious low fat foods can do this. Women who are gaining at an excessively high rate should be referred to the nutritionist or physician.

Gaining Too Slowly:

A woman who is gaining too slowly will have plots on the grid that are below the recommended area. See the prenatal weight gain grid example on the previous page.

What do you do?
Women who are gaining weight too slowly may not be eating enough calories. These women should be encouraged to eat at least three meals and three snacks per day. They need to be referred to the nutritionist for counseling.

_____
Note: Women who are gaining too quickly or too slowly may be eligible for the WIC program based on their weight gain history. This will be discussed in the Nutrition Risk unit of the Competency Manual.
_____

Gaining At a Good Rate:

A woman who is gaining in the recommended area should be encouraged to continue to eat a variety of nutritious foods and eat three meals and two-three snacks each day.

Recommended Pregnancy Weight Gain

The table below lists the total amount of weight a woman should gain during her entire pregnancy based on her pre-pregnancy weight.

WEIGHT GAIN CATEGORY	RECOMMENDED WEIGHT GAIN
Underweight Women BMI <18.5	28-40 pounds
Normal weight BMI 18.5-24.9	25-35 pounds
Overweight BMI 25.0-29.9	15-25 pounds
Obese BMI >30.0	11 -20 pounds

* BMI is calculated by dividing weight in pounds by height in inches by height in inches and multiplying by 703. (Weight ÷ Height ÷ Height x 703)

_____

Note:
◈   Women carrying twins and triplets need to gain about 10 pounds extra per additional fetus.
◈   Teens should gain at the upper end of the recommended range.
◈   Women who are 62" or less in height should gain at the lower end of the recommended range.

Explaining the Prenatal Weight Gain Grid

The Prenatal Weight Gain Grid can be used as an educational tool for the pregnant woman. The WIC staff person should explain the following to pregnant women:

✓ Show the woman the area that she should be gaining in based on her pre-pregnant weight.

✓ Show her how her weight gain is progressing so far.

✓ Compare her weight gain to the recommended weight gain.

✓ Provide encouragement and counseling for healthy weight gain.
Example:

Linda is a prenatal woman who was normal weight before she became pregnant. She gained 4 pounds at 5 weeks gestation and has gained 15 pounds at 18 weeks gestation.

WIC Staff: Have you seen a chart like this before at the doctor's office?

Linda: No.

WIC Staff: This chart shows us how much weight women should gain during their pregnancy so they have a healthy baby. We look at how much you weighed before you were pregnant to determine what would be a good weight gain for you. We would recommend that you gain in this area on the chart.

Linda: Oh, O.K.

WIC Staff: Each time you come in, we will weigh you and put it on this chart. Here are your last two weights (pointing at the marks). You can see that you are gaining weight a little more quickly than we would like to see.

Linda: Yes. I have been eating a lot.

WIC Staff: We don't want you to lose weight or stop gaining weight. That wouldn't be good for your baby. We want to help you slow down your weight gain.
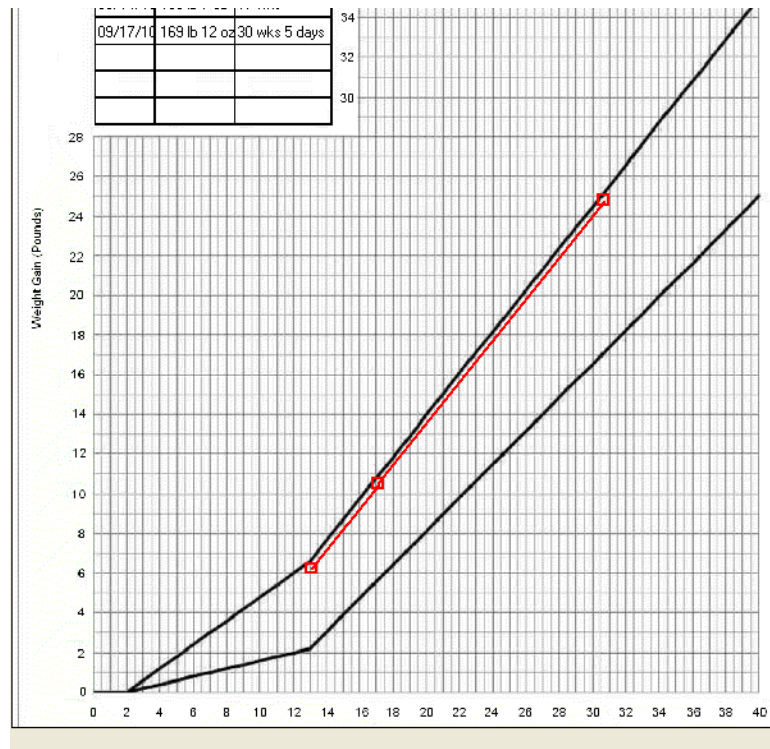
Linda: How can I do that?

WIC Staff: Let's talk a little about the foods that you are eating and see if there are any changes you could make.

☑ *Self-Evaluation*

1. Mae WIC is a 20-year-old pregnant woman whose EDC is July 22. She is 5'6 ¼ inches and weighs 170 ½ #. Her pre-pregnancy weight was 145# and BMI was 24.0. Today is May 16.

A) What is her weight category?
   a. Normal
   b. Underweight
   c. Overweight
   d. Obese

B) Approximately how many weeks gestation is she? _____

C) How much weight has she gained? _____

D) Is she gaining
   a. Too quickly
   b. Too slowly
   c. At a good rate

2. Daisie Duke is a 22-year-old pregnant woman who's EDC is August 15. She is 5'2 3/4 inches and weighs 162 #. Her pre-pregnancy weight was 145# and BMI was 26.5. Today is April 15.

07/06/10 157 lb	18 wks
08/10/10 163 lb	23 wks
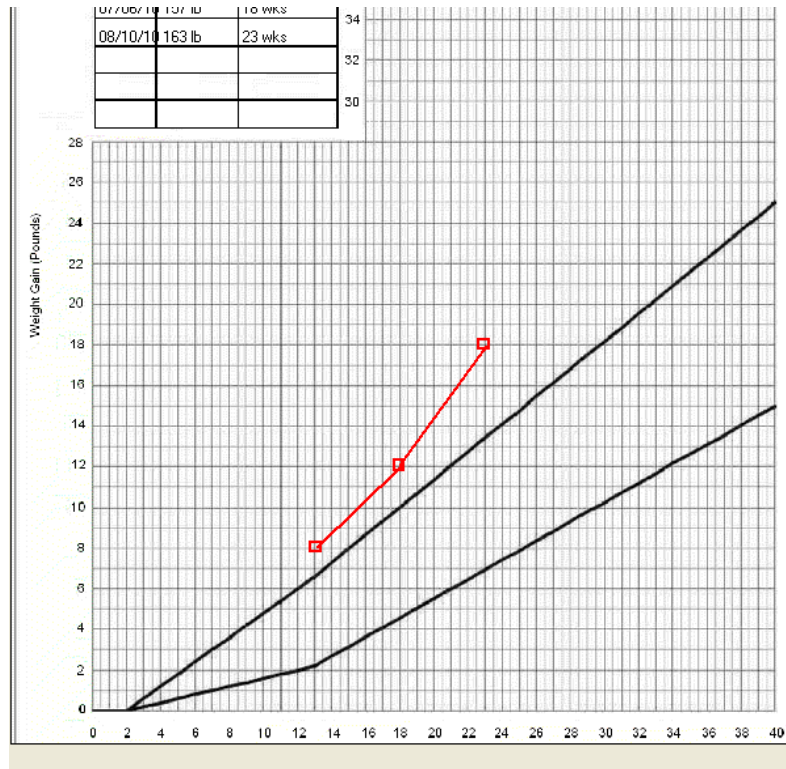
A) What is her weight category?
     a. Normal
     b. Underweight
     c. Overweight

B) How much weight has she gained? _____

C) Is Daisie's weight gain adequate? How would you counsel her?

3. How much weight would you recommend the following women gain during pregnancy?
     a. Normal weight woman _____
     b. Underweight woman _____
     c. Overweight woman _____

☑ *Skill Check*

1. Have the director or nutritionist observe you explaining a prenatal weight gain chart to a client. Have the director/nutritionist discuss the observation.

Item	Score	Max Pts	Comments
GROWTH GRIDS			
• Appropriately explained the prenatal weight gain grid (reason for use, how they are used, etc.)		1	
• Discussed how the client's weight gain is progressing		3	
• Compared the client's weight gain to the recommended weight gain		1	
• Provided encouragement and counseling for healthy weight gain.		3	
Total		/ **8**	

Item	Score	Max Pts	Comments
GROWTH GRIDS			
• Appropriately explained the prenatal weight gain grid (reason for use, how they are used, etc.)		1	
• Discussed how the client's weight gain is progressing		3	
• Compared the client's weight gain to the recommended weight gain		1	
• Provided encouragement and counseling for healthy weight gain.		3	
Total		/ **8**	

Item	Score	Max Pts	Comments
GROWTH GRIDS			
• Appropriately explained the prenatal weight gain grid (reason for use, how they are used, etc.)		1	
• Discussed how the client's weight gain is progressing		3	
• Compared the client's weight gain to the recommended weight gain		1	
• Provided encouragement and counseling for healthy weight gain.		3	
Total		/ **8**	

Answer Key to Self-Evaluations

4-1 Self-Evaluations
1. Environmental, genetic, behavior and hormonal factors.
2. Program eligibility, counseling and reporting
3. So that accurate results will be obtained, recorded and compared with appropriate growth references. To provide accurate information during counseling, obtain accurate nutritional risk and for current data.
4. Pregnant Women – At certification and each clinic visit
   Child – Each certification
   Infant – Certification, 2- 4 months, mid-certification (6-8 months) and health assessment (9-11 months)
   Underweight child – As recommended by the nutritionist or as local agency policy dictates.

4-2 Self-Evaluations
1. 0-23 months, 1/8; ≥2, 1/8
2. See section, page 15-16
3. Recumbent Length – See section, page 13
   Standing Height – See section, page 17

4-3 Self-Evaluation
1. 23, infant; 2 years, adult
2. See section, page 24
3. Infant and young child's weight – See section, page 22
   Adult's weight – See section, page 24

4-4 Self-Evaluation
1. a. 22 # 13 oz
   b. 143# 5 oz
   c. 36 # 11oz
   d. 106# 2oz
2. B
3. Ask your director

4-5 Self-Evaluation
1. a. True
   b. False
   c. False
   d. True
2. a. 10 and 85
   b. 5; 6 and 10
   c. 95; 85 and 95

4-6 Self-Evaluation
1. a. Normal (a)
   b. 31-32 wks
   c. 25 ½ #
   d. At a good rate
2. a. Overweight (C)
   b. 17#
   c. Her weight gain is above normal. Counseling on slowing down weight gain.
3. a. 25-35#
   b. 28-40#
   c. 15-25#

Name: _____

Date: _____

Score: ____/100 points

Percent correct:_____

Unit 4: Anthropometrics
<u>Unit Assessment</u>

DIRECTIONS: Circle the correct answer.

(4 points each)

1.   Which of the following is a reason for assessing weight and length (or height) of WIC
        applicants and clients?
        a.   Identify malnourished women, infants and children
        b.   Identify women, infants and children at risk for malnutrition
        c.   Monitor growth of the fetus in pregnant women
        d.   Monitor the growth and development of infants and children
        e.   All of the above

2.   Which of the following factors influence growth in infants and children and/or weight
        gain of a mother during pregnancy?
        a.   Genetics (inherited family characteristics such as race, body build)
        b.   Environment
        c.   Nutrition
        d.   a and b
        e.   All of the above

3.   Which of the following is the appropriate type of equipment to use when weighing?
        a.   Digital scale
        b.   Balance beam scale
        c.   Bathroom type scale
        d.   None of the above

4.   Which of the following should be used to measure children and adults?
        a.   Portable measuring board
        b.   Wall mounted measuring board
        c.   Measuring stick mounted on beam scale
        d.   a and b
        e.   None of the above

5.   Children should be measured lying down until what age?
        a.   6 months
        b.   12 months
        c.   24 months
        d.   30 months

6. Some common errors in measuring either standing or recumbent length include all but which of the following?
    a. Improper equipment is used.
    b. Head is not properly aligned with headboard.
    c. Measurement is taken three times.
    d. Legs are not straightened.

7. Scales should be "zeroed"
    a. First thing in morning.
    b. Each time before the scale is used for a weight.
    c. Once a week.
    d. None of the above.

8. It is important to measure accurately because:
    a. Information entered into the computer is used for reporting purposes and data analysis
    b. Growth information is an important tool used to determine proper growth and development and to screen for problems.
    c. Growth information is used to determine the nutrition education message.
    d. All of the above.

9. The recommended weight gain for normal weight women during pregnancy is:
    a. 11-20 pounds
    b. 20-25 pounds
    c. 25-35 pounds
    d. At least 30 pounds

10. The growth charts are useful in:
    a. Comparing a child's growth measurement to a reference set of children.
    b. Determining whether a child's growth pattern over time is normal.
    c. Determining nutrition risk factors for children to be eligible for WIC.
    d. All of the above.

11. A weight measure of 164.4 pounds was taken and would be converted to 164 pounds and _____ to enter into the STARS system.
    a. 2 ounces
    b. 4 ounces
    c. 1/16 pound
    d. 6 ounces

12. A height measurement taken of 37 ½ inches should be recorded in STARS as 37 and _____ /8 inches
   a. 1
    b. 2
    c. 4
    d. 5

DIRECTIONS: Write in the correct answer. 'F' for False or 'T' for True.
(2 points each).

_____ 13.   Underweight women need to gain more weight than overweight women for the healthiest pregnancy outcome.

_____ 14.   Infants less than 12 months old should be weighed in a dry diaper.

_____ 15.   Recommended weight gain in the first trimester of pregnancy is larger than in any other trimester of pregnancy.

_____ 16.   The pattern of growth or weight gain <u>over time</u> is a better indicator of healthy weight gain in pregnancy or during childhood than one single measurement.

_____ 17.   Physical growth is a good indicator of the nutritional status of children.

_____ 18.   Recumbent length and standing height are the same.

_____ 19.   Weight should be measured to the nearest ounce for infants and the nearest tenth of a pound for children and adults.

_____ 20.   It is possible for one person alone to obtain an accurate length measurement of an infant.

_____ 21.   Children and women should be weighed with shoes.

_____ 22.   Height or weight plotted at a certain age tells you how a child compares in size with other children of the same age and sex.

_____ 23.   Teenage girls should not gain as much weight during pregnancy as older women, because they have more difficulty with delivery.

_____ 24.   The height-for-weight graph is used in WIC for children >24 months.

DIRECTIONS: Use the following growth grids or pregnancy weight gain grids to answer the following questions. **(4 points each)**

25. Using the graph (height-for-age) below, what can you determine about the child's growth.
    a. The height is considered tall for the age.
    b. The height is growing at a consistent rate.
    c. The height-for-age is considered within normal range.
   d. Both a and b.
    e. Both b and c.
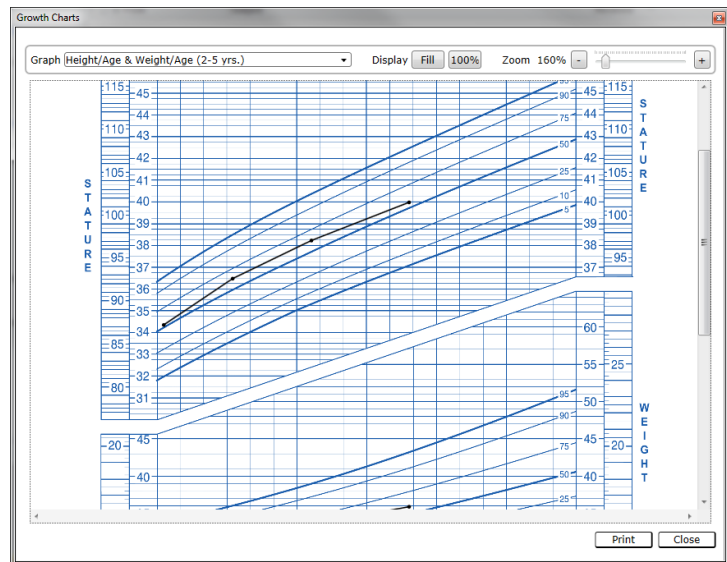
26. Using the graph (BMI-for-age) below what can you determine about the child's growth.
    a. The BMI-for-age is within the normal range.
    b. The growth has approximately followed the same growth curve.
    c. The growth has drastically increased since the last visit.

27. Using the graph (BMI-for-age) below, the client would be assessed at:
    a. Obese
    b. Overweight
    c. Normal
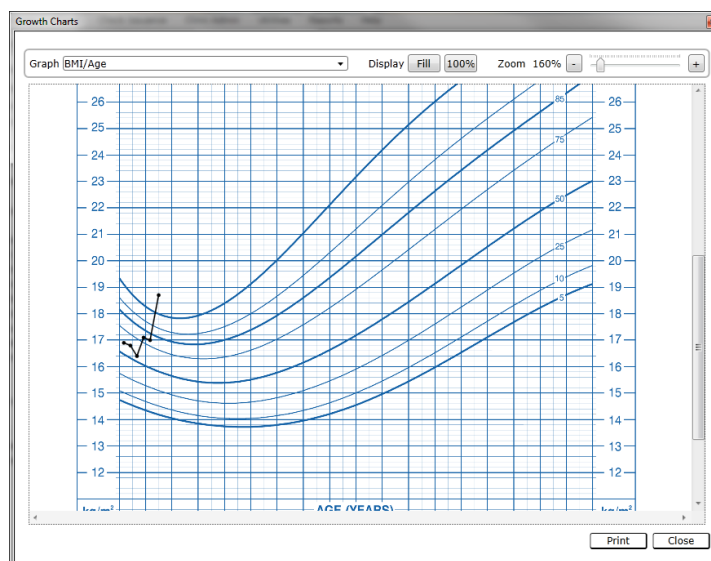
Using the Prenatal Weight Gain grid below, answer the following questions.
Heather is a 16-year-old pregnant woman. She is 5'1" and weighs 121 pounds 14 ounces.
Her EDC is October 6. Here weight on August 4 was 106#. Her pre-pregnancy weight was
97# and BMI was 18.3. Today is September 15.

28. What was her pre-pregnancy weight status?
     a. Underweight
     b. Overweight
     c. Normal

29. About how much weight has she gained?
     a. 25#
     b. 19#
     c. 23#
     d. 4#

30. Is she gaining:
     a. Low
     b. Normal
     c. High

31. What is the recommended weight gain for this client?
     a. 15-25#
     b. 28-40#
     c. 25-40#
     d. 25-35#