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Biology 12 Unit 10 Assignment 1: Blood Pressure Virtual Lab

Instructions:

Please complete the [Blood Pressure Virtual Lab](#) .

External Link:

http://www.glencoe.com/sites/common_assets/advanced_placement/mader10e/virtual_labs_2K8/labs/BL_14/index.html

Read the information and procedures provided in the lab and complete both the table and journal questions (provided below). Please note you should be answering your questions in detail, by providing support in the form of data values (external or from the lab) and scientific information/ research to explain your statements.

Table/Graph Section:

Table 1: __Blood Pressure in Variable Ages and Sexes Data___

	Male 11-17	Female 11-17	Male 18-24	Female 18-24	Male 25-34	Female 25-34	Male 35-44	Female 35-44	Male 45-54	Female 45-54
Patient 1	S=109 D=69 I=	S=113 D=76 I=Family history	S=141 D=91 I=High Salt, No Exercise	S=116 D=75 I=	S=130 D=81 I=	S=120 D=80 I=	S=121 D=76 I=	S=122 D=78 I=high salt	S=143 D=90 I=high salt, alcohol, no exercise	S=130 D=80 I=
Patient 2	S=110 D=71 I=	S=116 D=77 I=	S=125 D=78 I=	S=117 D=78 I=	S=126 D=76 I=	S=125 D=84 I=	S=120 D=79 I=	S=116 D=75 I=	S=144 D=91 I=no exercise	S=129 D=77 I=
Patient 3	S=118 D=79 I=	S=110 D=73 I=	S=131 D=82 I=Alcohol Consumption	S=109 D=72 I=	S=126 D=79 I=	S=120 D=79 I=	S=122 D=72 I=	S=120 D=77 I=	S=130 D=80 I=	S=129 D=80 I=
Patient 4	S=119 D=79 I=	S=110 D=71 I=	S=122 D=77 I=	S=112 D=72 I=	S=132 D=81 I=	S=113 D=74 I=	S=142 D=90 I=high salt, family history	S=118 D=77 I=	S=130 D=80 I=	S=142 D=91 I=family history

Patient 5	S=110 D=70 I=	S=127 D=80 I=Family History, No exercise	S=126 D=78 I=	S=119 D=79 I=	S=127 D=78 I=	S=112 D=72 I=	S=129 D=80 I=	S=118 D=75 I=	S=142 D=90 I=high salt, alcohol, no exercise	S=127 D=77 I=
Patient 6	S=110 D=72 I=	S=111 D=70 I=	S=121 D=76 I=	S=141 D=91 I=Family history, high salt	S=128 D=79 I=	S=114 D=73 I=	S=130 D=80 I=	S=141 D=90 I=high salt, family history, alcohol	S=142 D=90 I=no exercise, alcohol consumption	S=122 D=73 I=
Patient 7	S=111 D=71 I=	S=110 D=70 I=	S=127 D=78 I=	S=140 D=91 I=no exercise, family history	S=131 D=81 I=	S=111 D=73 I=	S=128 D=80 I=	S=123 D=79 I=	S=131 D=81 I=	S=147 D=98 I=
Patient 8	S=120 D=80 I=	S=117 D=77 I=	S=140 D=91 I=No exercise, alcohol consumption	S=117 D=73 I=	S=128 D=78 I=	S=117 D=78 I=	S=122 D=80 I=	S=120 D=75 I=	S=144 D=91 I=alcohol consumption	S=128 D=78 I=family history
Patient 9	S=126 D=80 I=Family History	S=113 D=73 I=	S=128 D=78 I=	S=115 D=72 I=	S=132 D=81 I=	S=111 D=71 I=	S=131 D=82 I=	S=142 D=92 I=	S=130 D=83 I=	S=129 D=76 I=
Patient 10	S=125 D=78 I=	S=114 D=76 I=	S=123 D=79 I=	S=113 D=74 I=	S=131 D=81 I=	S=110 D=72 I=no exercise	S=128 D=80 I=no exercise	S=142 D=91 I=high salt	S=131 D=82 I=	S=125 D=75 I=
Avg. Systolic	116.0	114.0	128.0	120.0	129.0	115.0	127	126.0	137	131
Avg. Diastolic	75.0	74.0	81.0	78.0	80.0	76	80	81	86	81

S= systolic pressure reading D= diastolic pressure reading I= health information

Blood Pressure in Variable Ages and Sexes Graph
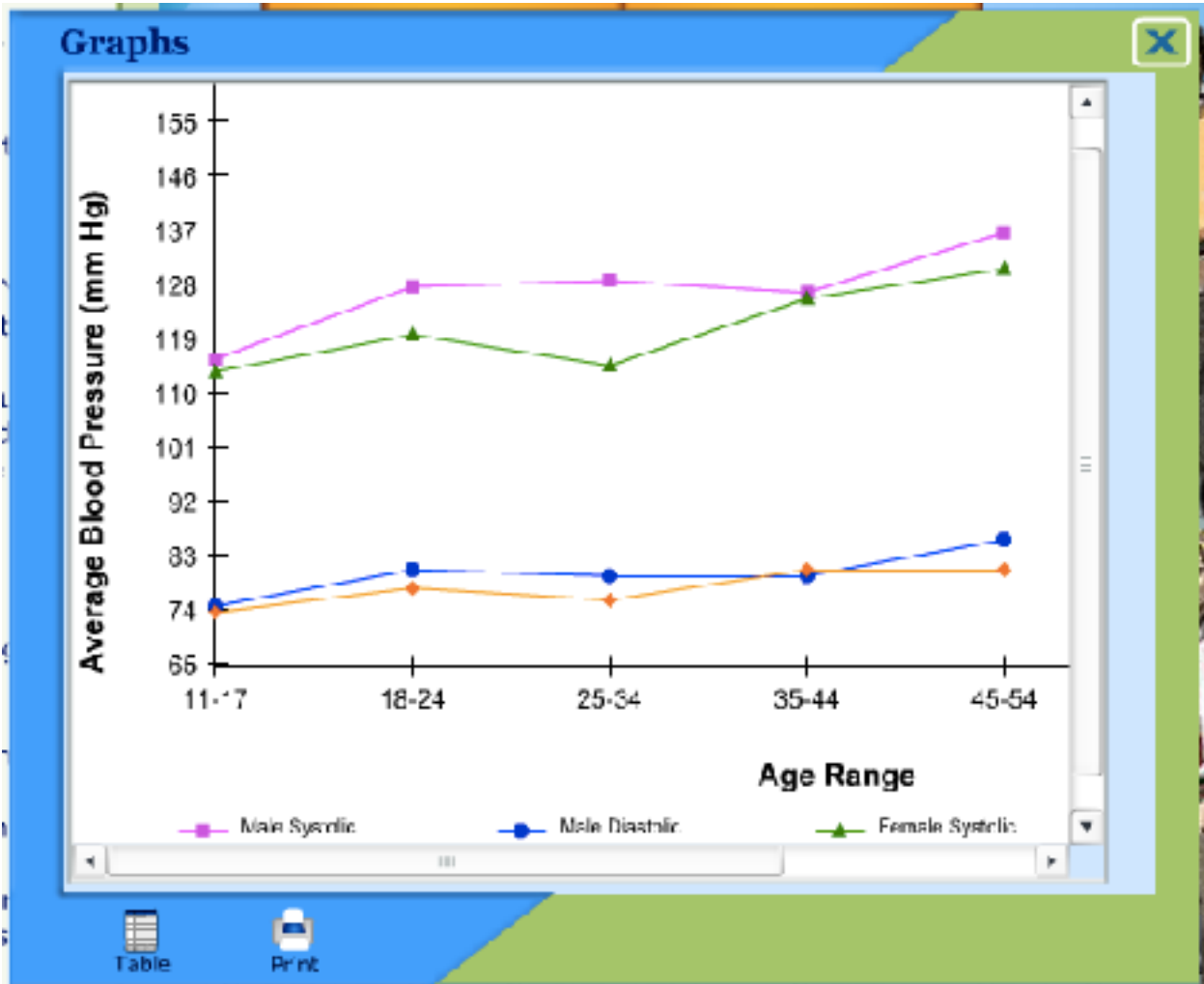
Post-Lab Quiz and Lab Report

1. Please make sure you have read through all of the information in the "Question" and "Information" areas. If you come upon terms that are unfamiliar to you, please refer to your textbook for further explanation or search the word here: http://encarta.msn.com/encnet/features/dictionary/dictionaryhome.aspx

2. In this exercise, you will learn a common method for determining blood pressure and investigate factors that may contribute to high blood pressure (hypertension). To begin, click on the gender pull down menu and select "Male" or "Female"; then select an age group from the "Age Range" button. Once you have this information selected, click "Measure Blood Pressure" to obtain the blood pressure readings from all 10 subjects (patients).

3. Please place the blood pressure for each patient's individual reading in Table I only. Then, using the "Calculator" tool on the bottom of the laboratory page or your own calculator, please determine the AVERAGE systolic and diastolic pressure readings for your subjects. To do this, add up all of the systolic readings you obtained from your group and divide by 10; round your answer up to the nearest WHOLE number. Repeat this process using the diastolic readings. Place these values in the correct areas of Table I and in the "Data Table" at the bottom of the laboratory page as well.

4. By clicking on each patient in the group, you may also read their medical history chart. Please make important notes on this information, especially on individuals whose blood pressure is higher than the group average (written in RED text), in Table I.

5. When you are through, click "reset", select a new group of individuals to test and follow the instructions above. There will be 8 subject groups to be tested in all.

6. Please finish this exercise by opening the "Journal" link at the bottom of the page and answering the questions.

Post-laboratory Questions:

1. Hypertension means:
a. High blood sugar levels
b. High blood cholesterol levels
c. High blood pressure levels
d. None of the above

2. A sphygmomanometer:
a. Measures blood pressure
b. When inflated cuts off blood flow to the brachial vein
c. Must be used in conjunction with a stethoscope

d. A and C

e. All of the above

3. In measuring blood pressure:

a. Diastolic pressure is measured as blood first reenters the artery

b. Systolic pressure is measured when blood flow just returns to normal in the artery

c. Blood pressure readings are noted as systolic over diastolic pressure

d. All of the above

4. Based on the laboratory activity, evidence shows that as a group:

a. Males experience an increased systolic and diastolic pressure with age

b. Males experience a decreased systolic and diastolic pressure with age

c. Males experience an increased systolic and decreased diastolic pressure with age

d. Males experience a decreased systolic and increased diastolic pressure with age

e. Males have relatively constant blood pressure with age

5. Based on the laboratory activity, evidence shows that as a group:

a. Females experience a decreased systolic and diastolic pressure with age

b. Females experience an increased systolic and diastolic pressure with age

c. Females experience an increased systolic and decreased diastolic pressure with age

d. Females experience a decreased systolic and increased diastolic pressure with age

e. Females have relatively constant blood pressure with age

6. On average for both sexes, normal blood pressure is typically defined as:

a. 140/60

b. 130/95

c. 120/80

d. 145/80

7. Based on the results of this exercise, which of the following blood pressure readings are significantly above normal, indicating hypertension?

a. 122/78

b. 130/84

c. 129/81

d. None of the above

8. Which of the following information from the medical charts appears to play the least role in determining blood pressure?

a. Sex

b. Height

c. Weight

d. Age

e. None of the above

9. Which of the following appear to be lifestyle related risk factors for hypertension?
a. Smoking
b. Lack of exercise
c. Family history
d. A and B
e. All of the above

10. A patient comes in to have their blood pressure taken. They are a non-smoker, they exercise daily and consume a healthy diet low in sodium. Based upon this information:
a. Their blood pressure will be normal
b. Their blood pressure will indicate hypertension
c. You cannot estimate their reading due to the effect of genetics on blood pressure

Journal Questions:

1. What factors are known to cause increases in blood pressure?

Factors known to increase blood pressure include a poor diet(which causes plaque to build up in the walls of arteries), lack of exercise, stress, smoking, stimulants, working too hard, high salt intake, as well as age, race and sex. Some diseases also may cause hypertension such as diabetes, polycystic kidney disease, and sleep apnea.

2. Use your knowledge about the heart and the circulatory system to make a hypothesis about how the average blood pressure for a group of people would be affected by manipulating the age and gender of the group members.

If the average age of a random group of people were to be quite high(say in the 50-70 age range) I predict that they would have a higher blood pressure than a group of people averaging a lower age, because occasionally as people get older, their lifestyles become less active as their mobility lessens, and also they may have poorer diets and more stress. I predict that a group of males would have higher blood pressure than a group of females, because men naturally eat more than women(which means potentially more unhealthy food intake). I would predict that youth below the age of 18 would have pretty low blood pressure.

3. What sorts of problems might a person develop who has chronic hypertension?

Someone who has chronic hypertension may develop difficulty breathing, fatigue or confusion, irregular heartbeat, chest pain, blood in the urine, difficulty sleeping, and facial flush. Long term effects could include heart disease, diabetes or stroke, or even death.

4. Analyze the result of your experiment. Explain any patterns you observed.

   In my experiment I observed that people younger in age tend to have less problems with high blood pressure, however as age goes up, so does blood pressure. I observed that while blood pressure goes slightly up between ages 18-24, between ages 25-44, it seems to stabilize or go down slightly(especially in the case of women), until middle age is reached around age 45-54, where is rises again.

5. Did the result of your experiment support your hypothesis? Why or why not? Based on your experiment what conclusion can you draw about the relationship of age and gender to group blood pressure averages?

   I believe that my experiment supports my hypothesis, because the younger groups had lower blood pressure, and older people, especially men, tended to have higher blood pressure results. Based on my experiment, I can conclude that simply being male can contribute to higher blood pressure, as well as age, where older people are at more risk for hypertension than younger people.

6. During the course of your experiment, did you obtain any blood pressure reading that were outside of the normal range for the group being tested? What did you notice on the medical charts for these individuals that might explain their high reading?

In Patient 1 of the males aged 18-24 year sold, his blood pressure read 141/91, which is much higher than normal for his age group. It was noted in his medical chart that he had a diet high in salt and did little to no exercise, which could be major contributors to his hypertension.
In Patient 6 of the 35-44 year old female group, her blood pressure read 141/90, also very high for any group. This may because of her lack of exercise, alcohol consumption, high salt diet, and also age, as generally, blood pressure increases with age.

7. List risk factors associated with the hypertension. Based on your observation, which risk factor do you think is most closely associated with hypertension?

The risk factors associated with hypertension include, age, race, diet, family history of hypertension, a high-salt diet, lack of exercise, use of stimulants such as cigarettes and alcohol, a stressful lifestyle, and obesity. Based on my observations, I would say that having a high-salt diet is a major risk factor associated with hypertension, as well as lack of exercise and a family history of hypertension.

8. What effect might obesity have on blood pressure? Does obesity alone cause a person to be at risk for high blood pressure? What other factors, in combination with obesity, might increase a person's risk for high blood pressure?

Obesity, along with a high fat diet, causes plaque to build up along the walls of the arteries, increasing blood pressure and putting a person at risk for hypertension and heart disease. Normally people who are obese become so do to many environmental and lifestyle factors, which could contribute to their obesity and thus their hypertension. These factors could include excess alcohol consumption, a high-salt diet, lack of exercise. Also, obesity can cause certain diseases such as diabetes or thyroid problems, which can themselves be causes for hypertension.