

# How to Develop the 400 Meter Sprinter

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## Training Principles – Individuality

Everyone is different and responds differently to training. Some people are able to handle higher volumes while others may respond better to higher intensity. This is based on a combination of factors: genetic ability, muscle fiber type, athletic age, mental state, and other life factors.

## Training Principles – Specificity

Each type of exercise has its own specific training effect. The load (work) must be specific to the individual athlete and to the event for which he or she is training. 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 fifty times in a game. Swimming will help improve your aerobic endurance but won't develop tissue resiliency and muscular endurance for your running legs.

## Training Principles – Progression

Training is a step by step process. It takes time to develop the base level of fitness required to handle training. The higher the fitness level the higher the training level the athlete will be able to handle. To reach the roof of your ability, you have to climb the first flights of stairs before you can exit the 20<sup>th</sup> floor and stare out over the landscape. You can view this from both a technical skill standpoint and from an effort/distance standpoint.

## Training Principles – Overload

The loading must challenge the athlete's present training state, in order to force the body to overcompensate for the new training load. The load produces fatigue, when the load stops it is followed by a recovery process in which the athlete returns not to the original level but above that level. To increase strength and endurance, you need to add new resistance or time/intensity to your efforts. This principle works together with progression. To run a 10K race, athletes need to build up distance over repeated sessions in a reasonable manner in order to improve muscle adaptation as well as improved soft tissue strength/resiliency. Any demanding exercise attempted too soon risks injury. The same principle holds true for strength and power exercises. This is the key to applying Progressive overload. If the training load remains the same, the rate of adaptation will decrease and the training will not have the desired effect.

## Training Principles – Adaptation

The body will react to the training loads imposed by increasing its ability to cope with those loads. Adaptation occurs when the training session is completed.

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 is why you need to change the stimulus via higher intensity or longer duration in order to continue improvements. The same holds true for adapting to lesser amounts of exercise.

#### Training Principles – Recovery

Rest is required in order for the body to recover from the training and to allow adaptation to take place. The body cannot repair itself without rest and time to recover. Short periods like hours between multiple endurance session in a day, And longer periods like days (speed and power sessions) or weeks to recover from a long session or cycle. It's important to avoid exhaustion and overuse as injuries will occur.

#### Training Principles – Reversibility

Any adaptation that takes place as a result of training will be reversed when you stop training. If you take a break or don't train often enough you will lose fitness. Use it or lose it. Different training components lose fitness at different rates. In a UK study on Olympic rowers, they found that an 8 week layoff, took 20 weeks to return to the 100% fitness level of prior to the layoff.

#### 2016 Wisconsin Track & Field Season – March 7 – June 4 (13 weeks)

General Preparation Training Phase – 50% season  
Specific Preparation Training Phase – 25% season  
Competitive Phase – 25% season

#### What components make up Speed?

Speed – Strength – Power – Endurance – Restoration

#### General Preparation

Monday – Speed Development – drills which address improvements in stride rate and stride length – Power & Strength development

Tuesday – Lactate Capacity & Core

Wednesday – Technique & Tempo endurance/Circuit endurance

Thursday – Speed Development & Strength Development

Friday – Technique & Tempo endurance/Circuit endurance

#### General Preparation

Training is General early to Specific late

Warm up: Dynamic mobility – hurdle mobility and general conditioning

Speed Development: Acceleration phase – drills to improve stride length and stride rate.

Power Development: begin with low impact plyometrics

Strength Development” focus on general strength through Olympic lifts & Core work.

Extensive tempo: >200m Aerobic capacity – low intensity – long rest int.

>100m Aerobic power – higher intensity – shorter recoveries  
Intensive tempo: >80m Lactic acid Capacity – aerobic/anaerobic) 80-89%  
Medium rest recovery

#### Lactate Capacity & Tempo Endurance workouts

4 X 300m or 4 X 250m or 4 X 400m at current 400m pace, recovery 1:6 ratio  
higher volume & lower intensity early gradually reducing the volume near the end of the phase. GSSE workout to bridge phases

Tempo Endurance: helps to facilitate recovery from speed & LAC days  
Exp: 1+1+1+2 X 2-3 or 4 done as 100m stride += 50m walk, 100m stride, 50m walk, 100m stride, 50m walk, 200m stride. Walk back to the start finish line for recovery

#### Specific Preparation

Monday: Speed (less than 6 sec, with 4-6 min recovery trying to extend top Velocity for as long as you can, as far as you can.  
Tuesday: LAC early, GSSE, Special Endurance 1 & 2  
Wednesday: Technique – Tempo endurance  
Thursday: Speed resistance – Speed Endurance  
Friday – Technique

#### Glycolytic Short Speed Endurance (GSSE)

Sprints designed to challenge the lactacid system at high work rates of  
Short durations  
4 X 4 X 60m at 90% 1' interval 3' set recovery  
Used after a period of training has occurred in the LAC system, used to bridge The gap between LAC and lactacid Power (LAP)

#### Speed

Emphasis on quality not quantity  
Full or near full effort over short distance between 30 – 60 meters  
Each repeat must be followed by complete recovery 1:25 ratio rec.  
Exp: 30 meters 6 – 8 reps  
Exp: 50 meters 5 – 6 reps  
Exp: 60 meters 4 – 6 reps  
Alactic Short Speed Endurance – bridge the gap between speed and speed Endurance  
Exp: 4 X 4 X 60m at 90% 3' interview 6' set recovery  
Used to increase the volume of alactic power and capacity work

#### Speed Endurance

Alactic capacity (Speed endurance) (80 – 150m)  
Emphasis: works on the ability to hold 95% speed  
15 – 30 seconds in duration recovery 1:15 ratio  
exp: 3 X 150m 5' rec

exp: 4 X 120m 4' rec

### Special Endurance 1

Fast work simulating competition over distances of 150m to 300m

This work develops endurance at speed

Usual number of reps 2 – 4

Distance covered in special endurance should decrease as competition

Approaches

Done once a week

Exp: 3 X 250m 10 min recovery

Exp: 1 X 300m – 1 X 280m – 1 X 250m 10 min recovery

### Special Endurance 2

Fast work simulating competition over distances of 300m to 600m

Lactate Tolerance (LAT) extremely important workouts

90 – 95% effort with long to full recoveries

Exp: 2 X 450m 30 min recovery

Exp: 2 X 380m 30 min recovery

### Speed Resistance & Strength Endurance

Resistance – sled pulls, inclines, ultra speed resistance (keep resistance

Low so athletes can perform at around 90% of max velocity)

Assistance – down hills, towing

Early – 3 X resistance – 3 X assistance – 3X normal (flat track)

Late – Strength Endurance – more than 9 reps 9 sec 90 meters

3-6min recovery one week sleds, next week up hills or long bounds

### Competitive Phase

Monday: Race modeling (meet prep) leave nothing un prepared for

Tuesday: Special Endurance 2 ( Lactate Power)

Wednesday: Technique

Thursday: Speed Endurance

Friday: Technique (race prep – short gun starts – fast but short workout