

# BMI Screening Guidelines for Schools

Massachusetts Department of Public Health



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# **BMI-for-Age Screening Guidelines for Schools Massachusetts Department of Public Health**

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## **Acknowledgements**

This manual is an update of the “Comprehensive Growth Screening Guidelines for Schools” originally developed and published in 2007 by the Massachusetts Department of Public Health. The state regulations on Physical Examination of School Children, 105 CMR 200.000, were revised in 2009 and amended in 2013. These guidelines reflect changes made in the regulations relative to height and weight measurements done in schools.

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# BMI-for-Age Screening Guidelines for Schools

## I. Introduction

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The goal of the Massachusetts Department of Public Health's (MDPH) Body Mass Index (BMI) Screening Guidelines for Schools is to provide school staff with the necessary information and tools to successfully collect heights and weights, and provide reliable data to the MDPH. After BMI is calculated for children and teens, the BMI values are plotted on CDC BMI-for-age growth charts (for either girls or boys) to obtain a percentile ranking. Percentiles are the most commonly used indicator to assess the size and growth patterns of individual children in the United States. The percentile indicates the relative position of the child's BMI number among children of the same sex and age. The growth charts show the weight status categories used with children and teens (underweight, healthy weight, overweight, and obese)."

The Public Health Council unanimously approved regulations for BMI screening in April 2009 as part of the Department's campaign to prevent and reduce overweight and obesity. Consistent with this goal, schools are required by Massachusetts General Law to provide health screenings for students (M.G.L. Chapter 71, Section 57 and 105 CMR 200.000). Regulations requiring BMI screening for students in grades 1, 4, 7, and 10 (or of comparable age) went into effect for all public school districts during the 2010-2011 school year.

In 2013, Massachusetts amended the regulations on Physical Examination of School Children, 105 CMR 200.000, to improve the screening and monitoring of the health assessment of children across the Commonwealth based upon the experience of school staff collecting and reporting this data during the prior four years. Review of the implementation of the BMI screening initiative has shifted the focus of the goal of this program to support change at the system and environmental, rather than individual level. The purpose of BMI screening in all schools is to gather valuable data that can help MDPH monitor trends in childhood obesity and identify possible systems-wide solutions. Data gathered from the BMI screenings performed by school nurses and other school staff is a core part of understanding – and reversing – the rising trend in childhood overweight and obesity in Massachusetts. In addition to giving schools and communities a clearer picture of their students' health status, the data has already helped MDPH focus its obesity prevention efforts and target its resources on areas of highest need. This will remain an integral goal of the regulations requiring BMI screenings in schools. The changes in regulations allow schools local control while retaining the core goal of the BMI screening initiative: data collection and systems change.

The current components of the Massachusetts Regulations 105 CMR 200.000: PHYSICAL EXAMINATION OF SCHOOL CHILDREN 200.500: Height and Weight Measurements include:

- prior notification of BMI screenings and the benefits of the screening to all parents and legal guardians by any reasonable means, including an opportunity to request, in writing, that their child's measurement not be taken;
- accurate measurement of height and weight and the calculation of BMI for students in grades 1, 4, 7, and 10 (or by a student's 7th, 10th, 13th and 16th birthday in un-graded

classrooms) by trained individuals approved by MDPH in accordance with these guidelines;

- requirement that every effort be made to protect the privacy of the student during the screening process; that confidentiality concerning height and weight measurements be properly safeguarded during the screening and reporting process;
- documentation of the students BMI in the student's health record;
- submission of aggregate BMI results to MDPH using appropriate data reporting tools as determined by MDPH;
- assurance that school health personnel or other school staff with access to student health records not disclose, either verbally or in writing, the height, weight or BMI of any individual student to anyone other than the parent/legal guardians or the individual student without written permission of the parent/legal guardian;
- identification of resources that support healthy eating and active living and prevent/reduce overweight and obesity and other chronic diseases in the community.

Overweight and underweight children are at risk for a variety of health problems, making early identification of their weight status important. Eating disorders such as anorexia, bulimia and binge eating can result in both serious long-term health problems and poor school performance. Overweight and obesity in children and adolescents are risk factors for a variety of serious health conditions such as Type 2 Diabetes and cardiovascular disease (*Comprehensive School Health Manual*, 2007). These guidelines include a review of the Massachusetts laws and regulations related to BMI screening of school-age children, information on the proper use and maintenance of equipment, protocols for collecting accurate measurements, discussion of concerns related to privacy and confidentiality throughout the screening process, templates for notification of parents and legal guardians concerning the screening program and suggestions for materials for referrals and resources to promote healthy eating and active living within the community.

## **II. Massachusetts General Laws and Regulations Pertaining to Growth Screening**

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105 CMR 200.000: PHYSICAL EXAMINATION OF SCHOOL CHILDREN 200.500: Height and Weight Measurements

Each school committee or board of health shall adopt policies and procedures to ensure that the weight and height shall be measured for each student in grades 1, 4, 7, and 10 (or, in the case of ungraded classrooms, by a student's 7th, 10th, 13th and 16th birthday), and that the student's Body Mass Index (BMI) score and corresponding percentile are calculated.

(A) Measurement of weight and height shall be done by trained school personnel or others approved by the Department for this purpose, and in accordance with guidelines of the Department. Prior notice of the screening and the benefits of the screening shall be provided to the parent or legal guardian by any reasonable means. Every effort shall be made to protect the privacy of the student during the screening. Trained school personnel or other personnel with access to the student's health information or records shall not disclose the height, weight or BMI calculations of an individual student, either verbally

or in written form, to anyone other than the parent and/or legal guardian without written permission of the parent and/or legal guardian. The school committee or board of health may provide for additional requirements to ensure confidentiality.

(B) The student's height, weight, BMI score and corresponding percentile shall be recorded and may be maintained in the student's school health record.

(C) The school or school district shall provide the Department annually with aggregate student BMI data including totals by grade, gender and BMI category, as specified in guidelines of the Department.

(D) Parents and legal guardians shall be provided with an opportunity to request, in writing, that their child's measurements not be taken.

### **III. Essential Elements of Body Mass Index (BMI) Screening**

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#### **A. Prior notification of students, parents or legal guardians and others**

- Notifying parents or legal guardians before BMI screening is done is an essential component of program success. Parents and legal guardians, students, school administrators and staff should all be informed about the purpose and process of the school's BMI screening initiative prior to collecting the BMI. This should include language to the effect that, in the same way that a student is given a vision or hearing screening test at school, calculating a student's BMI-for-age is also used as a screening instrument and should not be considered a diagnostic tool.
- In addition to written notification to all involved, it may be helpful to present information about the program and resources for learning more about promoting good nutrition, physical activity and maintaining a healthy lifestyle at parent and community meetings.
- Parental pre-notification can take many forms including a notice in a school publication, website, hand-carried notes to parents or legal guardians, or as part of the student handbook.
- Parents and legal guardians must be given the opportunity to request in writing to the school nurse that their child's measurements not be taken at school.
- Adequate notification of the school physician, school administration and staff will enhance support for the BMI screening program and minimize the barriers to securing appropriate space and scheduling time out of class.

#### **B. Proper supervision of appropriately trained staff under the direction of the school nurse**

- The school nurse has the responsibility for training, monitoring and follow-up of all screening activities.

- To improve accuracy, MDPH recommends that at least two staff conduct the BMI screening: one to measure the child and one to record the data. This greatly reduces recording errors.
- School nurses and any other staff conducting screenings should participate in a MDPH-sponsored training.
- Training should include:
  1. Proper use and maintenance of equipment for accurate and precise measurement;
  2. Review of forms for the recording of information;
  3. Emphasis on the importance of privacy and confidentiality for the students; and
  4. Appropriate and sensitive communication with students regarding height and weight measurement (e.g., saying “Let’s check your weight” instead of “Let’s see how big you are”; reassuring students that kids’ bodies come in different sizes and shapes; and avoiding labels such as “obese,” “overweight,” “too thin,” or “too short”).

### **C. Properly prepared and equipped space for screening**

- There should be adequate time for screening, as well as provisions for student supervision, access to proper equipment, and any special accommodations that are necessary to ensure appropriate assessment, confidentiality and individual privacy.
- Space should be arranged so that both visual and auditory privacy is assured. Mass screening in a corner of a gymnasium is no longer an acceptable practice. (Kubik, Story and Rieland, 2007)

### **D. Appropriate and well-maintained screening equipment**

- Use appropriate equipment that has been properly maintained and calibrated annually or more frequently as necessary. (For more information, see Section IV: Equipment and Tools for Proper Measurement of Height and Weight).

### **E. Protocols to assure privacy of the screening process and confidentiality of results**

- Each student should be weighed and measured in private with no other students present.
 

Students react in a variety of ways to being weighed and measured at school. Girls are most often concerned about being overweight regardless of their actual size. Boys worry about being short and too thin (Pennsylvania Department of Health, 2004). Screeners should be prepared to be objective, calm and open to students’ concerns. Consider the question, “How can this task be done in a way that will promote a positive [body] image and high self-esteem in youngsters of all sizes and shapes?” (Ikeda and Crawford, 2000).
- In order to promote confidentiality of screening results and reduce anxiety, all students should be weighed and measured facing away from the scales.

- Students' BMI screening results are part of the health record and, as such, are strictly confidential and should not be discussed with anyone other than the student and his/her parent or legal guardians and healthcare provider. Some students may need to meet with the school nurse at a later time to discuss their concerns; be sure to do so in a space that will respect the student's privacy.
- Care should be taken that individual student BMI results are never accessible or shared with staff unless the parent has agreed in writing.

#### **F. Reporting of Data to MDPH**

- Reporting of BMI results are mandated to be submitted to the MDPH in an aggregate form by school district and grade level (or age specific in ungraded classrooms) via an online data reporting form. The link to the reporting form is posted at <http://www.mass.gov/eohhs/docs/dph/com-health/school/bmi-reporting-data-memo.pdf>

## IV. Equipment and Tools for Proper Measurement of Height and Weight

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### A. Required Equipment



For measuring weight, use a properly calibrated balance-beam or strain-gauge floor scale (mechanical or digital) that:

- can weigh in 0.1 kilogram or ¼pound increments;
- has a stable platform;
- has the capacity to be “zeroed” after each weight is taken; and
- has the capacity to be calibrated.

For measuring height, use a stadiometer that:

- is able to read to 0.1 centimeter or 1/8 inch;
- has a large stable base; and
- has a horizontal headpiece that is at least 3 inches wide that can be brought into contact with the most superior part of the head (i.e., the crown).
- Movable headpieces which are attached to balance-beam scales are not recommended for use.



To ensure an accurate BMI calculation:

- if you use **inches** for height, please use **pounds** for weight
- if you use **centimeters** for height, please use **kilograms** for weight

### B. Maintenance and Calibration of Equipment

- Check the equipment regularly to ensure accurate measurements.
- Scales should be calibrated on a routine basis.
  - Re-calibrate if the scale has been moved to a different surface.
  - Portable digital scales, frequently moved, should be calibrated monthly.
  - For scales that are not moved or used excessively, calibrate annually by contacting the local Department of Weights and Measures (<http://www.mass.gov/ocabr/government/oca-agencies/dos-lp/>).

- Check the stadiometer regularly to be sure the base is stable and measures are accurate.

## **V. Protocols for Measuring Height and Weight**

To accurately weigh and measure students, the following procedures should be followed:

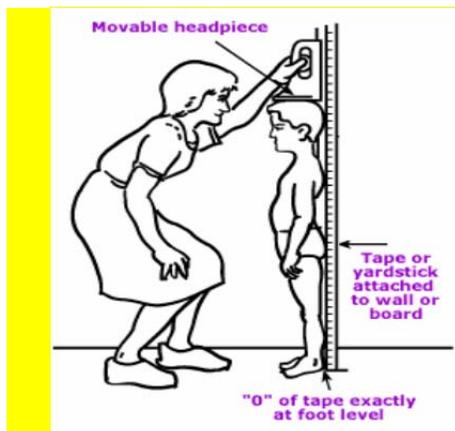
### **A. Weight**

- Make sure that the scale is on a firm surface, preferably an uncarpeted floor.
- Set the scale at zero reading.
- Have student remove shoes.
- Have student remove heavy outer clothing, such as sweater, jacket, vest and belts.
- Have student empty their pockets of heavy objects such as cell phones or iPods.
- Have student step on scale platform facing away from the scale, with both feet on platform, and remain still.
- Read weight value to nearest  $\frac{1}{4}$  pound or 0.1 (1/10) kilogram.
- Record weight immediately on the data form before student gets off the scale.
- If using a balance-beam scale, return weights to zero position.

### **B. Height**

- Have student remove shoes and hat.
- Have student remove hair ornaments, buns, and braids to extent possible (note on chart if unable to obtain an accurate measurement, don't "guesstimate" height of hair-do).
- Have student stand on footplate portion with back against stadiometer rule.
- Have student bring legs together, contact at some point (whatever touches first).
- Make sure that the knees are not bent, arms are at sides, and shoulders are relaxed.
- Make sure that the back of the student's body touches/has contact with stadiometer at some point.

- Make sure that the body is in a straight line (mid-axillary line parallel to stadiometer). Check to see if the student's head is in appropriate position. You should be able to draw a straight (perpendicular) line from the back of the board, past the ear opening and the top of the cheek bone. You can use a pencil or ruler to help check the line. This is called the Frankfort plane.
- Lower headpiece snugly to crown of head with sufficient pressure to flatten hair.
- Read value at eye level in an upward direction (from lowest to higher number).
- Measure to nearest 0.1 centimeter or 1/8 inch and record value.
- Repeat measurement, having the child line up again, and record appropriate value immediately on data form.
- Repeat measurements should agree within 0.5 (1/2) centimeter or 1/4 inch. If they do not, repeat measurement a third time.



(PA Department of Health, 2004)

### Reading Height Measurements

- Read at eye level
- Count visible lines
- If the arrow points at a line, count that line
- If the arrow points between lines, read to nearest line
- Use .5 (1/2) line as guide
- Read in upward direction (from lower to higher number)

## VI. Measuring Non-Ambulatory Students

Assessing the weight status of non-ambulatory students with special health care needs requires special consideration as children may not be able to stand up or lie flat. Alternate methods are available for measuring children requiring special accommodations.

(See Appendix B for more detailed information on measuring non-ambulatory students.)

## VII. Calculating BMI and Recording Measurements

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Schools that use a school health software program already have a way to calculate accurate statistics. For schools that do not have this type of software, however, a free, easy-to-use BMI calculator is available that calculates accurate BMI statistics and requires only a computer with Microsoft Excel software. This calculator is highly recommended for schools that do not have a health software program available, as it generates statistics that can be plugged in to the Department's report form, and keeps a record that can be helpful when tracking down errors.

To download the recommended Massachusetts BMI calculator, go the webpage: [www.mass.gov/dph/fch/schoolhealth](http://www.mass.gov/dph/fch/schoolhealth) . Scroll down to the bottom of the page and click on "School Health Screening" (this is the second-to-last link). Then on the "School Health Screening" page, scroll down and click on the link called "**Children's BMI Group Calculator for Mass. Schools**" and download the file.

In addition, record the information from each student's BMI screening in the individual student health record. (See Massachusetts Comprehensive School Health Manual 2007 for sample forms.)

Please do not use the BMI Excel calculator posted on the CDC web site, however, as it does not generate statistics in a form that is consistent with the MDPH report form, and the results can be very confusing. And do not use BMI calculators built into web pages, or hand calculations / charts, as those are error-prone tools and it is difficult to produce accurate statistics when using them. In addition, those methods do not automatically generate records of the BMI calculations, but put the burden of record-keeping on those compiling the statistics, making it difficult to track down the source of errors or unusual statistics.

## **VIII. Collection of BMI Data and Reporting to MDPH**

Since the implementation of the BMI regulation, 105 CMR 200:000: Physical Examination of School Children (200.500: Height and Weight Measurements), in 2009, MDPH has been able to gather valuable data to help monitor trends in childhood obesity and evaluate the effectiveness of strategies taking place at the state, local and regional level to increase active living, healthy eating and prevent/reduce overweight and obesity and other chronic conditions. BMI screening results should be collected during the school year and aggregate data submitted to MDPH on an annual basis using online forms. All reports are due by July 15<sup>th</sup> after the school year ends. No paper printouts or electronic computer files can be accepted.

Reports of BMI screening results should be completed online at the MDPH School Health Services website. Please refer to:

<http://www.mass.gov/eohhs/docs/DPH/com-health/school/bmi-reporting-data-memo.pdf> for the current reporting tool. This memo will be updated yearly with accurate links and will provide instructions on how to access the BMI data reporting site. There are several different links to report school-wide BMI data as determined by reporting requirements for school districts that may receive MDPH funds for school health services.

To ensure data quality and reliability, guidelines for checking for quality issues with data before reporting are available:

For Grade 1:

- if more than 1% of recorded heights are below 40 inches or over 55 inches
- if more than 1% of recorded weights are below 37 pounds or over 110 pounds

For Grade 4

- if more than 1% of recorded heights are below 48 inches or over 63 inches
- if more than 1% of recorded weights are below 51 pounds or over 180 pounds

For Grade 7

- if more than 1% of recorded heights are below 54 inches or over 71 inches
- if more than 1% of recorded weights are below 70 pounds or over 260 pounds

For Grade 10

- if more than 1% of recorded heights are below 57 inches or over 74 inches
- if more than 1% of recorded weights are below 74 pounds or over 275 pounds

## **IX. Follow-up**

While state regulations require schools screen students in grades 1, 4, 7 and 10, all children should have an annual BMI screening as a part of their regular physical examination at their primary care providers' offices. For school BMI screening results that are significantly out of range or of particular concern, it may be appropriate for the school nurse to contact the student's parents or legal guardians and encourage follow-up with the child's primary care provider. It is important to note that BMI does not differentiate between fat tissue and lean tissue (for example,

an athlete who has more muscle may have a higher-than-expected BMI for his/her height, weight. Any concerns should be discussed by the parents/legal guardians with their child's primary care provider.

The MDPH has developed and identified a variety of resources for schools to use to promote healthy weight and active living. Materials are accessible through the state's *Mass in Motion* website at [www.mass.gov/massinmotion/](http://www.mass.gov/massinmotion/). Resources and referrals for nutrition, physical education, recreation and mental health counseling, stress management, and dysfunctional eating can be incorporated in messages to families in the school community. (See Appendix D for a list of resources that can be used to provide families with additional information concerning healthy eating and active living.)

## **BMI Screening of Children and Adolescents in the School Setting**

### **Checklist**

- Notify students, parents or legal guardians, school staff and administrators and school physician prior to implementation of the screening program.
- Provide educational materials on healthy eating and active living to parents and guardians. (Use the resources provided in Appendix D. Resources of these guidelines and visit [www.mass.gov/massinmotion/](http://www.mass.gov/massinmotion/) for more information).
- Recruit and train all staff who will be involved with the screening program.
- Review confidentiality and communication issues with screeners.
- Make sure that appropriate equipment is available and has been properly maintained and calibrated.
- Select and prepare appropriate space for screening. Be sure to provide a private setting (not an open space such as a gymnasium) for measurement of heights and weights. Ensure student privacy and confidentiality when recording the results of the screening
- Use appropriate tools for documenting and calculating the results
- Submit BMI results to MDPH using appropriate on-line data reporting tools. Locate the link in the memo found below for instructions to submit data from all public schools on an annual basis at <http://www.mass.gov/eohhs/docs/DPH/com-health/school/bmi-reporting-data-memo.pdf>

## X. References

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## **XI. Appendices – Resources**

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- A. Sample Pre-Screening Notification Letter for Parents and Legal Guardians
- B. Guidelines for Measuring Non-Ambulatory Students
- C. Eating Disorders/Malnutrition
- D. Resources

## **A. Sample Pre-Screening Notification Letter to Parents and Legal Guardians**

[School Letterhead]

[Date]

Dear Parent or Legal guardians:

This letter is to let you know about the Body Mass Index (BMI) Screening Program that will be happening soon at your child's school.

A Body Mass Index, or BMI, is a measure that is used to show a person's "weight for height for age." It is calculated using an individual's height and weight. Just like a blood pressure reading or an eye screening test, a BMI can be a useful tool in identifying possible health risks, but it does not provide a diagnosis.

Massachusetts schools have taken heights and weights of students each year since the 1950's. According to the state's new BMI screening regulations (which were approved in 2013), schools must now collect the heights and weights of students in grades 1, 4, 7 and 10. BMI data collected for all children in these grades will be gathered and reported to the Massachusetts Department of Public Health as a combined number. No individual student BMI results will be shared with anyone other than to you.

The school nurse will supervise your child's screening and will make sure your child's privacy is respected at all times. The results of your child's height, weight, and BMI measurements are strictly confidential – the results will be kept in your child's school health record and will not be shared with anyone without your written permission.

This year, the BMI screening will take place in *[insert month of screening]*. All children in grades 1, 4, 7 and 10 will have their height and weight measured and will have their Body Mass Index (BMI) calculated at this time. Parents and/or legal guardians can request in writing that their child not participate in the screening. This letter should be addressed to the school nurse.

Please feel free to call me at *[insert phone number]* with any questions you may have about the BMI screening. Additional information about children's wellness and fitness is available upon request or you may access the state's resources at [www.mass.gov/massinmotion/](http://www.mass.gov/massinmotion/).

Sincerely,

School Nurse *[you may also consider having the principal co-sign the letter]*

## **B. Guidelines for Measuring Non-Ambulatory Students**

The following is a brief sample of guidelines when measuring non-ambulatory students with special health care needs. These guidelines were compiled by Judy Slaked, Project Director at the Brown University Institute for Community Health Promotion.

Assessing growth status of students with genetic or other medical conditions requires special consideration. In the event that it is necessary to collect height and weight information in the school setting, be sure that the screening is conducted by a health care professional such as the school nurse, occupational therapist or physical therapist. In addition, be sure that parents or legal guardians are also informed in advance of the screening.

In general, the purpose of measurements for children who may have atypical growth patterns should be for monitoring the progress of the individual child over time and not used to compare the child with others, even those who may have similar conditions. Remember that BMI is used to indicate measures of body fatness. With some conditions that involve muscle wasting and abnormal bone growth, the standard BMI reference percentile curves would not be an appropriate comparison point.

### **Possible options for assessing weight for children who cannot stand**

- Use a bucket seat scale if child is within size and weight limits for the equipment.
- Use a chair scale.
- Use a bed scale.
- Use a platform scale on which a wheelchair can be placed (subtract the weight of wheelchair).
- A caregiver may hold a child on the scale, and then the caregiver's weight is subtracted (make note of procedure used to obtain weight, due to potential for error).

### **Assessing stature and length in special situations**

#### **1. For children unable to stand but generally normal in body development and growth, their recumbent (lying down) length can be taken as follows:**

- Two people are needed.
- One person (parent or caregiver) holds crown of head against headboard.
- Check the head position – Frankfort plane (same as for standing height: head positioned so that imaginary perpendicular line can be drawn from the board surface through the middle of ear canal opening across side of face and lower bone of eye socket).
- Trunk and pelvis should be aligned straight along measuring board.
- The second person straightens the legs, holds the child's ankles together with toes pointed directly upward.
- The footboard is moved firmly against soles of **both** feet.
- The measurement made to nearest 1/8 inch or 0.1 centimeter.
- Repeat measurements until two agree within 1/4 inch or 0.5 (1/2) centimeter.

**2. For children with normal development but unable to stand, arm span can be measured. The arm span, when accurately measured, should equal stature 1:1 if growth is normal.**

- This method is appropriate for children older than age five, with involvement of the lower body only (e.g., some children with myelomeningocele or lower body paralysis).
- Arm span measurement requires two people to complete measurements.
- The child extends both arms while the anthropometer or measuring rod is held across the back, extended from the tip of one middle finger to the other (Trahms, 1997).
- Arms are held perpendicular to body.
- The anthropometer should touch the tip of the extended middle fingers of the right and left hands.
- Repeat measurements.
- This measure provides information about rate of growth (arm span to height ratio is about 1:1 with typical development).

NOTE: Arm span measurements can be plotted on the CDC charts for stature-for-age or length-for-age.



**Arm Span Measurement**

This is a photo of correct technique for arm span measurement. Note that the child's arms are perpendicular to his body and the anthropometer is touching the extended middle fingers of the right and left hands.

**3. For children unable to stand and/or have severe contractures, their sitting height can be measured.**

- Use a stadiometer and surface for sitting (typically 50 cm x 40 cm x 30 cm, which can be rotated depending on the size of child).
- Have the child sit on the base as erectly as possible.
- Buttocks should be in contact with stadiometer board, as well as the back and shoulder blades if possible, with back as straight and erect as possible.
- Legs should hang freely, with hands on thighs, and knees pointed straight ahead.
- Head should be positioned in the same manner as standing height (Frankfort plane).

- Repeat the measurement until two agree within 1/4 inch or 0.5 (1/2) centimeter.
- After taking the measurement, subtract the height of sitting surface from the reading to estimate the sitting height.
- Plot this value to indicate the individual pattern of growth, even though a percentile will not be indicated.

#### 4. Segmental lengths: Upper arm length and lower leg length

- Some children for whom stature measurements are impossible can use segmental lengths (for example, upper arm length and lower leg length) to monitor growth.
- Upper arm length is not as affected by a high spinal lesion as stature. It is recommended for children with Spina Bifida who are bedridden, wheelchair bound, or for other children unable to stand or stretch out on the length board (Cloud, 1997; Scott, 1997).
- The arm is straight and positioned along the side of the body.
- The elbow is bent so that the lower arm is at a right angle (90 degrees) to the upper arm.
- Flexible metal or sturdy plastic measure tape is placed with the tip at the end point of the shoulder bone (acromial process).
- The tape is brought straight down along upper arm to tip (point) of the elbow.
- Record the measurement to nearest 1/8 inch or .1 centimeter.
- Repeat measurements should fall within 1/4 inch or .5 (1/2) centimeters.
- For children with cerebral palsy or other conditions that cause or result in contractures, the lower leg length can be measured using either a steel or plastic tape measure or an anthropometer. This is a difficult measurement to take and, when taken, should be used with children ages 6-18 years old (Cloud, 1997; Scott, 1997; Chumlea, Guo, Steimbaugh, 1994).
- These measurements may be plotted on the CDC charts for stature-for-age or length-for-age. Even if measurements fall below the 5th percentile, they establish a growth pattern over time. Reference data exist for some segmental lengths (e.g., knee height), however they are old and do not include children with special health care needs or children who are non-ambulatory (and therefore may have different growth patterns) (Chumlea, et al, 1994).



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### **C. Eating Disorders/Malnutrition**

Although considered to be mental health disorders, eating disorders are remarkable for their association with nutrition-related problems. In anorexia nervosa, nutrition-related problems include refusal to maintain a minimally healthy body weight (e.g., 85% of that expected), dramatic weight loss, fear of gaining weight even though underweight, preoccupation with food, and abnormal food consumption patterns. Anorexia nervosa is 10 times more common in females, especially just after onset of puberty, peaking at ages 12-13 years.

Bulimia nervosa is an eating disorder with food addiction as the primary coping mechanism. In bulimia nervosa, problems include recurrent episodes of binge eating, a sense of lack of control over eating, and compensatory behavior after binge eating to prevent weight gain (e.g., self-induced vomiting, abuse of laxatives or diuretics, fasting). Body weight is often normal or slightly above normal.

Students identified to be at risk for malnutrition, failure-to-thrive or suspected eating disorders should be referred to a primary care provider for in-depth medical assessment. These nutrition-related conditions must be addressed cautiously and expediently. Aside from psychological disturbances, eating disorders can lead to serious electrolyte imbalances and dehydration. Long-term effects include osteoporosis. Death can occur in extreme cases. Because of the serious nature of these potential conditions, it is imperative that school health personnel communicate observations and concerns directly to the parent or legal guardians. Effective treatment for eating disorders involves medical and psychological treatment, nutritional counseling, and family and school support.

Keep in mind that a diagnosis of an eating disorder can be made only by a physician or an appropriate health care provider.

## **D. Resources**

*This is not a comprehensive list and should not be interpreted as an endorsement by the Massachusetts Department of Public Health of any particular product or website.*

### **School Resources**

#### **Massachusetts Comprehensive School Health Manual**

This tool is a comprehensive guide to school health services developed by the Massachusetts Department of Public Health's School Health Unit. <https://massclearinghouse.ehs.state.ma.us/>

#### **Resource Guide for Pediatric Overweight Treatment Services in Massachusetts**

This directory lists pediatric overweight treatment services available in Massachusetts and is recommended for health care providers and parents. <https://massclearinghouse.ehs.state.ma.us/>

#### **The CDC Growth Charts for Children with Special Health Care Needs**

This website provides information and tools for measuring children with special health care needs. <http://depts.washington.edu/growth/cshcn/text/moduleprint.doc>

#### **School Health Index**

The School Health Index developed by the Centers for Disease Control and Prevention is a self-assessment and planning guide that schools can use to assess and improve its physical activity, healthy eating, tobacco-use prevention, and safety policies and programs.

<http://www.cdc.gov/HealthyYouth/SHI>

#### **Planet Health**

This is an interdisciplinary curriculum focused on improving the health and well-being of 6th - 8th grade students while building and reinforcing skills in language, arts, math, science, social studies and physical education. <http://www.planet-health.org>

#### **Eat Well and Keep Moving**

Eat Well and Keep Moving is a multi-faceted curriculum developed by the Harvard School of Public Health. It is designed to use existing school resources to reinforce important messages about nutrition and physical activity to elementary school students through a variety of learning environments – from the classroom, cafeteria, and gymnasium to the school hallways, the home, and even community centers. <http://www.eatwellandkeepmoving.org/>

#### **EatFit**

This tool developed by the University of California Expanded Nutrition and Physical Activity Program and partners is a goal-oriented curriculum designed to challenge middle school students in 5th, 6th, 7th, 8th and 9th grades to improve their eating and fitness choices. It is adaptable for other learners, including after school programs, 4-H and other youth development programs.

<http://eatfit.net/>

### **FoodPlay**

This nutrition media company tours the nation's schools using the power of live theater and interactive resources to turn kids on to healthy eating and exercise habits. [www.foodplay.com](http://www.foodplay.com)

### **Massachusetts Department of Elementary and Secondary Education**

This Massachusetts Education website provides news on education related issues and relevant information on resources, educational technology and programs.

<http://www.doe.mass.edu/cnp/edtrain.html>

### **Action for Healthy Kids**

AFHK is the only non-profit organization formed specifically to address the epidemic of overweight, undernourished and sedentary youth by focusing on changes at school. State teams are formed nationwide. There is a link to the Massachusetts Action for Healthy Kids team page.

[www.actionforhealthykids.org](http://www.actionforhealthykids.org)

## **Health Care Provider Resources**

### **American Academy of Pediatrics**

National Guidelines for the Protection of Student and Staff Confidentiality: Health, Mental Health and Safety Guidelines for Schools: American Academy of Pediatrics

<http://www.nationalguidelines.org/guideline.cfm?guideNum=4-25&pageRefresh=true>

### **Supplement to Pediatrics, December 2007**

This website provides 4 key articles that have expert recommendations for the prevention, assessment and treatment of child and adolescent overweight and obesity

[http://pediatrics.aappublications.org/content/vol120/Supplement\\_4/](http://pediatrics.aappublications.org/content/vol120/Supplement_4/)

### **The Healthy Care for Healthy Kids Toolkit - Management and Treatment - Office Tools**

This clinicians toolkit developed by the National Initiative for Children's Healthcare Quality (NICHQ), and the teams from NICHQ's Learning Collaborative *Healthy Care for Healthy Kids, a Collaborative to Prevent, Identify and Manage Childhood Overweight*, was designed to provides basics tools for primary care practice teams to deliver coordinated, integrated, and multidisciplinary services to both prevent overweight and improve care for children who are already overweight or at risk for overweight.

<http://obesity.nichq.org/resources/healthy%20care%20for%20healthy%20kids%20obesity%20toolkit> **Community Resources**

**VERB** This website provides resources from the Centers for Disease Control and Prevention's (CDC) national social marketing campaign focused on getting kids active. It has resources that communities can use to implement their own VERB campaign.

<http://www.cdc.gov/youthcampaign/index.htm>

## **WeCan!**

Ways to Enhance Children's Activity & Nutrition is a national program designed for families and communities to help children maintain a healthy weight. The program focuses on *three* important behaviors: *improved* food choices, *increased* physical activity and *reduced* screen time. It has numerous resources for parents and children as well as information on how communities can become **WeCan!** Partners.

[http://www.nhlbi.nih.gov/files/docs/public/heart/toolkit\\_body.pdf](http://www.nhlbi.nih.gov/files/docs/public/heart/toolkit_body.pdf)

## **Share Our Strength's Operation Frontline®**

This website provides nutrition education programs that connect families with food by teaching them how to prepare healthy, tasty meals on a limited budget. <http://www.nokidhungry.org/about-us/programs>

<http://www.nokidhungry.org/about-us/programs>

## **Physical Activity Resources**

### **The President's Council on Physical Fitness and Sports**

This website includes publications and resources on physical activity as well as information on the President's Challenge which has incentives to help kids stay active and track progress with personal activity logs and presidential awards

### **National Center on Physical Activity and Disability (NCPAD)**

This website provides information and resources that can enable people with disabilities to become physically active. It includes educational resources, guidance on adapting gyms and other sites, handouts, writings from people with disabilities as well as nutrition information.

<http://www.nchpad.org/>

### **Special Olympics**

Special Olympics is an international nonprofit organization dedicated to empowering individuals with intellectual disabilities to become physically fit. This website provides information on how to become involved in the Special Olympics. [www.specialolympics.org](http://www.specialolympics.org)

## **Diabetes Resources**

### **National Diabetes Education Program**

This organization translates the latest science and spreads the word that diabetes is serious, common, and costly, yet *controllable* and, for type 2, *preventable*. The website provides publications, guidelines, tools, posters and other resources to prevent and manage diabetes. It has materials for all age groups as well as for professionals. Information is available in English and in Spanish.

<http://www.cdc.gov/diabetes/>

### **American Diabetes Association**

This organization funds research to prevent, cure and manage diabetes; delivers services to communities; and provides objective and credible information on the prevention and

management of diabetes. The website has materials for consumers and professionals as well as a section for parents and kids. [www.diabetes.org](http://www.diabetes.org)

## **Eating Disorder/ Malnutrition**

### **MEDA**

MEDA is a Massachusetts non-profit organization dedicated to the prevention and treatment of eating disorders and disordered eating. They provide educational presentations and have support groups for individuals with eating disorders/disordered eating. [www.medainc.org](http://www.medainc.org)

### **Eating Disorder Referral and Information Center**

This organization is dedicated to the prevention and treatment of eating disorders. The website provides research articles and other professional information on eating disorders as well as links to treatment resources nationwide. [www.edreferral.com](http://www.edreferral.com)

### **National Association of Anorexia Nervosa & Associated Disorders**

This organization is the oldest eating disorder organization in the nation. In addition to running a crisis hotline, the organization distributes listings of therapists, hospitals and informational materials and sponsors groups, conferences, and research. [www.anad.org](http://www.anad.org)

## **Professional Associations**

### **American Association for Health, Physical Education, Recreation and Dance**

AAPHERD promotes and supports leadership, research, education, and best practices in the professions that support creative, healthy, and active lifestyles. <http://www.shapeamerica.org/>  
The Massachusetts affiliate is MAHPERD <http://www.ma-hperd.org/>

### **The American Dietetic Association**

The ADA represents food and nutrition professionals across the US. The association is committed to improving the nation's health and advancing the profession of dietetics through research, education and advocacy [www.eatright.org](http://www.eatright.org)

### **The American Academy of Pediatrics**

This organization represents pediatricians and is committed to the attainment of optimal physical, mental, and social health and well-being for all infants, children, adolescents, and young adults [www.aap.org](http://www.aap.org)

## **General Resources and Other Websites**

### **Mass in Motion**

This Massachusetts Department of Public Health website provides healthy eating, physical activity, obesity prevention information and resources for use in schools, communities, worksites and in the home.

<http://www.mass.gov/massinmotion/>

### **Massachusetts Health Promotion Clearinghouse**

This clearinghouse, supported by the Massachusetts Department of Public Health provides free health promotion materials such as brochures, posters, and fact sheets free-of-charge to Massachusetts residents and health and social service providers.

<https://massclearinghouse.ehs.state.ma.us/>

### **Team Nutrition**

An initiative of the USDA Food and Nutrition Service, Team Nutrition provides information on nutrition education, healthy eating and physical activity with support and materials for teachers and food service professionals. [www.fns.usda.gov/tn](http://www.fns.usda.gov/tn)

### **HealthierUS**

This website is part of a broad presidential agenda designed to help Americans, especially children, live longer, better, and healthier lives and provides information on physical fitness, nutrition and making healthy choices. <http://www.fns.usda.gov/hussc/healthierus-school-challenge>

### **Bright Futures**

This health promotion initiative of the national Maternal and Child Health Bureau dedicated to the principle that every child deserves to be healthy and that optimal health involves a trusting relationship between the health professional, the child, the family, and the community as partners in health practice. The website has tools and resources on nutrition and physical activity for children. [www.brightfutures.org](http://www.brightfutures.org)

### **Robert Wood Johnson Foundation**

This not-for-profit organization has made a commitment to support obesity prevention. The website has a number of obesity prevention publications and useful resources.

<http://www.rwjf.org/childhoodobesity/>

## **Resources for Kids**

### **USDA**

The United States Department of Agriculture website provides resources and information to use to develop resource and educational materials to use with children.

<http://www.choosemyplate.gov/>

### **Kids' Health**

Kids Health developed by Nemours Foundation Center for Children's Health Media is an interactive, educational, and fun website that provides kids and parents' perspective, advice, and comfort about a wide range of physical, emotional, and behavioral issues that affect children and teens. <http://kidshealth.org/kid/>

### **YourSELF**

A United States Department of Agriculture (USDA) Team Nutrition publication developed especially for middle school students.

[www.fns.usda.gov/tn/team-nutrition](http://www.fns.usda.gov/tn/team-nutrition)

## **BAM!**

Body and Mind (BAM!) developed by the Centers for Disease Control and Prevention is an interactive website that gives kids aged 9-13 the information they need to make healthy lifestyle choices using interactive, educational, and fun activities. [www.bam.gov](http://www.bam.gov)

## **The Center for Young Women's Health**

This website developed by the Children's Hospital in Boston provides teen girls and young women with health information, information on conference and educational programs, and links to expert medical care at Children's Hospital.

[www.youngwomenshealth.org](http://www.youngwomenshealth.org)

## **Young Men's Health**

This website developed by the Children's Hospital in Boston provides carefully researched health information to teenage boys and young men. It is designed to help teen boys improve their understanding of normal health and development, as well as of specific diseases and conditions.

<http://www.youngmenshealthsite.org/>

## **Smart Mouth**

This interactive website developed by the Center for Science in the Public Interest has games, information on how the food industry's drive for profit affects what kids eat, a calorie meter that helps kids see how their favorite foods stack up, and other fun information about healthy eating and snacking. <http://www.smart-mouth.org>

## **Alliance for a Healthier Generation**

This website developed by the Alliance for a Healthier Generation was designed to inspire kids to eat healthier and move more. It has ideas and tips for eating healthy and being active, resources to share their story with other kids, celebrity videos, e-news updates, invitations to exclusive events, and contests. <https://www.healthiergeneration.org/>

## **Kidnetic**

This website developed by the IFIC Foundation, the educational arm of the International Food and Information Council supported by companies and organizations representing the broad-based food, beverage, and agricultural industries. The website is designed for kids aged 9-12 and their families and also includes a Leader's Guide which is a lesson-based curriculum guide for health professionals and educators to use when working with patients and students. [www.kidnetic.com](http://www.kidnetic.com)

## **Best Bones Forever**

This website developed by the Office on Women's Health within the U.S. Department of Health and Human Services is designed for girls ages 9-12 and includes games, information, healthy eating and physical activity tips, downloadable tools and other resources to help young girls establish lifelong, healthy habits that build and maintain strong bones.

<http://www.bestbonesforever.gov>