


# Cross Country – Building the Aerobic House



**Cross Country**  
- Building the Aerobic House



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*"In athletics, the intelligent coach and athlete are constantly searching for new approaches and improved methods. They are the people who advance our sport. Other, less inspired and creative, adopt their techniques."*



John 'Doc' Counsilman

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**Basic Running Skills**





- Running rhythms
- Acceleration
- Maximum speed running.

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**Maximal Oxygen Uptake - VO<sub>2</sub>max**

- The maximal oxygen uptake, VO<sub>2</sub>max, defined as *"the highest oxygen uptake an individual can attain during physical work and breathing air at sea level"*
- The maximal oxygen uptake is a measure of the aerobic capacity of an individual
- Elite endurance athletes of similar ages would normally show VO<sub>2</sub> max values of 70 - 85 ml/kg/min for men and 65 - 80 ml/kg/min for women.



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**Developing Aerobic Capacity - VO<sub>2</sub>max**

Aerobic endurance training sessions approx. 80% of VO<sub>2</sub>max producing following changes which combine together increase maximal oxygen uptake:

- Increased movement of air in and out of the lungs
- Increases diffusion of oxygen from the lungs into the blood
- More efficient transport of oxygen by the blood
- Increased number and efficiency of capillaries
- More effective circulation of blood to the muscles
- Increased size/number/efficiency of mitochondria
- Increased concentration/activity aerobic enzymes.

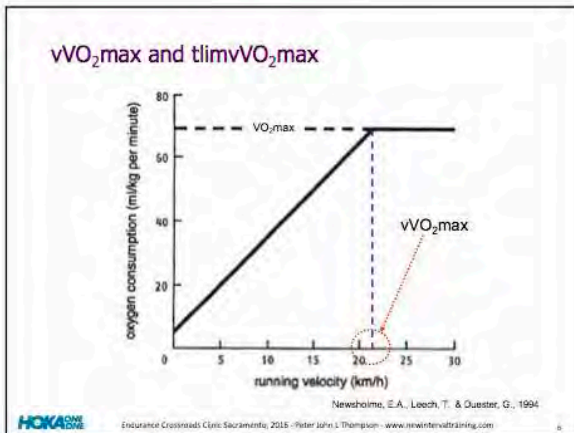
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**vVO<sub>2</sub>max and tlimVO<sub>2</sub>max**

- VO<sub>2</sub>max has traditionally been used as one of the critical indicators of endurance performance
- VO<sub>2</sub>max is a poor predictor of performance
- Use the velocity (vVO<sub>2</sub>max) and duration (tlimVO<sub>2</sub>max) at vVO<sub>2</sub>max
- vVO<sub>2</sub>max is simply then the minimal running velocity which produces VO<sub>2</sub>max
- tlimVO<sub>2</sub>max is the amount of time you can exercise at vVO<sub>2</sub>max.

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- Developing vVO<sub>2</sub>max and tlimvVO<sub>2</sub>max**
- Appropriate repetition and interval training sessions at the vVO<sub>2</sub>max produce the following changes which combine together to increase vVO<sub>2</sub>max and the tlimvVO<sub>2</sub>max:
    - Increased movement of lactate intra-muscularly and inter-muscularly
    - Increased utilisation of lactate as a fuel.

- Determining the vVO<sub>2</sub>max**
- The 6' vVO<sub>2</sub>max Test**
- This gives a distance run in 6' (e.g. 1,648m)
  - Then structure repetition sessions using 1' 30" and ¼ of 6' distance (412m)
  - Progress to repetitions of 2' and ½ distance (549m)
  - Progress to repetitions of 3' and ½ distance (824m)
  - 6' Re-Test after 6-8 weeks and revert to 1' 30" reps
  - Progress as before.




- What is 'Speed Endurance'?**
- Speed Endurance - ability to keep expressing speed - regardless of distance you are running
  - The speed endurance for a marathon runner is different from the speed endurance of a middle distance 800m and 1500m runner
  - Some call this speed endurance - 'event specific endurance' - but there has to be a foundation of 'general speed endurance' covering all distances
  - Athletes in Multi-events and Event Group Development stages are not specialist event athletes
  - Develop foundation of 'general speed endurance'.

- Training for Cross-Country Running Events**
- Training for all running events can be either:
- Continuous
  - Non-Continuous.
- 
- Two photographs showing runners in cross-country events. The left photo shows a group of runners in a race, and the right photo shows a runner in a race with a 'SIL' sign in the background.

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### Developing General Speed Endurance Continuous Running

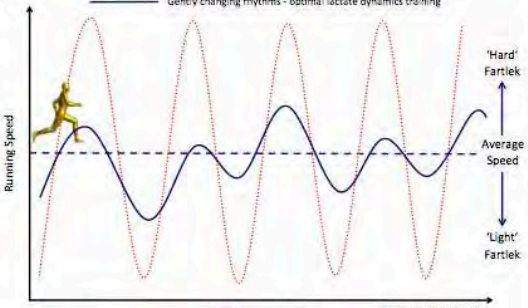
- Easy / recovery runs
- Steady / medium runs
- Tempo / sustained pace
- Mixed / varied pace
- Fartlek
- Surface and terrain
- Time trial
- Competition.



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### Fartlek Training - classic 'Lactate Dynamics Training'


Training too fast then too slow  
Gently changing rhythms - optimal lactate dynamics training



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### Developing General Speed Endurance Non-continuous Running

- Repetition training - extensive or intensive
- 'Interval training' - a specific type of repetition training
  - Original 'Gerschler Interval Training'
  - 'New Interval Training'.



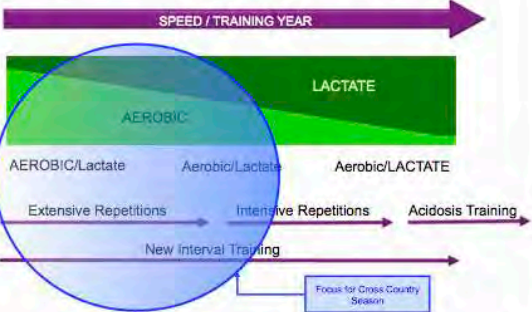
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### Developing General Speed Endurance Non-continuous Running

- Total distance
- Distance and number of fast segments
- Target pace or rhythm of fast part
- Same rhythm or mixed/varied pace or rhythm
- Duration of recovery
- Activity during recovery
- Location - surface and terrain
- Progression
- Is this suitable for the period and phase?.

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### Repetition Training and Metabolic Development



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### Planning General Speed Endurance Training

- When you plan sessions for your athletes be creative and have variety
- This is essential as the body and mind become less responsive to the same stimulus.



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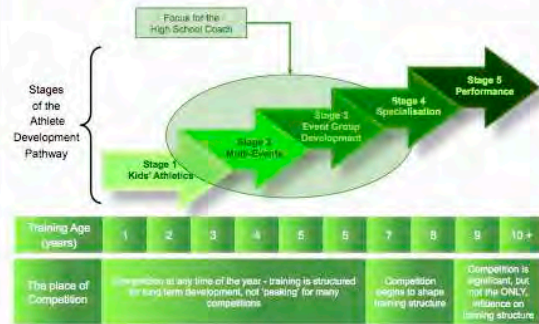
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## The Place of Competition in Planning

- The needs of Long Term Development determine the structure of the annual plan not Competition
- Competition is important and can be done at any time during the year **not just the Competition Period**
- The overall training structure should not be changed to fit in with competitions
- Rest or reduced training is appropriate prior to competition at any time
- Train for long term development and competition needs.

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## Athlete Development and the Role of Competition



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## Olympic Cross-Country



Paavo Nurmi FIN followed by Edwin Wide SWE Vilho Ritola (right) FIN Individual X-C at 1924 Olympic Games in Paris

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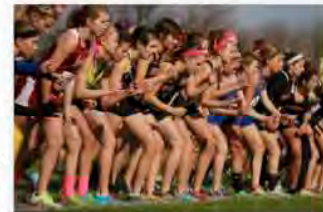
## Cross-Country vs. Track Running and Racing

- The basic difference between track running and cross country lies in
  - The different types of load placed on the muscular systems - sharp variations over the country and a 'constant' load on the track
  - You can overtake on either side in X-C
- Cross-Country running is an art - track running is a science

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## Topics

- Individual race
- Team race
- Hares and Hounds
- Yacht Handicap
- Mass Starts
- Running uphill and downhill and F1 cars



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## Hares and Hounds

	HARES IN FRONT	HARES BEHIND
HOUND 1	2	12
HOUND 2	3	11
HOUND 3	3	11
HOUND 4	6	8
HOUND 5	9	5
HOUND 6	13	1
	36	48

More HARES behind than in front – HOUNDS WIN  
If more HARES in front than behind – HARES WIN

Position	
1	HARE
2	HARE
3	HOUND 1
4	HARE
5	HOUND 2
6	HOUND 3
7	HARE
8	HARE
9	HARE
10	HOUND 4
11	HARE
12	HARE
13	HARE
14	HOUND 5
15	HARE
16	HARE
17	HARE
18	HARE
19	HOUND 6
20	HARE



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## Positive Benefits of Cross-Country

- Develops leg strength and aerobic fitness
- Enjoyable as well as challenging
- The variety makes it much more 'fun'
- Increases confidence – showing athletes they can overcome a physical challenge
- Builds 'team spirit'
- Develops a courageous approach to running.

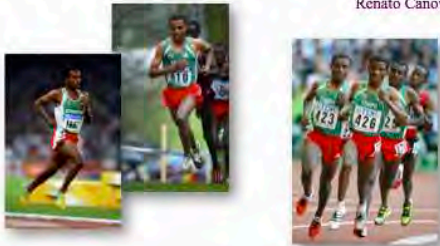


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*"It is therefore certain that athletes who achieve high level results in cross-country races are likely to achieve similar performances in track or road races but the contrary is not true"*

Renato Canova, 1998



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## Have a GREAT 2016 season



Thank you for your attention and contributions



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