How many calories do we burn in Aqua Exercise?

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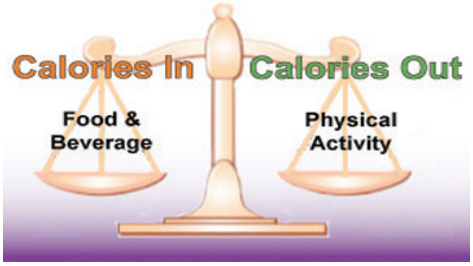
water in motion

Burning Calories

When analyzing the amount of calories a client may burn, we must take the following into account:

- Age
- Fitness Level – muscle mass
- Gender
- Weight **



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Water vs. Land

Land

- Weight Bearing
- Speed/Intensity
- Environment
  - Surface
  - Temperature
- Individual Characteristics

Water

- Depth/Buoyancy
- Speed of movement
- Force or effort
- Limb Length
- Environment
  - Temperature
  - Humidity
- Individual characteristics

Caloric Measurement: Calorimetry

Direct caloric expenditure

- Large airtight chamber, rigid engineering
- Amount of heat the body produces is measured
- Difficult because of sweating, evaporation, heat given off by electronic exercise equipment, and other factors difficult to control

Indirect caloric expenditure

- Known as VO_2 test
- Mouth piece, tube, computer
- Measures the difference between the amount of oxygen you breath in and out
- VO_2=Max O_2-Min O_2

Conclusion Measuring Caloric Expenditure

- Oxygen is used during water exercise
- Calories are expended during oxygen consumption
- Ergo – Water exercise burns calories

3 Issues that plague water as a viable tool for weight loss:

- Lower exercise HR during aerobic water exercise
- Faster recovery after exercise and EPOC (Excess Post-Exercise Oxygen Consumption) commonly referred as “After Burn”
  - Cool environment
  - Hydrostatic pressure
- Buoyancy lowers weight bearing capacity

Heart Rate (HR)

- HR is an estimate of intensity
- External influences:
  - Caffeine, medications, stress, temperature, humidity +
- Water's external influences
  - Cooling effect on the body, hydrostatic pressure, partial pressure, and the dive reflex (HR lowers 10-25% when mammals hit the water)
- Research shows that water exercise HR tends to underestimate oxygen consumption
- Conclusion: Aquatic Target HRs need to be adjusted/lowered.

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Faster Recovery & EPOC (Excess post-exercise oxygen consumption) = AFTER BURN

- Hydrostatic Pressure assists
  - Venous return, lactate removal and HR recover
- Not enough "solid" research for a conclusion that EPOC/After Burn is reduced in the water
  - Water facilitates venus return, lactate removal and heart rate recovery

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Buoyancy

- Reduce impact stress and weight bearing
- Great workout environment for those with musculoskeletal disorders
- Possible assumption
  - Less weight bearing=reduced work load
- NOT TRUE! "Resistance" of the water!
- Research: Cassedy 1992 & Darby 2000
  - "Even though the landing or loading forces due to gravity were reduced because the participants were exercising in the water, energy expenditure per unit of time was increased."

Cassidy 1992 Research

- On land – weight bearing is the primary factor for workload
- In water – the resistance of water all around creates workload
- Conclusion: Arms and leg work in the water compares to running on land
- 400-500 calories per hour

Darby 2000 Research

- Similar results to Cassedy
- Conclusion that their results indicated that water may be a GOOD PLACE TO EXERCISE FOR THOSE TRYING TO LOOSE WEIGHT
- While loading forces due to gravity were reduced because of the water environment, ENERGY EXPENDITURE PER UNIT OF TIME WAS INCREASED

BOTTOM LINE: Use Force

- The harder you push
- The more calories you burn

Pendergast 1988 Reserch

- Water temperature may play a role
  - causes reduced oxygen consumption
- 84F recommended
- WATERinMOTION® recommends 83-86 degrees

Water Exercise: A Good Tool

Research Review, 2009 Barbosa

Acute responses (during the exercise session)	Chronic adaptations (change over time)
Take into account ◦ water temperature ◦ water depth ◦ type of exercise and its variants ◦ the equipment used ◦ exercise cadence according to the subjects' profile	▸ Several papers reported consistent & significant improvement after at least 8 weeks. ▸ Results are cumulative and related to exercise intensity and modality

Conclusion from Research

- When you exercise in the water at the correct
  - Intensity
  - Duration
  - Frequency
  - With aquatic variables accounted for
- You achieve the same chronic adaptations as when you exercise on land.

Your Role as an Instructor

- Control the acute responses (during class)
  - Exercise choice, motivation, intensity
- To facilitate chronic adaptations (over time)
  - Exercise adherence, intensity, consistency
- By properly monitoring intensity
  - Understand water HR, Talk test
- And properly employing water's variables
  - Resistance, buoyancy, temperature, etc.
- Create caloric consumption for weight loss

Can you burn calories in water?

- Absolutely
- 400-500/hour
- Water works!