IMPACT Protocols

PROTOCOLS: HEIGHT / WEIGHT / CALF

PROTOCOL REVIEW

QUALITY CONTROL PROTOCOL

SETTING

The area should be set up so that each individual height and weight station is separated by a screen or wall to ensure the privacy and confidentiality of each student.

DATA RECORDING INSTRUCTION

It is important that measurement data be entered accurately into the appropriate spaces on the IMPACT Anthropometrics/Ultrasound Form. (Ultrasound protocol is a separate document).

When recorders are used, the measurer must clearly call out the measurement; e.g., 16.2 is read "one", "six", "point", "two". The recorder must repeat the name of the measure and the measurement value using the same cadence. Numbers must clearly be formed. If there is any confusion over a measurement value then the entire measure must be repeated.

Conventionally, "one" is written as a straight line, "seven" has a European cross stroke, "zero" is clearly formed and impossible to misconstrue as another number. All spaces must be filled, using "leading" zeros in cases where the measurement requires fewer digits than are present on the data form.

Rounding numbers to the nearest k significant digits will be as follows; round up if the (k+1) significant digit is 6, 7, 8, or 9; round down if the (k+1) significant digit is 1, 2, 3, or 4; and round to the nearest even number if the (k+1) significant digit is 5. For example if we want only 3 significant digits in this measurement; 62.56 becomes 62.6, 62.54 becomes 62.5, and 62.55 becomes 62.6

IMPACT ANTHROPOMETRIC FORM COMPLETION

| Student ID: | Place Subject ID label in the space provided. |
| Measurement Period: | Current measurement period. |
| Anthropometric Date: | Use the date the height/weight/calf is measured. |
| Height: | A single measure is obtained to the nearest 1/8". The examiner records the value in the space provided using a four-digit format (i.e., 5'4" is recorded as 64.00). |
**Weight:** A single measure is obtained. The examiner records the value to the nearest 0.5 lb. in the spaces provided (i.e., 100.5 is recorded as 100.5 lb).

**Calf Circumference:** The calf circumference is measured to the nearest 0.1 cm and recorded in the spaces provided (i.e., 17.9 cm is recorded as 17.9).

**Staff Initials:** The initials of the examiner performing each measurement should be recorded on the data form in the spaces provided.

The remaining part of the form is completed during the ultrasound measure.

**HEIGHT PROTOCOL**

**A. MEASUREMENT SET-UP**

**Equipment and forms needed:**

- Stadiometer - A stadiometer is a vertical board with attached measurements and a movable horizontal board, which can be brought down into contact with the head.
- IMPACT Anthropometrics/Ultrasound Form
- IMPACT Anthropometrics Protocol
- Pencil
- Clipboard for forms

**B. MEASUREMENT PROTOCOL**

1. Compare the ID# at the top of the Anthropometrics/Ultrasound Form to the ID# on the front of the envelope.
2. Ask students to remove heavy outer clothing (such as coats, jackets and vests), purses, shoes, and hair accessories located on the top of the head. If the student cannot remove hair accessories, or has a hairstyle which prevents the board from touching the crown of the head, please make a note on the form.
3. Instruct the student to stand with heels, buttocks and upper back (but not necessarily the head) touching the stadiometer or the wall and feet together, with arms hanging in a relaxed position by the sides of the body. The student should stand on a flat surface at a right angle (90 degrees) to the stadiometer. The highest point on the skull or vertex should be oriented in the Frankfort plane. The Frankfort plane is the line from the lower edge of the eye socket (orbital) to the notch above the flap of the ear (tragus) or the back of the cheekbone. These terms are illustrated in the following diagram.
The critical feature of this technique is to obtain the maximum distance from the platform of the stadiometer to the subject’s vertex. Technically, the vertex is the highest point on the skull when it is oriented in the Frankfort Plane. These terms are indicated in the diagram above. As shown, the required position is achieved when the line from the orbital to the tragion is horizontal. The orbital is the lower (inferior) edge of the eye socket. The tragion is the notch above (superior to) the flap (tragus) of the ear, or to use a landmark, at the superior aspects of the zygomatic arch at this point (back of cheekbone).

4. Instruct the student to take a deep breath, hold their breath, look straight ahead, and stretch up as far as possible while keeping the heels on the ground. Be sure and tell them when to breathe again.

5. The movable headboard on the stadiometer is moved down to the uppermost portion of the head, compressing the hair, if necessary. Lower the board until it firmly touches the crown of the head (Vertex). The value is recorded in a 4-digit format on the IMPACT Anthropometrics/Ultrasound Form.

6. Adjust your eye level to the level of the measurement before attempting to read the measurement by standing on a step stool or squatting down. Read the measurement indicated at the bottom of the right angle board. If the measurement is compromised due to hair accessories or hairstyle, please make a notation on the IMPACT Anthropometrics/Ultrasound form. Also make a notation if the student has abnormal conditions that may interfere with the measurement, such as leg braces.

7. Record the measurement on the IMPACT Anthropometrics Form to the nearest 1/8th inch. Record your initials.
References:

Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey (NHANES III), Anthropometrics Procedures Video, 1996.


WEIGHT PROTOCOL

Measurements should be taken in a remote area to ensure privacy for study participants. The use of screens or different locations is suggested.

A. MEASUREMENT SET-UP

1. Equipment and forms needed:
   - Digital scale
   - 4 Spare AA batteries
   - IMPACT Anthropometrics/Ultrasound Form
   - IMPACT Anthropometrics Protocol
   - Pencil
   - Clipboard for forms

2. Calibration of Scales

   (This will be done at the office each day prior to leaving for the school)

Calibrate each scale with standardized weights at each of the four weight levels (i.e. 50, 100, 150, 200 pounds or 20, 40, 70, 90 kilograms) each morning before the start of measurement. This can be done at a central location or on site at the school.

Scales should be evaluated if they mis-measure standards in any one of the four standard levels by more or less than 0.2kg (0.5 pounds). If this happens, first replace the battery and repeat the calibration procedures precisely as described above. Be sure that the scale is placed on a level floor surface without carpet or rugs of any kind. Check that the scale is programmed to the pound mode and that it balances at zero before your test.
If the scale still mis-measures the standards by more or less than 0.5lb, **DO NOT USE THE SCALE FOR IMPACT MEASUREMENT**. Follow the manufacturer's recommendations for reconditioning.

### Acceptable range for calibration of scales using pound weights:

<table>
<thead>
<tr>
<th>Standard Weight in lb</th>
<th>Evaluate scale if weight is more or less than as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 lb</td>
<td>&lt; 9.5 lb or &gt; 50.5 lb</td>
</tr>
<tr>
<td>100 lb</td>
<td>&lt; 99.5 lb or &gt; 100.5 lb</td>
</tr>
<tr>
<td>150 lb</td>
<td>&lt; 149.5 lb or &gt; 150.5 lb</td>
</tr>
<tr>
<td>200 lb</td>
<td>&lt; 199.5 lb or &gt; 200.5 lb</td>
</tr>
</tbody>
</table>

### Acceptable range for calibration of scales using kilogram weights (1kg = 2.2046 lb):

<table>
<thead>
<tr>
<th>Standard Weight in kg</th>
<th>Evaluate Scale if weight is more or less than as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 kg</td>
<td>&lt; 19.8 kg or &gt; 20.2 kg</td>
</tr>
<tr>
<td>40 kg</td>
<td>&lt; 39.8 kg or &gt; 40.2 kg</td>
</tr>
<tr>
<td>70 kg</td>
<td>&lt; 69.8 kg or &gt; 70.2 kg</td>
</tr>
<tr>
<td>90 kg</td>
<td>&lt; 89.2 kg or &gt; 90.2 kg</td>
</tr>
</tbody>
</table>

### B. MEASUREMENT PROTOCOL

1. Before each measurement, make sure the scale is zero-balanced. The scale will register zeros across the display, then will register one zero. If the digital scale does not register zero, do not use it.
2. Ask the student to remove heavy outer clothing (such as coats, jackets, and vests), purses, shoes, and any heavy accessories such as belts with heavy belt buckles. The student should also remove everything from their pockets including money (coins), pens, pencils, wallets, and papers.
3. Make sure the scale is zero-balanced and is programmed to the pounds mode before each student is weighed.
4. Ask the student to stand motionless in the middle of the scale platform with the feet slightly apart and the body weight distributed equally on both feet. The arms should be relaxed and hanging down loosely at the sides of the body.
5. Digital scales do not register over 440 lbs. If a student weighs over the limit of the scale, the scale will register an "error". If this happens or if the reading is compromised due to a cast or other device, please make a notation on the form. **Do not react to the student. While the weight measurement is being taken, it is important not to be judgmental. Any communication about the weight should be neutral (neither positive nor negative) and professional. In addition, you need to assure that the readings are kept private.**
6. Record the reading on the IMPACT Anthropometrics Form. Record your initials. Ask the student to step down from the scale.
7. Turn the scale off after all measurements are completed.
Calf Circumference Protocol

A. Measurement Set-Up

1. Equipment and forms needed:
   - IMPACT Anthropometrics Protocol
   - IMPACT Anthropometrics/Ultrasound Form
   - A non-stretchable centimeter tape measure.
   - Pencil
   - Clipboard for forms

B. Measurement Protocol

1. Ask student to remove heavy outer clothing and to remove or move clothing around the calf.
2. The examiner should be on the right side of the student, but kneeling down to the measurement level. Position the tape measure horizontally around the calf and move up or down to locate the maximum circumference. It is important that the circumference reading is taken at right angles to the long axis of the limb. The tape will be parallel to the floor. A light touch is required so that there is no indentation of the skin, yet the tape should be held snugly around the calf.
3. The examiner should hold the zero end of the tape in his/her left hand, and the rest of the tape measure in their right hand. The tape measure should fit snugly around the calf, and not raised or drooping. Instruct the student to stand erect with their feet apart and their weight evenly distributed on both feet.
4. Read the measurement at the right (lateral) side of the calf, and immediately record as a three-digit number to the nearest 1/10th centimeter on the IMPACT Anthropometrics/Ultrasound Form.

References:

Centers for Disease Control and Prevention, National Center for Health Statistics, National Health and Nutrition Examination Survey (NHANES III), Anthropometrics Procedures Video, 1996.


**REVIEW FOR HEIGHT / WEIGHT / CALF PROTOCOLS**

**BEFORE ALL MEASUREMENTS**

- Remove shoes
- Remove all heavy outer clothing such as coats, jackets, vests, and sweatshirts.
- Remove belts with heavy belt buckles
- Remove hair accessories from the top of the head

**HEIGHT MEASUREMENT**

**STUDENT POSITIONING**

- Heels, buttocks and upper back against the stadiometer
- Look straight ahead with arms at sides
- Feet together
- Take deep breath, stretch up as far as possible, keep heels on ground
- Check Frankfort Plane
- Read measurement at eye level

**WEIGHT MEASUREMENT**

- Zero balance or calibrate the scale

**STUDENT POSITIONING**

- Feet together with hands at sides
- Weight equally on both feet
CALF CIRCUMFERENCE MEASUREMENT

- Examiner to the right of the student
- Examiner kneeling down to the measurement level
- Use a non-stretchable centimeter tape measure

STUDENT POSITIONING

- Student stands erect with feet apart
- Weight evenly distributed on both feet

QUALITY CONTROL PROTOCOL

In order to assess and maintain quality of anthropometrics measurements of students, the following protocol for quality assurance will be followed.

Each anthropometrics examiner will repeat his or her measurements on 10% of the students chosen randomly from those seen on a particular day at each school. The repeat measurements must not be consecutive; the examiner should measure at least five other students before the designated students undergo repeat measurements.

Repeat measurements should be recorded on the Quality Control Form. Do not change the recorded measurements on the form even if the QC and the original measurements are different.

For example: Jane is planning to measure 75 students on Monday. Jane will randomly pick 8 students to participate in the QC. After measuring one of the students who will participate in the QC, the student is asked to remain in the waiting area away from measurement. After Jane has measured at least five other students, she will re-measure the QC student and record the measurements on the IMPACT QC Anthropometrics form.

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Number of Students for Quality Control Checks</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-19</td>
<td>1</td>
</tr>
<tr>
<td>20-29</td>
<td>2</td>
</tr>
<tr>
<td>30-39</td>
<td>3</td>
</tr>
<tr>
<td>40-49</td>
<td>4</td>
</tr>
<tr>
<td>50-59</td>
<td>5</td>
</tr>
<tr>
<td>60-69</td>
<td>6</td>
</tr>
<tr>
<td>70-79</td>
<td>7</td>
</tr>
<tr>
<td>80-89</td>
<td>8</td>
</tr>
<tr>
<td>90-99</td>
<td>9</td>
</tr>
<tr>
<td>100+</td>
<td>10</td>
</tr>
</tbody>
</table>
DO NOT PLACE THE QC FORM BACK IN THE STUDENTS ENVELOPE.
GIVE THE FORM TO THE TEAM LEADER AT THE SCHOOL.