



CARDIOVASCULAR ACTIVITY FOR PERFORMANCE

What is cardiorespiratory exercise?

Cardiorespiratory is defined as the health and function of the heart, lungs, and circulatory system. In order for it to be considered a cardiorespiratory activity the time involved must be longer than three minutes. The reason for this is it takes a duration of at least three minutes to be in the aerobic glycolysis system. This may vary as we explore the various energy systems utilized throughout the text of this article.

Increasing Performance through Cardiovascular Activity...

The human body is capable of adapting as a response to a stimulus such as exercise. When complete adaptation occurs, your body will plateau. Knowing this it is important to vary your cardiorespiratory training. The F.I.T.T principle allows you to vary factors of cardio. Below you will find a description of each principle.

Frequency: Is the number of exercise sessions performed each week. Your goals and lifestyle determines frequency. It is recommended by the American College of Sports Medicine and Surgeon General that a minimum of 30 minutes of physical activity should be performed every day.

Intensity: Is described as the speed and/or the workload in a workout. This is considered the most important and most difficult factor in developing a successful cardiovascular program. A good starting point is a target heart rate of 65-75% of your maximum heart rate. The maximum you will work up to is 90%. As always remember to consult your physician when starting an exercise program. Your physician will take into consideration all of your genetic factors, lifestyle factors, and prescriptions you are taking (i.e. beta blockers). Below you will find ways of calculating your target heart rate.

Basic Formula:

- Figure out maximum heart rate by subtracting your age from 220. ***If on Beta Blockers formula is $162 - (.7 \times \text{age}) = MHR$*** • Next calculate the target heart rate by multiplying the remaining number by the percent of intensity.
- Example a 40 year old beginner. $220 - 40 = 180$, $180 \times .65 = 117$ (THR per minute)

*It is important to note that this is a general formula for your maximum heart rate. In consideration to athletes the MHR can vary upon specific sport or activity. Exhaustion testing in various sports can help identify a closer MHR.

Karvonen Formula:

- This formula is similar to the first, but more individualized because it incorporates resting heart rate.
- Figure out your maximum heart rate by subtracting your age from 220.
- Next, subtract your resting heart rate from MHR.
- Multiply that number by the percent of intensity.
- Last, add the resting heart rate by the above number to get your target heart rate.

The Talk Test:

When you are performing a low to moderate intensity session you should be able to breathe comfortably and rhythmically throughout the entire session. At higher levels of intensity, breathing is significantly more strenuous and challenging than above. You should be able to get out a couple of words, than have to take a breath.

*A Heart Rate Monitor is the most accurate way of measuring heart rate. A Polar Heart Rate monitor is recommended.

Time or Duration: Duration can be described as the amount of time they spend with each session, excluding warm-up and cool-down. Duration can vary anywhere from two - three minutes and upward depending on the energy system you are training in.

Type: Selecting an exercise mode for oneself should be based on your goals, functional capacity, interests, and available equipment. The type of exercise should be manipulated every two to three weeks in order to avoid a plateau.

What is the energy system cycle?

An advanced formula to eliminate the possibility of adaptation is to train within the three energy systems utilized by the human system during daily activities. Dependent upon individual activity levels and daily demands, we utilize this energy cycle in conjunction with daily performance needs. Therefore, it is important to develop each of these systems in order to meet expectations and decrease the risk of injury.

Recovery Zone: This phase incorporates activities challenging the aerobic system (65-75% mhr). In order to effectively challenge this system requires the ability to work in this zone beyond three minutes. An example of a daily activity in this phase would be push-mowing your lawn.

Anaerobic Threshold Zone: This phase encompasses activities that require a higher intensity than that of Phase I. Phase II challenges what is called the anaerobic system (75-85% mhr). Activity demand for these movements will range around three minutes. Forms of training can go beyond the three minute guideline to push the bodies AT limits. An example of a daily activity in this phase would be carrying boxes upstairs.

Peak Training Zone: This phase consists of activities that require quick outputs of energy lasting no longer than twelve seconds. Phase III challenges the ATP/CP system (85-90% mhr). An example of a daily activity in this phase would be running quickly to your car in the rain.

The term interval training would define a cardio-vascular workout challenging the various energy systems. It is important to strengthen each system in conjunction with one another. This will enhance performance as the demand in your daily activity arises. It will also decrease the risk of injury and burn a tremendous amount of calories.

Individual recommendations will vary from person to person. This is dependent on physical condition, activity level, previous injuries, and personal goals. It is vital to the success of any cardiorespiratory training program that each participant begin at the proper intensity. This will eliminate over-training, which can lead to the loss of lean body mass and may increase the risk of injury.

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References:

Verstegen, Mark and Williams, Pete. Core Performance (2004). St Martin's Press. USA.
Clark, Michael A. Integrated Training for the New Millenium (2001). National Academy of Sports Medicine. Thousand Oaks, CA.
ACSM Guidelines for Exercise Testing and Prescription (6th Edition).

Weeks 1 & 2

Date

Zone 1 Recovery

Zone 2 Anaerobic Threshold

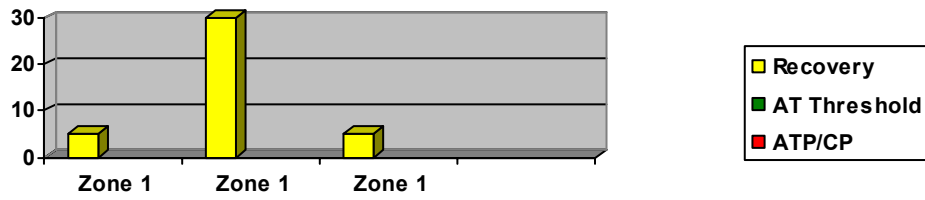
Zone 3 ATP/CP

Heart Rate _____

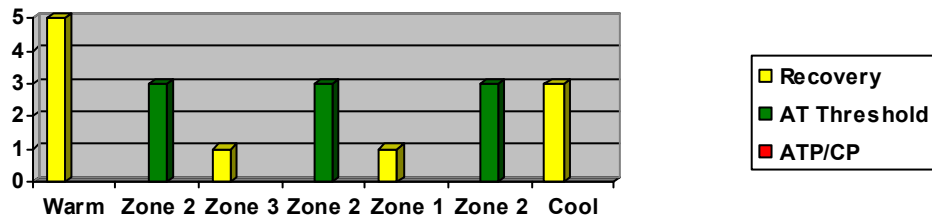
Heart Rate _____

Heart Rate _____

Day 1 Recovery Day



Day 2 Medium Intensity



Rotate the two workouts

Numbers on left of table indicates time to be spent in each zone.

Week 3-4

Date

Zone 1 Recovery

Zone 2 Anaerobic Threshold

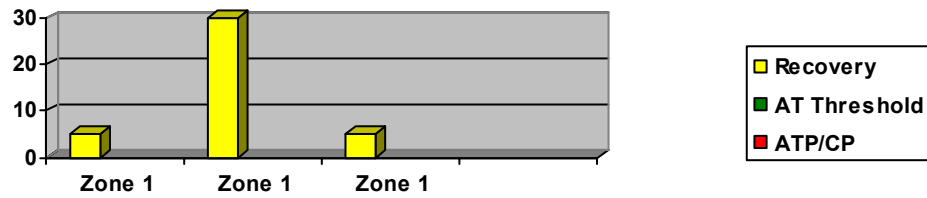
Zone 3 ATP/CP

Heart Rate _____

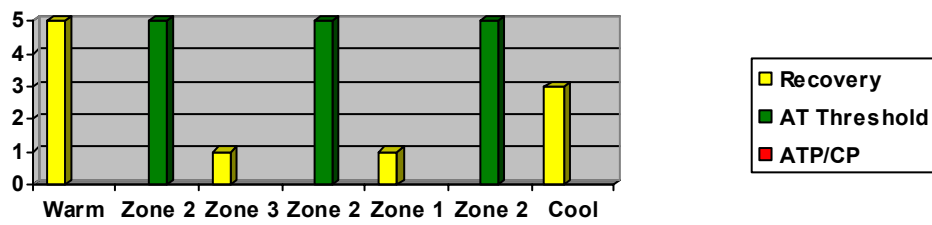
Heart Rate _____

Heart Rate _____

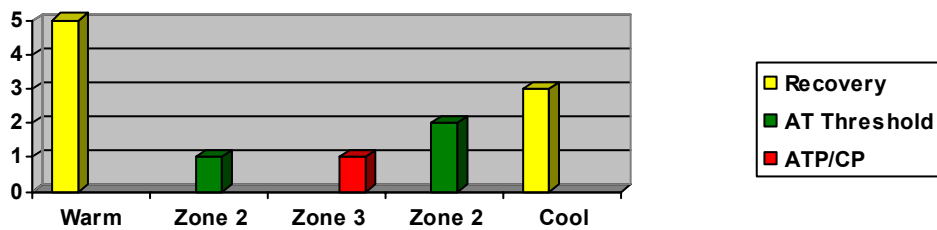
Day 1 Recovery Day



Day 2 Medium Intensity



Day 3 High Intensity Day



Rotate the three workouts