

Doing General prep distance training better

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All training plans begin with the following:

1. Purpose of training (season goal)
2. Competitive path
3. Individual qualities of your athletes

All training plans consist of various segments/parts (periodization)

** Here are the options:

- No basic plan – just wing it
- Random plan – wing it with dice
- Predetermined plan

Periodizing a season allows for more purposeful training

Different approaches to periodization

Example 1	Example 2	Example 3
Base phase	Base phase	Base phase
Preparation phase	Build phase	Strength phase (lactate threshold)
Peak phase	Peak phase	Speed phase (VO2max)
	Taper phase	Taper phase
	Race	Recovery phase
	Recovery phase	

A standard periodization approach is as follows:

General Preparation phase – introduction of aerobic training

Specific Preparation phase – introduction of anaerobic work

Pre-Competition phase – continued application of all elements of training

Competition phase – transition to higher quality workouts with longer rest

Some terminology:

Macrocycle: season-long training plan

e.g. Cross Country season training plan

Mesocycle: training block with a specific developmental goal

e.g. General Prep

Microcycle: period of training that contains the elements you use to achieve a developmental goal (e.g. if the developmental goal is developing anaerobic ability, the microcycle may include anaerobic workouts at various paces, recovery runs, sprint work). These elements are then effectively repeated in a way that helps us achieve the developmental goal of a particular phase.

Examples of what other programs do for General Prep phase (initial 4-6 week period)

Example 1

1 x tempo, 1 x long run, 2-3 x easy, 1 x fartlek

Alternate weeks 1 x shorter reps @ VO2 max, longer reps @ LT-CV-VO2 max

Example 2

Distance w/ long run

Weeks 2 & 5 include 5k race (to get paces)

Week 5 include 1 x LT run

Example 3

4 x distance (1 x strides, 1 x hills), 1 x long run

Week 1: 1 x 2 mi time trial

Week 2: 1 x fartlek

Week 3: 1 x long hills

Week 4: 1 x progression run

Week 5: 1 x fartlek, replace 1 x distance w/ 1 x progression run

Week 6: 1 x workout @ 5k pace, replace 1 x distance w/ 1 x progression run

Example 4

Distance w/ steady state, fartlek, long runs

Reduce a bit every 3rd/4th week

Example 5

Distance + strides – much less structure, runners set pace

Example 6

Weeks 1-4: 1 x distance, 2 x long run, 1 x distance + hills, 2 x rest/crosstraining

Week 5: 2 x distance, 1 x long run, 1 x distance + hills

Week 6: 2 x distance, 1 x long run, 1 x distance + hills, 1 x tempo

Example 7

Typical week: 1 x long run, 1 x hills, 1 x tempo, 3 x distance (1 x strides)

Example 8

1 x easy, 3 x steady, 1 x hills, 1 x tempo

Weeks 3 & 5 – replace tempo w/ 1 mile time trial

Week 5 – replace hills w/ fartlek

Example 9

4 x easy, 1 x long run, 1 x hills, 1 x fartlek

Example 10

Weeks 1-4: 1 x long run, 1 x faster distance, 3-4 x distance

Weeks 5-6: 1 x long run, 3-4 x distance, 1 x fartlek or hills, 1 x crosstraining

Types of running

Aerobic running

Aerobic running occurs when your body has enough oxygen to fuel your body, comparable to running easier at a conversational pace

Fueled through burning of carbs and fats

Byproducts of aerobic training: carbon dioxide and water, which are expelled by breathing

Aerobic training requires 20-24 weeks to make proper structural changes
(size of heart, capillaries & delivery system, blood volume)

If full development of the aerobic system takes 20-24 weeks, then we need to start developing that system within the General Prep phase.

Anaerobic running

Anaerobic running occurs when your body does not have enough oxygen to fuel your body, comparable to running at a harder pace, where talking is more difficult

Fueled through burning of carbs (process called anaerobic glycolysis)

Primary byproducts of anaerobic training: lactic acid and phosphates

- Lactic acid = lactate and hydrogen ions

Anaerobic training requires 9-11 weeks to make proper chemical changes
(biochemistry of body – ability to buffer H⁺ ions and other byproducts of anaerobic glycolysis)

If full development of the anaerobic system takes 9-11 weeks, then we don't need to start developing that system within the General Prep phase.

Max velocity training carries more subtle, long-lasting benefits that can be developed year-round. One purpose of the General Prep phase is to also prepare athletes for the anaerobic training that comes within the next phase of training.

Benefits from running fast:

(1) **Improved speed reserve** : “ASR is defined as the difference between an athlete’s absolute maximum velocity and their maximum aerobic speed.” (Scott Christensen)

(2) **Injury resistance**: “Many neuromuscular exercises employ large ranges of motions and high intensities. The combination of these two things allows for a varied stimulus on muscles. Stressing the body in these different ways from time to time can help prevent overuse injuries.” (Jeff Boelé)

(3) **Improved movement patterns**: The various drills and exercises associated with incorporating sprint training into practice allows athletes an opportunity to focus on their form and work on form-related issues. It's much easier for younger athletes to focus on proper form while running over shorter distances.

General Prep basics

Distance performance is primarily based on **VO2max** and **efficiency/running economy** (where VO2max = volume of oxygen a runner can process)

(1) **Developing VO2max:** we improve VO2max by running, but the biggest improvements come from running at VO2max pace (3k – 2 mile race pace). Slower running will still improve VO2max, but the process is slower (i.e. full development with just distance runs might be closer to 25-30 weeks).

Training:	Pace	Workout Distance
Recovery run	60-65% of VO2 max pace	30-50 min
Long runs	70% of VO2 max pace	50 min - 2 hrs
Intermediate runs	70-80% of VO2 max pace	
Tempo runs	80-88% of VO2 max pace	20-30 min
Critical value runs	88-90% of VO2 max pace	
VO2 max runs	97-101% of VO2 max pace	600-3200m

The continuum of training thresholds



Taken from the USATF Cross Country Coaching education handout

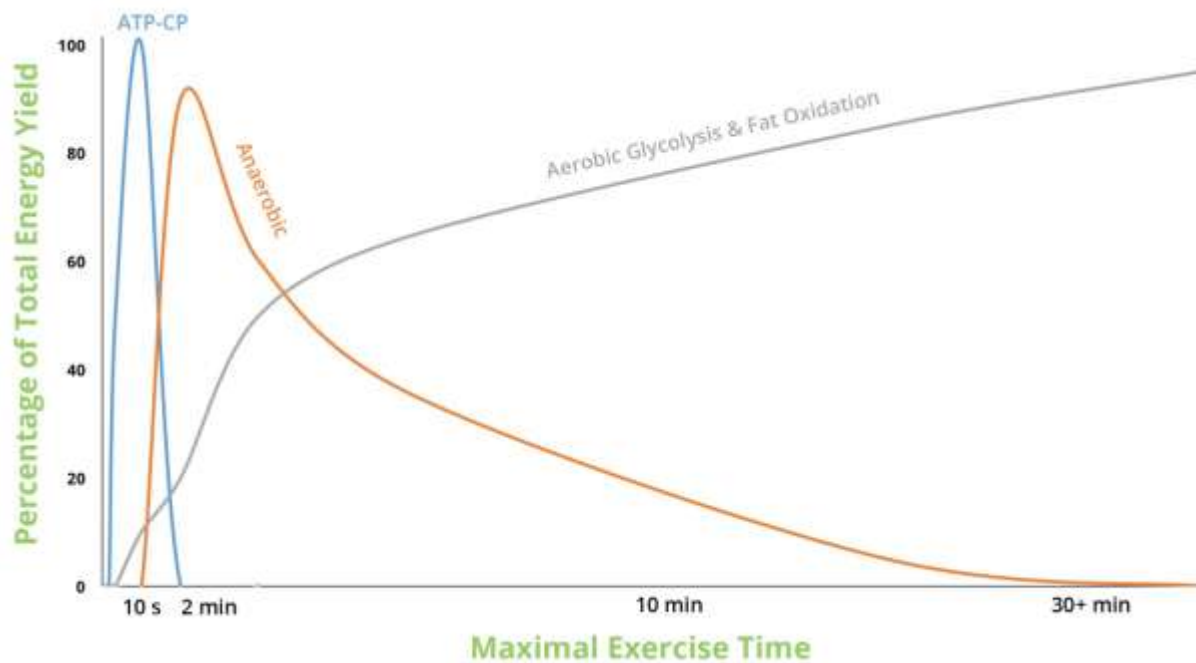
(2) **Developing efficiency:** we improve running economy by running at faster paces (e.g. interval work, sprint work).

Max Speed training involves the central nervous system, and is therefore best developed by running fast over shorter distances at the beginning of practice, maintaining low volumes of work with full recovery between efforts.

I.e., training which does not allow for full recovery, which maintains higher volumes of work, and involves something fast either during or after a workout is anaerobic training.

Training:	Pace	Workout Distance
Max Speed	~114% of 400m race pace	30-70m (6-10 sec)
Speed Endurance	~105% of 400m race pace	60-150m (10-25 sec)
Special Endurance 1	~95% of 400m race pace	150-300m (25-50 sec)
Special Endurance 2	~95% of 800m race pace	300-600m (45 sec - 2 min)

Energy systems vs duration of maximal activity



Taken from <https://blog.athletigen.com/your-endurance-thresholds-anaerobic-vs-aerobic>

Final concerns

Sequencing:

- 24 hrs: typical long run, hills, recovery runs, moderate tempo run, alactic work
- 48 hrs: races, long run +, SE1, SE2, above moderate tempo runs, VO2max workouts
- 72 hrs: races in the heat, very hard anaerobic work, hard tempo, longer workouts

Strength training:

Strength training prepares athletes for the higher intensity, greater volume coming in the Specific Prep and Pre-Competitive phases

** equivalent of strengthening the chassis of a race car when you put in a bigger motor

Types of strength training:

- Injury prevention – fixing muscular asymmetries, activating muscles, strengthening muscles that do not get used in a typical school day (e.g. hip flexors – as a result of sitting all day)
- General strength – improved muscular strength designed to improve power output and improve running economy
- Core strength
 - Exercises which help with resisting movement (e.g. planks)
Improving your body's ability to resist movement allows for improved movement patterns and greater efficiency/running economy
 - Exercises which initiate movement (e.g. crunches)
These exercises can serve as a complement to what we seek to achieve with planks and other similar core work

Putting it all together

Aerobic Development

A standard progression with aerobic development

- ** weeks 1-2: running distance runs (typically aimed at recovery-aerobic threshold pace)
- ** weeks 3-6: transition to 1-2 days per week of VO2 max and tempo training

Determining faster paces:

- ** Time trial (1 mile or 2 miles)
- ** Effort scale (pace based on perceived effort during the workout)

Cross Country vs Track

- ** during Cross Country, we rely on time trials to set faster aerobic paces
- ** during Track, we typically run in early season indoor meets to get aerobic pacing info

Speed Development

A standard progression with speed development

- ** weeks 1-3: running strides after distance runs (typically progressing from 75% to 95-100%)
- ** weeks 4-6: add 1-2 days per week of short sprints before distance runs/workouts

Hill work (hill sprints) – a complement to sprint development

- ** Hill training reinforces good sprint mechanics
- ** Hill training is an excellent conditioning tool
- ** Hill training helps runners develop strength

Cross Country vs Track

- ** during Cross Country, we typically sprint on grass and in training flats, typically later start with sprinting before practice
- ** during Track, we start out on fitness path or grass, progress to sprinting on the track or indoor surface – always in training flats, and switch to sprinting in spikes by mid-March

Developing Strength

A standard approach to strength training is 1-2 days of strength work with 2-3 days of core

- ** various considerations include: progression, availability of facilities, etc

Cross Country vs Track

- ** during Cross Country, we do more body-weight resistance exercises and general strength
- ** during Track, we have easier access to weights, so do a wider variety of exercises

Injury Prevention

Some thoughts:

- Cross Country: more typical to get brand new kids during the Summer
- Track: Winter months can be the Bermuda Triangle of training
 - To decrease the probability of injury, we transition recovery days into crosstraining days (aerobic development w/o the stress)

Our program:

General Prep Cross Country: typically June-July, 7 day microcycles

General Prep Track: typically December-January, 7 day microcycles

Our developmental goals during General Prep:

- Aerobic Development (primary goal)
 - we train at several different aerobic paces
- Speed Development
 - we incorporate sprinting into practice
 - we incorporate shorter hill sprints/running (note that hills could also be characterized as strength development)
- Strength Development
 - we implement a strength routine and core routine
- Injury Prevention
 - we implement a Winter Track crosstraining plan
 - we incorporate specific exercises into our warmup, warmdown, etc

Sample Training program for Weeks 1-6

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1/ Microcycle 1	35 min run	45 min run	35 min run (recovery)	45 min run	15 min run + Hill repeats + 15 min run	rest	55 min run
Week 2/ Microcycle 2	35 min run	50 min run	35 min run + <i>strides</i> (recovery)	60 min run	15 min run + Hill repeats + 15 min run	rest	45 min run + <i>strides</i>
Week 3/ Microcycle 3	70 min run + <i>strides</i>	10 min run + tempo run	45 min run (recovery)	60 min run	15 min run + Hill repeats + 15 min run	rest	10 min run + <i>strides/sprints</i> + time trial
Week 4/ Microcycle 4	70 min run + <i>strides</i>	10 min run + <i>strides/sprints</i> + 800s @ VO2max pace	45 min run (recovery)	50 min run + <i>strides</i>	15 min run + Hill repeats + 15 min run	rest	60 min run
Week 5/ Microcycle 5	80 min run + <i>strides</i>	10 min run + <i>strides/sprints</i> + tempo run	45 min run (recovery)	60 min run + <i>strides</i>	15 min run + Hill repeats + 15 min run	rest	60 min run
Week 6/ Microcycle 6	80 min run + <i>strides</i>	15 min run + 400s @ LT pace + 15 min run	35 min run (recovery)	60 min run + <i>strides</i>	20 min run + <i>strides/sprints</i> + 1200s @ VO2max pace + 20 min run	rest	70 min run