



Special Olympics **Health Promotion**

Clinical Director Manual
Chapter Three:
Health Promotion Core Subjects



Table of Contents

CHAPTER THREE: HEALTH PROMOTION CORE SUBJECTS

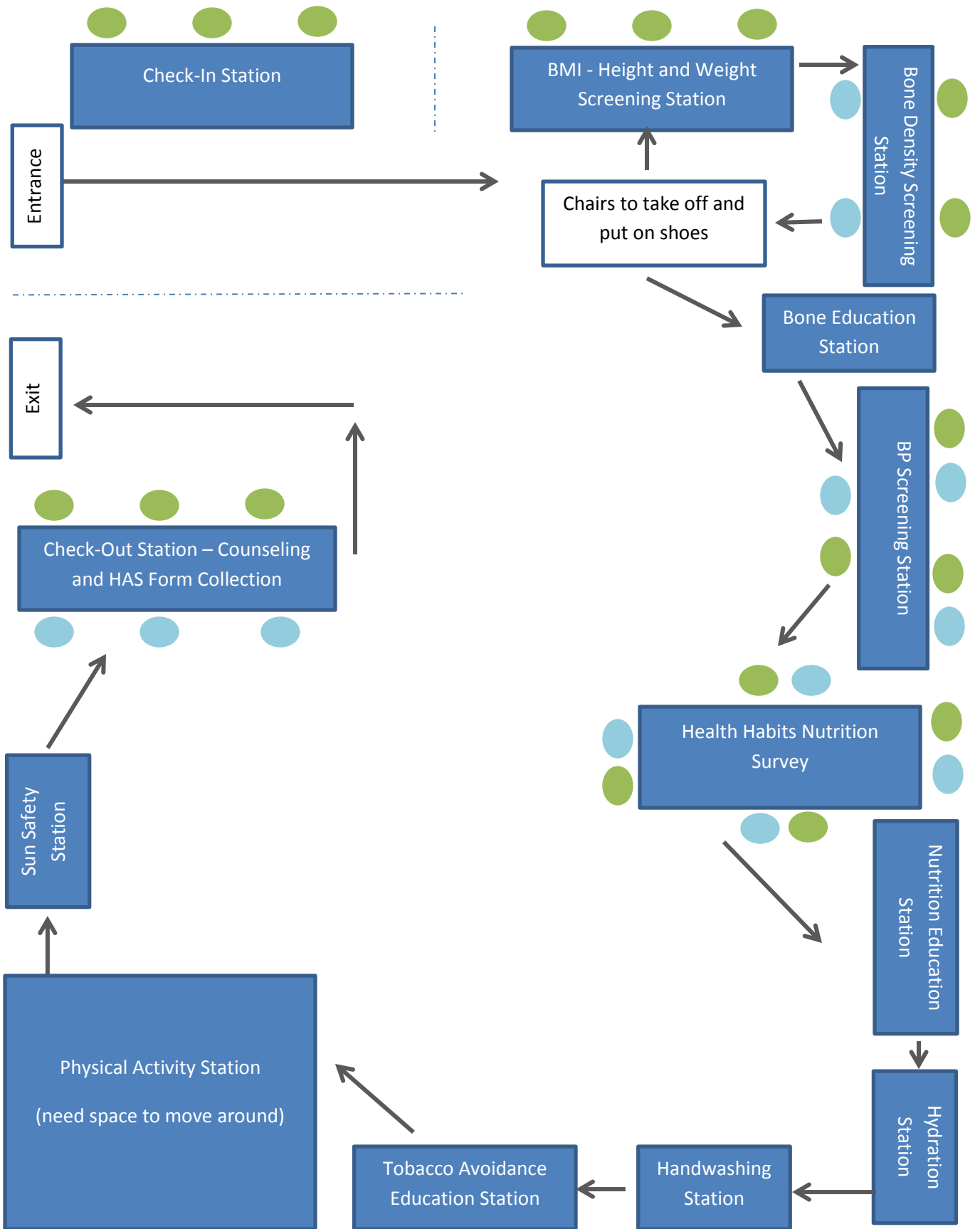
Core Subjects Table and Sample Layout Schematic	3
Screening Station Rubric Summary of Each Exam	5
Bone Mineral Density Screening Station	9
Bone Density Screening Procedure Instruction Guide	13
Performing Calibration and Quality Control Procedures with the Sahara	15
Shutting Down and Repacking the Sahara	16
Bone Density Frequently Asked Questions (FAQs)	19
Training Skills Checklist for BMD Testing	20
Bone Mineral Density Appendix	21
Sahara Operation Reminders	21
Request Loan of Sahara Equipment	23
Body Mass Index (BMI) Screening Station	27
Equipment Standards	29
Measurement Protocol	30
How to Avoid Measurement Errors	31
Alternative Methods for Measuring Height and Weight	32
Training and Teaching Aids for Volunteers	34
Height and Weight Quality Assurance Tool	34
Body Mass Index (BMI) Frequently Asked Questions	36
Body Mass Index (BMI) Screening Station Appendix	37
Body Mass Index Chart - Adults	37
Body Mass Index Chart - Male Youth	38
Body Mass Index Chart – Female Youth	39
Weight Measurement Poster	41
Height Measurement Poster	42
Stadiometer Set Up	43
BMI Equipment and Supplies Resources	44
Blood Pressure Screening Station	45
Blood Pressure Screening Station Appendix	49
Counseling Suggestions for Adults, Depending on BP Reading	49
Frequently Asked Questions (FAQs) – Blood Pressure	51
Training Skills Activity: Blood Pressure	53
Health Habits Survey	55

SOI recommends these 10 core subjects be included in all Health Promotion events. These include both screening and education stations, if time, space, and resources allow. This table summarizes the core stations and offers recommendation about the space and equipment needed. The tendency is to think that all stations require the same amount of space, but some stations require more space to complete the screening or properly display the educational materials. This Chapter will provide further detailed information about the screening stations (BMI, Blood Pressure, Bone Density, and Healthy Habits Survey). Chapters [five](#) and [six](#) will provide details about the education stations and example lessons plans.

Core Subjects Table and Sample Layout Schematic

Core Stations	Suggested Equipment and Supplies List by Station
Check In	Laptop if Healthy Athlete Software (HAS) forms are not pre-populated.
BMI Exam	Stadiometers and scales.
BP Exam	Extra-large, adult and pediatric cuffs, cartons of iodized and non-iodized salt, education board on DASH Diet recommendations, sodium and blood pressure graphics.
BMD Exam & Education Station	Sahara machines + clinic supplies, waste baskets, clipboards, Loss of a Bone Easel , food models (cups of fake milk and yogurt), calcium citrate supplement and vitamin D supplement bottles, education board on bone health if available. String cheese and light yogurt if available. Comparing Milk and Milk Alternatives and Sports Discussion sheets.
Health Habits	Current HAS forms and regionally appropriate food pictures to guide interview.
Nutrition Education	A variety of food models, food packages (Ramen, candy, etc.) electrician tape, education board on healthy nutrition, regional food guide e.g. MyPlate posters or display. Try not to use brand-name examples.
Sun Safety	Solar bracelets, raisins and grapes, 5000 IU vitamin D supplement bottle, lip balm, UV sun glasses, baskets for giveaway items UV Derm Scanner if available, education boards with colorful graphics and simple messaging. Baggo Sun Safety Bean Bag Toss.
Hydration	“Rethink Your Drink” materials. Clear cleaned soda bottles with sugar added (1 t per ounce if sweetened); include diet drinks, sports and energy drink containers. A few small zip lock bags with extra sugar, a measuring spoon; bottled water for athletes, education board with colorful hydration graphics and simple messaging.
Hand Washing	Glo Germ materials; or oil, cinnamon and soap, if handwashing facility or Cambro handwashing station is available. Spin the Water Wheel.
Physical Activity	Boom box, dance CD, hula hoops, yoga/exercise mats; education board with fun, colorful exercise graphics and simple messages.
Tobacco Avoidance	Straws, boom box, dance music, education board with colorful tobacco and health graphics and simple messaging.
Check-Out	I Choose to Change cards, Athlete Personal Health Report forms; Health Report Screeners Tool , a box or basket to collect completed HAS forms, HP Screening Reference Sheets for BMI, BMD and BP .
Optional Stations	Suggested Equipment and Supply List
Milk Moustache Photo Booth	Got Milk Celebrity Banners for backdrop; stick on moustaches, inflatable cow, plastic food models of dairy products, empty milk, and soy milk cartons. Use athlete’s cell phones for photos, if camera and printers aren’t available.
Food demo	Local decision, but must comply with food safety regulations for community.
Ask the RD, MD or RN	Food models, table and 2-4 chairs, education boards on selected topics.

HP Event Sample Layout (layout may need to change based on the size of the space & expected number of athletes)




4 Sample HP Event Layout

Key:


- = Table
- = screener chair
- = athlete chair

Screening Station Rubric Summary of Each Exam

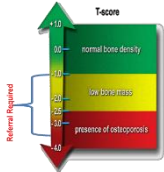
The following tables are intended to provide a broad overview of all the screening stations and recommended ways to evaluate volunteers on their ability to properly conduct the exam. This will be used at the Clinical Director Training, but is also a useful resource for the Clinical Directors to use as they plan and hold their events. The stations themselves are described in greater detail in the remaining section of this Chapter and Chapter 5.

BMI Height—Weight Screening Station Quality Assurance and Competency Training Tool				
Goal/Objective	Key Messages for Trainees	Methods & Materials	Instruction Resources	Evaluation Method
<p>Trainee will demonstrate the ability to accurately:</p> <ul style="list-style-type: none"> • Measure height and weight. • Use appropriate equipment. • Use appropriate technique. • Determine the BMI or BMI percentile. • State frequent causes of error. 	<p>People with Intellectual Disabilities (ID) are more likely to be overweight, obese or underweight than the general population, for a variety of reasons.</p> <p>An individual’s height and weight is used to calculate a BMI (BMI percentile for children) is a measure of overweight and one’s risk status for chronic diseases. Measurements should be accurate, reliable and replicable using appropriate equipment and a trained individual.</p>	<p>Demonstrate height and weight measurement technique.</p> <p>Trainee will practice measurement techniques with a partner. Trainer will confirm the technique.</p> <ul style="list-style-type: none"> • Record result on Healthy Athletes Software (HAS) form • Power Point slides • Poster on height and weight technique 	<p>Supplies from Special Olympics (SOI)</p> <ul style="list-style-type: none"> • HP Clinical Director (CD) Manual <ol style="list-style-type: none"> 1. Power Point Slides 2. Poster on height and weight technique • BMI Wheel –metric adult • BMI Wheel –metric pediatric <p>Equipment Specifications See Section 3 HP Manual Body Mass Index Station</p>	<p>Observation of techniques and confirmation of 100% accuracy.</p> <p>Have each trainee or volunteer measure one or two others, write down the results without saying them. Discuss concurrence of results.</p> <p>And/or use the Instruction Plan Checklist.</p>
<p>Referral /Follow-up for athletes with abnormal BMI results (BMI at 25 or higher, or 15 or lower).</p>	<p>Appropriate referrals are necessary to ensure athletes at risk receive care.</p> <div style="text-align: center;">  </div>	<p>Brainstorm process for follow-up for athletes with BMI at 25 or higher, or 15 or lower.</p>	<p>HP Clinical Director Manual- weight status classification tables, Health Promotion Screening Reference BMI</p>	<p>Group Discussion</p>

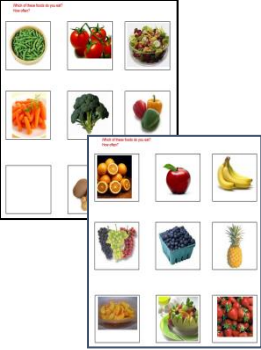
Blood Pressure (BP) Screening Station Quality Assurance and Competency Training Tool

Goal/Objective	Key Messages for Trainees	Methods & Materials	Instruction Resources	Evaluation Method
<p>Trainee will demonstrate the skills to accurately:</p> <ul style="list-style-type: none"> Select appropriate cuff size for individual athlete. Calibrate equipment. Use appropriate technique. Describe appropriate action and messages, based on comparison of blood pressure (BP) to the triage check list. State frequent causes of BP error. 	<ul style="list-style-type: none"> People with ID have at least if not more hypertension than the general population. An individual's (BP) reading is used to show general circulatory health, and can be used to discover other problems. Measurements should be accurate, reliable and replicable using appropriate equipment and a trained individual. If BP is too low the athlete may not receive adequate blood flow to the brain and heart If the athlete's BP is too high he or she may experience heart failure or stroke. 	<ul style="list-style-type: none"> Demonstrate calibration technique. Demonstrate the BP measurement technique with a partner. Describe action based on reading. Correctly record result on HAS form. 	<p>Supplies from SOI</p> <ul style="list-style-type: none"> HP CD Manual. Blood pressure monitor for adults and pediatric. BP charts for adults and children. Results action protocol. Choose to Change card- BP. Key message scripts Equipment specifications. Athlete's Personal Health Report Screeners' Reference Sheet. 	<ul style="list-style-type: none"> Observation of techniques and confirmation of 100% accuracy. Trainees will measure one another, and get the same results. Discuss "what if you get this reading", and assure trainees identify correct action based on BP reading. i.e., if hypotensive, athlete rehydrates; stage 3 hypertension: athlete rests retake BP. If BP still high after a 15-30 minute rest, see medic. Trainee will explain when and how to make BP referral at the event and/or at home.
<p>Referral /Follow-up for athletes with abnormal BP results</p> <ul style="list-style-type: none"> An adult with a systolic BP reading of 140 or higher, or a diastolic reading of 90 or higher will be referred to MD. A child with systolic and/or diastolic BP at or above the 95th % or below the 5th% is considered hypertensive and will be referred to MD. Pediatric hypotension not defined. 	<ul style="list-style-type: none"> Appropriate referrals are necessary to ensure athletes at risk receive care. Refer to adult and pediatric BP charts in Appendix. <div style="text-align: center; margin-top: 10px;">  <p style="font-size: small; margin: 0;">HEALTH PROMOTION BLOOD PRESSURE CHART</p> <p style="font-size: x-small; margin: 0;">This chart is for informational purposes only. It is not intended to be used for medical diagnosis or treatment. For more information, please consult your healthcare provider.</p> </div>	<ul style="list-style-type: none"> Brainstorm process for follow-up for athletes with hypotension or hypertension. 	<p>HP Clinical Director Manual - blood pressure classification tables, Health Promotion Screening Reference BP.</p>	<p>Group Discussion</p>

Bone Mineral Density (BMD) Screening Station Quality Assurance and Competency Training Tool

Goal/Objective	Key Messages for Trainees	Methods & Materials	Instruction Resources	Evaluation Method
<p>Trainees will demonstrate correct use of the bone density ultrasound equipment including the following:</p> <ul style="list-style-type: none"> • Reserve machine • Order supplies • Calibrate/QC • Operate • Replace printer tape • Repack Sahara. 	<ul style="list-style-type: none"> • Sahara an FDA approved medical device, is used to predict fracture risk. • Sahara test results are considered one aspect of a fracture risk assessment. • Use job aids to guide the proper operation of the Sahara for bone density screening. • Measurements must be accurate, reliable and replicable. 	<ul style="list-style-type: none"> • Demonstrate use of job aids for BMD competency checklist. • How to secure Sahara for event • Choose To Change Cards and messages • PowerPoint Slides • Sahara Manual 	<p>HP CD Manual BMD Job Aids:</p> <ul style="list-style-type: none"> • Reserve SOI loaner Sahara • Order Sahara supplies • Calibrate, QC and trouble shoot Sahara problems • Repack and return Sahara to loan source. 	<ul style="list-style-type: none"> • Reserve use of an SOI Sahara machine. • Successful volunteer training on use of the Sahara. • Critique one another in BMD screening service a skills based check list. • Demonstrate correct Sahara repacking for shipment.
<p>Key Messages and Counseling Tips</p>	<ul style="list-style-type: none"> • People with ID are at higher risk for low bone density, fracture and premature tooth loss for a variety of reasons. • Preventive measures and medical follow-up for abnormal scores may reduce fracture risk. 	<p>Trainees will deliver key messages for <i>Strong Bones</i> Education. Use role play and brainstorming to reinforce skills.</p>	<ul style="list-style-type: none"> • Key message scripts • Medication Watch List • Bone Health Education Resources • BMD testing procedure. • Record result on HAS 	<ul style="list-style-type: none"> • Critique one another in delivery of screening service using a skills based check list.
<p>Conducting BMD measurement</p>	<p>Getting an accurate T-Score depends on following SOI protocol, athlete cooperation and shape of the athlete's heel.</p>	<ul style="list-style-type: none"> • Demonstrate BMD testing process. • Record result on HAS form 	<p>Job Aids:</p> <ul style="list-style-type: none"> • How to conduct BMD measurement • See "Screening Follow-up BMD" in Manual. 	<ul style="list-style-type: none"> • Correctly test BMD on 5 others; explain the process to athlete, test, provide education, record data; sort for follow-up or not.
<p>Referral criteria for athletes with abnormal BMD scores</p>	<ul style="list-style-type: none"> • Athletes with low (-1.0 or lower) or very high T-scores will be referred to their health care provider for follow-up. • T-scores of >3.5 may indicate lead poisoning. Refer to MD. 	<ul style="list-style-type: none"> • Brainstorm process for follow-up for athletes with abnormal BMD scores. • Create list of local BMD follow-up resources. 	<p>See Screening Follow-up BMD in HP Manual.</p> 	<ul style="list-style-type: none"> • Implement a HIPPA compliant follow-up plan to refer athletes with abnormal BMD scores. • Observe competency using skills checklist.

Health Habits Survey (Nutrition, Tobacco, Sun Safety, Physical Activity) Quality Assurance and Competency Training Tool

Goal/Objective	Key Message for Trainees	Methods & Materials	Instruction Resources	Evaluation Method
<p>Trainee will demonstrate the ability to administer the Health Habits Survey to athletes:</p> <ul style="list-style-type: none"> • Introduce self and explain purpose of the interview. • Use food prompts to ask the nutrition questions. • Allow time for the athlete to respond. • Follow up with trigger questions if response is questionable or additional information is needed. 	<p>Responses to targeted questions provide some information on the athlete's eating habits.</p> <p>The responses can be used to develop nutrition education guidance or respond to questions the athlete may have.</p> <p>Responses to food questions may assist in developing referrals based on athlete feedback and screening results</p>	<p>Demonstrate introduction and interactive discussion with another trainee.</p> <p>Demonstrate use of food prompts (pictures, foods or food models) to assist in question response.</p> <p>Correctly record response on HAS form.</p>	<p>HAS Form</p> <p>HAS Food Pictures/Food Models/Foods</p> <p>HAS Foods Template</p> <p>HAS Form Instructions</p> 	<p>Observation of trainee and partner interaction.</p> <p>Discuss challenges in interviews, how to use food prompts to assist in athlete response.</p> <p>Recommend changes/additions to food prompts to assist in gathering information.</p>

Please see [Chapter 4](#) for full listing of all the Healthy Habits Questions as part of the HAS Form



Bone Density

Bone Mineral Density Screening Station

Background Information:

The purpose of including a focus on bone health in Health Promotion is threefold, to:

- Improve the health of athletes relative to prevention of bone fracture.
- Add to the database of information on the bone density status of this population, and
- Document the need to include prevention strategies in athlete health care.

People with intellectual disability (ID) have increased fracture risk for several reasons including sedentary lifestyle, inadequate dietary intake of key nutrients, low vitamin D levels, aging and hormone deficiency. Tobacco use and alcohol abuse further accelerate bone loss at any age. Certain underlying medical conditions are related to diminished bone health. Some may be prescribed medications that impact bone health.¹

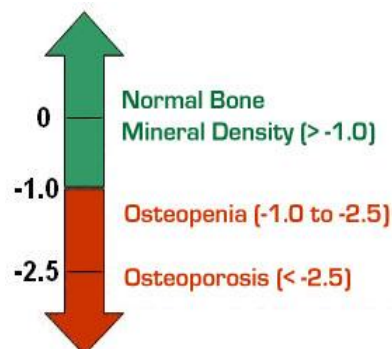
Early identification of low bone density through screening helps establish the need for lifestyle changes and/or medical intervention to improve bone health. Fortunately, we now have access to FDA approved medical devices to screen bone density. Health Promotion uses the Hologic Sahara Ultrasound to test bone density. The test is quick, painless, non-invasive, using ultrasound rather than x-ray. When correctly performed, abnormal T- scores results link to lifestyle and medical intervention protocols. An athlete's health care provider may order additional diagnostic tests including a 25 D (OH) vitamin D blood test; sequential height measurements; bone density x-ray of the hips and spine, also known as a DEXA or dual energy x-ray absorptiometry and blood or urine testing, so disease related causes for the bone loss can be ruled out. To standardize data collection and reliability of results, SOI only uses the Hologic Sahara Ultrasound device for bone density testing.

Osteoporosis treatment includes diet, safe sun exposure and/or vitamin D supplements, changing lifestyle habits and use of osteoporosis medications to prevent further bone loss and fractures. Osteoporosis is hard to reverse so prevention is the key to preventing fractures. A diet high in calcium is the cornerstone of prevention and treatment of osteoporosis. Many if not most individuals don't get enough calcium through diet or supplements. To enhance calcium absorption, vitamin D supplements or routine safe sun exposure are necessary. A regular exercise program that includes weight-bearing exercise, such as power walking, aerobics and resistance training can help keep bones strong and free of fractures if nutrient intake is adequate.

Counseling, Education, and Action Steps after Screening

What is low bone density? It's a thinning of the bones that increases the risk of fracture. It means that your bones are not as strong as possible.

How do we check for low bone density? The gold standard for measuring BMD is dual-energy x-ray absorptiometry (DEXA or DXA) scans. This test was done with a Sahara Ultrasound machine. Tests produce a **T-score**. Shows your score compared to a healthy 30 year old. **People with a T-score of -1.0 or lower should discuss the result with their health care provider at the next visit.** The chart on the next page will help with interpreting results and for specific recommendations for the referrals.



Some people have **very high bone density** scores, above +3.5. This may signal other problems with their bones and they should discuss this with their health care provider at the next visit.

Low bone density is not a disease. It shows us that the tested bones aren't as strong as they should be and are more susceptible to fracture. Our teeth are connected to the jaw bone, so bone loss may also lead to premature tooth loss. Many individuals with low bone density do not need medical treatment.

General Key Messages for Athletes About Protecting Their Bone Health

We can all take steps to ensure that we stay as healthy as possible.

1. Drink low fat cow's or soy milk daily, instead of soda, soft drinks, sports and energy drinks and other sweetened beverages.
2. Don't smoke or chew tobacco.
3. Eat healthy foods like dark green vegetables, fruit and almonds instead of candy or other sweetened foods.
4. Choose plain low fat yogurt and add your own fruit.
5. Take a calcium pill and a vitamin D pill (ask your doctor about the right dose).
6. Discuss your bone health with your doctor.
7. Ask your doctor about having a vitamin D test.
8. Be physically active.
9. Practice for your sport and do weight bearing and strength building activities at least three times a week.

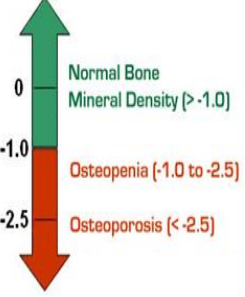
Thirty (30) minutes of weight-bearing and strength-building exercise daily benefits our bones, and improves heart and mental health, muscle strength, coordination, and balance. Those 30 minutes do not need to be done all at once; it's just as good to do 10 minutes at a time, several times each day. As a person builds strength, increase resistance, or weights rather than repetitions. Bringing a friend along can help some to keep going longer and more regularly.

Some weight bearing and strength building activities:

Lift weights Climb stairs Do aerobics Hike, jog or race walk Dance
Play court sports Play soccer Lift weights Play racquet sports Jump rope

Reference Chart and Action Steps Based on Bone Density T-Score

Abnormal BMD scores (-1 or lower, +3.5 or higher) do not “self-correct” and require medical and lifestyle intervention.

	T-score	Recommendations and Talking Points
	-1 to +3.5	<ul style="list-style-type: none"> • Normal Bone Density: Advise daily calcium intake of 1000-1200 mg per day from food and/or supplements. • Supplemental vitamin D dose should be based on vitamin D serum level, weight, age, skin color, medication use, sun exposure and dietary intake of vitamin D. • Participate in weight bearing and strength building sports e.g. running, basketball.
	-1.1 to -2.0 Referral required	<ul style="list-style-type: none"> • Low Bone Density: Advise daily calcium intake of 1000-1200 mg per day from food and/or supplements. • Supplemental vitamin D dose should be based on vitamin D serum level, weight, age, skin color, medication use, sun exposure and dietary intake of vitamin D. • Participate in weight bearing and strength building sports e.g. running, basketball. Weight lifting may put the athlete at risk for fracture until low bone density is resolved. • Discuss your bone health with your health care provider who may conduct additional tests and recommend treatment.
	-2.0 or lower Referral required	<ul style="list-style-type: none"> • Very Low Bone Density: Advise daily calcium intake of 1000-1200 mg per day from food and/or supplements. • Supplemental vitamin D dose should be based on vitamin D serum level, weight, age, skin color, medication use, sun exposure and dietary intake of vitamin D. • Participate in weight bearing and strength building sports e.g. running, basketball. Weight lifting may put the athlete at risk for fracture until low bone density is resolved. • Discuss your bone health with your health care provider who may conduct additional tests and recommend treatment.
	+3.5 or higher Referral Required	<ul style="list-style-type: none"> • Very High Bone Density: Advise to discuss bone health with their health care provider who may conduct additional tests, and recommend treatment.

Training and Teaching Aids for Volunteers

All materials are available in this manual and on the Special Olympics International website [http://resources.specialolympics.org/Topics/Healthy Athletes/Disciplines/Health Promotion.aspx](http://resources.specialolympics.org/Topics/Healthy_Athletes/Disciplines/Health_Promotion.aspx)

- Sahara instructions and forms: **Chapter 3 - Appendix**
 - [Sahara Calibration and QC Procedures](#)
 - [Repacking the Sahara](#)
 - [Sahara Request Form United States](#)
 - [Sahara Request Form International](#)




For supplies and ordering information regarding the Bone Density Machine, refer to **Chapter 2: HP Logistics and Administrative Topics Supplies and Equipment Ordering Information**





References

1. National Osteoporosis Foundation
 - a. December 2014: Ask the Expert, "What impact do intellectual and developmental disabilities have on an individual's bone health?"
<http://nof.org/files/nof/public/content/file/4309/upload/1051.pdf>
 - b. Vitamin D Status Around The World: Interactive global map for Vitamin D status. 2015
www.iofbonehealth.org/facts-and-statistics/vitamin-d-studies-map
2. Joanne E. Wilkinson, MD, MSc, Larry Culpepper, MD, MPH and Mary Cerreto, PhD J; Screening Tests for Adults with Intellectual Disabilities; Am Board Fam Med July-August 2007 vol. 20 no. 4 399-407.
3. U.S. Department of Health and Human Services. The Surgeon General's Report on Bone Health and Osteoporosis: What It Means To You. U.S. Department of Health and Human Services, Office of the Surgeon General, 2012.
www.niams.nih.gov/Health_Info/Bone/SGR/surgeon_generals_report.asp

Bone Density Screening Procedure Instruction Guide

Have a copy of this available for BMD screeners reference.

Images	Instructions and Notes
	<p>Step One:</p> <ul style="list-style-type: none"> • Calibrate the machine following the steps in the Sahara instruction manual (also on next page). • Clean the machine with <i>Baby Fresh Wipes</i>. <p>Do not use Bleach, Clorox wipes, or alcohol pads.</p>
	<p>Step Two:</p> <ul style="list-style-type: none"> • Plug the machine into a grounded outlet and turn the power on at the black box. A green light will appear. • Press the on button and the screen will say: <p>“Power on Self-Test” “In Progress.....”</p> <ul style="list-style-type: none"> • After a few moments the screen will say: “Ready” “Press ON”
<p>Figure 1. Press “On”</p> 	<p>Step Three:</p> <ul style="list-style-type: none"> • Press the “On” button (See Figure 1) • The screen will say: “Initializing” <p><i>This is a good time to describe the screening, let them know it won’t hurt, and what you’re testing.</i></p> <p><i>Ask other questions pertinent to bone health such as, “What sports are you involved in?” “What is your favorite dairy product?”</i></p>
<p>Figure 2. Press “open”</p> 	<p>Step Four:</p> <ul style="list-style-type: none"> • When the screen says, “See gel pads Press Open” • Press the “Open” button. (See Figure 2) • The transducers will come together, touch each other, and then retract <p>The screen will say, “Opening.....Insert foot and press measure” Do not put your foot in the machine!</p>
	<p>Step Five:</p> <ul style="list-style-type: none"> • The transducers are now retracted. • Place a foot sheet in the cradle. • Touch their left knee and ask the athlete put their left foot in the machine • Begin with the left foot. <p><i>Make sure the athlete’s heel is at the back of the foot carriage. It’s a good idea to rest your hand on top of the athlete’s foot to hold it still and provide reassurance.</i></p>
<p>Figure 3. Press “Measure”</p> 	<p>Step 6:</p> <ul style="list-style-type: none"> • Press “Measure.” (See Figure 3) • The transducers will close on the sides of the athlete’s foot. • Sound waves measure for about 30 seconds. <p><i>Continue to discuss bone health with the athlete. See Bone Health education for ideas</i></p>

	<p>Step Seven:</p> <ul style="list-style-type: none"> • The transducers will open on their own. • When they are fully open, ask the athlete to remove their foot. • Provide a tissue to wipe the gel from their foot. <p><i>Ask the athlete to remove their foot. This is important because the transducers will come back and touch during the "resetting" process. You may want to have them rest their foot to the side of the foot carriage in case you need to re-measure. E.g. if the result has an* beside it</i></p>
<p>Figure 4. Press "Prep"</p> 	<p>Step Eight:</p> <ul style="list-style-type: none"> • Push "Prep." (Figure 4) • The machine will process the score and display it on the LCD screen.
<p>Figure 5. Press "Print" (on the left), then press "On"</p> 	<p>Step Nine:</p> <ul style="list-style-type: none"> • Press "Print" for each left heel scanned, unless there is an * beside the score. Recheck up to 3 times while trying to get a score without *.' • Record the score on the HAS form. • Push "On" while printing, to reset the machine. <p><i>You can push "On" while the machine is printing which reduces the time between foot screenings a great deal. Use this time to record scores, ask questions, and explain the score obtained to the athlete.</i></p> <p><i>Screeners can reinforce the key messages for the Strong Bones component while the machine prints and re-sets for the next scan</i></p>
 <p>Athletes who use a wheel chair, the machine may be rested on the foot rest. It's important to test all athletes age 20 or older, especially those with ambulation difficulties.</p>	<p>Step Ten:</p> <ul style="list-style-type: none"> • When ready, repeat for the right heel. • Print the score for the right heel only if the score is lower than the left heel. • Staple the result to the right corner of the HAS Form. <p><i>Note: Do not record or attach results that have an * by them, as these scores are invalid. Redo test up to 3 times, and if a * appears each time, thank the athlete for their time, and note on HAS form "unable to test."</i></p> 

When screening an athlete, test the left heel first, followed by the right heel. Testing both heels is particularly important because our bodies are seldom symmetrical. For example we wouldn't test one eye and create a prescription for both eyes. Both T-scores are reported and treatment is based on the lower of the two scores. A significant variation in the two heel T-scores is not uncommon.

NOTE: There are specific instructions regarding the process to shut down and re-pack the machine on the next pages. Please review those before shutting down or returning any machines.

Performing Calibration and Quality Control Procedures with the Sahara

Calibration: Perform this process before beginning use, after it is unpacked. It should be recalibrated if the QC process fails after 3 attempts. Print the results of the process and save with the machine. This provides proof that it was in good working order before you begin testing giving assurance that all internal systems are operating correctly.

1. Turn machine on. Wait until it stops "opening and closing" and then
2. Push button that says Program
3. Push 2
4. Push enter
5. Push yes
6. Push yes
7. Then begin to follow the prompts that ask you to type in the numbers on the black "phantom" box. This will assure that the correct phantom is used with the machine.
8. Now follow the prompts exactly. If you type in the wrong number, or forget a decimal point, you can back space using the – key, but often, you'll have to start the entire process over so try not to get distracted.
9. Once the prompt reads "Calibration passed" you are ready to begin the testing process.

If the machine or the phantom is not at room temperature, the machine won't calibrate and you will have to wait about 60 minutes until the temperature stabilizes. Also, the phantom is the same temperature as the machine. If necessary, use a hair dryer or space heater to warm the area near the machine to speed up the process.

The rubber transducers may melt if heated up by direct sunshine.

Put the phantom back in the grey sponge box, zip lock bag or wrap with bubble wrap to protect it. Never store the phantom in the machine reservoir nor where it touches the machine as it will demagnetize.

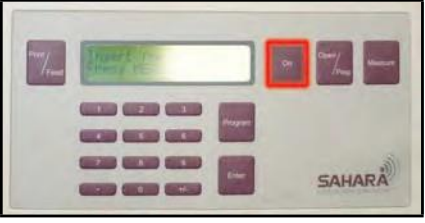
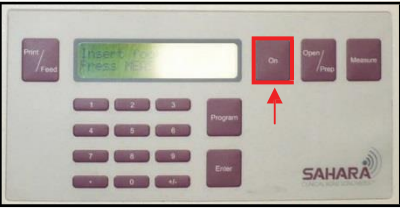



Quality Control (QC)


Perform this process after you do about 75 tests, or when you start getting asterix * beside the T scores. This means that the results are less than 100% accurate

1. Turn machine on. Wait until it stops "opening and closing" and then
2. Push button that says Program
3. Push 1
4. Push enter
5. Push yes
6. Push yes
7. When the transducers are "inside the machine", set the phantom in the foot resting spot. Press the measure button. The transducers will close and "measure the phantom".
8. Follow prompts and if all is well, the prompt will say QC passed.
9. If all is not well, it will say "QC failed. This means something is not okay with the machine, either the temperature of off, or the temperature is too cold or the machine is damaged. Refer to the **Sahara Manual** or call Hologic at 1-800-321-4659 for trouble shooting assistance.

Shutting Down and Repacking the Sahara

It is crucial for each Sahara machine to be repacked according to the following procedure. Omitting any one step will likely cause damage to the machine during the shipping process. Please follow these directions carefully.

Images	Instructions and Notes
	<p>Step One: Calibrate the machine following the steps in the Sahara instruction manual.</p> <ul style="list-style-type: none"> • Print the calibration tape to pack in the box. • Clean the machine with <i>Baby Fresh Wipes</i>. <p>Do not use Bleach, Clorox wipes, or alcohol pads.</p>
	<p>Step Two:</p> <ul style="list-style-type: none"> • Plug the machine into a grounded outlet and turn the power on at the black box. A green light will appear. • Press the on button and the screen will say: <p>“Power on Self-Test” “In Progress.....”</p> <ul style="list-style-type: none"> • After a few moments the screen will say: “Ready” “Press ON”
<p>Figure 1. Press “On”</p> 	<p>Step Three:</p> <ul style="list-style-type: none"> • Press the “On” button (See Figure 1) • The screen will say: “Initializing” <p><i>This is a good time to describe the screening, let them know it won't hurt, and what you're testing.</i></p> <p><i>Ask other questions pertinent to bone health such as, “What sports are you involved in?” “What is your favorite dairy product?”</i></p>
<p>Figure 2: Press “Open”</p>  <p>Figure 3.</p> 	<p>Step Four:</p> <ul style="list-style-type: none"> • When the screen says, “See gel pads Press Open” <ul style="list-style-type: none"> • Press the “Open” button. (See Figure 2) • The transducers will come together, touch each other (Figure 3), and then retract <p>The screen will say, “Opening.....Insert foot and press measure” Do not put your foot in the machine!</p>
<p>Figure 4. Insert plastic ring.</p> 	<p>Step Five:</p> <ul style="list-style-type: none"> • The transducers are now retracted. • Place the white plastic ring onto each transducer receptacle. (See Figure 4)

<p>Figure 5. Insert white foam block</p> 	<p>Step Six:</p> <ul style="list-style-type: none"> • Insert the white foam block between the two transducer rings protectors. • If the foam block does not fit, turn the machine off and begin again. • Do NOT scratch transducer heads (the things that retracted) by forcing the foam block between them. <p>This will not be a problem if the transducers are properly retracted</p>
	<p>Step Seven:</p> <ul style="list-style-type: none"> • Turn the machine off at the power box. • Unplug the machine from the wall. • Unplug the machine from the power box unit.
	<p>Step Eight:</p> <ul style="list-style-type: none"> • Place the machine in the shipping box with the foam padding provided.
	<p>Step Nine:</p> <ul style="list-style-type: none"> • Check to see the following items are in the box with the machine: • Power box and cord. • Any leftover gel, Kim Wipes, Baby Fresh Wipes, and printer tape. • The black QC rubber block. • Sahara Instruction manual.
	<p>Step Ten:</p> <ul style="list-style-type: none"> • Tape the box shut.
	<p>Step Eleven:</p> <ul style="list-style-type: none"> • Follow shipping instructions provided. • Store the machine according to instructions.

If you have problems or concerns about shipping the equipment, contact one of the following people from SOI Health Promotion:

- **PRIMARY Contact**
 - Peyton Purcell: ppurcell@specialolympics.org 202-824-0287 (office) or 914-844-4598 (cell)
- **Secondary Contact**
 - Mary Pittaway: mpitt59802@aol.com 406.543.8892 (home) or 406.544.3936 (cell)

Important Notes:

- Never store the Sahara in a cold location (50 degrees or below), nor should it be stored in an area higher than 80 degrees or higher, nor operated in direct sunlight to avoid melting the transducers. Keep the machine at room temperature at all times.
- Use the black rubber OQ block for calibrating or doing quality control tests ONLY.
- Do not replace the foam block by using the black, rubber OC block. This will damage the machine.
- If the foam block needed to keep the transducers separated is lost during shipment, call an SOI representative and request a replacement block (contact information below)
- If borrowed, return the machine to SOI or to Hologic within 24 hours after your event using the shipping instructions provided below.

Shipping Instructions

- Make sure to repack the machine exactly as per instructions above to avoid damage in shipment.
- Be sure to move the transducers such that they are “inside” the machine housing before placing the round plastic rings around each transducer, and before inserting the white foam block. Don’t scratch the transducers with the white foam spacer.
- If you lose the white rings or foam block DO NOT SHIP THE MACHINE BACK until we get you replacement parts.
- If parts get lost, and replacement parts are needed, SOI/Hologic will ship to parts to you overnight.
- On the shipping label, identify machine as “medical equipment” and insure the Sahara for \$7,000.

We have found that using ground shipping with FedEx is usually the least expensive shipping method.

If you borrowed the machine from SOI, the return address is:

Peyton Purcell,
Special Olympics International
1133 19th St, NW (11th Floor)
Washington, DC 20036
Office: 202-824-0287
Cell: 914-844-4598
Email: ppurcell@specialolympics.org

Please email Peyton the tracking number once the machine is shipped.

If you borrowed the machine directly from Hologic, please return the machine following instructions provided by Hologic.

Bone Density Frequently Asked Questions (FAQs)

What is Bone Mineral Density (BMD)?

- Bone Mineral Density (BMD) determines your bone health, the amount of minerals, mainly calcium in your bones.
- Proper amounts of minerals in bones keep them healthy and strong.

What does a BMD test measure?

- The test used to determine BMD can identify osteoporosis and determine risk for fractures (broken bones).
- It measures the density, or thickness, of your bones.
- The BMD test shows where you compare to people with healthy bone mineral density.

What do BMD Scores mean?

Level	Definition
Normal	T-score is between +1 and -1. Very low risk for fracture
Low bone mass or osteopenia	T-score is -1 to -2.4. Elevated risk for fracture
Osteoporosis	T-score is -2.5 SD or lower. This individual has 25% less bone mass than normal
Unusually high T-score	T-scores +3.5 or higher at risk for lead or other heavy metal exposure

What is the difference between osteopenia and osteoporosis?

- The difference refers to the amount of bone loss present. Osteopenia is less severe than osteoporosis. It's interesting to know that most fractures occur for people with osteopenia.
- Low bone density can be caused by factors such as vitamin D and calcium intake, tobacco and/or alcohol use, sedentary lifestyle, genetics, less-than-optimal bone mass during youth; a medical condition or medication to treat a condition that negatively affects bone and/or abnormally accelerated bone loss.
- Not everyone with low bone density will develop osteoporosis, but everyone with low bone density is at higher risk for the disease and resulting fractures and dental concerns.

How can I help slow down bone loss and prevent osteoporosis?

- Eat foods rich in calcium (milk, yogurt, cheese, broccoli, dark green lettuce, almonds).
- Take a calcium pill daily. Ask your doctor for a vitamin D test. Take a separate vitamin D pill daily to help keep your vitamin D blood levels between 40-60 ng/ml.
- Ask your doctor about using hormone replacement therapy.
- Ask your doctor to review medications for bone health side effects. Sometimes alternatives are available.
- Do weight bearing exercise such as walking, running or lifting weights
- Avoid tobacco and/or alcohol as both damage bones.

What should I do if I have osteoporosis?

- You should consult your doctor to determine what treatment plan the doctor recommends. Treatment plans are individualized, based on the underlying cause of the condition.
- Following the healthy habits above will help as well.

What are the treatments for osteoporosis?

- There is no cure for osteoporosis, but there are steps that can be taken to prevent, slow or stop its progress.
- It is important you see your doctor, who may want to schedule additional tests, including a vitamin D test, before a treatment plan is started. Your doctor may prescribe medication to either slow or stop bone loss or rebuild bone.
- Any treatment involves the behavior suggestions above including getting enough

We do not currently have a doctor -- what should I do?

- Talk with your SO Program as they may have resources to help connect you with a doctor or medical services for follow-up.

Training Skills Checklist for BMD Testing

When you are training volunteers, you can use a simple training tool like this to have the volunteers practice their skills at taking height and weight.

Unpack and set up Sahara machine, turn on.	Refer to instructions in the Sahara manual and/or previous pages.
Calibrate machine	Refer to instructions in the Sahara manual and/in previous pages.
Run Quality Assurance (QC) process on Sahara	Refer to instructions in the Sahara manual and/or previous pages.
Change printer tape	Refer to instructions in the Sahara manual. Graphics are also printed in the Sahara tape receptacle.
Test 5 subjects, right and left heel, and record on HAS form	Assure testing skills understood. Refer to BMD Screening Procedure in Section 3 in HP-CD Manual.
Provide nutrition counseling during testing	Use a glass of milk; cartons of Ca and vitamin D fortified soy milk and orange juice; Rice Dream; carton of unsweetened fat free yogurt. Ask athlete what they drink and how much. Discuss answer "that is great, and try to increase to three times a day." Or "when you eat in a restaurant, order milk not soda." For athletes who can't drink milk, discuss alternate ways of getting adequate calcium and vitamin D. Refer to attached Milk Comparison in HP-CD Manual – Chapter 5, Bone Health Station.
Identify the point at which a referral should be made, based on T-score.	Refer to T-Score graph and identify -1.0 or lower; +3.5 or higher as trigger for referral. See <i>Explaining BMD Test Results</i> in HP-CD Manual Screening References and Materials, BMD Station
Answer the question "are these machines accurate?"	FDA approves these machines for screening. It predicts future fracture risk (risk of breaking a bone). It is painless, quick and accurate. Take these results to your doctor.
Demonstrate how to find "error message" information in manual.	The Sahara Manual should be kept in storage pocket in Sahara carry case. Error messages and how to resolve them are detailed in Sahara manual.
Identify 5 reasons why you may not be able to get an accurate measurement for an athlete.	Athlete is under age 20; has an unusual heel shape (too wide or narrow); machine needs to have QC run; ambient temperature is too cold; athlete refuses test.
Describe 2 ways to insure that the screening results will be shared with the athlete, parents or guardian, and/or coach.	Brainstorm plan to share screening results with athlete's health care provider. What would work in your country or community?
Request a Sahara loaner machine(s) for your event.	Describe how to find and how to get a completed form to Mary, depending on whether your program is in or outside the SONA region. Chapter 3 - Bone Density Appendix
Repack the Sahara machine for shipment.	Refer to instructions in the HP-CD Manual Chapter 3 – Bone Density

Bone Mineral Density Appendix

Sahara Operation Reminders

Special Olympics offers bone density screening because people with intellectual disability are at higher risk for fractures. Some reasons for this health disparity include:

1. Inadequate intake of calcium and micro-nutrients
2. Inadequate sun exposure and/or intake of supplemental vitamin D
3. Excess consumption of soda in place of milk or soy beverages
4. Immobility and/or sedentary lifestyle
5. Use of tobacco and/or alcohol
6. Use of medications that accelerate bone loss such as anti-seizure drugs, Depo-Provera, NSAIDS, psychotropic medications
7. Estrogen or testosterone deficiency
8. Some conditions such as Down syndrome, Marfan syndrome, Premature Ovarian Failure and others.

By referring those with low bone density to their health care provider for further diagnostic testing (DXA) and medical intervention, many unnecessary fractures may be prevented.

1. The Sahara machine needs to be **calibrated** before using it the first time. Refer to the attached sections from the Sahara manual for detailed directions on the calibration and QC (**Quality Control**) procedures. The machine must be stored in an environment that is between 65 degrees F but no higher than 75 degrees F. If it gets too warm the transducers will melt. If it gets too cold, the machine will malfunction. **The machine needs to be at least 70 degrees to calibrate successfully.**
2. **Don't test folks under age 20.** They are still growing and the test results are not easy to interpret except when being done longitudinally.
3. Always start each athlete testing with the least **dominant heel**, usually the left. Then move to test the right heel. You will record both scores on the HAS form. (If a person is left handed, start with the right heel, if right handed, you start with the left heel.)
4. Change **foot paper** between athletes, but try to only use one sheet per athlete. Use Kleenex to wipe the athlete's heel, but only use Kim wipes when wiping the machine, to prevent fibers from getting into the machine.
5. For **gel application**, use a pea size amount of gel on the "angled" side of each transducer, where they make contact with the athlete's heel. You don't have to wipe the gel off the transducers even though the screen will tell you to do so. Gel protects the transducers from drying out and acts as a coupling layer between the heel and machine, transferring sound waves to the athletes' heel. Do not let the metal end of the gel tube touch the transducer as it may cause damage to the transducer. Apply the gel to the transducer with the tip of your finger.
6. Be very careful to write either "plus or minus" beside the T-score. If you don't put one or the other, the result cannot be used as SOI won't know if the T-score is below standard or above standard. For example, on the screen, the score will show -1.0 or 1.0 T-scores are shown on the machine screen, without the + sign, **you need to write the plus sign or minus sign in front of the T-score on the HAS form.** Record both left and right heel scores. Record results carefully. -1.0 is not the same as -0.1 and this is a common mistake. Please watch your testers throughout the day to make sure that these mistakes are avoided.

7. If you get repeated **asterix*** for an athlete, their heel may be too narrow or too wide or the foot wasn't correctly positioned for an accurate result. Repeat test up to 3 times as the problem may also be that the machine. Check the second heel. If you can't get a reading without an *, thank the athlete, tell them they did a great job and note this on the HAS form. If you get multiple asterix * readings for different athletes, you may need to follow the Quality Control (QC) procedure to reset the machine
8. Those with T scores of -1.0 or lower need medical follow up. Some athletes, especially weight lifters and distance runners, may have very high scores, nevertheless those with T scores of +3.5 or higher need follow-up due to the rare possibility of lead poisoning.
9. **Print** the results if your Healthy Athletes program has a plan to get them to the athlete, the athletes' parent or guardian.

If your questions are detailed and this "reminder list" doesn't answer them,

- a. Refer to the Hologic Operations Guide for additional instruction, http://media.specialolympics.org/soi/files/healthy-athletes/Health_promotion_Sahara_manual or
- b. Call Hologic Customer Care at 1-800-321-4659 during regular business hours EST, or
- c. Call Mary at home at 406-543-8892 or cell 406-544-3969.

Do not store the black rubber testing cube, referred to as the "phantom" anywhere except in its foam container, bubble wrap or zip lock bag. If it is touching the Sahara machine when not in use, the machine can be damaged due to an internal magnet in the phantom.

Make sure to repack the machine exactly as per instructions to avoid damage in shipment. Be sure to move the transducers such that they are "inside" the machine housing before placing the round plastic rings around each transducer, and before inserting the white foam block. Don't scratch the transducers with the white foam spacer. **If you lose the white rings or foam block DO NOT SHIP THE MACHINE BACK until we get you replacement parts.** If parts get lost, and replacement parts are needed, Mary will ship to parts to you overnight. On the label, identify machine as "medical equipment" and insure the Sahara for \$7,000. We have found that using ground shipping with FedEx is usually the least expensive shipping method.

The return address in the US is:

Peyton Purcell,
Special Olympics International
1133 19th St, NW,
Washington, DC 20036
Office: 202-824-0287
Cell: 914-844-4598
Email: ppurcell@specialolympics.org



Request Loan of Sahara Equipment
for Upcoming United States Healthy Athletes Health Promotion Event
Once completed, this Form should be returned to Peyton Purcell
(ppurcell@specialolympics.org)

Name of Special Olympics Program _____

Screening event dates _____ HP Clinical Director _____

Phone _____ Email _____

Address _____

How many athletes do you anticipate screening for bone density? _____

Person authorized to **receive** and sign for equipment:

Name and Title _____

Shipping address _____

Daytime Phone _____ Email _____

Person who guarantees the machine will be **protected** from theft; stored and used in an appropriate environment; and use will follow instructions in the Health Promotion Clinical Directors Manual 2015

Name and Title _____

Shipping address _____

Daytime _____ Phone _____ Email _____

Person responsible for assuring **return** of the equipment within 24 hours following close of the screening event; as per the detailed repacking instructions:

Name and Title _____

Shipping address _____

Daytime _____ Phone _____ Email _____

Special Olympics _____ (*Insert Program Name*) will refer athletes with low bone density to their health care provider for follow up on the identified condition. A description of our programs' plan is included with this Sahara request form. I will submit a brief report of the outcome of these referrals within 3 months after the event.

After use, repack the machine EXACTLY as instructed to avoid costly damages. Return machine according to the Hologic representative's information. Ship the machine out within 24 hours after the close of your event so the equipment will be available for the next programs' event.. Follow "repacking Sahara" instructions including purchase of insurance of the Sahara (medical equipment) for \$7,000.

Ship machine by FedEx to:

Special Olympics (C/O Peyton Purcell)
1133 19th Street, NW,
11th Floor
Washington DC 20036
Phone: 202-824-0287

NOTE: Please Email the tracking number to Peyton at ppurcell@specialolympics.org



**Request Loan of Sahara Equipment for Upcoming
For Upcoming **International** Healthy Athletes Health Promotion Event**
Once completed, this Form should be returned to Peyton Purcell
[\(ppurcell@specialolympics.org\)](mailto:ppurcell@specialolympics.org)

Name of Special Olympics Program _____

Screening event dates _____ HP Clinical Director _____

Phone _____ Email _____

Address _____

How many athletes do you anticipate screening for bone density? _____

Person authorized to **receive** and sign for equipment: Name and Title

Shipping address _____

Daytime Phone _____ email _____

Person responsible for guaranteeing the machine will be **protected** from theft, stored and used in an appropriate environment and will be used as instructed in the Health Promotion Clinical Directors Manual 2015.

Name and Title _____

Shipping address _____

Daytime Phone _____ email _____

Person responsible for assuring **return** of the equipment within 24 hours following close of the screening event as per the detailed repacking instructions:

Name and Title _____

Shipping address _____

Daytime Phone _____ email _____

Special Olympics _____ *(insert Program Name)* plans to refer athletes with low bone density to their health care provider for follow up on the identified condition. A description of the programs plan is included with this Sahara request form. I will submit a brief report of the outcome of these referrals within _____ months after the event.

After use, repack the machine EXACTLY as instructed to avoid costly damages. Return machine according to the Hologic representative's instruction.



Height & Weight

Body Mass Index (BMI Screening Station)

Background Information:

Special Olympics Health Promotion conducts height and weight measurements, and calculates the athlete's Body Mass Index (BMI) or BMI percentile (individuals under 20 years of age). The BMI index is a simple index of weight for height that is commonly used to classify underweight, overweight and obesity.

BMI is a screening tool, **not** a diagnostic tool. The number simply defines who is at risk for weight related issues. In the US and other countries, the BMI for children under 18yrs is age and gender specific and should be reported as a percentile.

How to calculate an individual's BMI

The BMI for an adult and child is calculated the same way. See below for the formulas.

Measurement Units	Formula and Calculation
Kilograms and meters (or centimeters)	<p>Formula: $\text{weight (kg)} / [\text{height (m)}]^2$</p> <p>With the metric system, the formula for BMI is weight in kilograms divided by height in meters squared. Since height is commonly measured in centimeters, divide height in centimeters by 100 to obtain height in meters.</p> <p>Example: Weight = 68 kg, Height = 165 cm (1.65 m) Calculation: $68 \div (1.65)^2 = 24.98$</p>
Pounds and inches	<p>Formula: $\text{weight (lb)} / [\text{height (in)}]^2 \times 703$</p> <p>Calculate BMI by dividing weight in pounds (lbs) by height in inches (in) squared and multiplying by a conversion factor of 703.</p> <p>Example: Weight = 150 lbs, Height = 5'5" (65") Calculation: $[150 \div (65)^2] \times 703 = 24.96$</p>

Interpretation of BMI

Adult

Special Olympics Healthy Athletes Program uses the World Health Organization's (WHO) BMI Classification. Within the WHO, there has been discussion of a different BMI cut-off points for different ethnic groups. At this time there are no WHO countries or regional standards for BMI.

Weight Status Classification	BMI
Underweight	<18.5
Healthy Weight	18.5 - 24.9
Overweight	≥ 25
Obese	≥ 30

WHO 2014

Child (*birth to the 20th birthday*)

A BMI for children is age and gender specific and is expressed as a BMI percentile. The first step is to calculate the BMI as described above. The second step is to determine the BMI percentile. SO Health Promotion provides each Clinical Director with a BMI calculator wheel to determine the athlete's BMI percentile. If one is not available an online calculator or a smart phone app or a pediatric BMI table can be used. The Healthy Athletes Software (HAS) will calculate the BMI/BMI percentile when the data is entered in the system.

Pediatric BMI Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

U.S. Centers for Disease Control 2014

Online BMI calculators

Adults

- U.S. Centers for Disease Control: http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/english_bmi_calculator/bmi_calculator.html
- European Food Information Council: <http://www.eufic.org/article/en/rid/eufic-bmi-calculator/>

Children

- U.S. Centers for Disease Control: <http://apps.nccd.cdc.gov/dnpabmi/>
- Kids Health Nemours: http://kidshealth.org/parent/growth/growth/bmi_charts.html

Equipment Standards

Scale Requirements (weight measurement)

- High quality beam balance or electronic digital
- Weighs in 0.1 kg (100 gm) or 1/4 lb increments
- Weight can be 'locked' in
- Weight is read at 'eye level' of measurer
- Stable weighing platform- a platform large enough to support the individual being weighed
- Can be easily 'zeroed'
- Can be calibrated
- No stature device attached
- No wheels on scale

Do not use spring balance and home use scales. These scales are not accurate over time. In addition, these scales often cannot be read to the nearest one-half or one-quarter pound.

Stadiometer Requirements (height measurement)

- A vertical board with an attached English/metric rule
- An easily moveable horizontal headboard that can be brought into contact with the most superior part of the head
- A wide and stable platform or firm uncarpeted floor as the base
- Firmly mounted on a stable wall
- Easily read, stable tape or digital readout in 0.1cm or 1/8 inch increments

The measuring rod attached to a scale should not be used to measure height. They are inaccurate, they do not provide a firm platform for the measurement, the headpiece is unsteady, too narrow and the base (scale weighing platform) will sink because of the individual's weight. The rod is somewhat sharp and can pose a safety hazard for the individual being measured. A tape affixed to the wall should not be used. The baseboard and accurate estimation of the height contribute to errors in measurement.

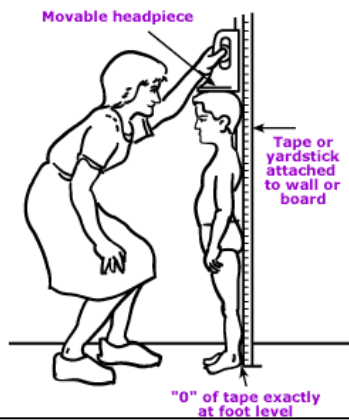
See HP Logistics and Administrative Topics ([Equipment and Supplies List – Chapter 2](#)) for information on ordering approved scales and stadiometers. These items can be purchased with Special Olympics Healthy Athletes Health Promotion grants.

Measurement Protocol

In the appendix of this Chapter there are two measurement posters (one for height and one for weight) which can be hung by the height and weight station to remind volunteers about the proper process for taking height and weight.

Height

Many athletes may have shoes, boots, caps, sports packs, jacket, hair accessories and other bulky items that interfere with measurement. Request that they remove these for the height measurement. It is most important to get the height without shoes or boots.



Permission to use from Washington State
Department of Health



Correct procedure

Step 1-Athlete placement on stadiometer- Have the athlete stand with his/her back against the measuring surface. The feet should be flat on the floor or foot piece, with both heels comfortably together and touching the base of the vertical board. When possible, the head, shoulder blades, buttocks, and heels should touch the measuring surface.

Step 2-Measure athlete- With the athlete looking straight ahead; slide the headboard firmly down to the top of the head compressing the hair. Be sure that the headboard is level and at right angles to the tape. Have the athlete move out from under the headboard.

Step 3-Record Measurement- With your eyes level to the bottom of the headboard, read the height to the nearest 0.1 cm or 1/8-inch* and record the measurement on the athlete's HAS form.

* A stool may be needed by the volunteer to read the height if the athlete is taller than the volunteer is.

Weight

Athletes should be weighed in light clothing. All shoes, boots, jackets and heavy clothing should be removed. In addition, many athletes have fanny packs, medals, and other items that will impact their weight. Request that they remove these for the weight measurement.

Step 1- **Balance** the scale at zero before weighing each athlete.

- **Digital scales**- push the button to zero the scale if it does not self-zero.
- **Beam balance**- move both weights left to zero before each use. If the scale does not balance at the midpoint, adjust the counterweight until it does.

Step 2- **Weigh** the athlete

- **Digital scales** –ask the athlete step up on the scale, wait until the digital reading has stopped and record the weight.
- **Beam scales** – ask the athlete to step up on the scale, then move the 50-pound weight to the approximate area for centering the arrow, and then move the pound to the right until the arrow is centered.

Step 3- **Record** the Measurement

- Read the measurement to the nearest ounce or 0.1 kg and record the measurement on the athlete's HAS form.

NOTE: If you are using a digital scale or balance beam scales, there is a chart on page 80 that shows how to easily convert decimals or ¼ pound measurements to ounces to enter the data into the HAS form.

Thank the athlete for their assistance in gathering the height and weight.

How to Avoid Measurement Errors

Make sure that measurements are accurate by:

- Using the correct equipment and checking it regularly for accuracy.
- Using the correct technique and always following standard procedures.

Frequent causes of error in measurement

- Using incorrect equipment. Do not measure using the height rod on scales. Bathroom scales should never be used to weigh.
- Misreading the measurement. Practice reading the fractional division of inches/centimeters or ounces/kgs. on your equipment. Confirm with your volunteers if you are going to use English or Metric and stick with only one.
- Failure to balance scales at zero before each use. Follow the described procedure for balancing scales before measuring every individual.
- Not positioning the athlete properly before measuring, check to be sure feet are flat on the floor and heels touch the back of the stadiometer.
- Measuring height with shoes on and weight with excess clothing. All athletes should be measured without shoes and excess clothing, fanny packs and other gear.
- Failure to use a right angle headboard when measuring height. Make sure that your venue has this equipment and it is used each time height is measured.
- Recording errors on HAS form- only put English measures in the English line or metric in the metric line.



Alternative Methods for Measuring Height and Weight

If the athlete has physical limitations that make it impossible to allow standard procedures, please refer below alternate methods for taking weight and height measurements.

Arm Span

Arm span can be used to estimate a person's stature. Arm-span is measured from the tip of the middle finger on one hand to the tip of the middle finger on the other hand, with arms outstretched as far as possible during measurement. This measurement is preferably done with an anthropometer, a straight rod which has measurements etched on it. There is an immobile tab at one end and a sliding tab at the other for the middle finger tips to touch (similar to an adjustable curtain rod). An expandable tape measure is used if an anthropometer is not available. Arm span has been found to correlate directly to stature.



Knee Height

Stature can be estimated from knee height when standing height cannot be measured. The knee height is measured with a sliding broad-blade caliper, such as the Ross ® Knee Height Caliper. With the subject lying on his/her back, both the left knee and ankle should be bent to a 90-degree angle. The fixed blade of the caliper is placed under the heel and the sliding blade is pressed down against the thigh about 2 inches behind the knee cap. The shaft of the caliper is held parallel to the shaft of the tibia, and pressure is applied to compress the tissue. The average of two measurements is converted to stature (cm) using one of the following equations:

- White Males 6 – 18 years: $\text{Stature} = (\text{knee height in cm} \times 2.22) + 40.54$
- Black Males 6 – 18 years: $\text{Stature} = (\text{knee height in cm} \times 2.18) + 39.60$

- White Males 19 – 59 years: $\text{Stature} = (\text{knee height in cm} \times 1.88) + 71.85$
- Black Males 19 – 59 years: $\text{Stature} = (\text{knee height in cm} \times 1.79) + 73.42$

- White Females 6 – 18 years: $\text{Stature} = (\text{knee height in cm} \times 2.15) + 43.21$
- Black Females 6 – 18 years: $\text{Stature} = (\text{knee height in cm} \times 2.02) + 46.59$

- White Females 19 - 59 years:
• $\text{Stature} = (\text{knee height in cm} \times 1.86) - (\text{age in yrs.} \times 0.05) + 70.25$

- Black Females 19 – 59 years:
• $\text{Stature} = (\text{knee height in cm} \times 1.86) - (\text{age in yrs.} \times 0.06) + 68.10$

Sitting Height and Crown-Rump Length

Sitting height or crown-rump length may be used when children are unable to stand or have severe contractures. A standard recumbent length board and stadiometer are the measuring devices. The only additional equipment needed for these measures is a sitting base for sitting height. Using the sitting surface and a wall mounted stadiometer, the child sits on the base as erect as possible with the buttocks, shoulders and head in contact with the backboard of the stadiometer. It is ideal to have the legs hanging freely, hands resting on thighs, and knees pointed straight ahead. The head is positioned in the same manner as when doing a standing

height, and the headboard is brought down for the measurement. Repeat the measurement for accuracy.

After the measurement, the height of the sitting surface is subtracted from the reading to estimate sitting height. Sitting height percentiles are available for assessment purposes and are included in this handout. It is also possible to record the sitting height on the CDC growth charts and over time the series of measurements may indicate a pattern of growth, even though a percentile will not be indicated.

For crown-rump length the child lies on a recumbent length board. The head is positioned as in doing a normal length. The legs are raised so that the thighs are at a 90 degree angle to the board and held in that position during the measurement. The sliding footboard is brought up against the buttocks with firm pressure and the reading is taken. It should be repeated for accuracy.

Adapted from NC Nutrition Services Section- Pediatric Nutrition Course 12/08

Waist Circumference

Excess abdominal fat is an important, independent risk factor for disease. The evaluation of waist circumference to assess the risks associated with obesity or overweight is supported by research. The measurement of waist-to-hip ratio provides no advantage over waist circumference alone. Waist circumference measurement is particularly useful in patients who are categorized as normal or overweight. It is not necessary to measure waist circumference in individuals with BMIs ≥ 35 kg/m² since it adds little to the predictive power of the disease risk classification of BMI. Men who have waist circumferences greater than 40 inches, and women who have waist circumferences greater than 35 inches, are at higher risk of diabetes, dyslipidemia, hypertension, and cardiovascular disease because of excess abdominal fat. Individuals with waist circumferences greater than these values should be considered one risk category above that defined by their BMI. The relationship between BMI and waist circumference for defining risk is shown in Table 2 on page 10.

https://www.nhlbi.nih.gov/files/docs/guidelines/prctgd_c.pdf

For additional information on measuring the height of children with special needs refer to: <http://depts.washington.edu/growth/cshcn/text/page3d.htm>

Training and Teaching Aids for Volunteers

See Appendix for height/weight protocol training/teaching aids and equipment resources information.

1. BMI Chart Boys ([Chapter 3 – BMI Appendix](#))
2. BMI Chart Girls ([Chapter 3 – BMI Appendix](#))
3. Avoid Measurement Error
4. Weight Poster
5. Height Poster
6. Stadiometer Set Up
7. Alternate Methods for Measuring Linear Growth
8. BMI Resource List
9. BMI Equipment and Supplies Resources ([Chapter 2 - Supplies and Equipment](#))

Height and Weight Quality Assurance Tool

Equipment Set up

- Scale plugged in or batteries work
- Set on flat surface
- Close to stadiometer

- Stadiometer- measurement numbers line up on both sides
- Set on flat surface
- Close to scale

- Chairs in area for athlete to take on/off shoes
- Area for shoes

Remember: Athletes should take off hats, shoes, fanny packs, etc. before having their height and weight taken.

Quality Assurance

- ✓ Set a regularly scheduled time for quality assurance observation of measurements
- ✓ Check all equipment before the training session begins
- ✓ Review the manual materials related to weighing and measuring before the session begins
- ✓ Establish Measurement teams of two individuals
- ✓ Each team completes a height and weight on two athlete- compare results

Training Skill Session BMI- Height and Weight Recording Form

When you are training volunteers, you can use a simple training tool like this to have the volunteers practice their skills at taking height and weight.

Date _____/Location _____

Health Promotion Clinical Director signature _____

Team # _____

Athlete # 1	Athlete # 1	Athlete # 2	Athlete # 2
Weight:	Weight:	Weight:	Weight:
Height:	Length:	Stature:	Stature:
Measurer:	Measurer:	Measurer:	Measurer:
Recorder:	Recorder:	Recorder:	Recorder:

Body Mass Index (BMI) Frequently Asked Questions

What is Body Mass Index (BMI)

- Body Mass Index is a number calculated from a person's weight and height.
- BMI is a reliable indicator of body fatness for most people.
- BMI does not measure body fat, directly, but research has shown that BMI correlates to direct measures of body fat, such as underwater weighing and dual energy x-ray absorptiometry (DXA)

How is BMI used?

- BMI is used as a screening tool to identify possible weight problems, but it is not a diagnostic tool.
- To determine if excess weight is a health risk, a healthcare provider would need to perform further assessments.

How is BMI Calculated?

- Formula
 - Weight (kg)/[height (m) x height (m)] OR Weight (lb)/[height (in) x height (in)]
- BMI numbers for Adults are based on the above formula.
- BMI numbers for children and youth are based on the above formula and then converted to percentile specific to Sex and age using pediatric charts/tables available at: <http://nccd.cdc.gov/dnpabmi/calculator.aspx>

Weight Status Categories

- For Adults: see chart on right.
- For children, refer to the BMI charts in the Chapter 3 BMI - Appendix or use the pediatric conversion wheels (available on the equipment and supplies list in Chapter 2)

BMI	Weight Status
Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30.0 and Above	Obese

What are the consequences of being overweight or obese?

- Individuals who are overweight or obese are at increases risk for many diseases and health conditions including: hypertension, type 2 diabetes, heart disease, stroke, osteoarthritis, respiratory problems and some cancers.

If I am overweight or obese, how can I take care of myself or help myself get to a normal weight

- Eat a better diet (make half your plate fruit and vegetables)
- Be vigilant of portion sizes when eating meals.
- Exercise regularly (60-90 minutes, 5 times a week at moderate intensity)
- Reduce soda and sugary drink consumption -- drink more water.

When should I worry about being underweight?

- You should consult your doctor to determine if you should gain weight, as low BMI can decrease your body's immune system, which could lead to illness such as bone loss, malnutrition, disappearance of periods (for women), and other conditions.

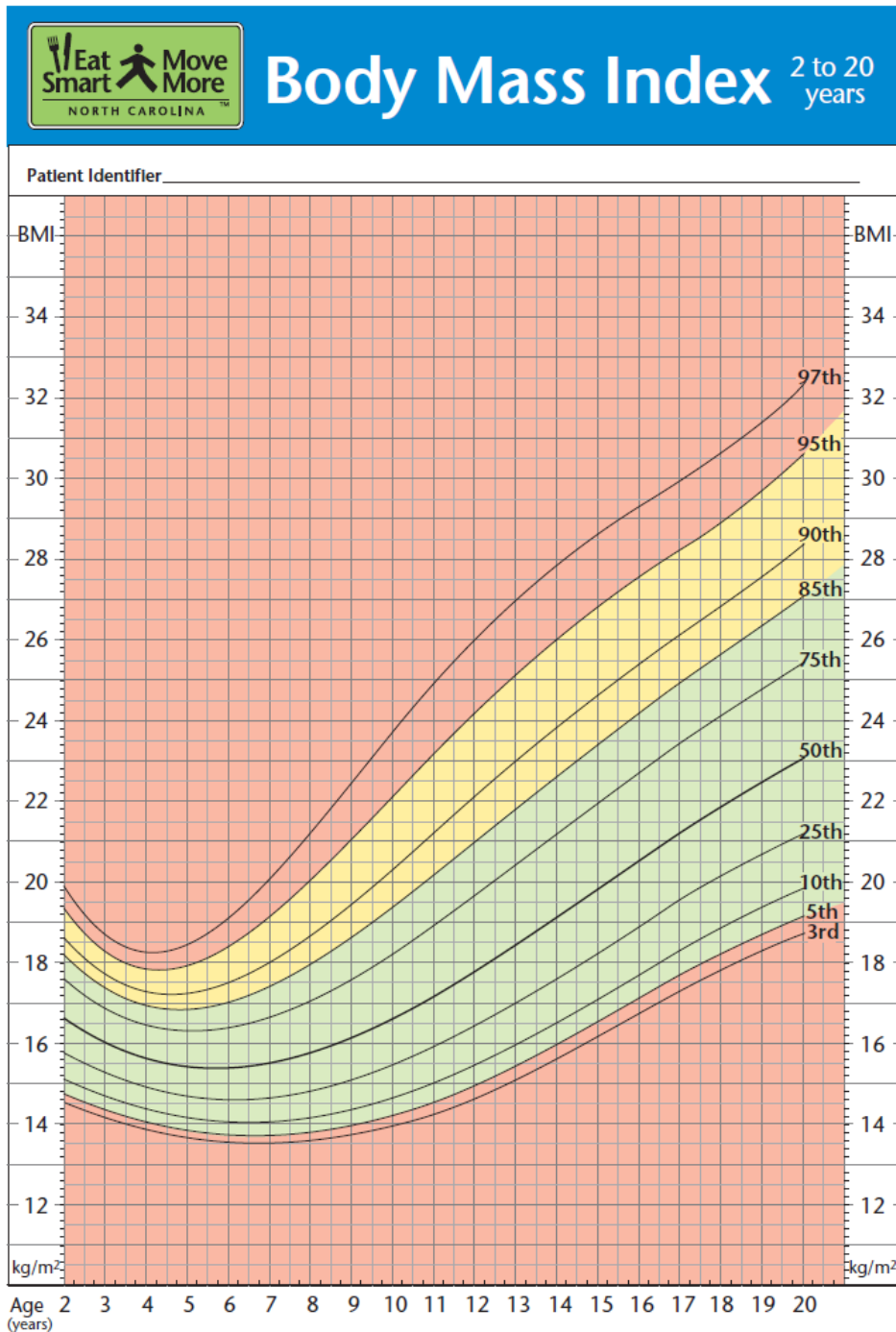
What are the treatments?

- In most cases, maintaining an active lifestyle, exercising regularly,, and eating a better diet will be the treatment to achieving a healthy weight status.
- However, Special Olympics suggests meeting with a doctor to discuss a plan and ensure no other health issues.

We do not currently have a doctor -- what should I do?

- Talk with your SO Program as they may have resources to help connect you with a doctor or medical services for follow-up.

Body Mass Index Chart - Male Youth



BOYS

To calculate BMI:
Kilograms and meters:
 weight (kg) / [height (m)]²
Pounds and inches:
 weight (lb) / [height (in)]² x 703

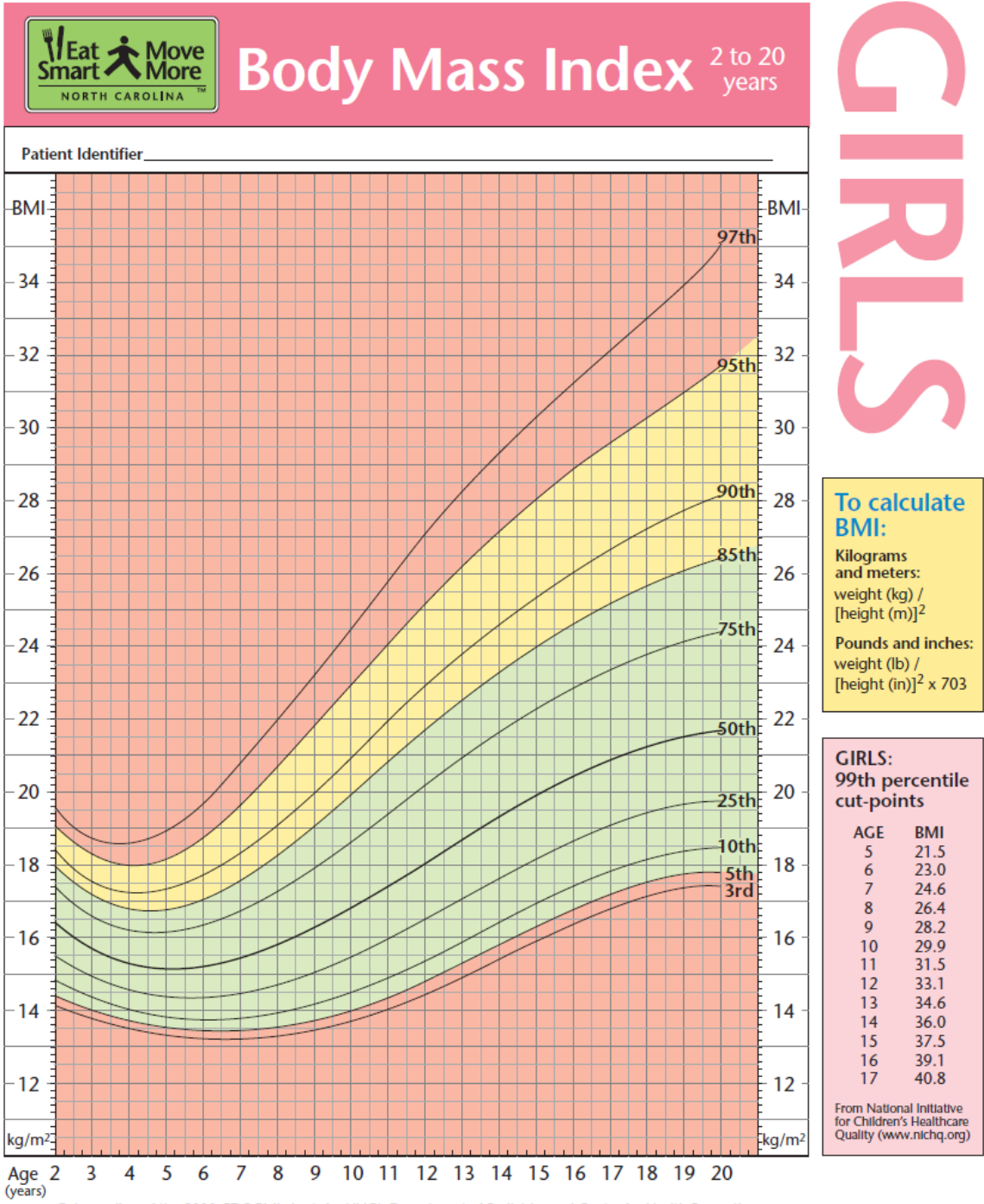
BOYS:
99th percentile cut-points

AGE	BMI
5	20.1
6	21.6
7	23.6
8	25.6
9	27.6
10	29.3
11	30.7
12	31.8
13	32.6
14	33.2
15	33.6
16	33.9
17	34.4

From National Initiative for Children's Healthcare Quality (www.nichq.org)

Color coding of the 2000 CDC BMI charts by UNC's Department of Pediatrics and Center for Health Promotion and Disease Prevention (CDC Cooperative agreement U48-DP-000059) for research and clinical purposes

Body Mass Index Chart – Female Youth



Tool For Easily Convert to Ounces for Reporting on HAS Form

Digital scale reading

Digital scales report weight measure and report in pounds and 1/10th pound (decimal) increments. Use the chart below to convert from a decimal to ounces.

Decimal	Ounce Conversion
.0	0 oz
.1	2 oz
.2	3 oz
.4	6 oz
.5	8 oz
.6	10 oz
.7	11 oz
.8	13 oz
.9	14 oz

Balance beam scale reading

Balance beam scales measure and report in 1/4 pound increments. Use the chart below to convert from 1/4 pound increments to ounces.

1/4 pound measure	Ounce Conversion
1/4 pound	4 oz
1/2 pound	8 oz
3/4 pound	12 oz

NOTE: This poster can be displayed at the height/weight station for all screeners to reference.

Weight Measurement Poster



1. Equipment Requirements

- High quality beam balance or electronic scale.
- Weighs in 0.1KG increments
- Weight can be locked in
- No sature device attached
 - No wheels on scale
- Do not use spring balance or home-use scales.



2. Athlete/Equipment Preparation

- Ask the athlete to remove shoes, hat, coat, sweater, fanny pack and medals
- Zero the scale, be sure it is on KG
- Ask athlete to step on the scale.



3. Athlete Placement

- Ask the athlete to stand at the center of the scale and to stand still while the scale measures.



4. Read and Record Weight

- Record the weight to the nearest 0.1 KG on the form.

NOTE: Be sure to have the scale on level ground (preferably not on carpet). Have an area for athletes to sit down and remove their shoes close to where they will have their height and weight taken.

NOTE: This poster can be displayed at the height/weight station for all screeners to reference.

Height Measurement Poster



1. Equipment Requirements

- A stadiometer with a 6 inch or wider headboard.
- OR
- A non stretch tape affixed to the wall
 - Headboard with right angle.



2. Athlete Preparation

- Ask the athlete to remove shoes, hat, coat, sweater, fanny pack and medals
- Stand tall and face the volunteer, looking straight ahead.



3. Athlete Placement

- Make sure there are three points of contact with the stadiometer/wall
1. Shoulder
 2. Buttocks
 3. Heels



4. Athlete Measurement

- Lower the headboard until it touches the top of the athlete's head and creates a right angle with the measurement surface.
- Read the height (where the bottom of the headboard touches the measuring tape) to the nearest centimeter.



Stadiometer Set Up



1. Stadiometer pieces (3-- head board, board, measuring rod)

2. Clasp



3. Secure the clasp



4. What it looks like when the clasp is in place



5. Insert measuring rod -- be sure the numbers line up properly



6. Read the measurements



BMI Equipment and Supplies Resources

Please refer to the full [Equipment and Supply list in Chapter 2](#) for all materials needed for a HP event.

Scales- must meet the specifications defined in the BMI Screening Protocol of this manual.

Approved equipment includes the following:

- Doran DS6100- portable, battery operated, 500 # capacity, has a pound or kilogram switch, 3 year warranty.
- SECA 869- portable, battery operated, 550 # capacity, has a pound or kilogram switch, 2 year warranty.
- Health O Meter 752 KL- portable, battery operated, 600 # capacity, has a pound or kilogram switch, 2 year warranty.

Stadiometer- must meet the specifications on page 1 of this manual. Contact the Health Promotion Manager if considering purchase of a different stadiometer.

- Perspective Enterprises Portable Adult Measuring Unit™- a freestanding stadiometer. A removable stature rod and hinged support legs and base allow this unit to be folded for transport and storage. Comes with a separate head piece. Order the carrying case for easy transport.

Recommended Equipment Vendor- Perspective Enterprises is the recommended vendor for Special Olympics Health Promotion height and weight equipment. They offer special pricing for Special Olympics.

Contact: <http://www.perspectiveent.com/>

Perspective Enterprises
7829 S. Sprinkle Road.
Portage, MI 49002
Phone: (269) 327-0869
Toll-Free: (800) 323-7452
Fax: (269) 327-0837

BMI Wheels- for manual calculation of BMI (or use smart phone apps)

Adult BMI Wheel Calculator

Trowbridge & Associates- Wheel for adults, available for Metric or English-\$5 plus shipping

Contact: <http://bmiwheel.com/>
E-mail: trowbridge-associates@comcast.net
Telephone: (404) 728-0705
Fax: (866) 536-9370

Pediatric BMI Wheel Calculator

McGill Discount Nurse Supplies- Calculates pediatric BMI on one side and BMI percentile (based on gender) on the other side. \$4.90 plus shipping.

Contact: <https://www.macgill.com/home>
1000 N. Lombard Rd.
Lombard, Illinois 60148
Toll Free Order Line 1-800-323-2841
Toll Free Fax 1-800-727-3433
E-mail: macgill@macgill.com



Blood Pressure

Blood Pressure Screening Station

Background Information:

Blood pressure screening is included in Health Promotion (HP) for several reasons; to

- Identify athletes with abnormal blood pressure readings so action can be taken to prevent adverse medial events before, during and after completion.
- Provide appropriate lifestyle counseling and referrals to improve opportunity for athletes' to normalize blood pressure and improve their health.
- Add information relative to blood pressure to the data base on hyper and hypo tension, for this high risk population.
- Encourage inclusion of preventive health strategies for SOI athletes.

Many individuals are skilled at taking blood pressures. However, Special Olympics Healthy Athletes established procedures to assure that standardized screening, counseling, referrals and on site actions for abnormal blood pressures are followed.

Equipment Standards:

Each program needs at least three sizes of cuffs, pediatric, adult and an extra - large cuff.

For SOI screenings, use of digital sphygmomanometers is recommended because they are easy to operate with minimal training, and can be used in noisy environments. To improve accuracy of the devices, test individuals need to be tested on all cuffs to confirm that comparable results are obtained on each machine.

How to choose an appropriate blood pressure monitor:

- The common digital monitors can measure blood pressure on the upper arm. Wrist devices are not recommended for use at HP events.
- Blood pressure cuffs come in different sizes. Make sure the cuff size fits the athlete's arm as using an incorrect cuff may give inaccurate results.
- The width of the cuff should cover two-thirds of the upper arm. The cuff should be long enough to encircle the whole arm. People with brawnier arm or who are overweight may need bigger cuffs.

How to measure blood pressure using digital monitors

Blood pressure is the pressure exerted by circulating blood upon the walls of blood vessels. "Systolic pressure" is the blood pressure when the heart contracts. "Diastolic pressure" is the pressure when the heart relaxes

Hypertension (high blood pressure) is a chronic disease. An adult is said to have hypertension if his systolic blood pressure (SBP) is persistently above or equal to 140 mmHg or diastolic blood pressure (DBP) is persistently above or equal to 90 mmHg. Generally, an adult should keep his SBP below 120 and DBP below 80 mmHg



Easy-to-use digital blood pressure monitors are available and are highly accurate when properly used. It is important that blood pressure is measured properly to avoid inaccurate results, leading to inappropriate referrals and possible exclusion from participation in the day's sporting events.

Validate accuracy of your monitors: Read the manual carefully before operating the device, and follow the manufacturer's instructions. The blood pressure monitor should be periodically validated by testing one individual on each of the size appropriate devices. The results should be the same on all devices.

Before taking measurements: To improve accuracy of the reading, athletes should avoid smoking, eating, and physical activity 30 minutes prior to taking a reading. If he or she is showing signs of stress, avoid taking the measurement until the feeling subsides.

Measuring blood pressure: Make sure the athlete's arm is supported on a tabletop at an even level with their heart.

Ask the athlete to keep their feet on the floor and do not cross the legs. Roll up the sleeve to expose the upper arm and wrap the cuff around it.

Place the cuff on the exposed arm 2cm (about two finger-breadths) above the elbow. Make sure the tubing is placed at the center of the arm facing the front, and that the sensor is correctly placed. Pull the end of the cuff so that it is wrapped evenly and firmly around the arm. Check that the tightness of the cuff is appropriate: you should be able to just slip two fingertips beneath the cuff, near its edge at the top end. When the cuff inflates it should not cause any painful sensation



Before starting, carry on a pleasant conversation with the athlete, and explain what test you are doing. When the athlete seems relaxed, press the "start" button. During measurement, ask athlete to stay relaxed, while you continue to chat.

The cuff will inflate, then slowly deflate. When the measurement is complete, readings of the systolic and diastolic blood pressures and pulse rate will be displayed on the digital panel. Record the reading on the HAS form and refer to the SOI HP chart (in [Chapter 5, Check-Out Station](#)) for correct referral action, based on reading. Do not round up or down.

Blood Pressure

Right arm _____/_____

Left Arm _____/_____

Referral made for BP follow Up? Yes No Urgent Not Urgent

If an athlete has high BP on initial screening:

1. Remove cuff from arm.
2. Let the athlete sit for a few minutes
3. Hold a light conversation with the athlete, asking:
 - Do you drink coffee, tea, soda? How much each day?
 - Do you smoke or chew tobacco?
 - Do you take medicine for your blood pressure? If yes, did they take it today?
 - What exercise did you do today?
 - How are you feeling today? Probe to find out if anxious, stressed out or unhappy.
4. Repeat reading with another cuff
5. If still high, confirm a third time, using alternate arm
6. If still high, refer to blood pressure triage chart ([Chapter 5 – Check-Out Station](#)).

Troubleshooting: If any abnormality with the reading occurs during use, please check and correct the following:

Condition	Correction
Display is blank when power is on.	Check and correct the polarity of the installed batteries. Reinstall or replace batteries.
Cuff pressure does not increase after pressing “start” button.	Check and reconnect cuff attachment and hose.
Measurement incomplete or abnormally low or high values displayed.	Review and follow “Applying Your Blood Pressure Cuff” and “Taking Your Blood Pressure Reading” sections.
Measurements are different from those typically measured by physician or every measurement reading is different.	Blood pressure readings are influenced by physical and mental conditions and/or even the time of day.
Cuff pressure falls very slowly or not at all. Measurement is not obtainable.	Tubing connector ring may be missing and must be reattached.

Key Messages for Athletes About Preventing High Blood Pressure

1. Enjoy regular physical activity
2. Maintain a healthy weight
3. Manage stress
4. Avoid tobacco use and second hand smoke
5. Comply with medication prescriptions
6. If you drink, limit alcohol
7. Eat a diet that's rich in:
 - Fruits and vegetables
 - Whole-grain, high-fiber foods
 - Fat-free and 1 percent dairy products
 - Beans
 - Skinless poultry and lean meats
 - Fish, especially salmon, trout and herringAnd low in saturated and trans-fats and salt
Low in fast foods and processed foods, with few added sugars

Resources

1. Preventing High Blood Pressure: Healthy Living Habits
www.cdc.gov/bloodpressure/healthy_living.htm
2. Your Guide to Lowering Your Blood Pressure with DASH)
www.nhlbi.nih.gov/health/resources/heart/hbp-dash-index.htm
3. Preventing High Blood Pressure: Healthy Living Habits
www.cdc.gov/bloodpressure/about.htm
4. WHO Hypertension guidelines
who.int/cardiovascular_diseases/guidelines/hypertension/en/
5. Blood Pressure Tables for Children and Adolescents: from the Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents* www.nhlbi.nih.gov/health-pro/guidelines/current/hypertension-pediatric-jnc-4/blood-pressure-tables.htm

Blood Pressure Screening Station Appendix

Have this factsheet out at the station for volunteer reference.

Counseling Suggestions for Adults, Depending on BP Reading

BP in Normal Range:

Tell the athlete "Thank you, you did a great job. Your blood pressure is in the healthy range."

If BP in Hypertensive Range: Stage 1, Stage 2 or Stage 3

1. Remove cuff from arm.
2. Let the athlete sit for a few minutes
3. Hold a light conversation with the athlete, asking:
 - Do you drink coffee, tea, soda? How much each day?
 - Do you smoke or chew tobacco?
 - Do you take medicine for your blood pressure? If yes, did they take it today?
 - What exercise did you do today?
 - How are you feeling today? Probe to find out if anxious, stressed out or unhappy.
4. Repeat reading with another cuff
5. If still high, confirm a third time, using alternate arm
6. Refer to blood pressure triage chart.

HEALTH PROMOTION BLOOD PRESSURE GUIDE										
SYSTOLIC PRESSURE	>210	STAGE IV HYPERTENSION								
	180	STAGE III HYPERTENSION							STAGE 4	
	160	STAGE II HYPERTENSION						STAGE 3		
	140	STAGE I HYPERTENSION					STAGE 2			
	120	NORMAL				STAGE 1				
	90	HYPO	NORMAL				STAGE 1	STAGE 2	STAGE 3	
	60		NORMAL							
	40		NORMAL							
	20		NORMAL							
	0	NORMAL			STAGE 1		STAGE 2		STAGE 3	
		<50	60	70	80	90	100	110	>120	
		DIASTOLIC PRESSURE								
HY	Confirm, hydrate, seek medical opinion									
N	Release for other screening									
S1	Confirm, refer to physician, sports participation OK									
S2	Confirm, serious, no sports until cleared by physician									
S3	Confirm, threatening, no sports until cleared by physician									
S4	Confirm, emergency, no sports until cleared by physician									

BP on Stage 4 Hypertensive Range:

Follow instructions for **hypertension**; and if range is still above either 160 (for systolic) or 100 (diastolic), refer to EMT or medical personnel on site for confirmation and medical clearance.

This factsheet is available on the SOI website:

http://resources.specialolympics.org/Topics/Healthy_Athletes/Disciplines/Health_Promotion.aspx

Other Tips for Counseling:

Sodium: A Good Thing in the Right Amount

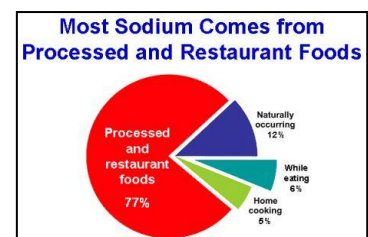
Sodium plays an important role in the body. It's essential for fluid balance, muscle strength, and nerve function. Iodized salt is table salt mixed with a minute amount of iodine salts. Worldwide, iodine deficiency affects about two billion people and is the leading preventable cause of mental retardation. Deficiency causes thyroid gland problems, including "endemic goiter". In many countries, iodine deficiency is a major public health problem that can be cheaply addressed by iodization of salt. Iodized salt is not used in processed food. Unfortunately, most of us get too much. U.S. guidelines call for less than 2,300 milligrams of sodium per day, about 1 teaspoon of table salt. And half of all adults should drop to 1,500 milligrams a day. Surprisingly, most of our salt intake is hidden in the foods we buy at the grocery store.

Why do processed foods contain so much sodium?

Salt helps prevent spoiling by inhibiting bacteria growth, yeast and mold. Salt brings out flavors in food. **Fast foods are higher in sodium, to increase thirst, and result in people buying beverages to quench their thirst.** Many people eat far more sodium than they need, with processed foods contributing as much as 75 percent of the sodium in the typical American diet. The 2010 Dietary Guidelines for Americans recommend limiting sodium to less than 2,300 mg a day, or 1,500 mg for those over the age 50, for African Americans or those with high blood pressure, diabetes or chronic kidney disease.

To reduce dietary salt try these tips:

- Eat more fresh foods, such as fresh fruits, vegetables, lean meats, poultry, fish and unprocessed grains. Only small amount of sodium is found naturally in these foods.
- Replace high-sodium foods with low-sodium products or products without added salt.
- Learn to cook foods such as soups, meat for sandwiches, deserts and casseroles. When home cooking, you control the salt that goes into a recipe.
- When eating out, ask that salt not be added to your food. Ask for sauces and salad dressings on the side so that you can control the amount you use.
- Instead of buying seasoning packets like taco spices, gravy, salad dressings, marinades, use herbs and spices, rather than salt to flavor your food.
- Remember to get iodine from a multivitamin if you don't use iodized salt at home. (restaurants and food processors use non-iodized salt)
- Adding fruit, leafy green vegetables and root vegetables, dairy products and dried beans provide potassium which helps control blood pressure.
- Maintaining a healthy level of vitamin D further reduces blood pressure.



Frequently Asked Questions (FAQs) – Blood Pressure

What is blood pressure?

• Blood pressure is the force of blood against your artery walls as it circulates through your body. The organs in your body need oxygen to survive. Oxygen is carried through the body by the blood. When the heart beats, it creates pressure that pushes blood through arteries and veins, also known as blood vessels and capillaries. The pressure --- blood pressure --- is the result of two forces. The first force occurs as blood pumps out of the heart and into the arteries that are part of the circulatory system. The second force is created as the heart rests between heart beats.

What does my blood pressure number mean?

• The first number is the systolic number, and represents the pressure when your heart beats. The second number is the diastolic number and represents the pressure when your heart is at rest.

Stages of Blood Pressure Levels

- Normal blood pressure—less than 120/80
- Prehypertension—120/80 or higher, but less than 140/90
- Stage 1 high blood pressure—140/90 to 159/99
- Stage 2 high blood pressure—160/100 or higher

What does it mean to have a high blood pressure?

- High blood pressure means the force of blood against your artery walls is higher than it should be.
- High Blood Pressure can be fatal or lead to serious health problems.
- When blood pressure is higher than normal most of the time, it starts to damage the blood vessels, heart, and kidneys. This can lead to heart attack, stroke, and other heart disease.

Why does [athlete] need to see a doctor for this?

• High Blood Pressure needs to be addressed so it is not damaging a person's body. A plan to reduce blood pressure or medication may be prescribed.

If I have high blood pressure, how can I take care of myself or manage my blood pressure level?

- Eat a better diet, which may include reducing salt and eating foods high in potassium like fruits, vegetables and legumes (beans).
- Do regular physical activity
- Maintain a healthy weight
- Manage stress
- Avoid tobacco smoke
- If you drink, limit alcohol
- Limit caffeine consumption

What causes high blood pressure?

- Many things can cause high blood pressure. Some unhealthy behaviors can contribute to high blood pressure such as not exercising enough, being overweight, smoking tobacco, or eating foods high in sodium. You should talk to your doctor about what might be causing high blood pressure and how you can prevent it in the future.
- It is also important that you talk to your doctor to make sure that you are not taking any medications that might raise blood pressure.

Why didn't I know that [athlete] had high blood pressure before?

- High blood pressure does not usually have warning signs or symptoms; so many people don't realize they have it. The only way to find out is to have a doctor or health care professional measure it.

What is the treatment for high blood pressure?

- It is best to talk to your doctor about potential treatments. We recommend you make an appointment with a primary care doctor to learn more. Possible recommendations include lifestyle changes or medication.

When should I worry about low pressure?

- Low blood pressure is a level lower than 90/60
- Low pressure is not an issue unless you have some of the following symptoms: dizziness or lightheadedness; fainting; dehydration and unusual thirst; lack of concentration; blurred vision; nausea; cold, clammy, pale skin; rapid, shallow breathing; fatigue; depression
- If you have any of the above symptoms you should see a doctor.

We do not currently have a doctor - what should I do?

- Talk with your SO Program as they be able to direct you to resources to help find a doctor or medical care.

Where can I learn more information?

- For more information on blood pressure, visit <http://www.cdc.gov/bloodpressure/>

Training Skills Activity: Blood Pressure

Volunteers measure athlete blood pressure in the left arm as a general health screening.

This will help determine whether the athlete is hypotensive (low blood pressure), hypertensive (high blood pressure) or has normal blood pressure.

Trainee/Volunteer Objectives:

Trainees will be able to:

- 1) Estimate the number of blood pressure stations given the estimated size of the event.
- 2) Calibrate the blood pressure monitors
- 3) Choose the correct size and of blood pressure cuff.
- 4) Correctly place the blood pressure cuff on athletes' arm.
- 5) Learn proper cut-off values for medical referral and/or suspension of athletic activity.
- 6) Learn decision tree for confirming abnormal values.

Athlete Objectives:

Safe participation in sports activity based on blood pressure criteria

Materials Needed:

Blood pressure cuffs, in adult, pediatric and extra-large sizes

Method or Activity Instructions - Blood Pressure Checklist Instructions:

Using the following list, observe trainees for at least 15 minutes as they interact with one or more athletes in the Healthy Athletes Health Promotion screening venue. Make a hash mark for each interaction observed. These observations are designed to provide insight to tangible suggestions for trainees.

Date of Observation: _____ Location/Event _____

Name of Trainee _____ Observed
by _____

Number of unique role play – volunteer interactions observed: 4

See table on next page for tracking observations.

Blood Pressure Competencies	Role Play				Observation Comments
	code for interaction observed				
	Hypo-tensive	Stage 1 or 2	Stage 3	Stage4	
Estimates number of BP stations needed based on event size and hours					300 athletes in 4 hours = 5 stations (based on 4 minutes per athlete)
Uses correct cuff size					
Aligns cuff with brachial artery					
Performs BP screening					
Identifies < 90/60 as hypotension					
Hydrates hypotensive athletes for retest 1/2 hour later					
Refers hypotension to physician and initiates STOP ACTIVITY order					
Identifies >140/100, <160/100 as stage 1 or 2 hypertension					
Retests stage 1 or 2 to confirm values					
Refers stage 1 or 2 to physician, once at home					
Identifies >160/100 as stage 3 or 4 hypertension					
Retests stage 3 or 4 to confirm values					
Refers stage 3 or 4 to physician and initiates STOP ACTIVITY order					

Ask trainees to identify action, based on the following results:

- Age 40 athlete with left BP of 91/51
- Age 20 athlete with left BP of 150/93
- Age 60 athlete with left BP of 145/89
- Age 25 athlete with left BP of 165/104
- Age 65 athlete with left BP of 208/128

In all cases, all results should be confirmed (confirmation values are the same as initial values for purpose of the role play). In cases where the value is high, the appropriate action and referral should be made.

Adaptations: All athletes can participate in the blood pressure program. The only physical adaptation necessary is to determine the proper size of the BP cuff. Some athletes may be averse to having their blood pressure taken. This can usually be overcome with demonstration of the procedure on another athlete or volunteer. For athletes' age 18 or younger, athlete's percentile of height for age, plotted on a gender specific growth chart is required to determine the blood pressure percentile. The pediatric chart in Chapter 3.c should be used.



Health Habits

Health Habits Survey

In addition to the health screenings, each athlete participates in a health habits survey. The health habits survey gathers information on a variety of health habits including nutrition, tobacco use, sun safety, hand washing and physical activity. Information gathered from the athlete during the health habits survey is used to:

- Gain knowledge about the athlete's individual health habits
- Determine areas the athlete may want more information
- Reinforce health habits the athlete currently practices
- Start the conversation with the athlete on health habits

Data gathered from all athletes along with the health screening measurements is used for:

- Health Promotion Program planning
- Profile of Special Olympic Athlete's health status and behaviors (National, Regional or Local)
- Analysis of specific health indices within the Healthy Athletes disciplines (i.e. bone health and oral health)

The Healthy Athletes Software (HAS) Health Promotion Form is used to document each athlete's health screening tests and the health habits survey. [A copy of the form and full survey is available in Chapter 4.](#)

Interview Protocol

Introduce yourself and explain to the athlete that you will be asking them questions about _____. Ask each question and remember to:

- Be a good listener; take your time; let the athlete take their time.
- Be non-judgmental throughout the discussion.
- Follow the question- open ended- Do you xxxx? Do not lead with the response- You do xxx.
- Affirm good health habits. *Keep it up; you're doing great. Congratulations, you are working hard to xxxxx.*
- Ask the athlete if they would like more information about xxx.
- Thank the athlete for talking to you about xxx.

The Special Olympics Health Promotion Training video includes techniques and tips for a successful athlete experience.

<https://www.youtube.com/watch?v=qWeRt54VbE0>

Options for Health Habits Interview

There are 2 ways to include the Health Habits Interview in the Health Promotion Venue. They are a designated interview station or conduct the interview in the education stations. Considerations on which method to use include, venue space, number of volunteers/athletes, volunteer skill level in interviewing and education and personal preference.

Option 1- Set up an interview station, where the entire Health Habits Survey is completed before the athlete moves to the interactive education stations. The athlete will bring their completed HAS form to each station, where the volunteer will view the athlete's responses and tailor the education to meet the athlete's identified issues.

Option 2- Conduct the interview questions at each station. Upon asking the relevant questions, the volunteer will transition to the education offered at the station.

Regardless of which option you choose, it is important for the volunteer to continue the conversation with the athlete relating the education and activity at the station to the topic. Provide the athlete an opportunity to state what they have learned about the topic, relate the information to their Special Olympics sport and respond to any questions they may have.

Tips for Success

Visual aids and pictures can contribute to the athlete's understanding of the questions being asked (see pictures below and examples on the next page). This is especially important for the Nutrition: Food and Beverage Habits questions. The Health Habits Survey appendix contains food pictures to use with each of the questions using a US example.

A modifiable template for the nutrition questions is available online for programs who want to develop their own food pictures to match regional and national foods. Access the template at: [http://resources.specialolympics.org/Topics/Healthy Athletes/Disciplines/Health Promotion.aspx](http://resources.specialolympics.org/Topics/Healthy_Athletes/Disciplines/Health_Promotion.aspx)



Question to Ask the Athlete

Example Images to show to the Athlete for the question to the left

Example 1:

What do you drink when you are feeling thirsty?

- Water
- Fruit juice
- Soft drink
- Sport drink
- Milk product (include soy milk)

What do you drink when you are thirsty?



Example 2:

Do you eat or drink any of these foods?

- daily
- more than once a week
- never

Calcium Foods



