

SCIENCE

OF LONG DISTANCE



RUNNING

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INTRODUCTORY

Distance running is already becoming a popular form of exercise. However, there are a few very important things that have to be considered before one decides to join in on all the fun.

Running, like any other exercise, has to be approved by a doctor first. Those who have a personal physician may consult their doctors on the kind of exercise regimen they're suited to before starting one. One must be checked out thoroughly.

This is to ensure that the exercise will not aggravate existing heart conditions. For those who think they are fit and healthy, it does not hurt to actually make sure that is the case. Feeling fit and knowing you actually are fit are not exactly the same. Remember the three men who died of heart attacks last 2007 while competing in different running races?

One of them in particular, Mike Banner, was said to have been unaware that he had a very rare heart condition. This caused his arteries to get clogged during the race, leading to a fatal the heart attack. Another one, Ryan Shay, died at 28 while running the U.S. men's marathon Olympic Trials had an enlarged heart.

However, he knew about his condition and used it to his advantage. Unfortunately, this advantage was what ultimately turned on him and led to his early death.

These are simply a few of the examples. Measures have also been taken to remind runners to drink while running. A substantial number of runners, however, are not really keen on guzzling down water while on the run. And who can blame them? After all, it breaks the concentration.

And when in a race to the finish line, drinking water may not exactly be the first thought that most athletes find themselves entertaining.

However, information from the USATF states that a person must take his/ her weight before and after a workout and the resulting difference between the two is that person's "sweat rate." Since the standard practice is to drink sixteen ounces of fluid for each pound one has lost, knowing one's sweat rate allows a person to determine it to a per hour or perhaps a per mile or whichever rate that one wishes to suit personal needs and preferences.

This way, athletes can also avoid succumbing to hyponatremia, a condition that is basically the exact opposite of suffering from dehydration. Meaning, one is overhydrated. This happens when athletes, after a long race without drink or fluid, fiercely guzzle down water. It is an extremely bad habit.

The body, specifically the kidney, is not made to withstand the consumption of huge volumes of water at just one time. There has to be intervals. Otherwise, water intoxication happens or what is commonly termed by doctors as hyponatremia.

This is why it is important to start an exercise regimen that is recommended by a doctor. It makes sense to seek the medical opinion of a physician before doing anything that involves one's body. One may not know that by unhealthy practices, one may already be putting one's health—and life—at risk.

One must then make sure a taking on an exercise like distance running is accompanied by medical check-ups. That way, one is sure to be healthy and fit. After all, it is not enough that one feels healthy. One must know it too.

CHAPTER 1: GETTING SET FOR DISTANCE RUNNING

Training is an essential part of every athlete's life. It dictates how he will perform on the grand stage of the sporting event he has chosen.

It doesn't matter if you're a ball player or a budding swimmer you have to pay your dues in training in order for your body to be readily equipped when the game proper is on. Distance running is an event that has been sweeping the globe in years. Many people have to come to love its events. Let's take a look at how you can shoot your way into getting set for distance running.

There are lots of things to consider when distance running is on the table. Aside for getting a trustworthy pair of running shoes, you should have your very own running log. You can place all the vital stats here as you monitor your progress and look for signs of improvement.

The log sheet consists of daily time or distance, weight, your morning pulse, more importantly subjective records regarding your run. Your comments are very important because it can give you an idea of how you felt after or even before the run. The log is most helpful in terms of providing you with information that you can tap into when you start feeling some sort of pain.

You can also figure out what's wrong with your training so as to shift into better methods.

Moving on, you have to think about your joints. Save them for the real thing. It's not good that you get them strained way before you get into the real action of distance running. Although you have to prepare your body for the long distance to come in the running proper, you have to do this preparation without compromising your lower back and feet as well as your knees, ankles, and hips.

The treadmill is the one tool you can rely on because it gives you less strain as supposed to the roads that you have to stride in the real world. It is important to avoid getting too much stress and the treadmill can do this while providing you with the sort of distance training for the real thing. You can make your treadmill work out more challenging by increasing the angle of incline gradually. Normally angles are set at three percent higher.

Nature can sometimes put your training to a temporary halt but you don't have to give so much of a fuss about it. All you need to do is adjust your schedule. Hot summer days can really take a toll on your hydration and overall performance. What you can do is mix it up.

It's like playing hide and seek with the sun. You can do your training before the sun can boastfully man the skies or you can go out in the late evenings so as to prevent your body from breaking down because of heat stroke.

Another aspect to give emphasis on while preparing to run for the distance is the fact that you have to take little steps before going for the giant leaps. Start at the pace of training which really suits your body's capacity and gradually employ changes over the weeks based on the stats that you have accumulated. This can save your body from injuries that can surely affect the length and quality of your training.

Apart from the physical preparation that you have to make in getting set for distance running you also have to make sure that you are sharp mentally and emotionally.

CHAPTER 2: BUILDING TOWARDS DISTANCE RUNNING

Running can be both a fun-filled activity and also a serious event that can be life-altering.

The distance you get to accomplish can be very rewarding both physically and psychologically. Runners often experience a certain kind of high after accomplishing a designated running time and distance. In order to become a successful runner especially for long distances you have to build on certain components that can boost your skills which will make you ready for the running proper. Let's take a look at the basic components that you have to know in order to fully build your way towards distance running.

First on the list is the Fartlek. This is the Swedish term for speed play. This distance running component is done by maneuvering into sudden burst of speed while in the middle of the training run. It allows your legs to utilize various paces that facilitate to recognition of your capacity to maintain such paces at certain distances.

The key in Fartlek is to designate your very own landmark. This landmark which may be a tree or a post can give you an idea of how far you keep on running at such a fast pace. Give your pace some time intervals. You can dash for about fifteen seconds or even longer at about three minutes. It's important that you do not overdo Fartlek. Make sure that each speed session is just right for your body's capacity to sustain.

Next on the list is something that most runners fear of. It is known as the Hills. Based on the name itself you have to go through hills in order to perfect this one. It also demands more of your mental and will power than that of your legs. A little bit of dedicated practice can really pull you through this distance running component.

Hill and incline routines and sessions give you a definite edge when it comes to running on hills as well as when you have your turn on the flat playing field. Remember that the muscle groups you utilize when running up those high inclines are just the same as those used when you run on a flat surface.

Thus, you gain more power, speed, and leverage. Your strides become longer at an increased rate. Another benefit of the hill routine is that the muscle around your knee is improved and strengthens so injuries are prevented.

Another one of the components that you have to be familiar of is the interval. Intervals are usually done on the track where distances are clearly defined.

This is a key concept in doing intervals. Sessions involving intervals revolve around speed workouts wherein distance and pace is accurately laid out before you even begin. It's very benefit is that you become more efficient physiologically over a period of time.

The least complicated of the speed workouts are the tempo runs. This is simply because you do not have to keep track of any distance and you don't have to recall your time splits every now and then. Through this session your body realizes how to economize running. You will be able to run a faster pace for longer periods of time.

Last but certainly not the least is the all-important long run. This will give your body the needed endurance and stamina that will carry you throughout the distant runs.

Building towards distance running is no joke. You can surely get hurt or injured so be sure to review these components before you head out to the road or track.

CHAPTER 3: CROSSING COUNTRIES IN DISTANCE RUNNING

Running offers a lot of benefits. It can enhance you physically by giving you a well-chiseled upper body and a very stable lower portion.

The psychological effect of running has been also noted as it is said that certain endorphins are released during the peaks of your run. This is why more and more communities are growing as they stride harder and longer to make running even more recognized across the globe. There have been lots of events showcasing running in a variety of distances. One of which enable the participants to cross countries via distance running. Let's take time to see how it is done.

Let's get your engines revving by pinpointing what cross country running is really all about. It has been considered a sport especially in areas across the world which is considered as temperate regions. Cross country running events usually take place during autumn and winter.

These sessions are quite challenging as they are done over a course that covers rough terrains. When you join in such events you will have to encounter grassy, muddy, and watery woodlands.

Variations are made in every course. The weather and the underfoot conditions really dictate how participating teams can perform on the courses. The distance and length between two courses may vary over time.

Cross country running is a sure-fire fun-filled event as team's race for supremacy in different challenging areas and terrains. Let's take a look at how the race really takes place. Races are started in a single gun fire or sound of a horn which signals the teams to head on for the finish line.

At times teams have their own boxes or what is coined as bull pen along the starting area. These boxes may be big enough to accommodate the whole team. In other meets, there may be ample room for only one runner on the starting line.

The other members of the team which may be around 2 to 7 persons wait their turn in a line. Once the race has started it gets rough as a number of persons start to converge on narrower paths. So you really have to be quicker in order for your team to gain some sort of advantage.

During the middle of the race the runners are designated to stay on a marked path. Normally markers such as ribbons, cones, flags, chalk, and tapes are utilized. Runners are advised not to run over and take markers such as cones and flags down in order to avoid confusion as to where the rest of the course goes.

Just like any other race, this one too ends and at times it's like a party at the finish lines because of the numerous participants involved. The finish line is marked by a chute of funnel. Your average chute is composed of a lengthy walkway made of rope. This keeps the athlete in ending the race in a more organized single-file order.

Due to the large amount of people involved in the race helpers are tapped into action to assist the athletes in keeping their movements forward as more finishing runners make their way to the end. Finishing positions are tracked using a slip at the bottom of a runner's number.

This is ripped off at the conclusion of the race in order to get the information of the said runner. There can never be a limit on how far your capacities will take you. Surely it will take more than crossing countries to stop the thrills and spills of a distance running.

CHAPTER 4: DISTANCE RUNNING – INJURIES AND ERRORS

In distance running, injuries are often regarded as a way of life just like in any other sports.

Some pundits even regarded them as medals or trophies telling everyone that one is a bona fide member of that larger, virtual fraternity of athletes around the world.

Surveys, however, indicated that 60% of running injuries were caused by training errors. Training errors do not mean they are caused by the wrong types of training, but by rapid changes in training or the intensity levels of training.

While on a training run, the leg bones, the joints and the muscles are stressed. They are already damaged, and must have a recovery period during which the body will repair the damage. However, if the training run continues, there is never sufficient recovery, and injury occurs.

It is the same story if the mileage is suddenly increased. The body is not properly prepared for the higher level of stress. The bones, muscles, tendons and the ligaments are only as strong as its present training level. It does not have the sudden extra strength for the new increased intensity level.

On the other hand, if there are adequate rests, there is “super- compensation”. With “super-compensation” the body and the related body parts react to the stress by becoming stronger. By then, they can now absorb greater stress and shocks.

Planning

The solution is careful planning of the training program. Training should not be wishy-washy; every part should be planned including rest days. Finally, the plan should be followed to the letter.

Any planned increases in mileage should never be greater than 10% a week. There should be a full rest day once a week or every other week. Easy days (light training) are recommended every three days or so.

The principle is to start working on the current level of mileage without injury. Then, a slow progression is made up to the intended mileage level. This is the key to improved performance.

Other training errors

One bad error is to abruptly add high-intensity training. It is like doing months of steady mileage training and then deciding to include fast anaerobic interval sessions. The body is not trained yet to cope with fast-paced running. The muscles tire fast and there is extra stress on the bones and joints.

Then, there is the error of changing running surfaces. If one trains on high-impact surfaces such as roads, the body naturally adapts. The same case is true in training on soft terrains.

However, if one trains on hard surfaces regularly and then abruptly changes into soft practice surface (or vice-versa), problems may happen because of the sudden different stress on the muscles.

Another very bad training error is doing compound changes fast. An example would be a runner doing steady training on the road for a season and then switches to fast training on a track with spikes. There are three sudden changes done here: the intensity, the surface, and the shoes.

A sudden change in the mechanics (caused by the shoes) and the higher impact surface (soft country terrains to the tracks) and speed require use of different muscles. This is often too much for the athlete's body.

However, if you include some speed training on the track (and in spikes) throughout the whole training year, injury risks are reduced when you increase intensities for track racing.

Athletes usually make the mistake of planning high-quality running sessions, but make up the 'steady runs' element of their training as they go along. The rule is to plan the training in every detail. Changes are to be carefully incorporated slowly.

What every athlete (and coaches, of course) must keep in mind is that protracted high-intensity training, prolonged high volumes of training, and any kind of rapid change in the training is a grave training error.

This is a crucial rule to understand, and this is true in any kind of sports, distance running included.

CHAPTER 5: DISTANCE RUNNING - RANDOM TIPS

One of today's popular sports is distance running. This popularity could be attributed to the fact that the sport does not require much in terms of gears (running clothes and shoes) and in terms of athletic qualifications (you just have to know how to run).

The start

You may have read and known from people that distance running promotes good health, is fun, and can be a source of popularity if you have a talent for long races. There are other good reasons for training to be a distance runner. The reality though is that distance running is hard.

The first hurdle is your mind. An untrained body will resist any exercise. Breathing is hard, the muscles ache. You get tired. All reasons are there for you to stop. With a tough mental attitude, you can continue and overcome them.

The secret? Start slow.

You may find your lungs will complain at first. But as you continue, the breathing eases up. The stiff and sore muscles eventually relax. This is the 'second wind'. Keep the pace slow at first. You are not just training, but building your muscle strength as well.

First, pick a distance not far and not too long either. Of course, first runs are always disastrous, or so you may think. Do the runs three to five times a week, with rests in between. Then, you can progress on your own, or with a running consultant. Running with a companion makes it more fun, too.

Gear

Your sports store clerk can help you choose your clothes. More important though are good shoes. They should be made for running, must fit well, and do not cause injuries. Avoid “black toes”, those bruised toenails common to runners. Pick a shoe size with about a thumb’s space between your toe and the shoe’s end. If there is heel slippage, experiment till you get the correct one.

Food

Distance running needs specific nutrition. Carbohydrates are on top of the list. These are for stocking glycogen needed for strength and endurance. A good helping in proteins would be needed too if your body still need to build strong muscles.

Distance runners must have carbohydrates during the run. (Carbohydrates drinks are now available.) Lack of carbohydrates results in low blood sugar and low muscle glycogen which would weaken endurance leading to muscle fatigue.

Water, lots of it, is also needed all the way. Make it a habit to drink fluids (water and those power drinks) every 10 to 15 minutes, notwithstanding whether you are thirsty or not. Body fluids are constantly depleted, dissipated via sweat as you run.

Endurance

When you become strong and comfortable with your running, you may want to increase the distance. Do it gradually. The rule is to increase not more than 10% every week.

You may begin increasing your speed, too, if you reach two miles. This is the time where you can set long-term goals. Goals will help improve your game and keep you going.

Your final goal might be running long distances or whatever are your ambitions. The very important aspect to remember is to go for that goal one easy step at a time, and the slower the better. You have to pace your mind with your body. Bodies are different from person to person.

Training log

Aside from a good pair of running shoes, another valuable tool is a detailed training log. There are examples on how to do this everywhere. The important thing is that you record all the details of your running (pulse rates, distances covered, rest days, dates of changes in anything, comments on being tired or achy, etc.)

The log is for your review as well as for planning future activities, based on all the details in front of you.

The log is done daily

These are some of the general things to keep in mind if you decide to do distance running. The details you will discover later as you go – from friends and coaches, from magazines, books and the internet. The most important thing is that you are already in it and enjoying yourself.

CHAPTER 6: NUTRITION AND DISTANCE RUNNING

Unlike other sports people, distance runners need carbohydrates for their nutritional needs in the endurance sport of distance running.

While other sports like, say weightlifting that rely mostly on proteins, runners depend heavily on carbohydrates.

The main reason, of course, is that different sports have different goals. Weightlifting, for instance, puts a heavy premium on proteins because proteins help build muscles and bulk up a person's body better and faster than other food. Distance running needs food that builds stamina and strength.

Carbohydrates

One of the most studied topics is the role of carbohydrates in sports performance. Most practicing sportsmen now know that carbohydrates are best for strength and endurance.

Scientists are now also taking a look on the link between low carbohydrates intake and exercise-induced free radicals that leads to impaired muscle function. Every athlete knows that carbohydrates can improve endurance, while the lack of it reduces glucose supply to the muscles which, in turn, leads to fatigue.

Fatigue is normally seen as the loss of the body's overall force-generating capacity. This may be caused by a lot of reasons, but scientists believe it is the loss of muscular ATP, a high-energy molecule that fuels muscle contraction generated by glucose.

A high-carbohydrates diet while training ensures a good store of muscle glycogen long before competition time. Glycogen, the body's carbohydrates store, is the fuel for endurance. The carbohydrates could be taken in as fluids (such as juices) or in solid forms (fruits or starches).

However, a long and hard exercise sometimes drains the muscles of stored carbohydrates (glycogen). Eating right away (the best time is within the first hour) food rich in carbohydrates combined with protein is best. The proteins would help in muscle repair broken by the strenuous exercise.

Commercial energy bars both have carbohydrates and proteins but they are expensive and mostly tasteless. A peanut butter sandwich is okay, washed down with some sports drink. Best, of course, would be some cereal with nuts and dried fruits in them.

Fluids

No other factor is more important in the success of a distance runner than maintaining enough fluids in his body. Running, in training or in competition, produces body heat more than in normal circumstances. This heat is then released through sweat, which in turn, depletes the body's fluids. When the body is dehydrated, general fatigue sets in.

To maintain the body's water status, runners should develop the habit of regular and fixed fluid consumption (every 10 to 15 minutes) during practice runs, whether thirsty or not. The amount is around one-half to one liter of fluid per hour on mild conditions. (The amount should be more, of course, if conditions are more severe.)

In hot and humid conditions, a combination of water and sports drinks (to provide carbohydrates and electrolytes like sodium) is best.

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Fibers

During scheduled runs (practice or competition), many runners suffer from bowel problems. One way to avoid this is to stay away from food high in fiber content as well as those rich in fat.

You can also buy commercial liquid meals formulated for athletes and convalescents. Make sure they have high carbohydrate content. You may also make your own formula using skimmed milk powder, fruits, and regular milk.

Caffeine

It is not very clear how caffeine appears to enhance endurance performances in athletes. It could be that it is a central nervous system stimulant. It stimulates the release of adrenaline that increases heart rate and blood pressure, blood flow to muscles and the release of glucose by the liver.

Caffeine is found in coffee, tea, and chocolates (cocoa). It is also added to cola drinks and other beverages. Normally, caffeine is a natural diuretic (with a 31% hike in urine production.) During competition, however, it loses its diuretic effect but may improve your capacity to have that extra kick at the end of the race.

All in all, the two things distance runners have to remember about nutrition is carbohydrates and fluids. These are the top two important nutrition needs for the sports.

CHAPTER 7: POSITIVE BODY EFFECTS OF DISTANCE RUNNING

Our body reacts to strenuous activity like distance running in two ways: acute reaction and training effect.

Acute reaction is when your heart rate speeds up, your stroke volume increases, your ventilation rate and depth of breathing increase, your blood pressure rises, and your muscles feel some fatigue. However, when an activity becomes regular routine to you, you will eventually feel the second reaction which is the training effect.

It is when your body gets used to chronic exercise; your muscles feel stronger and less discomfort to physical activity. Through training, your blood flow increases that it allows you to produce more energy and less lactic acid to accumulate during exercise.

Your resting heart rate becomes slower caused by a stronger heart that can pump more blood per beat. You will also most likely develop a lighter, springier step, lower resting blood pressure, lower body weight, and less fat under the skin.

Your body now can tolerate stress and ready for competitive efforts. "The system you stress during exercise is the one that stands to benefit from the stress," wrote Jack Daniels in his book Daniels' Running Formula. However, the principle of specificity restricts you to achieve gains through performing another activity.

By doing another activity, you take yourself away from your primary interest and might produce results that limit performance in your main activity. Long distance running has negative effect on performing explosive leg activities like sprinting and jumping.

Thus, you must give considerable thought to every aspect of your training and you must keep in mind that everything you do affects you and your body's reaction. Adding a new level of stress on top of your current training further increases your fitness level.

In distance running, if you have performed a training routine regularly and reached a stable level of proficiency, you can possibly take more training modifications (for frequency, duration, intensity, or recovery) which will lead you to a new level of fitness.

For example: you can increase the training frequency from three to four days per week, you can increase the amount of training from three to four miles per session, or you can increase the distance of each interval from one mile to one half and a half each. Another possible modification is to change the recovery time allowed between the mile runs within a workout.

Sticking with a training program for longer than six weeks produces more benefits. If you want to increase training, the best time is after six weeks of adapting to a specific training stress. The primary risk of increasing training too often and too soon is an escalated risk of injury and overstress. There are limits to training for distance running.

Overstressed system can affect variety of activities other than just the activity that caused the damage. For example, a stress fracture in leg caused by too much running or improper running can restrict a runner from doing other activities that stress the injured extremity.

Thus, it is important to watch out for abuses that you can possibly do as you try to reach your goals. You must learn to accept that even you are physically active; your body has still limits that dictate your success. In distance running, few people realize their limits and improvements are always possible. However, keep in mind to take things at the perfect timing.

