

Training Principles

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Kinesiology 11 The Principles of Exercise Training

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Plenty of people workout or exercise and never achieve the results they are hoping for because they do not consider the basic principles of training when designing their exercise plan. Setting goals and working with the proper training plan will help any athlete achieve results.

When you approach your multisport training, the best way to stay on track is to better understand the principles behind the work you are putting in to improve your conditioning.

These are seven basic principles of exercise or sport training you want to keep in mind when planning your program:

1. Individuality

- The principle of individuality states that each person has unique abilities and needs (when it comes to training)
- Everyone is different and responds differently to training
 - Some people are able to handle higher volumes of training while others may respond better to higher intensities and lower training volumes. (like doing a "30 min HIIT workout")
- These differences are based on a combination of factors like genetic ability, predominance of muscle fibre types, other factors in your life, chronological or athletic age, and mental state.
- When planning a program you should always take into account these individual factors and create a unique plan for every individual. * usually made by a fitness pro...

2. Specificity

- The principle of specificity states that sports training should be relevant and appropriate to the sport for which the individual is training in order to produce the desired effect.
- Additionally, training should progress from general conditioning to specific training for the particular skills required in that sport or activity.
- Specificity training essentially means that you must perform the skill in order to get better at it.
- It is the principle behind the saying, "practice makes perfect"

- Training for specificity means that you will regularly train for and repeat movements or actions that are utilized in your specific sport (skills training)
- **Example:** If you want to be a great pitcher, running laps will help your overall conditioning but won't develop your skills at throwing or the power and muscular endurance required to throw a fastball 50 times in a game.
- **Example:** Swimming will help improve your aerobic endurance but won't develop tissue resiliency and muscular endurance for your running legs.

3-4. Progression and Overload

- The Principle of Progression in endurance training implies that there is an optimal level of "overload" that should be achieved, as well as an optimal time frame for this overload to occur.
- The Progression Principle instructs that the overload process should not be increased too slowly, or improvement is unlikely to occur.
 - However, overload that is increased too rapidly can result in injury issues or muscle damage.
 - Thus, exercising above the target zone is counterproductive and can be dangerous and potentially result in injuries.

The Principle of Progression

- The Progression Principle states that there is a perfect level of overload in between a too slow increase and a too rapid increase.
 - **For example**, the weekend athlete who exercises vigorously only on weekends, but not regularly during the week, does not exercise often enough to see solid results and so violates the principle of progression
 - In this situation, the overload process is gone about too slowly
 - The Principle of Progression also makes us realize the need for proper - rest and recovery
 - Continual stress on the body and its joints, as well as constant overload, can potentially result in exhaustion and injury.
- You should not (and cannot) train HARD all the time. (you will get hurt)
 - Doing so will lead to overtraining and a great deal of physical and psychological damage could result

What Is Overload?

- Overload has been previously mentioned, as it is a central and key aspect of Weight training.
- Overload means is that the intensity with which an exercise is done must be high enough above the individual's normal range for any desired physiological adaptation (muscle growth) to occur.
 - Example: if you want to see results when lifting weights, you have to lift more weight than your muscles can physically handle at the time. (think of the load-deformation curve)
- The only way your body physically changes and grows is if the muscles are pushed to the point where they must grow stronger to lift that weight.
 - When the muscle fibres are taxed in this manner they break, allowing new, and in turn stronger ones, to develop.
 - The overload process will cause the muscle fibres to grow stronger and larger in order to handle the additional weight.

Progression and Overload (how they work together)

- Progression is a key aspect of overload.
 - Often, individuals do the same workouts over and over again which forms a level of familiarity with the body, and thus physical progress is not made.
- In order to properly overload the body, progression is key.
- Once an exercise starts to feel easy, it's time to switch it up so you are always overloading your muscles and causing them to adapt to get stronger and fitter.
- Sometimes progressing is as simple as changing the exercise you're doing to something different.
- It is also important not to always work at high intensities, which could lead to overtraining.

5. Adaptation

- The principle of adaptation refers to the process of the body getting accustomed to a particular exercise or training program through repeated exposure.
- As the body adapts to the stress of the new exercise or training program, the program becomes easier to perform

- Over time the body becomes accustomed to exercising at a given level.
- This adaptation results in improved efficiency, less effort and less muscle breakdown at that level.
 - This explains why beginning exercisers are often Sore after starting a new routine, but, after doing the same exercise for weeks and months at the same intensity, the exerciser experiences little, if any, muscle soreness.
- This reinforces the need to constantly vary the exercise and training routine if you want to maximize your results.
- This is why you need to change the stimulus by using higher intensity or longer duration in order for exercise programs to continue improvements.

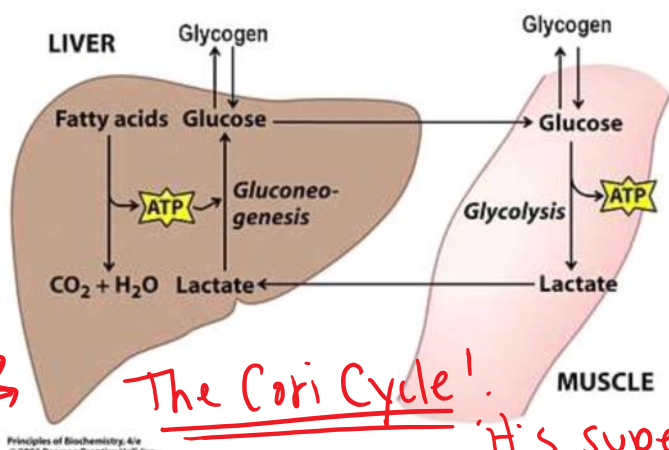
6. Recovery

- The Recovery Principle dictates that athletes need adequate time to recuperate from training and competition.
 - Many believe that an athlete's ability to recover from workouts is just as important as the workout itself.
- The Recovery Principle applies both to immediate rest needed between bouts of exercise, as well as to longer time intervals of several hours to about two days following exercise.
- We know that the body cannot repair itself without rest and time to recover.
- Both short periods like hours between multiple sessions in a day, and longer periods like days or weeks to recover from a long season are necessary to ensure your body does not suffer from exhaustion or overuse injuries.
 - Motivated athletes often neglect this.
- It is during rest periods that athletes' bodies adapt to the stress placed upon them during intense workout sessions and competitions.
- Rest also provides time for mental preparation and reflection.
- At the basic level, the more you train the more sleep your body needs, despite the adaptations you have made to your training. *
- Exercise intensity more profoundly affects recovery than does the duration of exercise.
- Maximizing the recovery processes after interval training, weight training, or repeated sprint work is important.

Post Workout

- Actively walking venous cooling down by jogging or immediately after intense exercise prevents the potential for pooling.
- Rhythmic exercise increases blood flow through the veins and heart during recovery, speeding up lactate removal from the blood and leading to less muscle soreness following exercise. *lactic acid build up = more soreness!*
- Active recovery consisting of light-to-moderate cardio activity decreases blood lactic acid significantly faster than complete rest or passive recovery. (ex. lying down)
 - o Whether cycling or running, activities should remain at about 30-60% of the lactic threshold level.

- Activity during recovery also maintains circulation to the heart, liver, and inactive muscles that are able to use lactic acid to synthesize glycogen for later storage.



- Sleep, proper nutrition, and healthy lifestyle habits after intensive training periods are critical if an athlete is hoping to recuperate and stay healthy during their competitive season.
- Recovery can also be facilitated by stretching after workouts.
- Whirlpools and massage can also help muscles rest and rebuild more quickly while minimizing muscle soreness.
- Upright activity in water (no impact) also assists with recovery.

7. Reversibility

- Reversibility means that an athlete can lose the effects of training when they stop, and can gain the effects when they begin to train again.
 - "If you don't use it you will lose it"
- Detraining occurs within a relatively short time period after an athlete ceases to train.
 - Performance reductions may occur in as little as 2 weeks or sooner.
 - In trained athletes, research indicates that detraining may result in greater losses in muscular power than strength.
 - Strength losses are due to first to neural mechanisms, and next due to atrophy of muscles.
 - Strength levels after detraining are rarely lower than pre-training levels, so training has a residual effect even when it is discontinued.
 - When the athlete returns to training, the rate of strength acquisition is high.
 - Example: if you discontinue a particular exercise like running 5 km or bench pressing 150lbs 10 times, you will lose the ability to successfully complete that exercise.
 - Your muscles will atrophy and the cellular adaptations like increased capillaries (blood flow to the muscles) and mitochondrial density will reverse.
 - The reversibility principle does not apply to retaining skills.
 - Motor learning research reveals that sport skills are retained for much longer periods of time than the physiological effects of training.
 - A skill once learned is never forgotten, especially if well learned.
 - Coordination appears to store in long-term motor memory and remains nearly perfect for decades, particularly for continuous skills (e.g., cycling, swimming)
 - Over time, strength, endurance, and flexibility are lost, but athletes remember how to execute sport skills and strategies.

FITT Principle = the basics of any good fitness regime

- Understanding the F.I.T.T. principle will help you create a workout plan that will be more effective in allowing you to reach your fitness goals.
- F.I.T.T. is an acronym that stands for:
 - F = frequency
 - I = Intensity
 - T = type
 - T = time
- These are the four elements you need to think about to create workouts that fit your goals and fitness level.
- The principles of specificity, progression, overload, adaptation, and reversibility are why practicing frequently and consistently are so important if you want to improve your performance.
- Missed sessions cannot really be made up within the context of a single season.
 - They are lost opportunities for improvement.
 - Example: skipping your long ride on weekend 1 means you can't or shouldn't go as far as originally planned on weekend 2 (progression & overload).
 - Skipping your Monday swim means your swimming skills and muscles won't be stressed that day (specificity).
 - Missing a week due to a vacation sets you back more than one week (adaptation and reversibility).
 - Apply these principles to your training to get a better understanding of your body and how to achieve success.

Frequency

The first thing to set up with your workout plan is frequency: how often you exercise. Your frequency depends on a variety of factors including the type of workout you're doing, how hard you're working, your fitness level, and your exercise goals.

In general, the exercise guidelines set out by the American College of Sports Medicine give you a place to start when figuring out how often to workout.

- **For cardio:** Depending on your goal, guidelines recommend **moderate exercise** 5 or more days a week or **intense cardio** 3 days a week to **improve your health.**
 - If you want to **lose weight**, you'll want to **work up to more frequent workouts**, often up to six or more days a week.
- **For strength training:** The recommended **frequency** is 2-3 **non-consecutive days a week** (at least one to two days between sessions).
 - Your frequency, however, will often **depend** on the **workouts** you're doing, because you want to work your muscles at least two times a week.
 - If you do a **split routine**, like upper body one day and lower body the next, your **workouts** will be **more frequent** than **total body workouts.**

Intensity

Intensity has to do with how hard you work during exercise. You can **change** the **intensity** depends on the **type of workout you're doing.**

- **For cardio:**
 - For cardio, you will usually monitor intensity by heart rate, perceived exertion, the **talk test**, a **heart rate monitor**, or a **combination** of those measures.
 - The general recommendation is to work at a moderate intensity for steady state workouts.
 - Interval training is done at a **high intensity** for a **shorter** period of time.
 - It's a good idea to have a **mixture of low, medium, and high-intensity cardio exercises** so you stimulate different energy systems and avoid overtraining.
- **For strength training:**
 - Monitoring the **intensity** of strength training involves a different set of parameters.
 - Your intensity is made up of the exercises you do, the amount of weight you lift, and the number of sets and reps you do.
 - The intensity **can change** based on how you're training.

- The general **idea** is to **lift enough weight** so that you **can only complete** the number of **reps** you've chosen.
- If your goal is to **lose weight** or **build endurance**, you might lift lighter weights for **more reps**.

Time

Time refers to how long you exercise for **during each session**. There isn't one set rule for how long you should exercise and it will typically **depend** on your **fitness level** and the **type** of **workout** you're doing.

- **For cardio:**
 - The exercise guidelines suggest 30 to 60 minutes of cardio but the duration of your workout **depends on what you're doing**.
 - If you're a **beginner**, you might start with a workout of **15 to 20 minutes**. If you're doing steady state cardio, such as going for a run or getting on a cardio machine, you might exercise for 30 to 60 minutes.
 - If you're doing **interval training** and working at a **very high intensity**, your workout will be **shorter**, around **20 to 30 minutes**.
 - Having a **variety** of workouts of different **intensities** and **durations** will give you a **solid, balanced cardio program**.
- **For strength training:**
 - How **long** you lift weights depends on the **type of workout** you're doing and your schedule.
 - For example, a total body workout could take up to an hour, whereas a split routine could take less time because you're working fewer muscle groups.

Type

The **type of exercise** you do is the last part of the F.I.T.T. principle and an **easy one to manipulate** to **avoid overuse injuries or weight loss plateaus**.

- **For cardio exercise:**
 - Cardio is easy to change, since any activity that gets your heart rate up counts.
 - Running, walking, cycling, dancing, and the elliptical trainer are some of the wide variety of activities you can choose.

- Having more than one go-to cardio activity is the best way to keep your body guessing and reduce boredom.
- For strength training:
 - Strength training also has a variety of types of workouts to offer.
 - It includes an exercise where you're using some type of resistance (bands, dumbbells, machines, etc.) to work your muscles.
 - Bodyweight exercises can also be considered a form of strength training.
 - You can easily change the type of strength workouts you do, from total body training to adding things like supersets or pyramid training to liven things up.

How to Use the F.I.T.T Principle in Your Workouts

The F.I.T.T. principle outlines how to manipulate your program to get in shape and to get better results. It also helps you figure out how to change your workouts to avoid boredom, overuse injuries, and weight loss plateaus.


For example, walking three times a week for 30 minutes at a moderate pace might be a great place for a beginner to start. After a few weeks, however, your body adapts to these workouts and several things may happen:


- Your body becomes more efficient at exercise: The more you workout, the easier it is to do the exercises, causing you to burn fewer calories than you did when you started.
- Weight loss: Your new workouts may assist weight loss if that is what you are looking to do. The downside is that you expend fewer calories moving that new, smaller body around.
- Boredom: Doing the same workout for weeks or months on end can get old, eating into your motivation to exercise.

It's at this point you want to manipulate one or more of the F.I.T.T. principles, such as:

- Changing the frequency by adding another day of walking
- Changing the intensity by walking faster or adding some running intervals
- Changing the time spent walking each workout day
- Changing the type of workout by swimming, cycling, or running.

Even just changing one of these elements can make a big difference in your workout and in how your body responds to exercise. It's important to change things up on a regular basis to keep your body healthy and your mind engaged.

 Hi everyone! If you made it this far and understood what you read send in a comment on the new "MS Teams" group I made! Tell me what your favourite workout or activity has been during this period of "social distance"

 I MISS our class
-Ms. Wood