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BLOOD PRESSURE¹

1.1 Equipment

- Omron HEM-907 or HEM-907XL blood pressure machines
- Cuffs in small, medium, large, and extra-large sizes
- Tape measure (and an extra for back-up)
- Laminated cuff size chart
- List from Omron IntelliSense™ Blood Pressure Monitor manual for error codes and other problems and their possible solutions
- Extra batteries for BP machine
- Clean t-shirts in a variety of sizes for the student to change into if his/her sleeves are too tight

1.2 Personnel

- Health Researchers trained and certified in taking blood pressure according to study protocol

1.3 Procedures

1. To set up the Omron HEM-907 or HEM-907XL blood pressure machine, see the Users Manual. Set the machine to **AVG** function of F1 (number of measurements) = 3 times, F2 (waiting time until the start of 1st measurement) = 5 minute initial wait time, F3 (measurement interval) = 1 minute.
2. Introduce yourself and explain what you are going to do and how the machine works.
3. Ask student to remove outer layers of clothing if necessary.
4. Direct the child to take a seat.
5. Blood pressure is normally measured on the right arm. If there is a mechanical obstruction or problem with the right arm, then the left arm may be used. If for some reason the blood pressure cannot be measured on either arm, make a note on data collection form.
6. Measure upper arm circumference on bare skin approximately half-way between the shoulder and the elbow using a tape measure.
7. Choose appropriate cuff size using the chart:

Blood Pressure Machine and Cuff Size Chart	
upper arm circumference	cuff size
17-22 cm (7-9 in)	Small
22-32 cm (9-13 in)	Medium

¹ Adapted from the HEALTHY Study

32-42 cm (13-17 in) 42-50 cm (17-20 in)	Large extra-large
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8. If the student is between sizes, choose the larger size. Check cuff size used on data collection form.
9. Palpate the brachial artery. Place cuff with **ART** marking on brachial artery.
10. Wrap the cuff snugly using both hands and securely fasten it with the Velcro™ tape. The white triangle marked "INDEX" should meet up with the white bar marked "RANGE," between "MIN" and "MAX." At this time, the lower edge of the cuff must be placed 1/2 " to 1" above the inner side of the elbow joint.
11. Rest the student's arm on table (or other appropriate surface) so that the cuff is at about his/her heart level. The inside of the forearm should be facing upwards.
12. Connect the cuff to the blood pressure machine's air tube. Make sure it is a tight connection.
13. Remind the student to sit upright with both feet flat on the floor and to remain still for 5 minutes. Sometimes it is helpful to tell the student to pick something to look at for the entire time you are taking the measurement. This keeps the student from moving and causing extraneous noises during measurement.
14. Check that the **MODE** selector is set on **AVG** and **PSET** is set on **AUTO**.
15. Press **START** to begin the 5-minute timer and measurement procedure.
16. If the student moves excessively during the 5-minute rest time, the timer must be reset. Do this by pushing the **STOP** button. Then reset the timer by pushing the **START** button again.
17. At the end of the 5-minute waiting period, the BP machine automatically begins to inflate the cuff to take the first blood pressure measurement. The cuff squeezes briefly and the student should continue to remain still and quiet. Then the cuff begins to slowly deflate as it takes their first blood pressure measurement. Record on data collection form.
18. After the cuff completely deflates, the machine automatically times a 1-minute interval and inflates again for their second blood pressure measurement. Record on data collection form. Remind the student to remain still and quiet.
19. Again the machine will repeat the 1-minute timer and take the third and final blood pressure measurement. Record on data collection form. Remind the student to remain seated until you can check the blood pressure readings and remove the blood pressure cuff from the arm.
20. At the end of the 3 blood pressure measurements, the machine displays the average values. Press the **DEFLATION/Avg/1st/2nd/3rd** button to view the first blood pressure measurements. Check these against your recorded numbers. Press the **DEFLATION** button again and the 2nd blood pressure measurement appears. Again, check these values against your recorded numbers. Press the **DEFLATION** button one last time to check the third blood pressure measurement values.
21. Monitor values as they are collected.
 - a. In general, after the 3 machine readings have been made, if any 2 of the 3 systolic measures OR any 2 of the 3 diastolic measures differ by > 20 mm Hg, then redo the entire BP measurement procedures (5-1-1) and record those values on the data collection form.
 - b. If the values are not > 20 mm Hg apart but do seem suspicious or indicate machine malfunction, also re-do the entire BP measurement procedures and record them on data collection form.
 - c. Use the comments section to make note of these situations, and to record manual measurements if taken. Always make sure the cuff on firmly and securely before starting.

The Next Generation Health Study

Blood Pressure Measurement Script

Note: equipment must be set up in accordance with the guidelines provided in the protocol

Hello. My name is _____ and I am a health researcher from the NEXT Generation Health Study team. Now, I am going to take your blood pressure. I am going to wrap a cuff like this (hold up cuff) around your right arm and ask you to sit still for 5 minutes. Then the machine is going to take your blood pressure, and you will feel the cuff squeeze your arm as it inflates and release as it deflates. We are going to do this 3 times with little breaks in between to make sure we get the correct blood pressure reading.

Please take a seat and roll up your right sleeve to just below your shoulder so that we can wrap the cuff around your bare upper arm. If you need a loose t-shirt because your sleeve is too tight to roll up I can give you one.

[Provide a t-shirt if necessary]

Now we are going to measure the area around your right arm so we can select the correct cuff size.

[Select appropriate cuff size following the guidelines provided in the protocol]

You can rest your arm right here (indicate appropriate surface) or in your lap so that the inside of your arm is facing up. Now I am going to put the cuff around your arm. How does that feel?

[Place the appropriate cuff on the student's right arm following the guidelines provided in the protocol]

I am going to start the timer now for 5 minutes, and then we can take your blood pressure. Please keep both of your feet flat on the floor, and try your best not to move. If you move too much, we will have to restart the 5 minute wait period. While we are waiting, I would like to show you a brief video about the online dietary questionnaire you will be completing.

If student moves excessively: We have to start the 5 minutes over so we can make sure we get the correct blood pressure reading. Please try your best not to move.

Okay, the five minute rest period is over and the machine is now going to measure your blood pressure. You are going to feel the cuff start to tighten and squeeze your arm now as it inflates. Please try your best not to move or make any noise. You will feel the cuff loosen and deflate as the machine measures your blood pressure.

[Wait until machine finishes performing the first reading]

The machine is going to take a 1-minute break until we take the next blood pressure reading. Please continue to sit still and not make any noise. You're doing a great job.

The cuff is going to squeeze your arm again and then loosen as the machine takes the second blood pressure reading.

[Wait until machine finishes performing the second reading]

Last time. The machine is going to take another 1-minute break and then take your blood pressure again the same way.

[Wait until machine finishes performing the third reading]

Please stay in your chair while I check your blood pressure readings and take the cuff off of your arm.

If the reading is not above SBP 179 and DBP 109:

You did a great job! Thank you for your patience.

Note: students may be told their blood pressure reading if requested but explanations or evaluations of the reading should never be given.

If asked: We use guidelines determined by physicians and experts for this study, but we cannot evaluate your blood pressure reading because we are not medical professionals.

Recommend Follow-up With Health Care Provider

Emergency Referral (SBP > 260 OR DBP > 130): **(TO PARENT):** Your child's blood pressure is very high. We need to end the visit, and we strongly recommend that you to take him/her to an emergency care facility now.

Immediate Referral (SBP = 210-259 OR DBP = 120-129): **SCRIPT (TO PARENT):** Your child's blood pressure is very high. We need to end the visit and recommend that you contact his/her physician immediately or seek alternative care.

Urgent Referral (SBP = 180-209 OR DBP = 110-119): **SCRIPT (TO PARENT):** Your child's blood pressure is high. We urge you to consult his/her physician or health care provider about these values within one week.