

AW

Getting it right

ALTHOUGH the focus is on middle-distance running this week, getting into the right shape doesn't happen by chance. It is the result of a myriad of factors and we include some this week.

First off, on pages 34-35, the four speeds at which to train are explained and it is suggested to run only as fast as is needed with perhaps some overly quick sessions not having the desirable physiological adaptations.

Tucked in behind that article is the art of middle-distance racing, AKA tactics on pages 36-37. Covered here are: front-running; even-splits; kicking; winding the pace up; incremental pace-building.

Some examples of the greatest and best known exponents are covered and although some athletes may be one-dimensional in their race plans, the very best have many tricks up their sleeve.

There's also an explanation of the advances in sports technology, plus a Club Night feature on *Watford Joggers*.

David Lowes, Coaching editor

PERFORMANCE GUIDE

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The speed of easy and long runs matters less than for other modes of training

THERE ARE ONLY FOUR SPEEDS AT WHICH RUNNERS SHOULD TRAIN, WRITES JASON KARP

THE goal of training is to obtain the greatest benefit while incurring the least amount of stress, so you should basically run as slow as you can to meet the purpose of the workout. So here are the four speeds at which you need to train.

Easy and long runs

The purpose of these is to stimulate the physiological, biochemical and molecular adaptations needed for good endurance. Some of those adaptations include the storage of more fuel (glycogen) in your muscles, an increased use of intramuscular fat at the same speed to spare glycogen, a greater number of red blood cells and haemoglobin, a greater capillary network for a more rapid diffusion of oxygen into the muscles and, through the complex activation

of gene expression, an increased mitochondrial density and number of aerobic enzymes to enhance your aerobic metabolic capacity.

Since many of these adaptations are volume-dependent, the speed of easy runs is not as important as their duration. Out of all the workouts you do, the exact pace matters the least for easy and long runs. However, the single biggest mistake competitive runners make is running too fast on their easy days. By doing so, you add unnecessary stress to your legs without any extra benefit and you won't be able to run as much quality on your harder days.

Your easy runs should be done at about 1½-2 minutes per mile slower than your current 5km race pace (about 70-75% maximum heart rate). As you increase your weekly mileage, you may need to run slower to accommodate the extra volume. Speed-type runners (those who fare better at shorter races) will have a greater difference between their race pace and easy running pace compared to endurance-type runners (those who fare better at longer races).

Acidosis threshold runs

The acidosis threshold (AT) marks the transition between running that is purely aerobic and running that includes significant oxygen-independent (anaerobic) metabolism and the development of acidosis. AT is the fastest speed that you can sustain aerobically. The purpose of AT training is to increase the speed at which your AT occurs, which allows you to run faster before anaerobic metabolism and fatigue begins to play a significant role.

The AT workout (tempo run) is the one of the most difficult for people to run at the correct speed since it requires holding back and not pushing the pace. There's a comfortably hard feeling to the pace and that requires much practice. For recreational runners, AT pace is about 10-15 seconds per mile slower than 5km race pace (or about 10km race pace and 75-80% max heart rate). For talented and highly trained runners, it's about 25-30 seconds per mile slower than 5km race pace (or about 15-20 seconds per mile slower than 10km race pace and 85-90%

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max heart rate). The better your endurance, the longer you can hold the AT pace and the better you'll be at sustaining any percentage of that pace.

VO2max intervals

VO2max is the maximum volume of oxygen your muscles can consume per minute. The purpose of VO2max intervals is to increase your VO2max by running at the speed at which this occurs. This pace corresponds to the pace at which you reach your maximum heart rate, maximum stroke volume (volume of blood the heart pumps per beat) and maximum cardiac output (volume of blood the heart pumps per minute). Cardiac output equals heart rate multiplied by stroke volume.

In the absence of a laboratory test to determine your VO2max pace, either run at close to your maximum heart rate or use your current race performances. There's not much benefit to running at 5km race pace other than to practice that pace since 5km race pace does not correspond to any physiological variable. It is too slow for a VO2max workout and too fast for an AT workout. VO2max pace, which is the speed that can be maintained for about 7-10 minutes,

is about 1-1.5-mile race pace for recreational runners and 3km race pace (10-15 seconds per mile faster than 5km race pace) for highly trained runners.

While reps lasting 3-5 minutes are ideal for training VO2max, since they provide the greatest cardiovascular load, research has shown that shorter reps are also beneficial as long as the recovery intervals are very short to keep VO2 elevated between reps. An advantage of shorter reps is that you can accumulate a greater distance or total running time at VO2max pace in a single workout.

Regardless of the length of the reps you choose, the speed should be the same since the goal is the same – to improve VO2max. As you progress, make the workouts harder by adding more reps or decreasing the recovery intervals rather than by running faster. Only increase the speed of the workouts once your races have shown that you are indeed faster.

As a recreational runner, if doing 800m reps in 3:30 elicits VO2max, running them in 3min 25sec will also elicit VO2max. However, since the key is to run as slow as you can to obtain the desired result, don't run each rep in 3min 25sec when five seconds slower will suffice.

Anaerobic capacity intervals

The purpose of anaerobic capacity intervals are to cause a high degree of muscle acidosis so you enhance your buffering capacity, to increase the number of enzymes involved in the metabolic pathway of anaerobic glycolysis and to increase speed by recruiting fast-twitch muscle fibres. The speed of these reps, which should be 45 seconds to two minutes long with recovery intervals up to twice as long as the time spent running, should be just fast enough to cause acidosis and recruit fast-twitch muscle fibres. For recreational runners that's about 400m race pace and for competitive runners around 800m to 1500m race pace.

The next time you go out of the door to run, ask yourself, "What's the purpose of this workout?" If you run all of your workouts at the correct speeds, not only will you be rewarded with personal bests, you may even be able to tell someone at the club how fast to run!

● **Dr Jason Karp has a Ph.D. in exercise physiology and is the author of five books as well as over 200 published articles. He is also a frequent speaker at coaching conferences**



Running at close to maximum heart rate is necessary for VO2max intervals

DAVID JONES

Coaching courses



ENGLAND

● Leadership in Running Fitness

June 6: Hertfordshire Sports Village, De Havilland Campus, Hatfield. **Cost:** £155 (EA affiliated £135).

June 13: Ranelagh Harriers Clubhouse, rear of Dysart Arms Pub, Richmond, London. **Cost:** £155 (EA affiliated £135).

June 13: Easton & Otley College, Norwich. **Cost:** £155 (EA affiliated £135).

June 14: Cranleigh Leisure Centre, Cranleigh. **Cost:** £155 (EA affiliated £135).

June 18 & 25: Ashbrooke Sports Club Ltd, Ashbrooke, Sunderland. **Cost:** £155 (EA affiliated £135).

June 20: Eastlands (Sportcity), Manchester. **Cost:** £155 (EA affiliated £135).

● Coaching Assistant

June 13-14: Brunel University, Uxbridge. **Cost:** £230 (EA affiliated £170).

June 13-14: Leeds Beckett University, Headingley Campus, Leeds. **Cost:** £230 (EA affiliated £170).

June 20-21: Shildon Sunnysdale Leisure Centre, Shildon. **Cost:** £230 (EA affiliated £170).

● Disability Inclusion Training Workshop

June 13: Brunel University, Uxbridge. **Cost:** £50 (EA affiliated £30).

● Leading Athletics

June 14: Leeds Beckett University, Headingley Campus, Leeds. **Cost:** £50 (EA affiliated £30).

Contact: englandathletics.org

WALES

● Coaching Assistant

July 11 & 12: Swansea University. **Cost:** £210 (WA affiliated £170).

July 18 & 19: Glyndwr University, Wrexham. **Cost:** £210 (WA affiliated £170).

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