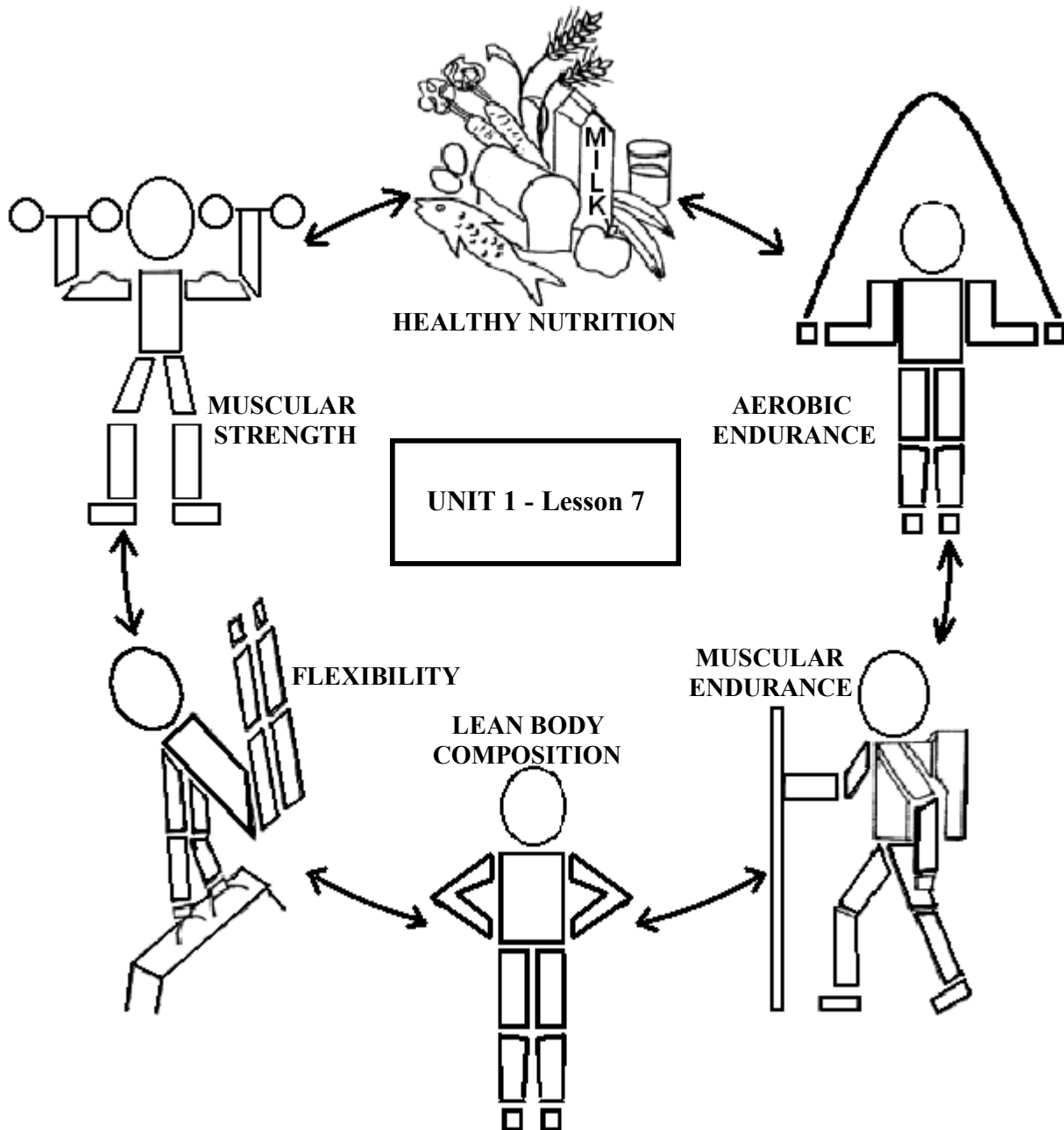


# LIFETIME FITNESS



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## LESSON 7 – RECOVERY & OVERTRAINING; MONITORING EXERCISE INTENSITY

### RECOVERY

The human body is designed to maintain a constant level of functioning of all of its systems. For example, when you catch a cold or a flu, the body has various mechanisms that go into effect to battle these situations that are upsetting its constancy, so that it can return to a steady state. This *steady state* that the body tries to maintain is called homeostasis.

Exercise such as strength or aerobic training causes an initial upset in homeostasis. But if the rest period following the exercise session is long enough, the body reacts to recover the energy it lost during the workout and to restore homeostasis; in this case, a new steady state can be achieved.

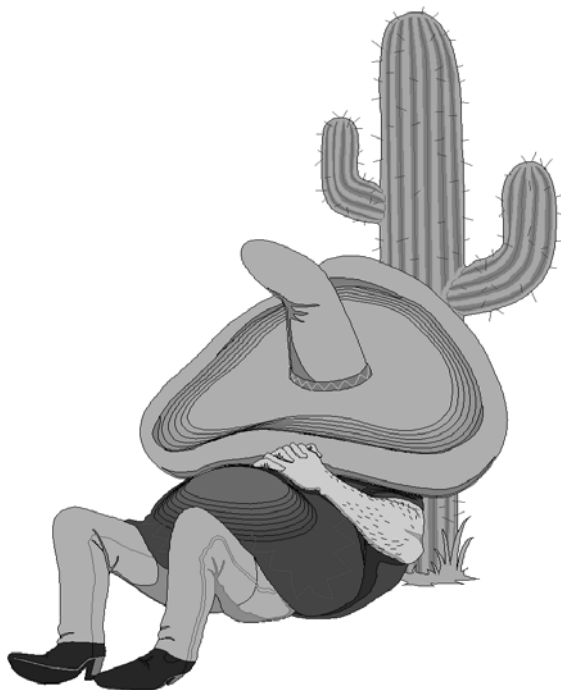
*The rest period following an exercise session is the most important part of a training program*; it is during this time that tissue growth and improvements in the functioning of the main components of fitness occur (muscular strength; muscular endurance; aerobic conditioning). It is therefore crucial that you allow sufficient time for rest and recovery following each training session.

#### A. Some of the effects of recovery include:

- Short-term (minutes - hours):
  - Body adjusts back to resting homeostasis (heart rate returns to normal; fluid replenishment of working muscles/tissues)
  
- Long-term (hours - days):
  - Protective adaptations that give the body systems a greater tolerance to the stresses of exercise.
  - Increases in general fitness and tissue repair.
  - Replenishment of glycogen (carbohydrate stores in the muscles).

B. Recovery time between workouts:

To enable sufficient recovery between workouts, you should allow 48-72 hours of rest following the training of a muscle group. For example, if you work the chest and back muscles on Monday at noon, you should wait at least until Wednesday at noon before repeating the same training. However, you could train a different muscle group on Tuesday, such as the legs. Still, as a beginner, you should limit your actual weight training sessions to 3 - 4 per week, so that you can be sure that appropriate recovery is being achieved. This will be discussed in further detail when we examine the F.I.T.T. principle and the components of fitness.



## OVERTRAINING

Overtraining is a situation in which an individual has stress continually placed on his system, through strength training (or other lifestyle stressors), without allowing adequate time for rest and recovery. The longer it exists, the longer it takes to fully recover, and the more serious are its results. Through overtraining, the body is unable to return to homeostasis, causing moderate to extreme results.

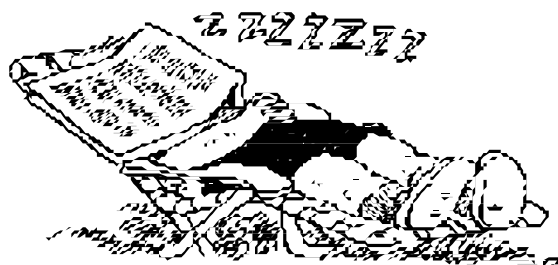
A continuum of *overtraining results* would resemble the following:

- Stage 1. Acute tissue damage due to intense training which exceeds the muscle's stress tolerance.
  - Symptoms: -prolonged muscle soreness
  - Treatments: -apply ice; massage; rest; return to light training
  
- Stage 2. Short-term overtraining
  - Symptoms: -incomplete return to homeostasis; decrease in skill execution; increase in resting heart rate; weight loss.
  - Treatments: -rest for 3-5 days (initial); high carbohydrate intake; more frequent days off  
-resume training with lower intensity and less volume initially
  
- Stage 3. Chronically decreased performance (longer-term overtraining)
  - Symptoms: -weight loss; disturbed sleep; decreased appetite; increased heart rate; irritability; susceptibility to injuries/infections
  - Treatments: -stop training completely; several days to weeks/months off

Clearly, overtraining has some serious consequences. It is important that you do not rush into a program with great expectations of huge gains, or of significant changes in a short time, or with plans for some high-intensity, frequent training. This is only counter-productive to everyone's primary goal, which is to improve general health and fitness. Recovery and overtraining go hand-in-hand: if adequate required recovery is not ensured, symptoms of overtraining will occur, halting or reversing any progress you may have made in your program.

So, how can you prevent overtraining, so that you can have an effective and safe program?

- Educate yourself:
  - Learn about the principles and techniques of training, and become educated about the importance of proper nutrition (which will be covered later), and recovery.
- Develop a well-balanced program:
  - With the help of your instructor, determine your fitness needs and goals, and design a program that will (a) help you to safely obtain your goals, (b) take into account all of the components of fitness, and (c) ensure adequate recovery.
- Monitor your training:
  - Keep a log of your training, so that you are aware from session to session of what exercises, repetitions and weights you've been doing, what nutritional habits you've been following, and what your general feelings have been regarding your program.
- Monitor your exercise intensity:
  - Use one of the 4 main methods available to check the intensity of your workouts (on following page). Keep your training within recommended ranges.
- Ensure adequate recovery:
  - Always make sure that you are allowing proper time for recovery and for rest between workouts.



## **MONITORING EXERCISE INTENSITY**

To help avoid overtraining, and to help maximize recovery during your rest phases, it is important to monitor the intensity at which you train.

Intensity can be measured during *aerobic* training by monitoring your heart rate and comparing it to normal ranges for your age group, and by keeping track of and/or adjusting the duration of your aerobic workouts, if necessary. Intensity can be measured during *strength* training by keeping track of the weight you use with each exercise, as well as the sets and repetitions that you perform with each exercise. Both of these topics will be discussed in greater detail in upcoming lessons on the F.I.T.T. principle (Frequency of workouts; Intensity of workouts; Time/duration of workouts; Type of activity used in the workout).

There are **4 main methods to measure the aerobic intensity of your training:**  
(AFLCA Strength Trainer Manual, p.88-90)

### **1. Observation**

-The instructor (and other participants) should watch for physical changes, such as a “red face, [and] shortness of breath,” and “comments about being dizzy [or] having a cramp or a pain.” (AFLCA manual, p.88)

### **2. Rate of Perceived Exertion**

-By using a scale and descriptive terms of how you are feeling during a workout, you can get a general calculation of the intensity of your workout.

-NOTE: Because this method relies on how you “feel”, and is therefore based on a judgment call, it *may not* be the most effective method for beginners.

	0	None
	1	Very Light
	2	Light (Weak)
	3	Moderate
	4	Somewhat Strong
THRZ --	5	Strong
	6	
	7	Very Strong
	8	
	9	
	10	

### **3. Talk Test**

-This is a simple method that implies that “the participant should always be able to hold a conversation while exercising.” (AFLCA Manual, p. 90)

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#### **4. Monitor Heart Rate: Target Heart Rate Zone → 5 Heart Rate Zones**

Working at 65-90% of your maximal heart rate is necessary to obtain an aerobic training effect (to actually *improve* your aerobic or cardiorespiratory component of fitness) (AFLCA manual, p. 88);

- A. By measuring your pulse during activity, you can check to make sure that you are working within the required range, or Target Heart Rate Zone (THRZ), to ensure that you are achieving the desired effect of your training. Maximal heart rate is approximately determined by using the formula,  $220 - \text{age}$ . For example, the maximal heart rate for a 15-year-old student would be 205. To achieve improvements in cardiorespiratory fitness, this individual should work within the range of 65% - 90% of maximal heart rate (205). 65% of 205 is 133; 90% of 205 is 184. Therefore, the student should work within the range of 133 beats/minute to 184 beats/minute, depending on his/her current state of fitness, to achieve improvements in cardiorespiratory fitness.

\*Beginning trainers should start near the lower end of this range before eventually progressing into higher intensity training.

(Your instructor can show you how and where to properly measure your pulse – either on the radial artery on the wrist, or the carotid artery on the neck – and how to count your pulse rate.)

~~ Take a moment to label your Upper and Lower Heart Rate Zone Limits ~~

<p align="center"><b><u>Target Heart Rate Zone</u></b>          Based on Maximal Heart Rate = <math>220 - \text{Age}</math>          Upper Limit = 90% THR          Lower Limit = 65% THR</p>
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- B. 5 ***heart rate zones*** can also be used to guide the intensity of your training. Review the information below to learn the benefits that will result from training within each heart rate zone; each zone represents a certain percentage of your maximal heart rate.

### **The 5 Heart Rate Zones**

1. **Healthy Heart Zone**: 50%-60% of maximal heart rate
  - Type of activity – brisk walking
  - Breathing – slightly heavier than normal, but easy to carry on a conversation
  - Benefits – little improvements in cardiorespiratory fitness component; however, it will help to decrease body fat & lower blood pressure, and to strengthen your heart.
  - Energy source used (or burned) in this zone – 10% carbohydrates, 5% protein, 85% fat
  - Ideal for those who may be out of shape or have heart problems; training or activity in this zone is typically used for warming up and cooling down around more intense training.
  
2. **Fitness Zone**: 60%-70% of maximal heart rate
  - Type of activity – faster walking; slow jogging
  - Breathing – heavier, but can still speak in short sentences
  - Benefits – similar health benefits as with Zone 1, with increased calorie burn
  - Energy source used (or burned) in this zone - 10% carbohydrates, 5% protein, 85% fat
  
3. **Aerobic Zone**: 70%-80% of maximal heart rate
  - Type of activity – race walking; jogging, or running
  - Breathing – very hard; only able to speak in short sentences
  - Benefits – training in this zone will improve cardiorespiratory fitness, by providing increases in cardiorespiratory endurance, heart and lung capacity, and size & number of blood vessels; there will also be an increased caloric expenditure (training should be done for at least 20 minutes to 60 minutes)
  - Energy source used (or burned) in this zone – 50% carbohydrates, 50% fat, <1% protein
  
4. **Anaerobic Zone**: 80%-90% of maximal heart rate
  - Type of activity – jogging, running, sprinting (training duration of approximately 10-20 minutes, often in intervals)
  - Breathing – very heavy; only able to possibly speak one word at a time
  - Benefits – increases in the amount of oxygen you can consume and the amount of calories burned per minute
  - Energy source used (or burned) in this zone – 85% carbohydrate, 15% fat, <1% protein
  
5. **Red-Line Zone**: 90%-100% of maximal heart rate
  - Type of activity – full out running or sprinting intervals of short bursts and maximum intensity
  - Breathing – very heavy; unable (or unwilling!) to speak
  - Benefits – effectively trains fast-twitch muscle fibers (increases power and explosive speed); only the very fit can train effectively within this zone to acquire the benefits it may provide, performing exercises that mirror the lengths of the activities they perform (for example, maximum speed running [sprints], cycling, or swimming sprints)
  - Energy source used (or burned) in this zone – 90% carbohydrate, 10% fat, <1% protein