HHP 100 - Foundations of Exercise Science

Name_____

Lab # 3 9/22-10/1 Energy Costs

Purpose/Goals The total amount of energy required per day is the basal metabolism requirement plus daily activity requirement. The difference in the way COG is moved and in leg swing between walking and running causes a difference in caloric expenditure. The purpose of this lab is to familiarize the student with the basic principles of energy costs.

Textbook chapter 10

Equipment small flashlight and charts for BMR (both at the lab desk)

Task Calculate Basal Metabolic Rate (BMR) and Daily Energy Expenditure. Summarize the energy cost difference between walking and running

Procedure and Data

I. Calculating BMR. Obtain the "Estimating Total Body Surface" chart from Elise. Follow the direction on the chart and find your body surface._____

2. Find your "Basal Metabolic Rate factor (for age and sex). Obtain the chart from Elise. _____

3. Body surface_____ X BMR (factor)_____ = BMR (per hour)_____

BMR _____ X 24 = BMR (per day) _____

II. Calculate Daily Energy Expenditure by completing worksheet (Elise has them). You will also need the chart (Elise has it) for Cal/min/lbs for each activity. EVERY activity is not listed - you may need to be creative. For hours sleeping - multiply hours slept X BMR per hour calculated above (# 3).

III. During walking there is always one foot in contact with the ground, but in running there is a moment when neither foot is in contact with the ground.

A. Place the flashlight (turned on) at the COG (your navel) of the lab partner you are observing. Note the degree of medial/lateral, anterior/posterior, and superior/inferior displacement of COG while walking. It might be helpful to have them move toward a wall with a sheet of paper that you can mark the displacement of the light on the paper
Describe the degree and direction of displacement.

B. Note the degree of displacement of COG (medial/lateral, anterior/posterior, superior/inferior) while running.

C. Note any differences in the displacement between walking and running.

D. Also, note the where the COG is in relationship to the base of support (BOS) for both walking and running.

E. You may use stick figure drawings or pictures to embelish, but not replace write-up.

Analysis and Interpretation What is the relationship between BMR and Daily energy expenditure? How does the COG change when you move from a walk to a run?

Application Why does running require more energy than walking? What happens to your BMR as you increase in age? (Look at the BMR - Age and Sex chart)

Questions

!. How is mechanical energy defined as it relates to human movement? What is the mechanical efficiency of the body?

2. Which fuel source (carbohydrates, fats, protein) is most important to an athlete? **WHY?**