



CrossFit Staunton Endurance Handbook

By Coach Dan Lennon

Edited by Kimberly Lester

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Introduction

Running is good stuff. It improves cardiovascular endurance, stamina, lung capacity, power, speed, and overall athletic ability. The capacity to get from one point to another, efficiently and quickly, just makes sense as a fitness priority. In CrossFit Staunton's training program, running is a critical aspect of general physical preparedness.

There is a running revolution occurring in the endurance world. Old ways of thought are being replaced by techniques and methods backed up by recent studies, research, and empirical experiences. Instead of traditional methods of logging long miles and pounding pavement, alternative techniques are being used by top runners. We have researched the current schools of thought, and offer this guide to help you sift through the best resources. In this guide, we highlight some of the techniques and methods you need to optimize your performance, decrease injuries, and give you more time to spend doing, well, all of the other things you need to do with your time besides running.

CrossFit Staunton (CFS) believes in developing athletes in every avenue of fitness. We want to help people of all physical abilities be able to push, pull, jump, climb, and run. We believe that embracing the methods in this handbook will ensure the greatest rewards for your running efforts.

This handbook covers the highlights of our endurance exercise research. The methods and techniques discussed have been compiled from these resources:

- The Running Revolution by Dr. Nicholas Romanov and Kurt Brungardt
- Born to Run by Chris McDougall
- Unbreakable Runner by Brian MacKenzie and T.J Murphy
- Ready to Run by Kelly Starrett

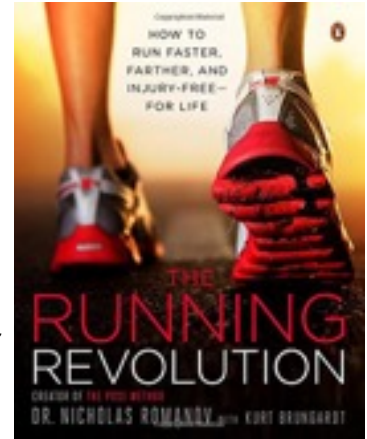
Highlights From *The Running Revolution*

Running Program; Low mileage, High reward

The excessive pounding of the pavement in traditional long slow distance (LSD) running programs does not work. Well, not for 99% of us, anyway. We can't say that LSD training doesn't work at all, because there are world class athletes who run and run and run.

However, for the rest of us who cannot physically run for hours on end, either due to injuries or just wanting more time for *life*, running *less* may actually be more rewarding than running long slow distances anyway.

With the correct training volume and intensity, (i.e running harder NOT longer and occasional long slow distance) has the same effect (and than some) on the body than traditional programming. The physical adaptations from an anaerobic state (low mileage, high intensity) reaps the same benefits of aerobic training (LSD) in less time on the road with less chance for injury. Taking the least amount of steps to achieve the desired physical adaptation is our goal.



The best way for an athlete to improve their running ability is to view running as a skill. There *IS* a right or wrong way to run. Even better - the right way can be taught. Contrary to common misconceptions, running form is not unique to each athlete.

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If your running form is less than ideal, you will be severely limited in your ability to improve your speed, endurance, efficiency, or running economy. Also, running becomes a hassle rather than a *primal* enjoyment.

Learning - and practicing - correct form is the path to running faster, longer, and stronger. The biggest reward will be injury-free running for as long as you decide to run (The Running Revolution).

Running is a skill. There are skills and drills that CFS coaches teach that are essential to sustainable running. Learning how to run is a step-by-step process, literally, and it will take time for your muscles and neuro-pathways to adopt these concepts and new ways of moving, replacing old, inefficient patterns. But just like every other functional movement we practice in CrossFit, the key is learning the correct form and repeating it over and over again. And, just like an Olympic Lifter needs a Lifting Coach, a runner needs a Running Coach.

Highlights from *Ready to Run*

Kelly Starrett's 12 Standards for Being Ready to Run

The standards outlined below are from Kelly Starrett, a doctor of physical therapy, developer of the Movement and Mobility System, author of *Supple Leopard* - a guide for basic human maintenance. These guidelines will produce healthy and hydrated tissues, and the surfaces between your tissues will slide and glide rather than stick like Velcro. Joints will be in proper position, maintained by strong and pliable muscles. The normal range of motion will be restored so that your ankles, knees, and hips work the way they are designed to, unleashing your full power and minimizing the destructive forces that can wear holes in your wheels. Essential mechanics and motor control patterns will be reinstalled so that when you stand, walk, and run you are not chewing up cartilage and connective tissue. Your hip function will be optimal, resulting in more power for your running, less stress on your knees, and the capacity to run with good form, whether you're a beginner setting out on your first run, or CrossFit workout, or you're a longtime competitive runner heading into the deepest, darkest corners of the fatigue that hits in long runs and races.

The Standards:

1. Neutral feet
2. Flat shoes
3. Supple thoracic spine
4. An efficient squatting technique
5. Hip flexion
6. Hip extension
7. Ankle range of motion
8. Warming up and cooling down
9. Compression

Squats make knees stronger. Squats make athletes better. Squats are good for kids, teenagers, adults, elderly people, and anybody else who can perform them correctly. Squats are a functional expression of human skeletal and muscular anatomy, and the human body is designed to do them. The squat is the way that tens of thousands of years of evolution has adapted the bipedal human body to lower itself to the ground. It is the position in which half the population of South Asia spends the afternoon. And when done weighted, it is the best exercise in existence for strength, power, coordination, joint integrity, bone density, confidence, discipline, intelligence, and charm.

-Mark Rippetoe

10. No hotspots

11. Hydration

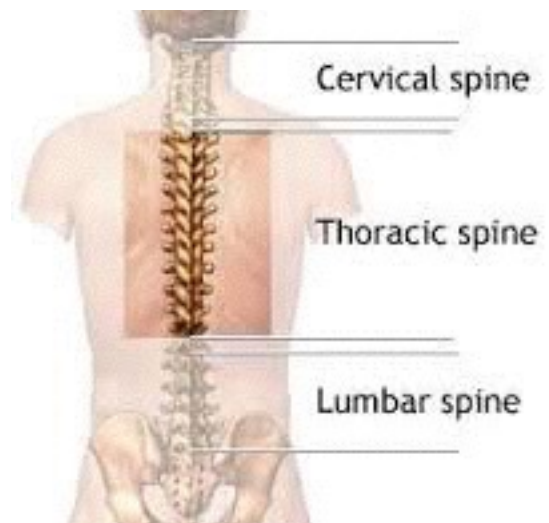
12. Jumping and Landing

Neutral foot position simply means that when you're standing, walking, or running, your feet are straight. They aren't pigeon-toed in or splayed out like a duck's feet. They're straight. Stop walking with duck feet. Neutral foot is, neither splayed outwards, nor pointed in. Your feet should be in aligned with your legs, hips and spine. They should be parallel, both facing forward. Check right now and see what your feet are doing. Fix them. Do that often. Just like you check periodically to make sure you don't have spinach in your teeth, your shirt is tucked in, and your deodorant is still working, check in with your feet and fix them.

Flat shoes won't throw your biological movement off. The half an inch cushion under the heel messes with the springs in the feet. It screws up the whole system. Let the foot work the way it was intended to. If we put our feet on massive cushions, the foot 'relaxes' into poor positions (i.e collapsed ankle).

Having a **supple thoracic spine, efficient squatting technique, hip flexion, hip extension, and ankle range of motion** will ensure your body is moving biologically sound. This will improve all areas of fitness, not just running.

Your thoracic spine ("T-spine") is the section of 12 vertebrae in the middle of your spine, between the upper 7 Cervical, and lower 5 lumbar vertebrae. The T-spine doesn't get as much limelight as the others- even though poor posture in this section can translate to pain throughout the body! If you spend most of your day hunched over a computer, you are doing a lot of damage to your running form without realizing it. Maintaining a neutral spine and keeping your shoulder blades back and down will help strengthen and protect your T-spine.



Hip Flexion and extension is pivotal to full range of motion of the hips, which in turns means more efficient motor pattern for your legs. Hip flexion is the ability to close your hip – try raising your knee up to your chest when you stand, you should be able to bring your knee well pass 90 degrees from the ground. Hip extension is the opposite, have the hip open or fully extended is the goal. Most of us sit all the time, so we have a slight hinge forward from the hips, the hips are glued together, we've adapted the sitting position.

We must have a full depth **squat**. This will improve mobility, strengthen the tissues and joints of the hips and legs. Also, squatting will develop core strength. Studies have

shown that runners improve their running efficiency when they include squats and other resistance training in their running program. A mature squat can make or break a runner.

Proper warming up and cooling down is key to maximizing the work output of any athlete. Taking the time to do necessary foot, ankle, hip and back mobility then light sport specific running before the target workout will increase performance and reduce injury. Immediately after workout, its important to lower the heart rate, keep the body moving, and flush out the potential soreness. Walk, light run, bike, or row will keep a full body activate.

Compression can help restore sliding surface function and range of motion to the joint. It will also flood the area with fresh nutrient dense blood. It also reduces swelling and revives the joint.

If the body is dehydrated you will decrease performance and increase the chance of injury, period. When your total body water volume is running low, there's less blood available for circulation, which means your body's deliver of oxygen and nutrients to your tissues is compromised. **Hydration** = increase performance. Achieving this standard means that you're drinking at least 2 - 3 liters of water per day. When you're not drinking your water with food, you can spike it with electrolytes to facilitate absorption.

The mastery of **jumping and landing** with good mechanics is central to the mastery of good running mechanics. This standard drills deep into the essence of jumping and landing that running involves. Fascia and yoga expert Jill Miller likes to talk about one of the dramatic differences between how runners think about movement and how dancers think about movement. Dancers, she says practice jumps and landings all the time, hours every day, week in and week out. Each time a ballet dancer launches into a jump, the dancer is thinking hard about every piece of that jump and its landing—every angle, every firing muscle, every shape, and every detail. They perfect the jump. With this standard, the idea is to zero in on your jumping and landing mechanics and reset poor mechanics. Rather than let the mechanics unfold through the sheer force of repetition, I want you to pay detailed attention to how you pop off the ground and set a new groove—with good patterns and sound mechanics.

Running Mechanics (Physical And Mental)

Our goal is to help athletes of all abilities to run faster, and farther, while staying injury free for life. The physical components are critical, but so are the mental. Arguably, mental faults cause more failures than physical ones.

There are a million ways to teach something, but here are some techniques and tips for your mental checklist to improve your running mechanics, help you push through the challenges and maintain good position for a longer run.

Physical Technique Running Check List

Land on the balls of your foot.

Heel strike is a no go. Midfoot is a no go. **The forefoot landing is the only natural landing for a runner.** Your feet are springs that absorb the shock of your body weight. Landing on the ball of the foot unleashes the muscular-tendon elastic system, decreasing both impact and energy expenditure, while helping propel you into your next stride.

The heel strike, by contrast, disrupts the system and the ankle, knee, and hip have to handle the impact. This increases chance of injury. Most modern running shoes greatly reduce your foot's ability to behave naturally.

Pull.

Pull the foot off the ground towards your glutes, try to outline support leg with the heel. The idea is that the active motion is pulling your foot off the earth, rather than pushing forward. By pulling your foot upward, you use the hamstring muscles rather than your quadriceps to run. This will reduce impact on your knees, and help prevent injuries. *But it does take some time and practice.*

Pose.

The top position of running mechanics or the "Pose" should be a work of art. From side view, the athlete's Pose will look like the number 4. The legs will bend at the knee, with shins horizontal to the ground, the arms will maintain 90 degree position, torso upright and slightly leaning forward with spine in nature S curve, the heel is outlining the support leg, and the weight of the support leg is on the forefoot.

Fall.

To run, you must learn to fall. Runners will "catch" their fall over and over again to continue running. Obviously, if you didn't land another foot on the ground to keep your momentum going, you would fall...on your face. Maintaining a brace spine athletes should lean from the *heels*, with no break in body alignment, and then you fall into your next pose.

Common Physical Faults

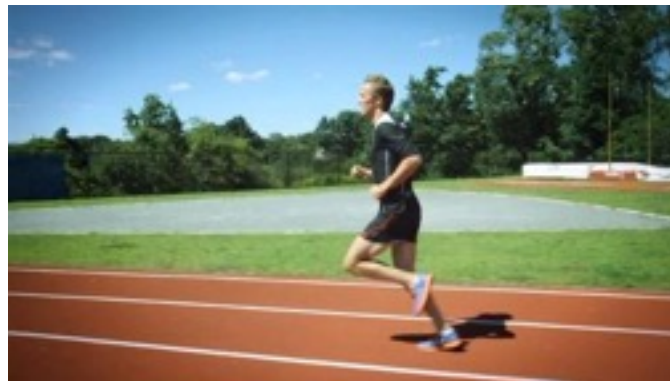
Heel striking

Stop that. Your body hates you for this. You may think that pushing off the ground helps you run faster, but in fact pushing usually causes over-striding, and that slows you down considerably. When you push off, instead of pulling as described above, it is like you are running with your brakes on. Not very efficient, especially when athletes over stride. The foot should land directly under the body, there should be no reach of the foot.



Falling Alignment

Leaning forward does not mean bend at the waist. To run correctly, you must learn to fall. You fall and catch yourself over and over again. The key to falling—without collapsing—is to utilize the power of gravity to drive your movement forward. This happens when you 'pull' your foot up toward your glutes, as described above, while maintaining a good braced spine position, leaning slightly forward as if you're gonna timber! ... like a tree falling flat on your face. But instead of falling, subconsciously your supporting leg catches you, as the other leg lifts. Should you maintain a braced spine? Yes! This will keep falling alignment vertical and protect spine during impact, twisting, and movement.



Mental Techniques Running Checklist

Easy, Light, Smooth, and Fast

From the book *Born To Run*, Caballo Blanco says, "Think Easy, Light, Smooth, and Fast. You start with easy, because if that's all you get, that's not so bad. Then work on light. Make it effortless, like you don't give a shit how high the hill is or how far you've got to go. When you've practiced that so long that you forget you're practicing, you work on

making it smoooooth. You won't have to worry about the last one -- you got those three, you'll be fast."

I love the simplicity of Caballo Blanco's thoughts - a succinct summary of the mental focus while running. In my opinion, this mental checklist is an outline of the path to reach the elusive "runner's high." The feeling where everything is landing and pulling right, and you seem to have the lung capacity to keep running. Some may say you get lost in that moment, a nirvana-like effortless state of being.

We look and function as we do because our survival once depended on endurance running. Humans have an evaporative cooling system, in the form of sweat, many animals don't. When conditions are right, a man can run even the fastest antelope on earth to death by overheating. Humans use to hunt by "persistence hunting" or running an animal to death.

Common Mental Faults

Discouragement

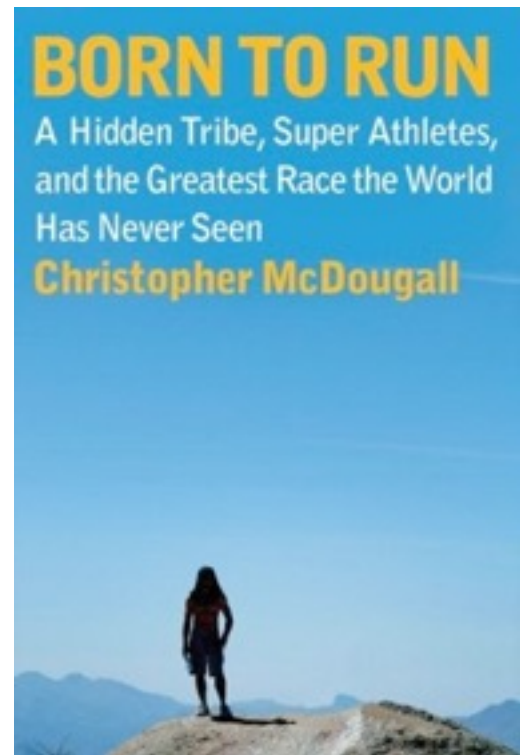
I see so many people get frustrated as soon as they learn this "new" way to run. The first time they make a misstep in the speed ladder drills, or an over stride, people so often throw up their hands in exasperation, groan, and say that running isn't for them. Learning this skill (or any skill) takes time; be patient. Allow yourself the freedom to fail, to look foolish, and be awkward as you train your body. Don't let pride or worry about how you may look to others keep you from growing.

"Running isn't for me"

Bullshit. You are legitimately born to run...You're an animal. Embrace your species and do what you are biologically designed to do. Your fitness will improve...I promise.

Not Focusing

FOCUS! Running is a skill. You need to mentally repeat everything you've learned, over and over again. Internalize it! Continue to go down your mental checklist of movement cues. And always keep checking in as you run, especially when you are wicked tired. It takes many repetitions to master a skill.



How long until I 'get' it?

There is a saying in the study of martial arts that it takes 10,000 days of practice to master a skill. Western thought tends to want to put this on a calendar and tick off days until the official date of mastery, but something very important is lost in the that literal translation.

In Eastern thought, the number 10,000 can sometimes be considered to be an approximation of the infinite. So, rather than a checklist of days, the implications is "Just keep doing it."

A similar concept can be found in the Bible, when Peter asks Jesus, "Lord, how many times should I forgive my brother? Seven times?"

Jesus replies, "Not seven, but seventy times seven."

Clearly Jesus is not suggesting that we keep a running tally until we get to 490, but again, the same idea of - just keep doing it.

How To Prepare For Your Next Run

Training Program; A New Approach To Endurance Training

A traditional running program full of mostly running-specific workouts will lead to too many miles, and may cause the body more harm than good. But if we can incorporate a few training days a week with constantly varied, functional movement performed at high intensity (CrossFit), you will experience the rewards of an overall well rounded athletic build, ready to face the challenges of endurance running. The compound movements of CrossFit develop the joint and range of motion health, while high intensity workouts build lung capacity, and the practice of daily suffering allows the mind to accept any and all distances in the run.

What is CrossFit Endurance?

CrossFit Endurance (CFE) was developed by Brian MacKenzie to prepare runners for races. His perception was to combine specific running workouts, strength workouts, and CrossFit metabolic conditioning workouts. According to MacKenzie, the use of CrossFit workouts allows a runner to obtain equal if not greater performance results as the traditional long slow distance training methodology.

What is the benefit of CrossFit Endurance?

This training program improves athletic performance while running fewer miles overall. Also, expect reduced injury risk as longer mileage is replaced with functional fitness workouts (that train the same energy systems). CFE will increase explosive power and speed. Athletes should expect less damage to mobility and range of motion through incorporating workouts that improve range of motion in the joints and muscle tissues. Increased production of human growth hormone, which helps counter the natural loss of muscle mass that comes with age. CFE athletes will burn excess body fat while improving coordination of upper- and lower-body muscle groups through the inclusion of compound movements in training.

Is this training approach right for you?

There are elite endurance runners who have prescribed to the traditional running program of long slow distance, and they have been successful. CFE is not THE way, it's a way. CFE is an alternative method of training that is highly effective. Many runners are sick of getting injured. According to a Harvard study from 2012, 79 percent of runners deal with an injury each year. CFE requires less time and less pounding on the pavement, thus reducing the chance of injury.

The program's low-volume, high-intensity training model is based on the following pillars:

- Developing the running skill -- learn how to reduce the wear and tear of running through the development of good mechanics. (for skills and drills, www.crossfitendurance.com)

- Building running endurance without creating injuries -- avoid injury by avoiding the miles that hurt you rather than help you.
- Building functional strength, conditioning, and mobility -- by executing varied, functional movements at high intensity, you will build an all-around athletic foundation and state of health that will support faster, healthier running.
- Focusing on nutrition -- learn to feed your body the fuels it needs to enhance health, ensure recovery, and prepare for peak performance.

Running is a skill, and it will require focus and mental power to get better, stay efficient, and avoid injury. Although your body is designed to run, nobody is born an expert runner. You have to think about, and you have to work on it.

The next section we show a simplified version of a training program that has been empirically tested for a 5k, 50k, obstacle races, and leisure trail running.

What Does A Training Cycle Look Like?

This training program is designed assuming the member is of a CrossFit gym who is interested in adapting more endurance specific workouts for distance running sport or for pure enjoyment of running/endurance adaptations. Any reasonable CrossFit-based workout attached to the “CrossFit” label can take the spot. (For example Cindy, Fran, Isabel)

LSD = Long, slow, distance or running for long periods of time. And, in this training program the LSD distance is dependent on the athlete.

TT = time tempo or “race speed.”

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
CROSSFIT	Skills & Drills 10 x 200m (start at 70% intensity and increase by 5% each run) Rest 2 minutes	CROSSFIT	Long Warm Up Skills & Drills 3 x 800m run Rest 3 minutes	CROSSFIT	Skills & Drills Run 5K at 85% TT Pace	LSD
OFF	CROSSFIT	Skills & Drills Run 5K at 85% TT Pace	CROSSFIT	Skills & Drills Run 7 min on 4 min jog x 4	Recovery WOD 80% 20 Air Squats 15 pushups 200m Run 15min AMRAP	LSD

OFF	CROSSFIT	CROSSFIT	OFF	Run 45 seconds on 45 seconds off until form deteriorates	OFF Active Recovery: Walk/Hike	OFF Active Recovery: Walk/Hike
CROSSFIT	Skills & Drills Run 5K at 95%	Recovery WOD	CROSSFIT	OFF	CROSSFIT	LSD

CrossFit Staunton Endurance Group Programming’s core training philosophy is to build the muscle tissue and joints of the body to sustain the repetitive motion of running, and train the body to move properly through repetition in skills and drills. Running is a skill but it’s also a mental game--there is a constant mental conversation going on throughout your run. Whether your internal voice is urging you to run faster, or asking to stop when the right hip hurts. Learning to recognize and control the tone of this conversation will make or break your running success. Controlling your breathing while running is key to gaining control over your mental state.

Effects of Running More

Learning a new skill and putting in extra work will beat the body up. Any type of training will stress the body. It is personal responsibility to take care of the machine you are building. In *Ready to Run*, Kelly Starrett writes, "If you're going to make the demands on your body that being an athlete requires, then it's your job to support that body."

How we do this:

- Habitually seeking optimal positions from which to transmit power
- Full Range of Motion
- Practicing and mastering good movement patterns and positions
- Develop strength and conditioning to support good movement positions from the first mile to the 26th and beyond.

Conclusion

Richard Conniff in *Men's Health* says that anyone who has put in some miles knows how good running can feel, once it stops feeling bad. But beyond the way it feels, medical evidence also suggests that humans are built for endurance exercise. During endurance exercise the left ventricular chamber of the heart can increase as much as 20 percent in volume. The chamber walls thicken too. So the heart fills up faster and pumps more blood to the rest of the body. The coronary arteries also change, dilating more rapidly to meet the body's demand for oxygen. Endurance exercise seems to make the cardiovascular system function the way the owner's manual intended.

Why would running feel bad? Because we are doing it wrong, and a lot of us are, 90% of runners get hurt. We have to improve our quality of movement. How do we do this? Practice.

The only way to see if something works is to do it. So as an athlete and/or coach seeking to implement the best training practices for yourself and others, put the lessons in this handbook to the test.

Personally, through three months of practicing CrossFit's constantly varied, functional movement at high intensity, with a heavy emphasis on running skills and drills to improve positions and form before endurance specific workouts, I felt more like a runner.

The CrossFit Endurance training methodology successfully prepared me to complete two (2) 50k ultramarathons. Combining CrossFit and running specific workouts cut my training time in half, compared to a traditional program, and kept my body running injury-free during training. I believe it also helped me recover much faster.

"I'm asking you to hold your quality of your running to a high standard. It is a personal responsibility to focus on running form, taking care of body maintenance to increase mobility and decrease injuries, and have the discipline to put in quality training. Success comes from your daily habits. So stop blasting through your workout with poor form. Focus. Run properly. Make it a habit to do the skills and drills. Put in the time and work to get better. "

I was able to use CrossFit Endurance to increase my efficiently running an Ultra, decrease my recovery time, and save training time. I strongly believe using CrossFit as a tool, incorporating skills and drills to improve form, and proper nutrition will give you better race performance. This approach will give athletes greater strength, improved form, and greater running efficiency.

As a coach, I'm asking you to hold your quality of your running to a high standard. It is a personal responsibility to focus on running form (even while tired). By taking care of mobility, body maintenance, and having the discipline to put in quality training, you WILL improve your running.

If your running form and efficiency needs to improve then put in the work! Success comes from your daily habits. So stop blasting through your workout with poor form. Focus. Run properly. Make it a habit to do the skills and drills. Put in the time and work to get better. Build your training into the day and *never stop getting better*.