

Summer Training for Speed

Summer training is a critical time for all athletes regardless of their sport. It is possibly the most important season with regards to training especially for high school athletes. Most high school athletes are 3 sport athletes so they go from soccer, to basketball, to baseball, football to track to lacrosse, field hockey to gymnastics to tennis, etc.

So coaches have a problem. Do they just try to get you ready as quickly as possible for your current sport? Do they try and work on the overall development of the athlete? Are they concerned about conditioning levels of the incoming athletes? Are they concerned about the condition of the athletes leaving after their sport season is over? Is there enough time in 3 months for a coach to put together a great periodized training program?

Now there are certain coaches that focus on different aspects of what they feel is important to work on during the season. And most state athletic rules are set up so the coach can not work with their athletes outside of that sports season. This is why summer training is so important. The athletes get to work on and focus on improving all biomotor abilities.

Some consider the summer GPP (general preparatory period) work of their training plan. I wrote a few months ago about periodization (Periodization - structure of a continuous training plan) and structure of a workout plan/program so I am not going to go into this too much. A great resource that discusses periodization and program design is [Alwyn Cosgrove's Training Design Program](#).

I am going to break this Summer Training Plan Recommendations Article into sections so I can cover in detail each aspect of speed training. To start off, let's hit the topic that everyone is mostly concerned about: Training Speed over the summer.

Speed Work

I hear that speed training should not be worked on in the offseason. I still have not heard a good reason for this. Why would you stop speed training when this is the skill that you are trying to improve?

I have seen athletes work on their 'conditioning' in the off season and not perform any speed work. Then when they show up to camp for pre-season they are expected to sprint and time and time again, injuries occur. Sprinting is high intensity work that involves recruiting specific groups of muscle fibers, improving the efficiency of neuromuscular firing patterns and is extremely taxing to the central nervous system. To not have your athletes train for this complicated process then all of a sudden you want them to perform at full speed at practice or a game is crazy.

Now, volume, intensity and density of your speed work will change throughout your training program. You should not drop speed training from your program at any part of the year.

Let's begin first, with saying what speed training is not. [Speed training](#) is not running at speeds/intensities less than 90-95%. So, running a 40 yard dash at 100% is speed work, while jogging a 100 meters at 65%. (65% is a tempo run and we will get more into tempo running during the Conditioning for Summer Training article in days to come).

Now, you maybe thinking, 'well, if I run a 400 meter (800 meter, 1 mile, etc.) at 100% intensity, then that must be speed training right?'

Wrong. This is where we need to drop a little science and physiology to clarify.

Athletes' Acceleration's own Speed Expert Latif Thomas wrote a great energy systems article last year and I will just para-phrase it for you.

'Adenosine Triphosphate, or ATP, is the immediate usable form of chemical energy for muscular activity. Any forms of chemical energy that the body gets from food must be converted into ATP before being used by muscle cells. ATP stores in muscle is limited and will deplete in 1 to 2 seconds unless restored. Resynthesis of ATP must occur immediately for muscular activity to continue. There are three systems available within the body to replace concentrations of ATP.

Anaerobic Phosphagen (ATP - CP) Energy System Creatine Phosphate (CP) is an energy rich compound found in muscle cells. After high intensity exercise, creatine phosphate immediately restores ATP in the muscle without forming waste products (lactic acid). The amount of ATP that can be resynthesized from CP can last for 4 to 5 seconds. So, add that to the 1 to 2 seconds of original ATP stores within the muscle and you have about 5 to 7 seconds of ATP production from the ATP-CP Energy System.

According to the USA Track and Field Level II Sport Science manual, to really challenge this system, you need workouts of 7 to 10 seconds of high intensity (sprint) work. This means running at full speed or near full speed, but with no fatigue present.'

So, basically as Latif stated in his energy systems article, your 'true' speed work cannot be longer than 10 seconds or 100 meters for those elite runners.

OK, so now that we know what true speed work is, what should we focus on during our summer training plan?

The focus of speed training during the summer is going to be primarily on acceleration development. Acceleration is the key to most sports and needs to be constantly worked on and improved.

Acceleration work is considered from 0-30 meters in distance for each repetition. We start out with shorter distances at about 15-20 yards. The reason we start with such short intervals, is that we want to make sure that our athletes are accelerating correctly. Your drive phase, which is your first 6-8 strides, is primarily what we are working on here.

We are looking for during each repetition for acceleration work is:

- * Your body is driving out at approximately a 45 degree angle
- * Your legs are driving down and back, attaching the ground in a piston-like action
- * If you are driving your legs down forcefully, your heel recovery will be kept low
- * The foot should strike directly below or slightly behind the hips
- * As we discussed in many newsletters before, you are stepping over the opposite knee and driving down (again in almost a piston-like action)
- * Arm action is tight, not crossing the body, at a greater than 90 degree angle (your arm angle will open up a little more since your steps are greater and your ground contact time is longer than at top speed)

When you mastered intervals at 20 yards, we start to extend the distance looking for the same form perfection. If you are having form issues, we break down the training because we have found that many athletes are not strong enough to hold and maintain that ideal drive phase. What we do is trick the body to maintain the proper form by having our athletes start using different positions. For example, we will have them starting their interval on the ground seated, lying down in the push-up position, on one knee, etc. So we really bring them to the ground to make their bodies reach the proper position. Another great way to do this is through short hill training. So now you can bring the ground to them to put them at the correct angles and positioning.

Example of an Acceleration Workout:

- * 3x 20 meters - push up (down position) start
- * 3x 20 meters - push up (up position) start
- * 3x 25 meters - seated facing 'forward' start
- * 3x 25 meters - seated facing 'backwards' start

Rest interval in between each repetition is 2-2.5 minutes and 3-5 between each set.

Acceleration is the 'easiest' form of speed work because they are performed at such short intervals but don't underestimate its importance. Acceleration work must be done before you can even look at starting maximum velocity (top speed running) work.

Maximum velocity work is when you are running at full speed, so your body will be completely upright (perpendicular to the ground), and you will no longer be leaning at an angle as you were during acceleration. You will want to relax or 'float' during maximum velocity. What this means is you want to ease back in the amount of effort you are expending while running but without slowing down and losing any speed.

This idea sounds contradictory, and like any new skill, it takes some practice to perfect. While running, you want to continue to step over the opposite knee, but you do not want to drive the ball of the foot down into the ground. This is tough to do but it is essential if you want to maximize your speed and reach your full speed potential. If you are not relaxing while you are running, your body is really fighting itself and causing you to slow down. Relaxation while at top speed must be practiced. A great work out for maximum velocity training is called 'Ins & Outs' or 'Sprint/Float/Sprint' or 'Fly Runs'.

Example of a Maximum Velocity Workout:

Flying 40's

Place a cone at the starting line, at 20yards, at 60 yards and at 80 yards. Accelerate hard to the first cone (20y). Maintain the speed you have generated by running relaxed and following the maximum velocity cues from 20-60 yards. Once you hit 60 yards, slowly decelerate for the next 20 yards, coming to a full stop at the last cone. This is a fly 40. Total volume for these workouts should be between 250 - 350 yards.

Workout 6-8 x Fly 40's

Rest interval is 5-6 minutes between each bout.

Start with 2 days a week of acceleration work. Once you feel comfortable and are performing each rep with proper form and you have reached running 30 meter intervals with no problem, add a day of maximum velocity work in. The summer is not that long and there is a lot of training to get done. The first 2 weeks of the summer will look like this:

(**Note the days that I left blank I will fill in as we discuss other aspects of summer training in future newsletters) Also, it is summer so we can give our athletes the weekend off to 'recover'.

Monday:

Tuesday: Acceleration

Wednesday:

Thursday - Acceleration

Friday:

Next 2 weeks

Monday: Acceleration

Tuesday:

Wednesday: Maximum Velocity

Thursday:

Friday: Acceleration

Depending on your improvements and progressions:

Next 2 weeks

Monday: Maximum Velocity

Tuesday:

Wednesday: Acceleration

Thursday:

Friday: Maximum Velocity

I will discuss Speed Endurance when I cover Conditioning as they will be easier to explain both topics together, but this is what your speed training days will look like at the end of the summer:

Monday: Maximum Velocity (w/ Acceleration)

Tuesday:

Wednesday: Speed Endurance

Thursday:

Friday: Maximum Velocity (w /Acceleration)

The sport requirements and goals of the athlete will influence the workouts but those are some general recommendations.

Other Summer Training Speed Guidelines:

*Intensity 95-100%

*Distance of run 20-60 meters

*Rest interval approximately 1 minute rest for every 10 meters (this is what Charlie Francis recommends and it has worked amazing for our athletes)

*Number of reps/set 2-4

*Number of sets 2-4

*Total distance in set 80-160 meters

*Total distance in session 300 - 500 meters

*Rest at least 36-48 in between each speed session

Summer Training for Speed - Part II

Conditioning

Most coaches agree that conditioning work is a must for summer training. What they don't agree on is what conditioning is. Conditioning should not be referred to as just aerobic training. If you are a speed and power athlete and you are running mileage, I truly feel bad for you. You are putting yourself at a severe disadvantage and are actually hurting your performance.

Some of our conditioning work focuses on recovery. There are so many programs that are just hammering athletes with sprints, [speed and agility training](#), plyos, weights, etc. These modalities should be worked on but there needs to be a structured recovery program in place. You can't overload the central nervous system day in and day out, recovery is essential. As they say, you don't get stronger and faster from the workouts, you get stronger and faster from recovering from the workouts.

What types of conditioning should you do?

I continually stress the importance of general strength circuits. You can work on multiple facets while performing GS circuits. You are working on strengthening, balance, coordination, and aerobic capacity. We use this as a recovery day type of workout.

These workouts are especially great when training younger athletes. General strength circuits help build a greater work capacity, something today's youth athletes are badly in need of.

Example of a General Strength workout:

Here is an example of a general strength circuit performed on the grass:

Split squats - 10 each leg

Jog 50 yards

Rotational push-ups - 8 each

Jog 50 yards

Bicycles - 1x30

Jog 50 yards

Burpees - 1x10

Jog 50 yards

Staggered push-ups - 10 each

Jog 50 yards

Russian twists - 1x25

Jog 50 yards

Backwards lunges - 10-each leg

Jog 50 yards

Lateral lunges - 10 each leg

Jog 50 yards

Reverse crunches - 1x20

Jog 50 yards

1 Leg squats - 10 each leg

Rest 3 minutes and repeat circuit.

Tempo Running

Extensive Tempo are runs at 65-79% intensity (HR ~140-160). I typically use these runs at 100-600m. The length of these runs are going to be dependant on the demands of the sport.

For the most part, I do not use Extensive tempo runs too often. The old saying 'train slow to run slow' could be used here. A problem with extensive tempo is that you can't work on your running form at all with such slow speeds. The demands of most sports do not require our athletes to run far distances at slow speeds.

The benefit of using extensive tempo runs are they can be used to help flush out the system. If your athletes are feeling tired from previous workouts or even sore, extensive tempo workouts are great for recovery.

We do use them at the beginning of training sometimes to build a little base before jumping into intensive tempo workouts. Also this type of workout helps to enhance oxidative mechanisms.

We use extensive tempo with our general strength circuits for the most part. This is where the athlete 'runs' from station/exercise to the next.

Examples of an Extensive Tempo Workout:

- 1) 2 x 10 x 100m (75% intensity) 30' rest between reps and 2' between sets
- 2) 2 x 8 x 200m (70% intensity) 1' rest between reps and 2' between sets

Remember, as a [speed training coach](#), your athletes should be able to hit their times and be within their target heart rate. If they aren't, give them more rest between reps, reduce the volume of the workout or shut the workout down because you are missing the training benefit/goal.

Intensive Tempo

Intensive tempo is usually referred to as interval training. Intensive tempo is running distances over 80 meters at 80-89% intensity. (HR ~160-180). Running intervals for tempo work is also great for conditioning and superior to running long distances.

Because intensive tempo borders on speed and special endurance due to the high intensity, lactate levels can become very high. The athletes body must adapt to handle, buffer and remove the lactate so training in this state is extremely helpful for sports that meet the same demands. Since all energy systems more or less turn on at the same time, intensive tempo is highly stressful on both the aerobic and anaerobic systems. It is a great conditioning tool used for most field and court sports.

Examples of an Intensive Tempo Workout:

- 1) 6 x 200m (82% intensity) 3.5' recovery between reps
- 2) 2 x 4 x 250m (86% intensity) 4' rest between reps and 8' rest between sets

Progress the intensity of your tempo runs based on your conditioning goals. The ability of athletes to buffer lactate accumulation will determine their success as fatigue levels rise throughout the course of their game or competition.

Speed Endurance

Speed endurance is the ability to maintain speed in the presence of fatigue without decelerating. Speed endurance runs are going to vary in distance depending on your sport.

For example, football consists of short bursts of acceleration followed by low intensity movements so our speed endurance workouts would be of smaller distances with shorter recoveries than a track sprinter that would require longer distances and greater recovery times. So, for a greater chance of success, we must train our athletes to maintain high levels of speed and intensity, even when tired.

These workouts are mentally challenging (since the presence of fatigue), so maintaining proper [running mechanics](#), form and technique must be stressed. Training at high levels while fatigued will help to improve performance, both mentally and physically at the end of the game/competition when the game could be on the line.

Examples of a Speed Endurance Workout:

- 1) 2 sets of 7 x 30 yards 25 seconds rest between reps and 3 minutes between sets

2) 2 x 80y (95-100% intensity) 7 minutes rest
2 x 100y (95-100% intensity) 8-10 minutes rest
2 x 120y (90% intensity) 10 minutes rest

How it relates to your summer training:

Monday: General Strength Circuits
Tuesday: Acceleration
Wednesday: Extensive Tempo
Thursday - Acceleration
Friday: General Strength Circuits

Next 2 weeks

Monday: Acceleration
Tuesday: GS Circuits
Wednesday: Maximum Velocity
Thursday: GS Circuits
Friday: Acceleration
Saturday: Intensive Tempo

Depending on your improvements and progressions:

Next 2 weeks

Monday: Maximum Velocity
Tuesday: GS Circuits
Wednesday: Acceleration
Thursday: GS Circuits
Friday: Maximum Velocity
Saturday: Intensive tempo

Your training days will look like this at the end of the summer:

Monday: Maximum Velocity (w/ Acceleration)
Tuesday: GS circuits
Wednesday: Speed Endurance
Thursday: Extensive tempo
Friday: Maximum Velocity (w /Acceleration)
Saturday: Intensive tempo

**Again the structure, set-up and volume of these workouts could all be different sport and goal dependant. Break down your sport and see how much time you are actually jogging around vs. sprinting. Then time how long each break/rest you have in between each bout of running. This will tell you where you really need to put your training focus.

What I provided is a general guideline since I can't provide exact workouts for each sport. Some sports like soccer, gaelic soccer, rugby, field hockey, etc. are going to require more aerobic work and longer tempo intervals then sports like football, baseball and track sprinters.