

Aquatic Programming Techniques for Weight Loss

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Objectives

- Look at history of water and weight loss.
- Talk about what we know about water and weight loss.
- Look at concepts for working with obese/overweight clients.
- Discuss aquatic programming for weight loss.
- Discover aquatic programming tips.
- Examine CR programming, monitoring intensity, RT, and flexibility.
- Learn the new Krueel Aquatic Heart Rate formula.
- Discover how to keep your client adapting

Bad History

- Publicity about how water not a good place to exercise to lose weight.
- Oprah Winfrey and Covert Bailey and others give bad press.
- Study done in the 1980's in California: walk, bike and swim.
- Swimmers didn't lose any weight.
- Bad press led to past and current misconceptions about weight loss in the water.

The three issues that continue to plague water exercise's contention to burn calories are:

- lower exercise heart rates during aerobic exercise in the water.
- faster recovery after exercise and the concern that post exercise caloric expenditure does not remain elevated for as long a period of time after water exercise.
- and the fact that buoyancy lowers your weight bearing capacity and therefore your caloric consumption in the water.

What We Know: Research Reasonably Clear

Effects of human immersion: immersion has anatomical, physiological, psychological, and emotional impacts on the human organism.

- At the same oxygen consumption, heart rates are lower in the water than on land.
- Not an indication that water impairs oxygen consumption and the ability to burn calories.
- Does, however, affect the way we monitor intensity in CR exercise in the water.

We know you can burn calories in the water and can lose weight.

- Results showed that AE and W groups both had significant decrease in body weight. (AE 6.8 kg, W 5.6 kg) (Nagle)
- Upper and lower body movements combined in the water
- Estimated that the exerciser would be expending somewhere between 7-15 mets.
- Equivalent to running or walking at 10-11 minutes/mile
- Caloric expenditure estimation of 400 to 500 calories for one hour of water exercise. (Cassedy) (Lindle)

Getting a better picture of how many calories you burn as well as how to more effectively burn calories in the aquatic environment as research advances.

- 9.8 Kcal/ minute being consumed during deep water exercise, which is equivalent to a 10-11 minute/ mile walk or run. (Baretta)
- Caloric expenditure per unit of time was higher (1-2 Kcal/min) in the water due to the water's resistance. (Darby)

Bottom line:

- (Gappmaier 2006) Conclusion: "results indicate that there are no differences in the effect of aerobic activities in the water versus weight-bearing aerobic exercise on land on body composition components as long as similar intensity, duration, and frequency are used."

Working with Obese Clients

- Many clients looking for exercise to aid in weight loss efforts are obese.
 - Varying degrees of obesity and overweight affect programming parameters and options for a client.
- May be difficult or impossible for some obese participants to do weight bearing exercise on land.
- Exercise helpful in weight loss efforts.
 - Biomechanical load may narrow options for exercise and comfort during exercise.
 - Posture analysis of weight bearing joints important: (kinetic chain)
 - Feet – Ankles – Knees – Hips - Low Back
 - Water reduces stress and load on weight bearing joints.
 - Enables most obese participants to work with reduced body load and the water's resistance to create sufficient overload while sparing joint stress.
 - Deep water provides zero impact and reduces compression of the lumbar spine.
 - Safety in the aquatic environment
 - Shoes and supportive clothing / Safety getting to pool / Safety in and out of the pool
 - Psychological aspects:
 - environment of facility / locker room and privacy / exercise clothing

Aquatic Programming for Weight Loss

ACSM Guidelines for Exercise to reduce Obesity:

- Same general guidelines with modifications to encourage greater overall energy expenditure.
- Match the client's needs and goals to the program.
- Primary mode should be large muscle group aerobic activities.
- Initial intensity should be moderate (40-60% HRR) with emphasis on increased duration and frequency.
- Progress to higher exercise intensities (50-75% HRR) if the client wants to.
- Frequency of training = 5-7 days/week at lower intensities.
- Duration of training = 30 to 60 minutes depending on intensity. (Magic number 35-45 min.)
- Volume of Training:
 - Initial training: 150 minutes/week
 - Progress if client desires to ≥ 2000 Kcal/week (Takes most individuals 200 to 300 minutes/week.)
 - Addition of resistance training for building muscular strength and physical function.

Programming Tips

- Very important to build the metabolic base.
- Combination of moderate CR training with moderate RT training.
- Build duration and frequency- then intensity.
- Can eventually add interval or fast continuous at a lower duration.
- May take months to see the metabolic base change- especially in women.
- May need to try a new strategy for a non-responder.
 - Professional diet intervention
 - Interval work
 - Higher intensity, lower duration work
 - Change mode or use multi-mode

CR Program Considerations

Water Temperature: Cool Water (Pendergast)

- Effect of Body Cooling on O₂ Transport
 - Body cooling results in an increase in resting metabolism proportional to the decrease in core temperature.
 - Oxygen supply to meet cost of activity is decreased due to respiratory effectiveness, cardiac function, muscle blood flow.
 - Exercise in vasoconstriction environment/ core temperature too low- affects oxygen transport to muscles.
 - SUGGESTED that water temperature may affect VO₂.

- A water temperature around 29 C/ 84 F was recommended to optimize oxygen consumption.

Water Temperature: Warm Water (Yazigi)

- Pools above 32 C/ 90 F are more favorable to the increase in lactate concentration and consequent installation of fatigue than in cooler water.
 - Higher effect in maximal effort than in submaximal effort.
- Submitting a non-athlete to exercise in higher water temperatures may cause unwanted physiological consequences.
 - Beware with special populations and health concerns.
- Studies indicate that the water's drag properties make up for the loss of energy expenditure due to reduced body mass.
- Water depth
 - Body composition and buoyancy
 - Use of arms under water to increase caloric consumption
 - Control of movement
- Speed of movement
 - Full Range of motion
 - Appropriate intensity
- Force applied against water's resistance
 - Manipulate intensity using the properties and principles of the water- NOT speed.
 - Be aware of body size and frontal surface area if person is overweight or obese.

MONITOR INTENSITY!

Many, many people exercise at an exercise intensity that is not congruent with their goals.

- Intensity too high.
- Intensity too low.

By monitoring intensity you will determine:

- If the session is EFFECTIVE and is congruent with the client's GOALS.
- If the session is safe and within their capabilities.
- Whether you are causing a program that will positively affect the attainment of their goals.
- Provide direct evidence to advance cardiorespiratory endurance.
- Provide input and feedback for monitoring and progressing the program properly.

Personal Training

- Finding a true resting HR.
- Calculating desired intensity using Karvonen's formula.
- Monitoring HR/ RPE during EVERY exercise session with a HR monitor or HR palpitation.
- Recording intensity for each exercise session.
- Re-evaluating HRrest and goal intensity every 3-4 months.

Group Fitness

- Heart rate checks
- Perceived exertion checks
- Heart rate target zone calculations for students serious about losing weight.

ACSM recommends use of HRR method (Karvonen's formula) combined with use of perceived exertion.

This is highly recommended for water exercise also.

NEW! Aquatic Heart Rate Reserve Formula

Developed in Brazil and adapted by the AEA Research Council.

Kruel Method for Aquatic Heart Rate:

The equation

[(220 – age – Individual Aquatic HR – HRrest) x desired percentage] + HRrest

is suggested for use in water exercise.

Individualized Aquatic HR Deduction

- Have your client enter the pool area and get comfortable in the environment.
- This protocol should be initiated before an exercise session or vigorous activity.
- Have the client put on a heart rate monitor. If a heart rate monitor will not be used, locate and practice a palpitated radial artery 30 second pulse using a stop watch.
- Have the client stand for 5 minutes at the side of the pool outside of the water. At the 5 minute mark, either record a reading from the heart rate monitor OR palpitate a 30 second pulse, multiply by 2 and record.
- Have the client enter the pool and stand in water at arm pit depth or at the xiphoid process (located at the bottom of the sternum). At the 5 minute mark, either record a reading from the heart rate monitor OR palpitate a 30 second pulse, multiply by 2, and record.
- The difference between the one minute heart rate recorded standing outside the water and in the water is the individual aquatic heart rate deduction.
- Environmental conditions, medication, caffeine, and excessive movement when entering the pool can all affect heart rate response. Keep these factors to a minimum when possible.

Keep Your Client Adapting

Multi-mode exercise is recommended for weight loss efforts and is particularly useful for a non-responder.

- Deep / shallow
- Continuous / interval
- Lower intensity / higher intensity
- Water / Land
- Promotes optimal muscle balance and a well rounded fitness profile.

Aquatic Resistance Training

- Resistance training is an important part of weight loss efforts.
 - The water provides resistance with reduced impact load.
 - Additional resistance (equipment) should be considered when the client is ready.
- Provide proper stimulus and overload in order to achieve results.
- Critical to monitor intensity as best as possible.
- In RT, intensity = weight lifted (on land) or the load used (in water).
- Monitoring load for RT in the water is possible and should be properly practiced.
 - Size, shape, surface area of equipment.
 - Repetitions in time through full range of motion.
 - Speed of repetition through full range of motion.
- Periodization of acute program variables is critical in aquatic RT just as it is on land.
- Manipulate the acute program variables.
 - Resistance (intensity) / Sets and reps / Type of exercise / Order of exercise / Type of equipment / Rest periods / Speed of exercise

Flexibility

- Use primarily full range of motion exercises in cardiorespiratory, resistance training, and flexibility component of the program.
- Environmental conditions and chilling may hinder static stretching in the warm up and cool down.
- Dynamic/ rhythmical stretching can be used when conditions will not allow static stretching.

Summary

- Use moderate intensity, longer duration CR activity to build a metabolic base.
 - Work up to 50-75% HRR
 - Work up to 50-60 minutes 5-7 days/week.
- **MONITOR INTENSITY!**
- Include moderate RT.
- Post stretch to maintain or improve flexibility.
- Use multi-mode exercises.
- Adjust your strategy for a non-responder.