

SPEED v. SPEED-ENDURANCE

Introductory Training Theory and Ramifications For Endurance Runners

Terms:

Speed:	Terminal running velocity on level ground.
Speed-Endurance:	The ability to carry the highest velocity possible over time.
Interval:	Short training bouts repeated with pre-determined rest periods.
Microcycle:	A training period of 7 (or up to 14) days.
Macrocycle:	A training period of 3-4 months (one season).
Rest Interval:	Typically notated as "1:1", meaning the rest interval is equal to the workout bout duration. "2:1" would mean the rest interval is twice the duration of the bout duration.
VO2 Max:	A ration of the body's ability to absorb and process oxygen over time and under stress.

Training Theory:

Training improvement in running velocity requires two differentiated abilities in an athlete; the runner must improve terminal velocity (speed) and the ability to carry that velocity over a space of meaningful time in competition (speed-endurance). It is presumed that the athlete has developed a background of strength (to maintain form) through resistance work (weights, core, and resistance running such as hills and sand)) and added longer runs at sub-maximal velocity (power runs, fartleks, steady-state runs, recovery runs). Speed workouts increase flexibility of velocity and give you more options when racing . . . speed-endurance workouts lower overall event time more effectively by giving you faster overall velocity over longer periods of competition.

Workout Protocols:

Workouts must be designed within a microcycle/macrocycle format that allow for physiological change in the athlete over a period of time. That change requires a rest period after stress is applied and necessitates a hard-easy alternating day approach. This would mean that in a normal 7-day microcycle, one day is

reserved for a 'hard' workout targeting speed, one day is reserved for a 'hard' day targeting speed-endurance, and one intense day remains for continued strength or endurance.

Of speed and speed-endurance the day requiring the highest quality effort would normally be placed the furthest away from a competition (Saturday), so that best day for inclusion of speed-endurance would be Monday. Allowing for a rest day, the workout based on speed would then be placed on Wednesday. If there is *not* a competition within the microcycle, Friday becomes a day of strength. If there *is*, then Friday becomes part of a 2-day intensity taper.

Recovery from the workouts on Monday and Wednesday is critical and requires a warm-up (800m +), cool-down (800m +) and excellent hydration (Gatorade) within the 30 minute carbohydrate replenishment window. Adequate rest will allow for muscle regeneration in the 48-hour recovery period.

Workout Design:

SPEED

Speed requires form that, although critical in all running, is most important to efficiency and progress in this particular effort. Three things must be constantly monitored as you design and implement a speed workout:

- 1.) *Dorsiflex the feet.* During a speed workout, conscious effort should be made to prevent the heel from touching the ground. Ground contact should be at the midfoot or forefoot. We desire to 'pre-load' the calf muscles and promote a short and quick 'pop' off the ground with minimal contact time.
- 2.) *Drive the arms down.* Runners naturally pull the arms up in the running action, but allow gravity to supply most of the directional force in the armswing down. Counter the 'slowness' of gravity by aggressively driving the arms down so the hands reach the hipbone. The increased speed of the arms will increase the stride rapidity.
- 3.) *Cycle the legs without overstriding beyond the center of gravity.* As the interior ball of the foot is drawn up and forward, it should be driven straight down as soon as it reaches the inside of the opposite knee. The objective is to keep the foot from landing in front of the center of gravity and forcing a 'braking' action. Natural forward lean and velocity will provide the stride length.

When designing a speed-based workout, emphasize maximal velocity for short periods of time. As soon as the individual workout bout distance becomes so great the athlete loses velocity, or the overall workout length causes the same decline, the athlete has lost the basic benefits of speed. Speed-based workouts are formed around minimal distances and slightly longer rest periods (intervals). Samples of speed-based workouts might include:

Workout 1

Warm-up & Stretch

12 x "Flying 40s"

Cool-down & easy volume recovery (2-3m)

(Roll into a 40m 'all-out' section once every 400m track loop, then throttle back to a jog of 8:15/mile pace or slower) Repeat 12 times.

(Volume 3m.)

Workout 2

Warm-up & Stretch

4 x 50m with a 1:00 rest interval (6:1)

3 x 75m with a 1:30 rest interval

2 x 100m with a 2:00 rest interval

3 x 75m with a 1:45 rest interval (7:1)

4 x 50m with a 1:15 rest interval

Cool-down & easy volume recovery (2-3m)

(Volume 2m with active (jog) rest.)

Workout 3

Warm-up & Stretch

8 x 1 lap "Ins and Outs"

Cool-down & easy volume recovery (2-3m)

(Accelerate straights from jog pace to full out, then jog/walk curves.)

(Volume 2m.)

SPEED-ENDURANCE

Speed-endurance volume usually causes the athlete to drop to a midfoot striking position. Basic sprint form is emphasized as the athlete becomes stronger and able to hold the positions. Bout duration is lengthened and rest intervals are shortened as overall velocity decreases in this form of anaerobic work.

The athlete focuses on efficiency, forcing adaptation of the VO₂ and lactate systems, and callousing the emotional state. Sample workouts might include:

Workout 1

Warm-up & Stretch

3 x 90 seconds with a 90 second rest (1:1) (Rest in position)

3 x 60 seconds with a 60 second rest

3 x 45 seconds with a 45 second rest

1 x 200m all out

Cool-down & easy volume recovery (2-3m)

("Canadian" workout protocol)

(Volume 2000m.)

Workout 2

Warm-up and Stretch

5 x 800m with a 3:00 rest (1:1 max)

2 x 200m all-out

Or

5 x 1200m with a 4:30 rest (1:1 max)

2 x 200m all-out

Cool-down & easy volume recovery (2-3m)

Workout Validations & Conclusions:

SPEED

Speed flexibility is used to enable the athlete to:

- 1.) Surge (to break an opponent).**
- 2.) Kick (using terminal velocity -- and having a higher terminal velocity) at the closing stages of a competition.**
- 3.) Position (instantly take positions in a field to take advantage of course conditions or wind).**

SPEED-ENDURANCE

Speed-endurance is used to enable the athlete to:

- 1.) Hold a surge (in order to break an opponent).**
 - 2.) Lower overall event time (become faster).**
 - 3.) Increase Max VO₂ levels to improve overall conditioning.**
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