



BMI Data Gathering Procedures Manual

A Report from the Communities and Schools Together (CAST) Project¹

Geraldine Moreno-Black, PhD, CNS

Dawn Branham, BA

Eleanor Dizon, BA

Rachel Jensen, MSW

Introduction

The prevalence of childhood obesity in the U.S. is high and a major concern and focus of public health efforts. The Body Mass Index (BMI) is widely accepted as a reliable and valid tool for assessing weight status of children. The recognition of the high prevalence of overweight and obesity among children led both the American Pediatric Society and the Institute of Medicine to urge schools to assess the BMI of their students and provide the information to parents. At present, Oregon does not have a formal system in place to collect data on the heights and weights of children in the state. The CAST project included a BMI data collection process in all of all of the children in the seven elementary schools in the participating school district.

Our height and weight measuring was done in conjunction with the Bethel District's annual health screening which included vision, dental, and head lice examinations. It was essential that we worked with the appropriate school personnel in order to insure that everyone's needs were met. In the past Bethel had an only done height and weight measurement on kindergarten and third grade children. Consequently they extended the time allotment for health screening in order to accommodate the measurement of all elementary grade students.

The goal of this protocol for (BMI) assessment is to provide information about the protocol and procedures. It was used in the annual training session for the personnel who conducted the BMI measurements.

¹ The Communities and Schools Together (<https://cast.ori.org/>) project is a unique partnership among the Bethel School District, Oregon Research Institute, and several community organizations. The mission of CAST is to support schools, parents, and community groups in reducing childhood obesity. CAST does this by working together to increase neighborhood health and safety for elementary school children. CAST was supported by Grant 5R01HD057839-04 from the National Institute of Child Health & Human Development, National Institutes of Health. Report published 2013, Oregon Research Institute, Eugene, Oregon.

STANDARDIZED MEASUREMENT PROCEDURE

BMI Team Personnel

Stadiometer Adjuster (2 people)

Adjusts the stadiometer head piece and reads aloud the measurement.

Stadiometer Recorder:

Records the height measurement and verifies the accuracy of the measurement that is read aloud by the stadiometer adjuster.

Weight Recorder:

Instructs the student, records the weight measurement.

Logistics:

Helps organize and direct children during the BMI assessment, including, when necessary, helping with shoe removal and removing heavy clothing prior to weighing and height measurement.

Pre-Screening Procedures

A. School Related Procedures

1. Work with the school/district health staff and administration to determine the schedule for the screenings. This should be done with enough lead time to insure the dates are included on the school calendar. If other health screenings (vision, dental, lice etc.) are being conducted at the same time as the BMI screening make sure to include them in the scheduling meetings. Confirm all dates in advance.
2. Work with the appropriate school personnel (school nurse, secretaries and possibly the custodian) to make sure the location is reserved and set up for the weighing and measuring.
3. Check the date and time of each health screening with the school secretary or school health nurse.
4. Establish a private area for measurements to insure complete privacy for students.

Forms

A. The health screening forms are preprinted at the district office with the student's name, gender, grade level, DOB, student ID#, school, and teacher. The form also includes space to indicate:

1. Date of measurement
2. Height in inches & decimal format
3. Weight in pounds

B. BMI Data Collection Cover Sheet

1. The purpose of this form is to create a daily data collection overview
2. The form should include:
 - a. School name
 - b. Date of data collection (start and finish time)
 - c. Grade levels of data collected
 - d. Staffing assignments (stadiometer adjuster, stadiometer recorder, weight recorder, logistics)

- e. Comments
 - 1) Note any anomalies, concerns or unusual situations. Comment examples include: interrupted by fire drill, 2nd grader chose not to participate, 20 minutes/class was insufficient to screen kindergartners, child would not take shoes off, hairdo interferes with height recording

Equipment

- A. For anthropometric measurements (weight, height) the following equipment is needed:
 - 1. Weight scale (digital: Tanita BWB-800AS Digital Scale)
 - 2. Stadiometer with movable head piece (portable: Shorr Board Stadiometer)
 - a. carpenter's level (optional)
 - b. several calibrated weights (e.g. 10 kg or 20 kg each) that can be combined to give test weights between 50 kg and 100 kg. Calibration takes place at ORI, not at schools.

Measuring Station

- A. Typically health screenings are conducted in a gym.
 - 1. If possible, set up the height/weight measuring station in a corner against the wall.
 - 2. Since height is measured first, the height station should be to the right of the weight station.
 - 3. When possible, provide a chair or table to hold clothing that children remove.
 - 4. Place the digital display for the scale on a table outside the view of children.
 - 5. The stadiometer should be placed against the wall.

Respecting the rights of children

- A. Confidentiality and Privacy
 - 1. Height and weight information is confidential, and every effort should be made to maintain student privacy.
 - a. To maintain student data confidentiality, student names, student ID and CAST ID numbers will never be stored in the same location. If names, student ID and CAST ID numbers appear together on a BMI data collection document and the documents will be stored rather than shredded, the names will be removed.
 - 2. For all children, there is a need to respect privacy. Privacy may take into account:
 - a. where the measurements are taken, clothing removal and respecting children's reluctance to remove clothing.
 - b. Describing the measuring process to increase comfort level.
 - 3. Do not discuss or make any comments regarding student measurements.
- B. Physical touch
 - 1. Always ask permission before touching a child.
 - 2. Always, describe and ask permission before physically manipulating a child into a desired position.
 - 3. Ask permission to make adjustments to a child's hair or clothing.
 - a. Clearly indicate what you would like them to do, and if they need assistance, ask permission to help them.

- b. If a child declines to remove hair accessories or clothing that may affect any measurement, make note of this on their data sheet.
- C. Communication
- 1. Do not comment on the height or weight of a child at the time that measurements are being taken.
 - a. Neutral comments such as “Thanks, you can get off the scale now” are appropriate.
 - b. If a child makes a negative comment about his/her body, it is appropriate to say, “Bodies come in lots of different sizes and shapes.”
 - c. If a child asks, “Am I too fat? Or Am I too skinny?” say that you don’t know and suggest the child ask his/her doctor this question. At this time you can also say “Kids’ bodies come in lots of different sizes and shapes.”

Measurement Procedures

A. Measurement Team Training

- 1. It is important that all individuals who will be conducting the survey be trained in the protocols for all of the anthropometric measures (height and weight) as well as any other instruments being used (dietary assessment, transportation questionnaire etc.). This will insure that all team members understand the process, are familiar, with the measures and are versed in the instruments being used.
- 2. Set a date with all of the team members.
- 3. Allot sufficient time for discussion of the process and training of all team members. During this time it is acceptable for the team to practice on each other.
- 5. Recruit a pool of appropriately aged children (not from the sample) for training purposes.
- 6. Conduct the training session.
- 7. Training for all team members should include:
 - a. Instruction and demonstration on obtaining accurate height and weight measurements.
 - 1). An online source of training is located at:
<http://depts.washington.edu/growth/module5/text/page7a.htm>
 - b. Appropriate ways to communicate and work with children.
 - 1). (Details are in BMI Talking Points with Children, see Appendix)

Reliability

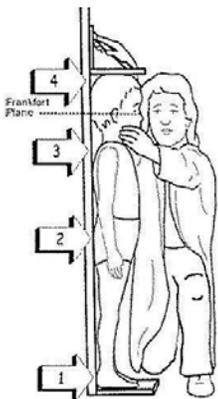
- A In order to insure accuracy it is important that those taking measurements are trained in standardized procedures.
- B. The risk of error is decreased if digital equipment is utilized.
- 1. When using a non-digital stadiometer for height measurement, the height recorder, in addition to the height measurer, will read each measurement.
 - 2. When there are measurement difference greater than 1/8th inch between the recorder and the measurer, the difference will be resolved immediately by taking a second measurement.
 - 1). The weight recorder will tally the number of measurement differences greater than 1/8th inch on the Data Collection Cover Sheet.

3. Measurement differences of less than 1/8th inch is not recorded.

Measuring techniques

A. Height

1. Preparing the child for measuring
 - a. The recorder should confirm the child's name or ID number.
 - b. Before beginning, check to make sure the child has removed their shoes.
 - c. Ask the child to remove shoes, hat, and bulky clothing such as coats and sweaters.



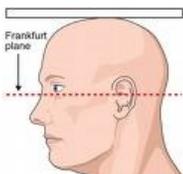
- 1). Provide a chair or table to hold clothing that children remove.
- d. Ask the child to remove or undo hair styles and hair accessories that interfere with taking a measurement.

- 1). When possible, use existing school resources to ask parents to dress and groom their children for ease and accuracy of measurement.
- 2). The recorder may need to remove or adjust the hair accessory. Be sure to ask permission of the child and be as gentle as possible while removing the hair accessory.
- 3). In rare cases, a child may be unwilling to undo an intricate or costly hairstyle. In these situations, care should be taken to locate the actual crown of the head.
- 4). Sometimes it may not be possible to take the measurement because of the hairstyle or accessory. In this case, measure to the best of your ability and make a note on the BMI data collection coversheet and the health screening form.
- 5). If needed, help the child readjust their hair accessory after the measurement is taken.

2. Adjusting the child's stance
 - a. Ask the child to stand with their heels and toes close together and against the back of the measuring board or wall.
 - b. The child's feet should be flat on the floor or foot piece, with heels and toes comfortably together and touching the base of the vertical board.
 - c. The child's legs should be straight and their arms should be in a relaxed position and at their sides
 - d. Ask the child to relax and stand straight. There are four contact points between the body and the stadiometer: head, upper back, buttocks and heels.

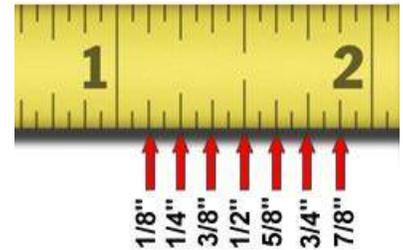
3. Adjusting the child's head position

- a. Make sure the child's head is in the Frankfurt plane and the child is looking forward.
- b. The Frankfurt Plane is an imaginary line from the lower margin of the eye socket to the notch above the tragus of the ear (the fleshy cartilage partly extending over the opening of the ear).



- 1). This is best viewed and aligned when the viewer is directly to the side of and at the eye level of the child.
- 2). When aligned correctly, the Frankfurt Plane is parallel to the horizontal headpiece and perpendicular to the vertical back piece of the stadiometer.

- 3). NOTE: When the chin is correctly positioned, the back of the head may not make contact with the board. In fact, in a very few individuals, only two points will make contact with the vertical back piece.
 - c. Give the child something at their eye level to view. This could be a sticker that is on the back of the recorder's clip board held at the child's eye level.
4. Taking the Measurement
 - a. Ask the child to breathe in and maintain his/her position.
 - b. Gently lower the headpiece until it touches the crown of the head.
 - c. Check contact points to ensure that the lower body stays in the proper position and the heels remain flat.
 - 1). Some children may stand up on their toes, but verbal reminders are usually sufficient to get them in proper position.



5. Recording the measurement
 - a. Read and record the measurement to the nearest 1/8th inch
 - b. At the point of data entry this measurement will be converted from inches to decimal equivalent.
 6. After reading the measurement
 - a. Raise the headpiece
 - b. Thank the child.
 - c. Assist with hair and clothing as needed
 - d. Give child “next steps” instructions.
- B. Weight
1. Preparing the child for weighing
 - a. Since height measurements are taken before weight, shoes, hat, and bulky clothing such as coats and sweaters should have already been removed.
 2. Weighing
 - a. Have child stand at the center of the scale platform
 - b. Ask the child to stand still and look forward. We are using a scale that has a detached display.
 - 1). This enables the recorder to see the information without the child being tempted to look down.
 - c). The screen is digital and will not require any estimation on the part of the recorder.
 3. Recording the weight
 - a. The recorder should confirm the child's name or ID number
 - b. The weight is recorded at the nearest tenth (0.1 lb)
 4. After recording weight
 - a. Ask the child to step off the scale.
 - b. When appropriate, remind/assist child with the clothing they removed.
 - c. Thank the child
 - d. Give child “next steps” instructions

BMI Data Processing Procedures

- A. Concluding each day's data collection.
 - 1. School personnel will collect and sort (by teacher and then student last name) the forms throughout health screening.
 - 2. The screening forms of students who have been identified as needing immediate dental care contact (level 3 or 4) by the school health nurses will be set aside and may be handled differently from school to school.
 - 3. Immediately following the health screening, all (except perhaps level 3 or 4) of the forms will be taken to the school district copy shop by a school staff person, preferably the CAST Community Coordinator.
 - a. Following each data collection the school nurse will make copies of those needing immediate dental care or those that have other urgent concerns.
 - b. To ensure that all data is backed up, the CAST Community Coordinator will scan each data collection form.
 - c. The CAST Community Coordinator will keep the original set of the health screening forms in a locked file cabinet.
 - 1). If the CAST Community Coordinator is unable to make and store the copies, they will be identified as "CAST" and stored in a locked file cabinet in the school's office until picked up by the CAST Community Coordinator.
- B. Entering the BMI data
 - 1. An identified school district staff person (typically a health aid) will enter the BMI data into the eSchools database.
 - 2. A second school district staff person will assist with converting the height in inches to decimal format.
 - 3. Data entered: health screening date, height, and weight.
 - 4. After the data has been entered, the forms will be returned to the CAST Community Coordinator for storage.
- C. Data entry reliability check
 - 1. The Community Coordinator will do a 10% reliability check on the BMI health screening data entered into eSchools for each grade.
 - 2. Every 10th health screening form will be compared to the values (date, height and weight) in the final dataset using the AbleBits Random number generator to obtain an unbiased starting point.