

Health and Nutrition Assessment Handbook (HNAH)

Anthropometric

Contact other agencies that have purchased the same equipment to find out if they are pleased with their purchase. Before purchasing any equipment, determine if there are companies in the area which provide service or repairs if needed. You may also contact the Technical Assistance (TA) nutritionist in your district for recommendations.

When contacting a company to place an order confirm whether the company has a 30-day return policy and if the company guarantees the equipment against defects for at least one year. Determine who should be contacted regarding returns or repairs if applicable. Inquire about price and volume discounts and cost of replacement parts. Local WIC providers are responsible for maintenance, repair costs and replacement of anthropometric equipment as allowed by their contract. Pediatric Examination tables are allowable when minimum criteria for both weight and length equipment is met.

Minimum Criteria for Measuring Equipment

Minimum Criteria for Recumbent Length Board (Mechanical and Digital)

- Constructed of durable (non flexible), easy to clean materials with no sharp edges or unfinished parts.
- Length board shall be a firm, inflexible, flat horizontal surface. Cushing is acceptable if part of the manufacturer device.
- Measuring tape shall be made of a non-stretchable material (imbedded if possible), which is clearly marked to one-eighth inch (1/8 inch) or 1 mm or less. Digital Infantometer must have graduations to one-eighth inch.
- A fixed head piece must extend above the measurement surface [always at right angle (90 degrees)]. Zero inch mark must be exactly at base of headboard.
- Must have a smooth movable mounted footboard, perpendicular to the tape.
- Pediatric Examination table foot piece must be stable and locked when in the perpendicular position.

Minimum Criteria for Standing Height (Mechanical and Digital)

- Measuring tape shall be attached to a firm surface, clearly marked to one-eighth inch (1/8") or 1 mm or less, (entire tape mounted on a board or attached to a wall without floor molding).
- Equipment should allow at a minimum the heels, buttocks and the back of the head to be in contact with the vertical surface of the equipment when measuring. When the equipment does not extend to the floor an extension must be attached to complete the vertical surface.
- The equipment should have a removable or attached headboard; if mounted, always at right angle (90 degrees) to the measurement surface.
- Headboard should be at least six inches (front to back) wide to measure at the participant's crown while standing.
- Digital stadiometer must have a hold function.
- The measuring arm on the platform scale is not an allowable device to obtain a height measurement for children or adults.

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Minimum Criteria for Weighing Equipment

Minimum Criteria for Scales (Mechanical and Digital)

- The scales should be constructed of durable, easy-to-clean material with no sharp edges.
- The scale should be placed on a hard floor or a hard surface if the floor is carpeted.
- LWP should keep the equipment manual on file.
- Infant scales shall have sturdy curved infant tray or car seat, etc.
- Spring-type bathroom scales are **NOT** acceptable.

Mechanical Scales Guidelines

- A scale must have a mechanism to allow zero balance. A screw type is preferred. The zero balance should be checked before every clinic session, routinely in the clinic and after the scale has been moved.
- A scale must have a mechanism to allow calibration.

Infant Scale

- Should be marked in increments of one ounce or less and accurate to that degree.
- Should have capacity at minimum of 40 pounds.

Adult/Child Scale

- Should have a platform.
- Should be marked in increments of four ounces or less and accurate to that degree.
- Should have a capacity of at least 300 pounds.

Digital Scales Guidelines

- Shall have automatic-zero.
- Shall have automatic-tare to zero. NOTE: Some digital/electronic scales have a tare feature, which allows you to zero the scale while the mother is on it, before handing her the infant. With this feature, only the weight of the infant will appear in the scale display after the mother's weight is tared.
- Should have a feature where the weight can be "locked" in.
- The scale should provide measurement reproducibility (i.e. consistent readings).
- Should select scale depending on where the scale will be used (e.g., satellite clinics) and the power source could be electrical, battery or both electrical and battery operated.
- Should provide accurate measurements, with minimum error at both low and high ends of the scale range.

Infants Digital Scale

- Shall have sturdy tray to support the infant.
- Shall have a minimum weighing capacity of 40 lbs or 20 kg for infant's scales.

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- Shall have a large enough platform (sturdy curved infant tray or car seat, etc) to ensure the infant's safety.
- Shall have an accuracy of one ounce for pediatric scales.

Adult/Child Digital Scale

- Shall have an accuracy of within ¼ pound (four ounces or one hundred grams) for adult scales.

Digital Scales Definitions

Digital Scales- Represent data as numbers by processing, storing, transmitting, representing, or displaying data in the form of numerical digits through the use of distinct electronic or optical pulses that represent the binary digits 0 and 1.

Tare – The weight of a blanket or diaper that can be deducted from the total weight to obtain an accurate weight of the baby when used in reference to infant scales.

Gradation - Signifies the amount of discrimination that the measurement instrument allows. With most professional infant scales the degree of difference is down to a fraction of an ounce while maintaining a precise reading.

Scale Weight - Displayed in pounds (lbs) and constitutes the actual weightiness of the scale for the purpose of portability.

Cradle Size - Dimensions that represent the holding area for the baby only and are listed as the cradle width by cradle length. The actual dimensions for the scale as a complete unit will vary.

Lock-In Weight - A feature that the LWP staff can use to carefully remove the baby from the scale while the baby's weight remains displayed.

Weight Memory Recall - A function that displays the last stored weight reading for comparison purposes. This function allows the user to instantly assess any change in the infant's weight.

Scale Inspection

Scale Inspections are required by the WIC Program because accurate anthropometric measurements are integral to assessing every WIC participant's health and nutrition status. New scales require an inspection before use and then annually.

- Scale inspections should be scheduled with either Missouri Weights & Measures Device and Commodity Program (573) 751-5639 or a private contractor who must place a seal directly on the scale or provide written documentation.
- LWP will provide Weights & Measures Division with the contact person's name at the agency, phone number and location of the scale to be inspected. Weights and Measures may request all scales needing inspection to be available in the same location. It is recommended that LWP request service one month in advance.
- A map of Weights and Measures Small Scales Inspection territories and the associated Inspectors for each territory is located at: http://www.mda.mo.gov/wm/wm_staff.htm
- If scales pass inspection, you will receive a Missouri Department of Weights & Measures Seal that will be dated and placed directly on the scale.
- When scales do not pass inspection, LWPs may contact Division of Weights and Measures for a list of registered service technicians who provide calibration services.

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The LWP cannot use this scale until it is repaired and passes inspection. When the scales are repaired, an inspector will perform a retest and affix a current approval seal.

Procedures for Weighing

All participants shall be weighed at every certification and re-certification. Record data collected in MOWINS.

- Infants are to be weighed on an infant scale either lying down or sitting on the scale. Infants will be weighed again at their scheduled follow-up visit (or more frequently if they are determined high-risk).
- Children > 12 months and < 24 months of age are weighed on an infant scale or adult scale if they are able to stand.
- Children over two years of age and women are weighed on an adult scale while standing upright.
- Pregnant women should be weighed at bimonthly intervals (monthly if she is determined high-risk).
- Refer to the manufacturer's equipment specifications for additional operating instructions.

Measuring Weight for an Infant or Child Under 2 Years of Age

1. Instruct parent/guardian to undress all infants down to a dry diaper. Children will need to remove their shoes and any heavy outer clothing. Note: child needs to have a dry diaper.
2. Mechanical scales - Balance the scale (if using scale paper balance scale with paper).
3. Place the infant or child in the center of the scale.
4. Move the weights away from zero until the marker drops into the center point of the beam's cutout area.
5. Read the weight to the **nearest ounce** and record information in MOWINS. If your infant scale displays the weight in pounds and ounces, this chart below is **not** needed.

Use this conversion chart below when converting a decimal weight to ounces. Use only if the scales display the decimal weight in either one or two tenths of an ounce.

Reading as a decimal on the digital scale	Conversion of decimal measure to ounces
0.1	2
0.2	3
0.3	5
0.4	6
0.5	8
0.6	10
0.7	11
0.8	13
0.9	14

Note: Resources used for rounding weight to the nearest ¼ pound adopted from Michigan WIC Anthropometric Measurements (Anthropometric Manual Rev 04/02/04) and Maryland WIC Program.

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- 6 Mechanical scales - When finished, return both the upper and lower beam weights to zero, if applicable.
7. All scales shall be cleaned on a daily basis and as needed. If no scale paper is used then clean after each participant.

Infant Test Weighing

Test Weighing- Weighing a baby before and after breastfeeding to determine intake.

Purpose for Test Weights

- To monitor intake and to assure mothers that their infants are receiving an adequate amount of breastmilk from each nursing session.
- To verify if infants are receiving enough breastmilk so that the need for formula supplementation can be determined.

Principles to Consider

- A digital scale must be accurate to 2 grams or less and have an integration function that allows for infant's movement.
- Infant is weighed before and after the feeding, either without clothes or with the exact clothing.
- The difference in grams between the first and second weight is considered the intake in milliliters. (Some scales automatically store weights and compute the difference in milliliters- see manufacturer's instructions.)
- An International Board Certified Lactation Consultant (IBCLC) must conduct or supervise test weighing in the Local WIC Provider facility.

Measuring Weight for a Woman or Child Over 2 years of Age

1. Check scales for zero balance:
 - a. For balance beam scales, first balance the scale. The scale is balanced when the marker indicates zero while the weights are in the zero position or the marker is in the middle of the cut out area on the balance beam scale. When necessary, move the weights to zero and turn the adjustment screw until the scale is balanced.
 - b. For digital scales, turn the scale on and ensure that it is zeroed before weighing the participant.
2. Instruct parent/guardian/participant to remove any excess clothing like a jacket, sweater, or sweatshirt and to empty heavy items from their pockets and remove their shoes.
3. Instruct participant to stand in the center of the scale's platform, look straight forward, feet slightly apart and with their arms hanging naturally at their side.
4. Obtain measurement:
 - a. For Mechanical scales:
 - i. Move the beam's lower weight away from the zero until the marker drops below the center point. Then slide the lower weight back one notch toward zero until the marker is now above the center point.

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- ii. Slide the beam's upper weight away from zero until the marker is centered. It may be necessary to move the upper weight back-and-forth a few times until the scale is balanced.
 - b. For digital scales:
 - i. Ensure the participant remains on the scale until the reading is stable, the machine beeps, or the display indicates the weight is locked in.
5. Read the weight measurement to the **nearest ¼ pound** and record information in MOWINS.
- For digital scales that weigh to the nearest 0.1 pound, use the conversion table below to convert the decimal reading to the nearest ¼ pound.

Reading as a decimal on the digital scale	Women & Children Round off ounces to nearest ¼ pound
0.1	Previous whole number
0.2	¼ pound
0.3	¼ pound
0.4	½ pound
0.5	½ pound
0.6	½ pound
0.7	¾ pound
0.8	¾ pound
0.9	Next whole number

- If a participant's weight is greater than the LWP scale can measure, the LWP shall enter the maximum value that the scale is designed to weigh in the weight field of the Ht/Wt/Blood tab in MOWINS. The LWP shall select the radio button for possible inaccurate measurement and select "Greater than (>) Scale Max" from the drop-down list.
- 6. When finished, return both the upper and lower beam of the mechanical scale weights to zero.
 - 7. All scales should be cleaned on a daily basis and as needed.

Procedures for Height or Length Measurements

All participants shall have a height/length measurement at every certification and re-certification. Record data collected in MOWINS. All infants and children less than 24 months shall be measured lying down (recumbent or supine) on a measuring board. In order to measure length accurately, two people are required.

Height (Stature) – Measurement of the distance from the top of the head to the bottom of the feet that is performed standing upright.

Length (Recumbent) - Measurement of the distance from the top of the head to the bottom of the feet that is performed lying down.

Height and Length are **NOT** the same and cannot be used interchangeably.

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Measuring Length for an Infant or Child under 2 Years of Age

1. Place scale paper on the measuring board, if applicable.
2. Lay infant/child face up on the measuring board; body must be straight, lined up with the measuring board.
3. Have the parent/guardian hold the infant's/child's head firmly against the non-moveable headboard until the measuring is completed. Have the parent/guardian place the other hand on the infant's/child's abdomen.
4. LWP staff use one hand to hold the infant/child's legs together just above the *knees* and gently push both legs down—fully extending the infant's/child's legs. Avoid using just one leg to measure, as this technique can displace the hip and make the infant/child appear longer than actual length measurement.
5. With the other hand, move the footboard until it is resting firmly against the infant's/child's heels. The toes should point directly up.
6. Read the measurement to the **nearest 1/8-inch** and record information in MOWINS.

For digital infantometers that measure to the nearest tenth or one hundredth, use the conversion table below to convert the decimal reading to the nearest 1/8 inch.

Converting .01 (one hundredth) to 1/8 inch	Converting 0.1 (tenths) to 1/8 inch	Number of Eighths
.01 - .06	0.0	0/8
.07 - .18	0.1	1/8
.19 - .31	0.2 - 0.3	2/8
.32 - .43	0.4	3/8
.44 - .56	0.5	4/8
.57 - .68	0.6	5/8
.69 - .81	0.7 - 0.8	6/8
.82 - .93	0.9	7/8
.94 - .99		Round up to the next whole inch

7. Measuring board shall be cleaned on a daily basis and as needed. If no scale paper is used then clean after each participant.

Measuring Height for a Woman or Child over 2 years of Age

1. Remove shoes and hat. Move any pigtails, or hair accessories out of the way that would obstruct or affect the accuracy of the measurement.
2. Stand on a bare, flat surface, heels slightly apart and flat on the floor.
3. Back straight as possible; knees should not be bent.
4. Heels, buttocks, shoulder blades and back of head should touch the wall or measuring surface. Note: depending on the overall body conformation of the individual, all four contact points may not touch the measuring surface. In addition, some narrow stadiometers may not allow contact with all points e.g. shoulder blades. In such cases, have as many contact points as possible.
5. Arms hanging naturally to side, shoulders relaxed.

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6. Looking forward – eyes straight ahead.
7. Slowly lower moveable headboard until it touches crown of head firmly.
8. Read measurement to the **nearest 1/8-inch** and record information in MOWINS. To ensure an accurate reading, the measurer’s eyes should be parallel with the headpiece.

For digital stadiometers that measure to the nearest tenth or one hundredth, use the conversion table below to convert the decimal reading to the nearest 1/8 inch.

Converting .01 (one hundredth) to 1/8 inch	Converting 0.1 (tenths) to 1/8 inch	Number of Eighths
.01 - .06	0.0	0/8
.07 - .18	0.1	1/8
.19 - .31	0.2 - 0.3	2/8
.32 - .43	0.4	3/8
.44 - .56	0.5	4/8
.57 - .68	0.6	5/8
.69 - .81	0.7 – 0.8	6/8
.82 - .93	0.9	7/8
.94 - .99		Round up to the next whole inch

Example: A child is measured standing with a digital stadiometer. The stadiometer reads 36.8 inches. The conversion chart indicates that 0.8 inches equals 6/8 inch. Therefore, the height is entered into MOWINS as 36 6/8 inches.

Participants with Disabilities

Contractures about the hips, knees, and ankles can interfere with an accurate stature measurement. Several measures are useful alternatives to length or height. These include crown-rump length, sitting height, arm span, and tibia length.

In MOWINS, under the *Height/Weight* tab select “Participant Disability” when the participant has a condition that prevents them from being weighed and measured using standard procedures. Non-standard procedures may be used or referral data may be obtained from the health care provider.

Participant Unable to Stand or Uncooperative Child

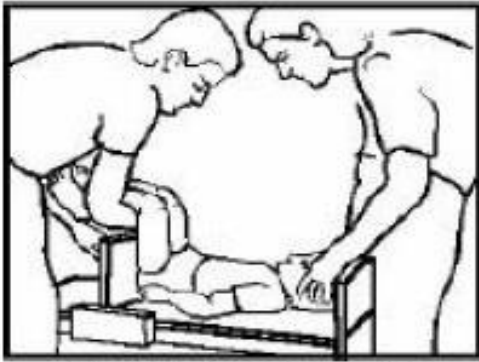
Children who are unable to stand without support should be measured by Crown Rump measurement. Refer to <http://depts.washington.edu/pwdlearn/web/pdfs/mod1print.pdf>.

Document the non-standard measurement method used. The measurements will not correlate directly with height or length, but can indicate a child’s rate of growth on CDC growth charts. Although the measurements will be below the 5th percentile for age, they will show whether the child is following a consistent growth curve.

Using the general/SOAP notes in MOWINS document “Crown-Rump” which indicates how the height or length measurements were taken. Assign all applicable risk factors. Tailor the nutrition education contact to meet the needs of the participant.

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Crown-rump length



Sitting-height measurement

Note: Resources used for individuals with disabilities adopted from CDC website on growth charts, Department of Education Washington and Wisconsin WIC Program (Operations Manual Rev 04/01/03).

Children who are unable to stand on the adult scale may be weighed using the following method: weigh the adult holding the child and record the combined weight. Then weigh the adult alone. Subtract the adult's weight from the combined weight. The difference represents the child's weight. (Note: This procedure may also be used for uncooperative children who refuse to be weighed using standard procedures.) Document in MOWINS the weight was obtained by the parent/guardian holding the child.

Participants Wearing a Cast

Include documentation in the general notes if the participant is wearing a cast that prevents the standing height measurement being obtained. Omit the height measurement until the cast is removed and the height can be measured accurately. If an individual is wearing a cast that does not prevent his/her height from being obtained, complete the measurement using standard procedures, and document that a cast was being worn in the progress notes.

An individual wearing a cast can usually be weighed using standard procedures. The presence of a cast should be documented on the growth chart and in the progress notes. Remember that overweight risk factors may not be used for WIC certification in this situation, and plotting on the growth charts will be affected.

Physically Handicapped Participants

If a participant has a physical handicap that prevents her/him from being measured, document the issue in MOWINS.

One Leg Shorter Than the Other

If a child is less than three years of age and one leg is shorter than the other, the child should be measured lying down. Both legs should be fully extended. Record the measurement of the longer leg and document this measurement in MOWINS. A child over three years of age or a woman can be measured in a standing position by having him/her stand on his/her longest leg and document how the reason in MOWINS.

Amputee/missing Limbs

Infants or young children who are missing arms or legs may be weighed on the pediatric beam balance scale using the standard procedure. Document the weight and physical problem in MOWINS. It is very important to remember that the risk factors for being underweight cannot be used for WIC certification in this situation. If an older child or adult cannot stand to be weighed

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and cannot be held by a parent/caretaker to be weighed, the weight measurement should be estimated by the LWP staff. These circumstances shall be documented in the MOWINS.

If the participant is missing limbs that prevent the recumbent length or height from being measured, this measurement should be estimated by the LWP staff and this fact shall be documented in MOWINS. If the handicap does not prevent the measurements from being obtained, complete them using the standard procedures.

It is important to note that the growth percentile for weight for height or length will not be accurate because of missing limbs. However, plotting the participant's weight gain over time will still be useful in assessing growth.

Source : *Anthropometric measurement procedures. (Weight, Height, Head Circumference). WIC Division. Michigan Department of Community Health ...michigan.gov/documents/AnthroManual2004_88984_7.pdf*

Body Mass Index (BMI)

Body Mass Index (BMI) is an anthropometric index of weight and stature and is the commonly accepted index for classifying adiposity in adults and has become the recommended index for children and adolescents. In adults, BMI is expressed as a specific value. For children and adolescents, BMI is age- and gender-specific and is identified by percentiles on the growth chart after incorporating the person's (child or adolescent) age as a factor (not just the weight and stature alone, as with adults).

BMI is a screening tool used to identify individuals who are underweight, overweight or normal weight. BMI is not a diagnostic tool. For example, a child who is relatively heavy may have a high BMI for his or her age, but to determine whether the child has excess fat, further assessment is needed that might include a variety of skin-fold measurements which is not a required WIC function.

Local WIC Providers shall use the MOWINS calculation for determine BMI. When it is necessary to calculate BMI, the following methods may be used:

- The CDC BMI Calculator located [here](#).
- BMI Wheels
- Pen and Paper method using the BMI Mathematical Formula below

BMI Mathematical Formula

Weight in pounds divided by height in inches divided by height in inches multiplied by 703 equals BMI. Round the calculation to the nearest tenth.

Weight (lbs)*

Height (in) ÷ Height (in)** X 703 = BMI**

* Weight must be expressed in 1/4th pound, if not in whole pounds

Example: 1/4 lb = .25

1/2 lb = .5

3/4 lb = .75

** Height must be expressed in 1/8th inch, if not a whole inch

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*Example: 1/8th inch = .125
2/8th inch = .25
3/8th inch = .375
4/8th inch = .5
5/8th inch = .625
6/8th inch = .75
7/8th inch = .875*

Standards for Children

BMI is calculated for children 2 years and older who are measured by stature (standing height), and who will then be plotted on the 2 to 6 years chart, which includes the BMI-for-Age growth graph.

It is recommended that the terms “overweight and obese” be used for risk assessment only and more neutral terms (e.g. weight disproportional to height, excess weight or excess BMI) be used when discussing a child’s weight with a parent/caregiver.

Standards for Prenatal Women

When the pre-pregnancy weight is not known, per CDC guidelines use the first trimester weight, which she self-reports. Staff shall obtain her current height. BMI determination also assists the counseling staff with recommendations regarding weight gain during pregnancy. Categories of underweight, normal weight, overweight or obese BMI, have been developed for WIC-eligible women and are reflected on the Prenatal Weight Gain Chart.