

## **Fit & Well - Session III**

### **Muscular Fitness (Chapters 4, 5, 7)**



### **Phase I - Muscular Endurance**

All beginning lifters and/or young lifters, and experienced lifters who have not lifted for several weeks should start off doing an endurance lifting program, which I call Phase I. Muscular endurance can be achieved by choosing light weight and by completing high repetitions with moderate to high sets for each exercise. The rest interval is short. There should be low to moderate stress on the muscles at work.

- **Light weight selection (60% - 65% of 1 Repetition Maximum)**
- **High repetition (10 - 15 repetitions)**
- **Moderate to high sets (3 - 4 sets moderate) (4 - 5 sets high)**
- **Rest interval is short, 30 seconds to 1 minute rest between sets.**
- **Concentration on lifting form is encouraged over immediate strength gains.**

When the lifter can easily complete 10-15 repetitions on all sets, then the lifter should increase the weight 5 - 10 pounds on all sets. (Small muscle groups need small increases in weight, 5 lbs; large muscle groups need larger increases in weight, 10 lbs. Additionally, a younger, inexperienced lifter should always make small increases in weight at all times to avoid injury.)

- **Beginning strength training is started at this phase.**
- **Circuit training is taught during this phase. (30 seconds lifting interval, w/little rest)**
- **Cardiovascular endurance can be improved with the use of circuit training.**
- **Benefits from this program would help the following athletes: Swimmers, Wrestlers, Distance runners, Soccer players, Tennis players, Golfers, various individual sports and endurance sports athletes.**

### **Circuit training**

Circuit training is a type of endurance lifting program that trains the person to lift quickly and with little to no rest. In the circuit lifting program the lifter will set up several lifting stations and then do the endurance lifting program moving quickly from one exercise to another, with very little rest. The lifting cycle would be as follows: lift for 30 seconds, rest for 30 seconds, lift for 30 seconds, rest for 30 second, etc... The lifter will continue this cycle for at least 20 minutes in length. It teaches the muscles to work hard with little rest. The key to this program is choosing the correct weight selection so that the lifter will complete at least 10 repetitions in each exercise for each 30 second lifting cycle. A light weight selection is use mostly for this program. Also, this program will increase your cardiovascular endurance level, if you push yourself

## Phase II - Muscular Strength

This lifting routine is a great overall strength training program, for all types of individuals who are interested in general strength gains. Muscular strength can be achieved by choosing a moderate weight, and by completing moderate repetitions with moderate sets for each exercise. The rest interval is moderate. There should be moderate to high stress on the muscles at work.

- **Moderate weight selection (65% - 75% of 1RM)**
- **Moderate repetition (8 - 10 reps.)**
- **Moderate sets (3 - 4 sets)**
- **The weight selection in this strength program can be at various percentiles. Usually the lifter will start with 65% of 1RM and work up to 75% of 1RM.**
- **A common routine would be 1st set at 65%, 2nd set at 70% and the 3rd set at 75%.**
- **The repetitions would be 8 - 10 on each set.**
- **The rest interval is moderate, 1-1/2 minutes to 2 minutes rest between sets.**

When the lifter can easily complete 10 repetitions on all sets, then the lifter should increase the weight 5 - 10 pounds on all sets. Small muscle groups need small increases in weight, 5 lbs.; large muscle groups need larger increases in weight, 10 lbs. Additionally, a younger, inexperienced lifter should always make small increases in weight at all times to avoid injury.

- **Basic strength development and strength gains can be achieved with this program for all sports or for basic individual fitness.**
- **Core lifts are to be completed first, auxiliary lifts are to be completed after the core lifts**

## Phase III - Muscular Power

This strength training program is for people who are interested in large (bulk) muscular gains, for explosive type sports/activities. High Stress on the muscular system is experienced in this program. Muscular power can be achieved by choosing a high weight and by completing low repetitions with high sets for each exercise. The rest interval is long. There should be high stress on the muscles at work.

- **High weight selection (70% - 95% of 1RM)**
- **Low repetitions (2 - 6 reps.)**
- **High sets (4 - 5 sets)**

The repetitions are 2 -6 reps. on each set. On the last set it is common to fail before completing all 5 repetitions, however at least 2 repetitions should be completed on the 5th set. When the lifter can complete all 5 repetitions on the 5th set, they need to increase the weight 5 to 10 pounds on each set. (Small muscle groups need small increases in weight, 5 lbs., large muscle groups need larger increase in weight, 10 lbs.)

The weight selection in this strength program can be at various percentiles. Usually the lifter will start with 70% of 1RM and work up to 90% of 1RM. A common routine would be; 1st set - 5 reps at 70%, 2nd set - 5 reps at 75%, 3rd set - 5 reps at 80%, 4th set - 5 reps at 85%, and the 5th set - 5 reps at 90 %. The rest interval is long in this phase, 2 minutes to 3 minutes rest between sets. (Never rest longer than 3 minutes)

Another common program that can be completed for muscular power would be a heavy ladder routine. This ladder workout would be as follows: 1st set - 8 reps at 70%, 2nd set - 6 reps at 75%, 3rd set - 4 reps at 85% and the 4th set - 2 reps at 90%.

Powerful strength development and explosive strength can be achieved with the muscular power program. Explosive type sports or for basic power lifting competition. Core lifts should be completed first. Auxiliary lifts should be completed after the core lifts.

- **A 4-day a week program (Split 4) can be set up as follows:**
  - Monday/Thursdays = Upper body workout**
  - Tuesdays/Fridays = Lower body workout.**

## **Physical Fitness Concepts**

### **Principle of Progression/Over Load**

The principle of overload states that a greater than normal stress or load on the body is required for training adaptation to take place. The body will adapt to this stimulus. Once the body has adapted to the stress, then a different stimulus is required to continue the change. In order for a muscle (including the heart) to increase strength, it must be gradually stressed by working against a load greater than what it has adapted. To increase endurance, muscles must work for a longer period of time than they are used to. If this stress is removed or decreased there will be a decrease in that particular component of fitness. A normal amount of exercise will maintain the current fitness level.

### **Principle of Specificity**

The principle that the body adapts very specifically to the training stimuli it is required to deal with. The body will perform best at the specific speed, type of contraction, muscle-group usage and energy source usage it has become accustomed to in training. In order to improve your strength, endurance and fitness, you have to progressively increase the frequency, intensity and time of your workouts. A simple way to stimulate your body is to try different activities. The body will adapt in a highly specific way to the training it receives, a strong athletic foundation is needed before specific training methods will work optimally. The Specificity Principle simply states that for these reasons, training must go from highly general training to highly specific training. For example, if you are a sprinter, you may start out with easy running and general strength training before moving on to explosive training in the way of plyometrics or sprinting out of the blocks. If you try to do explosive, high intensity training too soon, you will run the risk of such training being ineffective and possibly resulting in injury. The principle of Specificity also implies that to become better at a particular exercise or skill, you must perform that exercise or skill. Your strength training exercises should try to emulate the same movements that you intend to perform during competition/sport/activity

### **Variation in Exercise**

Variation in your exercise routine is very important to keep you moving towards your fitness goal, to keep you from hitting a fitness plateau. Because your body adapts quickly to the stress that is applied to your body, you need to change your workout routine every 4 to 6 weeks, and consider cross-training to keep your workout routine fresh. Variation in your workout can occur in several ways;

- Change the intensity level of your workout.
- Change the repetitions along with the intensity level of your workout.  
Note: When the intensity level goes up the repetitions should go down, when the intensity level goes down the repetitions should go up.
- Change the duration/time/length of the workout.
- Change the types of exercise/apparatus used during the workout.
- Change the sequence of exercises you are already doing to create variety and a new overload. Because the muscles are being fatigued in a different order or pattern, they must adapt to this change in stimulus.
- Replace some or all of the exercises in your routine.
- Utilize Cross Training in your workout routine to make it more interesting

### **Cross Training**

The term cross training refers to a training routine that involves several different forms of exercise. While it is quite necessary for an athlete to train specifically for their sport if they want to excel, for most sports enthusiasts, cross-training is a beneficial training method for maintaining a high level of overall fitness. For example, you may use both biking and swimming each week to improve your overall aerobic capacity, build overall muscle strength and reduce the chance of an overuse injury. Cross-training limits the stress that occurs on a specific muscle group because different activities use muscles in slightly different ways. Cross training can help keep you motivated and interested in continuing your program, as well as stimulate greater strength gains. For optimal muscular development, variety is the name of the game.

## **Benefits of Cross Training**

- Reduces exercise boredom
- Allows you to be flexible about your training needs and plans (if the pool is closed, you can go for a run instead).
- Produces a higher level of all around conditioning
- Conditions the entire body, not just specific muscle groups
- Reduces the risk of injury
- Work some muscles while others rest and recover
- Can continue to train while injured
- Improves your skill, agility and balance

## **F.I.T. Concept**

**Frequency** - How often do you exercise per week? (exercise sessions per week)

Aerobic activities must be performed at least three times per week to reach an adequate level of cardiovascular fitness.

**Intensity** - How hard is your exercise session? (Level of intensity) To obtain the greatest cardiovascular benefits, the American College of Sports Medicine recommends that the intensity of your training be sufficient to increase your heart rate to a range of 60% to 90% of your maximum heart rate. This is your target heart rate zone. To find your target heart rate zone;

$220 - (\text{minus your age}) \times .90 = \text{Upper limit of your target heart rate zone}$

$220 - (\text{minus your age}) \times .60 = \text{Lower limit of your target heart rate zone}$

**Time** - How long do you exercise? (Duration of the exercise session). To achieve all the values of cardiovascular training, you must maintain the target heart rate (60% - 90%) for a minimum of 20 minutes. As you become more fit, you should increase the your time in the target heart rate zone to gain a higher level of fitness. However the intensity level may need to be reduced or lowered, in order for your body to accommodate or handle the stress from the increase in time.

## **Benefits of Cardiorespiratory Exercise (CRE)/Aerobic Activity**

**CRE is usually considered, by most fitness professionals, to be the most important component of physical fitness.** Basically it involves the cardiovascular and respiratory systems and their ability to adapt to and recover from stress and physical activity. Cardiorespiratory endurance is the ability of the body's circulatory and respiratory systems to supply fuel during sustained physical activity (USDHHS, 1996 as adapted from Corbin & Lindsey, 1994). To improve your cardiorespiratory endurance, try activities that keep your heart rate elevated at a safe level for a sustained length of time. The activity you choose does not have to be strenuous to improve your cardiorespiratory endurance. Start slowly with an activity you enjoy, and gradually work up to a more intense pace. The best way to maintain or increase your cardiovascular fitness is to find a form of aerobic exercise that you enjoy. This can be swimming, running, walking, biking, or another activity that raises your heart rate to a sufficient level. Performing CRE type exercises has also been linked with reducing the risk of getting life threatening diseases, such as heart disease and type two diabetes. Low levels of cardiorespiratory endurance (CRE) have been linked to a marked increase in risk of premature death due to several causes, but primarily heart disease.

## **Rest and Recovery**

Consecutive days of hard resistance training for the same muscle group can be detrimental. The muscles must be allowed sufficient recovery time to adapt. Strength training can be done every day only if the exercised muscle groups are rotated, so that the same muscle or muscle group is not exercised on consecutive days. There should be at least a 48-hour recovery period between workouts for the same muscle groups. For example, the legs can be trained with weights on Monday, Wednesday, and Friday and the upper body muscles on Tuesday, Thursday, and Saturday. Recovery is also important within a workout. The recovery time between different exercises and sets depends, in part, on the intensity of the workout. Normally, the recovery time between sets should be 30 seconds to 3 minutes.

## **Benefits of proper warm-up and cool down**

Both a warm-up and cool-down period are essential parts of any exercise session. Warming up brings about important physiological changes that reduce the risk of injury, while also preparing the body for higher levels of effort and energy utilization.

Specifically a gradual warm-up:

- Leads to efficient calorie burning by increasing your core body temperature
- Produces faster, more forceful muscle contractions
- Increases your metabolic rate so oxygen is delivered to the working muscles more quickly
- Prevents injuries by improving the elasticity of your muscles
- Gives you better muscle control by speeding up your neural message pathways to the muscles
- Allows you to work out comfortably longer because all your energy systems are able to adjust to exercise, preventing the buildup of lactic acid in the blood
- Improves joint range of motion
- Psychologically prepares you for higher intensities by increasing your arousal and focus on exercise

Blood tends to accumulate in the lower body when a vigorous exercise session is stopped abruptly. With reduced blood return, cardiac output decreases and lightheadedness may occur. Because muscle movement helps squeeze blood back to the heart, it is important to continue lower level physical activity after the exercise session is completed (i.e. the cool-down period).

The best activities for both are simply to work at a much lower pace in an aerobic/cardiovascular activity that you are using for training. Examples include slow cycling on a bike or walking on a treadmill. As a general guideline, a 5 – 10 minute session should be dedicated for both warming-up and cooling-down.

## **Benefits of Exercise**

### **KEY MESSAGES**

- Adolescents and young adults, both male and female, benefit from physical activity.
- Physical activity need not be strenuous to be beneficial.
- Moderate amounts of daily physical activity are recommended for people of all ages. This amount can be obtained in longer sessions of moderately intense activities, such as brisk walking for 30 minutes, or in shorter sessions of more intense activities, such as jogging or playing basketball for 15-20 minutes.
- Greater amounts of physical activity are even more beneficial, up to a point. Excessive amounts of physical activity can lead to injuries, menstrual abnormalities, and bone weakening.

### **FACTS**

- Nearly half of American youths aged 12-21 years are not vigorously active on a regular basis.
- About 14 percent of young people report no recent physical activity. Inactivity is more common among females (14%) than males (7%) and among black females (21%) than white females (12%).
- Participation in all types of physical activity declines strikingly as age or grade in school increases.
- Only 19 percent of all high school students are physically active for 20 minutes or more, five days a week, in physical education classes.

- Daily enrollment in physical education classes dropped from 42 percent to 25 percent among high school students between 1991 and 1995.
- Well designed school-based interventions directed at increasing physical activity in physical education classes have been shown to be effective.
- Social support from family and friends has been consistently and positively related to regular physical activity.

### **BENEFITS OF PHYSICAL ACTIVITY**

- Helps build and maintain healthy bones, muscles, and joints.
- Helps control weight, build lean muscle, and reduce fat.
- Prevents or delays the development of high blood pressure and helps reduce blood pressure in some adolescents with hypertension.

Regular physical activity that is performed on most days of the week reduces the risk of developing or dying from some of the leading causes of illness and death in the United States. Regular physical activity improves health in the following ways:

- Reduces the risk of dying prematurely.
- Reduces the risk of dying prematurely from heart disease.
- Reduces the risk of developing diabetes.
- Reduces the risk of developing high blood pressure.
- Helps reduce blood pressure in people who already have high blood pressure.
- Reduces the risk of developing colon cancer.
- Reduces feelings of depression and anxiety.
- Helps control weight.
- Helps build and maintain healthy bones, muscles, and joints.
- Helps older adults become stronger and better able to move about without falling.
- Promotes psychological well-being

### **Benefits of Flexibility**

- Allows greater freedom of movement and improved posture
- Increases physical and mental relaxation
- Releases muscle tension and soreness
- Reduces risk of injury

Some people are naturally more flexible. Flexibility is primarily due to one's genetics, gender, age and level of physical activity. As we grow older, we tend to lose flexibility, usually as a result of inactivity rather than the aging process itself. The less active we are, the less flexible we are likely to be. As with cardiovascular endurance and muscle strength, flexibility will improve with regular training.

### **Benefits of proper Hydration**

During athletic activity, a sports drink and/or water would be the preferable beverage, and if the event lasts more than an hour, the sports drink would be the drink of choice. However, fluid consumption during meals can include drinks like milk and juice, as well as sports drinks and water.

Douglas J. Casa, PhD, ATC, CSCS, chair of the NATA Position Statement on Fluid Replacement for Athletes points out some basic signs and symptoms of dehydration.

"The first indicators of dehydration are thirst, irritability, and general discomfort," said Casa. "And, if the dehydration progresses the signs and symptoms may include headache, cramps, chills, vomiting, nausea, head or neck heat sensations, and decreased performance."

Water is one of the most essential components of the human body, yet many people do not understand the importance of a well-hydrated body nor how much water is lost during the day.

Water regulates the body's temperature, cushions and protects vital organs, and aids the digestive system. And, because water composes more than half of the human body, it is impossible to sustain life for more than a week without it.

**Here are some tips to keep you well hydrated:**

- Drink fluids frequently
- Drink one to two cups of fluid at least one hour before the start of exercise.
- Drink eight ounces of fluid 20 to 30 minutes prior to exercising.
- Drink four to eight ounces of fluid every 10 to 15 minutes or so during exercise.
- Drink an additional eight ounces of fluid within 30 minutes after exercising.
- Drink two cups of fluid for every pound of body weight lost after exercise.
- Drink at least eight cups of fluid a day, or more if physically active
- Make fluids easily accessible
- Carry individualized fluid containers
- Begin all summer activity well hydrated
- During activity, drink the equivalent of how much you sweat
- Don't just drink when you're thirsty
- Avoid caffeine
- Both caffeine and alcohol can have a diuretic effect, so be sure to compensate for this additional water loss.

**Benefits of proper Nutrition**

It is the position of the American Dietetic Association, Dietitians of Canada, and the American College of Sports Medicine that physical activity, athletic performance, and recovery from exercise are enhanced by optimal nutrition. These organizations recommend appropriate selection of food and fluids, timing of intake, and supplement choices for optimal health and exercise performance. During times of high physical activity, energy and macronutrient needs—especially carbohydrate and protein intake—must be met in order to maintain body weight, replenish glycogen stores, and provide adequate protein for building and repair of tissue. Fat intake should be adequate to provide the essential fatty acids and fat-soluble vitamins, as well as to help provide adequate energy for weight maintenance. Overall, diets should provide moderate amounts of energy from fat (20% to 25% of energy); however, there appears to be no health or performance benefit to consuming a diet containing less than 15% of energy from fat. Body weight and composition can affect exercise performance, but should not be used as the sole criterion for sports performance; daily weigh-ins are discouraged. Consuming adequate food and fluid before, during, and after exercise can help maintain blood glucose during exercise, maximize exercise performance, and improve recovery time. Athletes should be well-hydrated before beginning to exercise; athletes should also drink enough fluid during and after exercise to balance fluid losses. Consumption of sport drinks containing carbohydrates and electrolytes during exercise will provide fuel for the muscles, help maintain blood glucose and the thirst mechanism, and decrease the risk of dehydration or hyponatremia. Athletes will not need vitamin and mineral supplements if adequate energy to maintain body weight is consumed from a variety of foods. However, supplements may be required by athletes who restrict energy intake, use severe weight-loss practices, eliminate one or more food groups from their diet, or consume high-carbohydrate diets with low micronutrient density. Nutritional ergogenic aids should be used with caution, and only after careful evaluation of the product for safety, efficacy, potency, and whether or not it is a banned or illegal substance. Nutrition advice, by a qualified nutrition expert, should only be provided after carefully reviewing the athlete's health, diet, supplement and drug use, and energy requirements. J Am Diet Assoc. 2000;100:1543-1556.

## Suggestions for food intake

- Low-energy diets will not sustain athletic training. Instead, decreases in energy intake of 10% to 20% of normal intake will lead to weight loss without the athlete feeling deprived or overly hungry. Strategies such as substituting lower-fat foods for whole-fat foods, reducing intake of energy-dense snacks, and doing activities other than eating when not hungry can be useful.
- If appropriate, athletes can reduce fat intake but need to know that a lower-fat diet will not guarantee weight loss if a negative energy balance (reduced energy intake and increased energy expenditure) is not achieved. Fat intake should not be decreased below 15% of total energy intake, because some fat is essential for good health.
- Emphasize increased intake of whole grains and cereals, beans, and legumes.
- Five or more daily servings of fruits and vegetables provide nutrients and fiber.
- Dieting athletes should not skimp on protein and need to maintain adequate calcium intakes. Accordingly, use of low-fat dairy products and lean meats, fish, and poultry is suggested.
- A variety of fluids—especially water—should be consumed throughout the day, including before, during, and after exercise workouts. Dehydration as a means of reaching a body-weight goal is contraindicated.
- Encourage athletes not to skip meals, especially breakfast, and not to let themselves get too hungry. They should be prepared for times when they might get hungry, including keeping nutritious snacks available for those times.
- Athletes should not deprive themselves of favorite foods or set unrealistic dietary rules or guidelines. Instead, dietary goals should be flexible and achievable. Athletes should remember that all foods can fit into a healthful lifestyle; however, some foods are chosen less frequently. Developing lists of "good" and "bad" food is discouraged.
- Help athletes identify their own dietary weaknesses and plan strategies for dealing with them.
- Remind athletes that they are making lifelong dietary changes to sustain a healthful weight and optimal nutritional status rather than going on a short-term "diet" that they will someday go off.

## Reference:

For additional information go to: [http://www.eatright.org/Public/Other/index\\_adap1200.cfm](http://www.eatright.org/Public/Other/index_adap1200.cfm)  
ADA Web Site [www.eatright.org](http://www.eatright.org)



For more information go to: <http://www.cdc.gov/nccdphp/dnpa/physical/importance/why.htm>  
To read more about Target Heart Rate Zone: [Understanding Your Training Heart Rate](#)



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