

Experiment HP-32: Cell Phone Addiction

Exercise 1: Heart Rate and Blood Pressure at Rest with Cell Phone

Aim: To determine the blood pressures and heart rate while the subject is resting and looking at images or messages on their cell phone.

Approximate Time: 15 minutes

Procedure

1. Instruct the subject to rest for at least five minutes before their blood pressure is taken. The subject should be actively using their cell phone to check messages and notifications.
2. While the subject is resting, place the blood pressure cuff around the upper portion of the left arm, just above the elbow. Place the pulse sensor on the volar surface (where the fingerprints are located) of the distal segment of the left middle finger or thumb. Wrap the Velcro strap around the end of the finger to hold it in place.
3. At the end of the rest period, click on the Record button to begin recording the subject's pulse, blood pressure and heart rate.
4. Record for at least 3 minutes without taking blood pressure.
5. After the initial recording period is done, inflate the blood pressure cuff until the finger pulse wave on the Pulse channel disappears.
6. Once the pulse wave disappears, release the cuff pressure at the rate of ~10 mmHg/second. Continue to release the pressure in the cuff until the gauge reads 0 mmHg. Continue to record for an additional 30 seconds. Try not to release the pressure too fast.

Warning: Remember that restricting circulation for a prolonged period can be dangerous. Do not release the pressure in the cuff at a rate any slower than 5 mm Hg per second.

7. After the cuff is fully deflated, click the Stop button. Make sure the blood pressure cuff is completely deflated and is not putting any unnecessary pressure on the subject's arm.
8. The subject should rest in the sitting position between Exercises 1 and 2. To improve circulation in their arm, the subject should flex and extend their fingers to encourage blood circulation.
9. Select Save in the File menu.

Data Analysis

1. Scroll through the recording and find the section of data recorded before, during, and after the pressure in the cuff was occluding the pulse.
2. Use the Display Time icons to adjust the Display Time of the Main window to show the pulse before taking the blood pressure reading. Double the display time so that there is at least 30 seconds of pulse data on the screen.

3. Read the Mean Resting Heart Rate on right corner of the Heart Rate channel.
4. Use the Display Time icons to adjust the Display Time of the Main window to show the blood pressure reading and the pressure in the cuff from the occlusion of the artery to the time 15 seconds after the cuff was fully deflated.



Figure HP-5-L1: The pulse, pressure in the cuff, and heart rate recorded before, during, and after the occlusion of the brachial artery.

3. Data can be collected from the Main window or the Analysis window. If you choose to use the Analysis window, click on the Analysis window icon in the toolbar.
4. The mathematical functions, V2-V1, Mean, and T2-T1 should appear on screen. These values are seen in the table across the top margin of each channel, or to the right of each graph.
5. Once the cursors are placed in the correct positions for determining the blood pressures, the values for the blood pressures can be recorded in the on-line Journal by typing the names and values directly into the Journal.
 - Place the cursors at the locations used to measure the cuff pressures from the Blood Pressure channel.
 - Transfer the name of the mathematical function used to determine the blood pressure to the Journal using the Add Title to Journal function in the ECG Channel pull-down menu.

- Transfer the value for the blood pressure to the Journal using the Add Ch. Data to Journal function in the ECG Channel pull-down menu.
7. Once the cursors are placed in the correct positions for determining the systolic, diastolic, and pulse pressures, record the values for these pressures in the Journal using the one of the techniques described in Steps 5 or 6.
 8. Use the single cursor mode in the Main window, use the mouse to click on and drag the cursor to specific points on the pulse and blood pressure recording to measure the following:
 - Systolic blood pressure. To determine the subject's systolic blood pressure, place the cursor on the first of the smallest pulse waves that reappear after the pressure from the cuff is released. The Value on the Blood Pressure channel is the subject's systolic blood pressure. Enter this pressure in Table 1.
 - Diastolic blood pressure. To determine the subject's diastolic blood pressure, move the cursor to the first of the largest pulse waves that reappear as the pressure from the cuff is released. The Value on the Blood Pressure channel is the subject's diastolic blood pressure. Enter this pressure in the data table.
 - Heart Rate. To determine the subject's heart rate, place a cursor on the recording just after the point used to determine the diastolic pressure. Place the other cursor on the recording about 10 seconds after the first cursor. Mean on the Heart Rate channel is the subject's average heart rate after the blood pressure determination. Enter this rate in the data table.



Figure HP-5-L2: The pulse, pressure in the cuff, and heart rate recorded before, during, and after the occlusion of the brachial artery displayed in the Analysis window. Cursors are placed for measuring the systolic and diastolic pressures, which are 115.8 mmHg and 70.4 mmHg, respectively.



Figure HP-5-L3: The pulse, pressure in the cuff, and heart rate recorded before, during, and after the occlusion of the brachial artery displayed in the Analysis window. Cursors are placed for measuring the mean heart rate in the 10 seconds after the diastolic pressure is measured. The mean heart rate is 85.3 BPM.

Table HP-5-L1: Blood Pressures and Heart Rate, Before and After Cell Phone Removal

Subject's Age ____ years	Systolic Pressure (mmHg)	Diastolic Pressure (mmHg)	Mean Heart Rate (bpm)
Body Position			
Resting			
Cell Phone Removed			
1 min			
5 mins			
10 mins			
15 mins			

Exercise 2: Heart Rate and Blood Pressure After Cell Phone Removed

Aim: To determine the blood pressures and heart rate while the subject is resting with no access to their phone. Make sure the sound is turned on before putting the phone in the box.

Approximate Time: 30 minutes

Procedure

1. Repeat the same basic procedures outlined in Exercise 1 on the same subject while the subject is sitting and the cell phone has been placed in a box away on the instructor's table.
2. Record for 1 minute, click Stop. Measure the subject's heart rate and blood pressure as stated above.
3. Immediately begin recording for 5 minutes, measure the subject's heart rate and blood pressure as before.
4. Immediately begin recording for an additional 5 minutes, measure the subject's heart rate and blood pressure as before.
5. Immediately begin recording for an additional 5 minutes, measure the subject's heart rate and blood pressure as before.
6. Remove the blood pressure cuff after the final recording.

Data Analysis

1. Use the same techniques used in Exercise 1 to determine the systolic and diastolic blood pressures and heart rate at 1 min, 5 mins, 10 mins, and 15 mins.
2. Record the values for each parameter in the Journal and on the data table.

Questions

1. How often does the subject use their cell phone during the day and for how long?
2. Do they feel anxious or restless when they cannot access your phone?
3. Do they notice any changes in mood, sleep quality, or concentration after using their phone?
4. Were there any changes to the subject's heart or blood pressure during the first minute without their cell phone?
 - After 5 minutes?
 - After 10 minutes?
 - After 15 minutes?
5. What factors might explain these changes? How do these changes relate to cell phone addiction?