

Introduction to Exercise Physiology SHSS4072



Learning Objectives

- To perform a peak power test and be able to determine if there is a relationship between leg circumference and leg power
- To undertake video assessment of the test and describe the procedures that are involved in the test.
- To undertake and get valid reliable test results for a handheld dynamometer test and describe the significance of the data.
- To be able to record data on excel documents accurately and reliably

Practical Two

POWER/STRENGTH



Muscle Activity Definitions

- Muscular Strength
 - the amount of force that a muscle, or muscle group, can produce in a single maximal effort.
 - One repetition max, dynamometer
- Muscular Endurance
 - the ability of a muscle group to perform repeated contractions against a light load for an extended period of time.
 - Partial curl ups, push ups, repetitions of a % of body weight
 - Vertical jump
- Muscular Power

Assessing Power

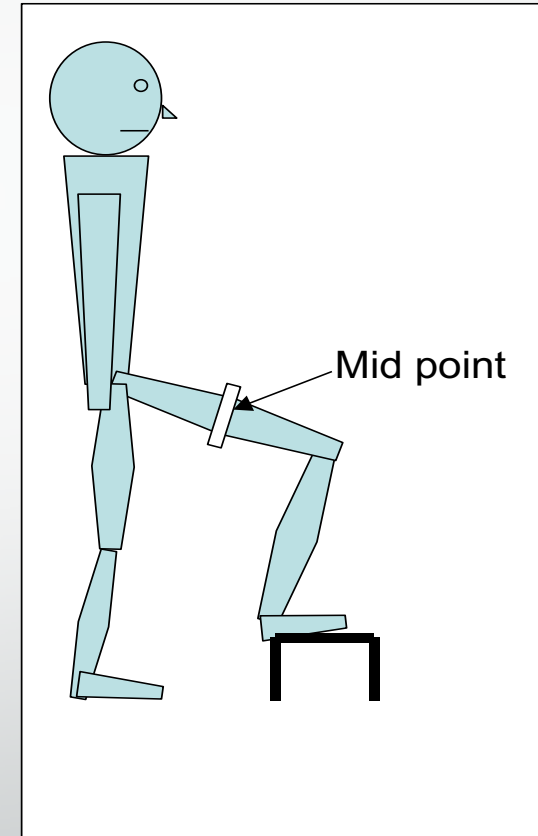
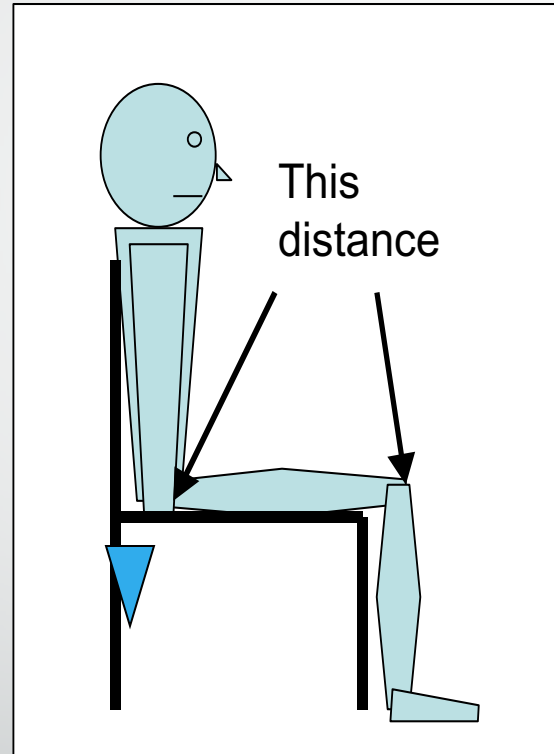
- Assessing Power
- Power is defined as the rate at which energy is used or created from other forms. Power can be calculated by the following formula
- $\text{Power} = \text{force (strength)} \times \text{velocity (speed)}$
- As you can see from above, power is a function of the force that can be produced and the speed of that force application.

Anthropometric Data

- Height
- Weight
- Gender
- Age

Muscle girth

- Find midpoint of thigh
- Measure girth at this point



Peak Power

- 3 min warm-up (60W)
- 2 minute warm-up (90W)
- 2 min rest before test begins

Resistance Settings

			Female		
Weight (kg)	Air Setting	Magnet Setting	Weight (kg)	Air Setting	Magnet Setting
<50	1	1	<45	1	1
51-55	2	1	46-50	1	1
56-60	2	1	51-55	2	1
61-65	3	1	56-60	2	1
66-70	3	1	61-65	2	1
71-75	4	1	66-70	2	1
76-80	4	1	71-75	3	1
81-85	4	1	76-80	3	1
86-90	5	1	81-85	3	1
91-95	5	1	86-90	4	1
96-100	6	1	91-95	4	1
101-105	6	1	96-100	5	1
106-110	7	1	101-105	5	1
111-115	7	1	106-110	5	1
116-120	8	1	111-115	5	1
121-125	8	1	116-120	6	1
126-130	9	1	121-125	6	1
131-135	9	1	126-130	7	1
136-140	10	1	131-135	7	1
141-145	10	1	136-140	8	1
146-150	10	5	141-145	8	1

The Test

- The Wattbike has pre-set test workouts and a number of automatic outputs following completion of a test.
- From the Main menu select **workout/Tests** and then **Tests** – the Tests screen appears.
- Select **Peak Power 6" Test**.
- Input rider weight and press **ENTER** to start the Test.
- A loading screen will appear with a progress bar once this has disappeared the person can start riding.
- The monitor is set at 6". The live display will show each pedal revolution, the peak power achieved and a live graph build up with the time counting down.
- Record peak power results as displayed by the WattBike

Tasks and Documentation

- Add all values to an excel document
- Look at the values between peak power and muscle circumference
- Compare the two and produce a graph on excel to display your data
- Is there any difference in the relationship when you look at gender differences?

Assessing Upper Body Strength

- Grip Strength Protocol
- The client takes hold of the grip strength dynamometer in their dominant hand and moves their shoulder in to full flexion with the elbow and wrist in extension.
- The client takes a breath in, and as they exhale they squeeze the dynamometer with maximum force whilst lower the arm from flexion to neutral (arm by the side).
- Record the maximum reading (kg)
- The client repeats the test 3 times with a 1 min rest period between repetitions and a maximum reading is recorded.
- Compare the maximum strength in the dominant and non-dominant hand.

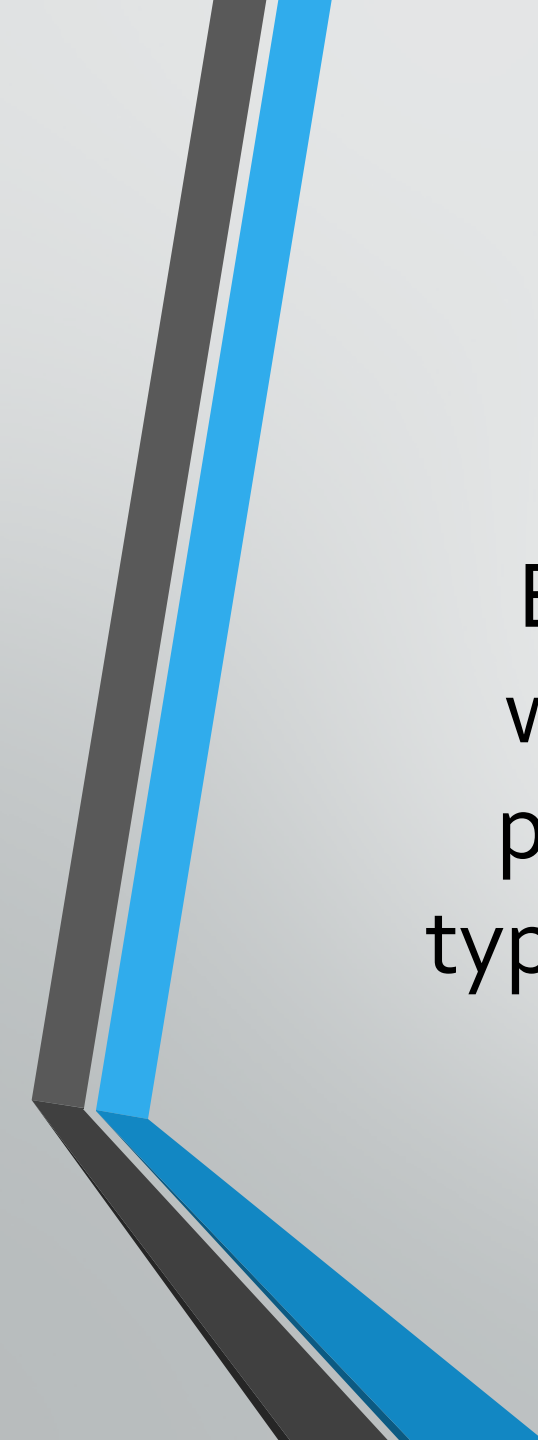


Task

Can grip strength be used as a representative of total body strength?

See resources folder – For literature links

Submit your results to moodle for the rest of the group to view?



Task

Based on your data, suggest a training program with appropriate reps and sets to improve either power or strength, explaining why you chose the types of exercise? Use the studio gym equipment as required?