

**Human Anatomy & Physiology 2**

**NURS142**

**Group C : Names & ID**

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**Objectives:**

1. **measure change in heart rate and blood pressure during cold, & hot medium, breath holding, different positions (standing, sitting, sleeping).**
2. **Meaure mean value of the change in the HR and BP.**

**Introduction:**

**The Cardiovascular system is so vital that its activity defines the presence of life. It begins its activity when the fetus is barely a month old and is the last body system to cease activity at the end of life. The heart & Blood vessels Made up our Closed circulatory System, It’s affected by Several situations & Positions such as: activities, sleeping, sitting, & standing Positions, & also the surrounding environment (Hot or cold).**

**Experimental Data:**

**Tabal1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Name | BP-sitting | HR-sitting | BP-standing | HR-standing | BP-supine | HR-supine |
| 1 | 119/72 | 88 | 114/75 | 95 | 118/70 | 75 |
| 2 | 103/60 | 94 | 101/69 | 100 | 102/61 | 89 |
| 3 | 108/52 | 80 | 105/55 | 95 | 117/65 | 74 |
| 4 | 110/70 | 92 | 121/82 | 110 | 119/78 | 76 |
| 5 | 129/79 | 93 | 113/56 | 107 | 102/48 | 86 |
| 6 | 125/72 | 73 | 117/67 | 104 | 121/74 | 82 |
| 7 | 116/74 | 107 | 114/71 | 123 | 114/66 | 93 |
| 8 | 101/65 | 87 | 115/73 | 90 | 117/71 | 89 |
| 9 | 142/73 | 88 | 130/98 | 92 | 136/78 | 82 |
| 10 | 120/105 | 83 | 120/61 | 92 | 111/64 | 88 |
| 11 | 118/69 | 73 | 116/63 | 80 | 127/67 | 76 |
| 12 | 120/65 | 95 | 122/65 | 100 | 117/60 | 78 |
| 13 | 127/75 | 81 | 121/66 | 100 | 119/66 | 82 |
| 14 | 130/82 | 85 | 137/63 | 100 | 142/68 | 87 |
| 15 | 134/66 | 82 | 135/70 | 82 | 125/69 | 70 |
| 16 | 114/79 | 84 | 113/73 | 84 | 122/63 | 67 |
| 17 | 118/74 | 71 | 123/83 | 86 | 122/67 | 65 |
| 18 | 122/80 | 89 | 120/79 | 87 | 124/83 | 87 |
| 19 | 116/73 | 81 | 118/40 | 80 | 120/75 | 84 |
| mean+/-SEM(n) | 1.65+/-0.15(19) | 85.5+/-2.5(19) | 1.76+/-0.085(19) | 95.10+/-3.2(19) | 1.77+/-0.04(19) | 80.5+/-1.82(19) |

**Tabal2**

|  |  |  |
| --- | --- | --- |
| Name | BP-breath holding | HR-breath holding |
| 1 | 129/79 | 90 |
| 2 | 127/65 | 90 |
| 3 | 96/58 | 77 |
| 4 | 116/77 | 85 |
| 5 | 106/59 | 82 |
| 6 | 118/75 | 68 |
| 7 | 120/80 | 100 |
| 8 | 116/78 | 74 |
| 9 | (-) | 84 |
| 10 | 120/58 | 97 |
| 11 | (-) | (-) |
| 12 | (-) | (-) |
| 13 | (-) | (-) |
| 14 | (-) | (-) |
| 15 | (-) | (-) |
| 16 | (-) | (-) |
| 17 | (-) | (-) |
| 18 | (-) | (-) |
| 19 | (-) | (-) |
| mean+/-SEM(n) | 1.68+/-0.06(9) | 84.7+/-31.7(10) |

**Tabal3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | BP-the hand put in cold water | HR-the hand put in cold water | BP-the hand put in hot water | HR-the hand put in hot water |
| 1 | 119/79 | 98 | (-) | (-) |
| 2 | 109/65 | 94 | (-) | (-) |
| 3 | 111/65 | 84 | (-) | (-) |
| 4 | 119/80 | 108 | (-) | (-) |
| 5 | 135/60 | 99 | (-) | (-) |
| 6 | 116/73 | 94 | 161/138 | 113 |
| 7 | 116/78 | 113 | (-) | (-) |
| 8 | 104/72 | 80 | 123/97 | 114 |
| 9 | 122/77 | 102 | 109/77 | 112 |
| 10 | 137/73 | 118 | 119/89 | 109 |
| 11 | 127/81 | 95 | (-) | (-) |
| 12 | 121/73 | 86 | (-) | (-) |
| 13 | 116/67 | 94 | (-) | (-) |
| 14 | 135/85 | 85 | (-) | (-) |
| 15 | 144/94 | 98 | (-) | (-) |
| 16 | 102/75 | 92 | 115/67 | 80 |
| 17 | (-) | (-) | (-) | (-) |
| 18 | 138/88 | 83 | 113/71 | 78 |
| 19 | (-) | (-) | (-) | (-) |
| mean+/-SEM(n) | 1.61+/-0.046(17) | 95.4+/-2.5(17) | 1.41+/-0.08(6) | 101+/-7.02(6) |

**Tabal4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | BP-other hand not put in cold water | HR-other hand not put in cold water | BP-other hand not put in hot water | HR-other hand not put in hot water |
| 1 | 126/69 | 84 | (-) | (-) |
| 2 | 105/67 | 97 | (-) | (-) |
| 3 | 106/62 | 80 | (-) | (-) |
| 4 | 118/81 | 90 | (-) | (-) |
| 5 | 119/56 | 85 | (-) | (-) |
| 6 | (-) | (-) | (-) | (-) |
| 7 | (-) | (-) | (-) | (-) |
| 8 | (-) | (-) | (-) | (-) |
| 9 | (-) | (-) | (-) | (-) |
| 10 | (-) | (-) | (-) | (-) |
| 11 | 118/83 | 95 | (-) | (-) |
| 12 | 134/81 | 87 | (-) | (-) |
| 13 | 125/72 | 94 | (-) | (-) |
| 14 | (-) | (-) | (-) | (-) |
| 15 | 139/95 | 98 | (-) | (-) |
| 16 | 120/94 | 80 | 119/63 | 81 |
| 17 | (-) | (-) | (-) | (-) |
| 18 | 121/78 | 85 | 117/81 | 82 |
| 19 | (-) | (-) | (-) | (-) |
| mean+/-SEM(n) | 1.74+/-0.18(11) | 88.6+/-1.96(11) | 1.66+/-0.2(2) | 81.5+/-0.4(2) |

**Figure1**

**Fugure2**

**Discussion:**

In the first portion of this experiment, we observed the heart`s anatomy and structure which is composed by four chambers, two atrioventricular valves (tricuspid and mitral), two semilunar valves (pulmonary and aortic), superior and inferior vena cava that deliver deoxygenated blood into the right atrium, pulmonary veins that deliver oxygenated blood into left atrium for it to be pumped into systemic circulation toward the body`s tissues and organs.

After that, we measured changes in cardiovascular parameters under the effect of changing positions, cold and hot pressor, and temporary respiratory cessation.

First, we conducted the changing positions effect on cardiovascular parameters, we started the test by measuring the blood pressure and heart rate at standing position and then at a sitting position, and lastly when we were lying down and then recorded the results.

As shown in the table, results indicate that blood pressure tended to drop in the standing position compared with the sitting and this is because when we stand, gravity causes our blood to pool in our legs and abdomen and less blood circulating back to our heart which causes drop in blood pressure. Heart rate increases when standing compared to sitting because our blood vessels narrow, and this results in increase of heart rate to maintain adequate blood flow to the heart and brain and try to minimize blood pressure from dropping significantly low. In supine position, blood pressure was higher compared to sitting position and heart rate decreased in supine position compared to sitting position.

Second, we measured changes in cardiovascular parameters under the effect of temporary respiratory cessation, first we measured heart rate and blood pressure prior to breath holding, then we measured them during breath holding, and lastly, we measured them immediately after breath holding and recorded the results. Blood pressure increases after three minutes of breath holding due to constriction of blood vessels once the oxygen levels in our blood starts dropping. however, heart rate drops within thirty seconds of breath-holding, and this is because our heart cannot pump fresh, oxygenated blood to body when the body is deprived of oxygen.

Finally, we measured changes in cardiovascular parameters under the effect of hot and cold pressor, we put one hand in huge box filled with very cold water for about 3 to 5 minutes and then measured the heart rate and blood pressure from the hand that was in cold water, and then we measured heart rate and blood pressure from the hand that was not put into cold water, and we recorded the results. After that we did the same experiment but instead if cold water, we put one hand in hot water.

As shown in the table, results indicate that in cold pressor, the cold stimulus (cold water) activates afferent sensory pathway and causes change in thermoregulatory system which triggers a vascular sympathetic response that results in an increase in blood pressure and heart rate. Hot stress causes an increases blood flow to the skin and pooling of blood in the legs which can result in a decrease in blood pressure, heart rate increases during hot pressor because our heart beats faster and pumps harder trying to cool the body down.

**Conclusion:**