Exercise physiology assignment

Psychology

When the human body is put to work and undergoes any sort of activity, it requires more energy and resources in order to sustain this. The cells in muscles and organs must work faster, and thus require more energy to do so. The body compensates by increasing heart rate and respiration in order to increase the amount of oxygen entering, carbon dioxide leaving and rate at which these gases are delivered to cells throughout the body.

In this lab, we tested the effects that increased activity had on these physiological responses, and measured the heart rate, blood pressure, and gas exchange evils during states of rest, light activity, and moderate activity. The body requires energy even during complete rest, called the basal metabolic rate (BAM). The body is still active and is working, though to a lesser extent than during physical activity. Tasks including the maintenance of ion gradients, internal temperature, circulation of blood, and many other basic functions happen in order to sustain life at its most basic level.

A small amount of oxygen is needed for these functions relative to when the body becomes active, which requires an increased amount. The cells work harder o maintain homeostasis, and therefore require more oxygen. Furthermore, they create more carbon dioxide as a byproduct and must expel this quicker. These two factors cause the increase in heart rate and respiration, in order to accommodate this necessity. Energy that the body uses is measured in Calories, and relates to the amount of oxygen consumed as well.

From the amount of oxygen inspired and carbon dioxide expired, we are able to calculate the respiratory exchange ratio, which tells us how much of the

person’s energy use comes from fats versus carbohydrates. This value varies with intensity of exercise, and was lactated during this lab. In this lab, we measured the heart rate and blood pressure during states of rest, light activity and moderate activity. We also measured the oxygen and carbon dioxide levels during exercise.

We hypothesized that with increased activity level, all of these values would increase -?? the heart will beat faster, the subject will respire more, and the amount of oxygen consumed/carbon dioxide produced will increase. Materials and Methods In this lab, we measured various physiological responses during different stages of activity. First we collected data of the subjects BAM, followed by efferent levels of activity using several exercise machines. To measure the BAM, we used the Biopic system. Our subject put on a heart rate monitor and blood pressure cuff, and rested for 5 minutes prior to collecting data.

The subject then breathed into the mouthpiece connected to the Biopic machine with a plug on their nose to restrict extra air flow. Data was recorded for 6 minutes, with the heart rate measured every minute and the blood pressure measured at the beginning and end. Data was collected in Tables 1 and 2. Next, our subject used a bicycle regretted in order to test the effects of eight and moderate exercise. A heart rate monitor was attached to their chest and a blood pressure cuff was placed around their arm. To determine proper resistances, they pedaled at 60 RPM for 5 minutes at a resistance that resulted in a heart rate of 1 50 BPML.

This resistance was used for the moderate exercise phase. We divided the resistance obtained by two to get a new resistance that would result in light exercise. Our subject then pedaled at this light resistance for 5 minutes. The heart rate was measured every 30 seconds or minute, and the blood pressure was taken at the end. Our subject as given a 5 minute rest period, in which the heart rate and blood pressure were taken at the same intervals. The same procedure was executed for the predetermined moderate exercise resistance, followed by another rest period.

Data from this phase was collected and recorded in Tables 3, 4 and 5. The next phase of the experiment was performed on a treadmill. The subject put on a heart rate monitor and nose piece, and breathed into a one- Way tube connected to a chamber for 5 minutes to establish a baseline Of oxygen/carbon dioxide composition. The heart rate was also measured every 0 seconds during this period. The subject then began to walk for 5 minutes, and the heart rate was again taken every 30 seconds and the expired air was measured in Libraries.

After 5 minutes of walking, the subject ran for 5 minutes. The data was collected in the same manner and was recorded in Tables 6 and 7. Rest Its Table 1: Baseline Data Time (min) Heart Rate Blood Pressure Before experiment 76 118/83 1 min 78 2 min 3 min 77 4 min 5 min 116/85 Table 1 outlines the data collected from the BAM phase of the experiment. The heart rate and blood pressure were relatively constant. Table 2: Calories of heat/hour 206. 88 Calories of heat/day 4965. 18 Table 2 contains the Calories of heat produced from the BAM per hour and day based on collected oxygen levels.