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### **Over, Under, and Optimal Training**

The assumed goal of any physical fitness or sports training program is to maintain or improve the body's state of fitness health or state of sports performance capability. In the state of optimal training, the exercises and activities utilized are done in just the right amount. The body, in its recovery period after the exercise session is over, is able to regenerate itself and grow to an improved state of fitness. With proper rest, diet and health habits, this is the optimal state of fitness.

In the state of over-training, the exercises and activities utilized have been done in excess. The body, during recovery, is unable to regenerate itself to a minimum recovery level, that is, to the baseline-state of training before the exercises or activities were performed. Over-training, except on rare occasions, usually causes no injury or adverse consequences as long as you realize that more time than usual needs to be taken to recover before the next exercise session. If a person subjects their body to multiple exercise sessions where recovery is incomplete, then over-use injuries will occur and fitness will decline. This will cause a loss of your "drive" to exercise and the feeling of well being gained from participation in fitness activities will be lost. Most overuse injuries and other problems associated with fitness programs are directly due to over-training.

In the state of under-training, the exercises and activities utilized have been done in amounts too small to improve your present state of fitness. The exercise performed was done in an amount that requires no recovery period, or a recovery time of a short duration. Just as over-training should be avoided for its increased injury potential and potential for fitness loss, under-training must be avoided when fitness gains are a goal of your fitness plan. However, when injury or medical complications are present, or in the period of time when an unfit person is initiating a fitness program, under-training is desirable to allow the body's systems time to undergo the initial adaptations necessary to prepare someone to exercise more vigorously.

In the successful fitness program, exercise is "dosed" in an amount needed to gain or maintain fitness improvement, avoid injury and make optimal utilization of the time devoted to fitness activities. For athletes and serious fitness enthusiasts, their success is dependent upon proper manipulation and balance of fitness dosing and periods of rest and recovery.

As you proceed through the aging process and continue to pursue your fitness activities, the goal of your fitness program progressively evolves into that of maintaining the fitness factors already possessed. A solid base of fitness factors developed throughout a lifetime of exercise and activity will allow you to pursue your exercises or activities at a level

where the state of optimal training is reached in the proper “dose”. This will allow these activities to continue indefinitely, without the interruptions and fitness losses caused by constant over-training.

### **Detraining**

Detraining refers to the loss of the physiologic adaptations and improvements in fitness obtained from a regular fitness regime. Detraining fitness losses can occur in as little as 10 to 14 days if fitness training is stopped altogether. It is not recommended that you entirely stop your fitness program altogether. If you cannot follow a specific, regular set of exercises, as usual, on the 2 time per week maintenance routine, then try to substitute other exercises. That is, if you are used to jogging but cannot due to time or illness, then walking can be substituted instead. If you are interested in weight training and cannot get to a gym with equipment, you can substitute body weight exercises as outlined in the exercise section of the book. The point is to keep active in stimulating the body’s fitness by remaining active, at least at the maintenance level. If you are forced, due to illness or injury, to stop fitness training altogether, then you must decrease training intensity when you resume training after your period of illness or injury is over. Generally I recommend that you take a period of time double that of your period of inactivity to build back to your previous fitness level. That is, if you missed 3 weeks of fitness training entirely due to travel or illness, then take 6 weeks to build back to your pre-layoff fitness level.

### **Recovery Between Exercise Sessions**

To prevent the effects of over-training, enough rest and recovery time needs to be taken between workouts. This will allow the body’s systems to “recharge” and restore energy storehouses to allow energy consumption in the muscle cell and cardiovascular system. It will also allow the body to repair any small “injuries” that may have happened to the muscles, ligaments or joint structures.

Generally speaking, fitness gains are rapid in inexperienced exercisers. Later, as you continue to exercise regularly, the chances of experiencing the effects of over-training become greater.

The Periodization Principal is a concept that helps the athlete and fitness enthusiast avoid over-training. The principal basically states that the longer it takes to acquire the HFF or SFF, the greater the level possible and the longer it can be retained. When utilizing the periodization principle, a sport training or fitness routine is specifically planned and mapped out over long periods of time. These time spans of training plans can be for weeks, months or even years in length. A sample periodization program will be outlined in the exercise section of the book.

### **Signs Of Optimal Training**

1. In strength training programs, strength is steadily improving as judged by the RM Principal.
2. In endurance or aerobic training programs, there is a steady improvement in endurance performance.
3. In flexibility training programs, flexibility improves and causes no joint or muscle pain.
4. In sports training programs, performance steadily improves.
5. No muscle soreness.
6. Decrease in resting heart rate.
7. Decrease in resting blood pressure.
8. Feeling of well being and continued desire to exercise and train.

### **Signs of Over-Training**

1. In strength training programs, there is a failure to progress, based on the RM Principal. There also can be a loss of strength based upon a drop in the particular 'working-RM'.
2. In cardiovascular or aerobic training programs, there is no improvement or a loss of endurance performance.
3. In flexibility training programs, there is no improvement or loss of flexibility.
4. In sports training programs, there is a drop or loss of sports performance skills.
5. Muscle soreness that does not go away before the next exercise session.
6. Increase in resting heart rate.
7. Increase in resting blood pressure.
8. Constant feeling of tiredness and desire to skip workouts.
9. Lack of enthusiasm to train.
10. Difficulty sleeping or staying asleep.
11. Lack or loss of appetite.
12. Frequent or recurrent injuries to the bones, joints or muscles.
13. Frequent or recurrent illness.

### **Prevention of Over-Training**

1. Awareness of fitness and/or sports performance goals.
2. Monitor regularly resting heart rate and blood pressure.
3. Proper diet and nutrition.
4. Proper sleep and rest.
5. Moderate social life and alcohol consumption.



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### **Exercise Contraindications, Signs of Trouble**

Pain during exercise  
Pain which persists after exercise ceases  
Popping or cracking in a joint  
Swelling of a joint or muscle  
Stiffness persisting more than 12 hours  
Loss of range of motion of a joint  
Loss of strength in normal movements  
Shortness of breath  
Chest pain  
Feeling of unusual fatigue  
Extreme environmental temperature or humidity