

Chapter 13

Training Principals

Physical Fitness

- **The body's ability to function efficiently, to enjoy leisure time, and be healthy, and resist hypokinetic diseases**
- **Consists of health related fitness and skill related fitness**

Components of Physical Fitness

Health related

- Body composition
- Cardiorespiratory capacity
- Flexibility
- Muscular endurance
- Muscular strength

Skill related

- Agility
- Balance
- Coordination
- Power
- Reaction time
- Speed

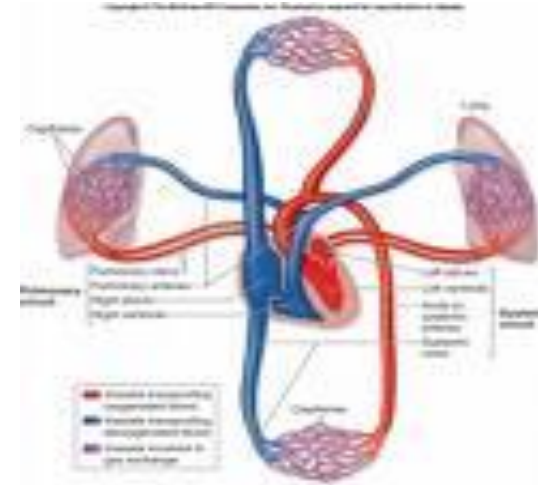
Body Composition

- Relative percentage of muscle, fat, bone
- A person who is physically fit has a relatively high amount of lean muscle mass, and bone density
- Body fat for men 5-25%
- Body fat for women 8-30%



Cardio-respiratory Fitness

- The ability of the heart, lungs and blood vessels to deliver oxygen, and nutrients efficiently to the tissues
- Individuals who are Physically fit, have higher ventilatory thresholds and anaerobic thresholds



Flexibility



- Range of motion available in a specific joint.
- This becomes problematic later on in life as it limits an individual's range of motion and thus ability to perform every day functions.



Muscular Endurance

- Ability of a muscle to repeatedly exert itself
- A fit person can repeat movements over a longer period of time
- How many times?



Muscular Strength



- The ability to exert an external force or lift/move a heavy object.
- Can hinder an individual's ability to complete daily chores/activities
- How much?

Agility



- Ability to rapidly and accurately change direction of the entire body in space

Balance

- **Static Balance-** ability to maintain equilibrium while stationary
- **Dynamic Balance-** ability to maintain equilibrium while moving

Coordination

- **Ability to use senses with the body to perform motor tasks smoothly and accurately**

Speed

- The ability to perform a movement in a short period of time

Power

- The ability to exert a force at a fast rate
- This is the combination of muscular strength and speed

Reaction Time

- **The time elapsed between the stimulus/stimulation and the beginning to the reaction to the stimulus**

Training

- Sir Roger Bannister became the first person to run a mile in less than 4 minutes (1954)
- His training techniques were at the cutting edge in that day....
- However if you were to compare them to today's methods they seem quite primitive

What is Training?

- It is a process by which the human body is made more efficient. In physical activity, individuals seek to improve their fitness components through training
- Eg. Running longer/faster, shooting a basketball more accurately, or lifting more weight

Training continued...

- The process and changes that occur due to training can take many forms depending on the goals of the individual. (Olympic athlete, blue collar worker, aesthetics)
- Training methods are like recipes....there are many ways to make chocolate chip cookies!



F.I.T.T.

- The recipe most widely used is the FITT formula

FITT Factors Applied to Physical Conditioning Program						
	Cardiorespiratory Endurance	Muscular Strength	Muscular Endurance	Muscular Strength and Muscular Endurance	Flexibility	
F I T T	Frequency	3-5 times/week	3 times/week	3-5 times/week	3 times/week	<u>Warm-up and Cool-down:</u> Stretch before and after each exercise session <u>Developmental Stretching:</u> To improve flexibility, stretch 2-3 times/week
	Intensity	60-90% HRR*	3-7 RM*	12+ RM	8-12 RM	Tension and slight discomfort, NOT PAIN
	Time	20 minutes or more	The time required to do 3-7 repetitions of each exercise	The time required to do 12+ repetitions of each exercise	The time required to do 8-12 repetitions of each exercise	<u>Warm-up and Cool-down Stretches:</u> 10-15 seconds/stretch <u>Developmental Stretches:</u> 30-60 seconds/stretch
	Type	Running Swimming Cross-Country Skiing Rowing Bicycling Jumping Rope Walking/Hiking Stair Climbing	Free Weights Resistance Machines Partner-Resisted Exercises Body-Weight Exercises (Pushups/Situps/Pullups/Dips, etc.)		<u>Stretching:</u> Static Passive P.N.F.	
	* HRR = Heart Rate Reserve * RM = Repetition Maximum					

Figure 1-1

Training Principles

- If you would like to know how to train properly you will need to understand a little about each of the following principles.

Overload Principle

- In order for physiological change to occur, the human body must be subjected to greater stresses than it is accustomed to. Applies to aerobic and anaerobic exercise.
- Eg. Of aerobic overload?
- Eg. Of anaerobic overload?

Principle of Progression

- In order for the effect of the training to progress, the athlete must be subjected to progressively greater and greater overloads.
- Eg. Once you can lift 100 lbs on the bench press 12 times on your 3rd set increase the amount to 110 lbs.

The Specificity Principle

- Also called the S.A.I.D. principle (Specific Adaptations to Imposed Demand)
- In order for specific outcomes to occur, training exercises must be specific to those outcomes.
- Thus the training should mimic activities from the actual sport

Principle of Individual Differences

- Every athlete has a different physiological and psychological makeup and thus will have different needs when training.
- E.g. History, type of activity, fitness level, age, gender, ability to recover from intense workouts.

Principle of Reversibility

- When training is removed, muscles will over time lose the benefits that training brought about. Atrophy occurs, and muscles lose size and strength.
- Use it or lose it!

Principle of Diminishing Returns

- Individuals who have trained little or not at all will experience greater results than those who have trained for longer periods of time.
- Elite Sprinters train endlessly in hopes of decreasing their times by hundredths of seconds while a beginner may decrease their time by seconds
- Plateaus often occur in individuals training for long periods of time