

See Deeper Blog #22 Endurance Athlete Training Overview for Periodization, Base & Rest



Endurance Athlete Training - Intervals/Speed/HIIT ... DB#23

Becoming your own coach

Periodization, Base, Intervals/Speed/HIIT & Rest



Endurance Athlete Training Overview

Speed/Intervals/HIIT

Background:

As in an subject we might get interested in we research & at times devour all the data we can find so we might find a starting point and areas to experiment with along the way. My path of running to martial arts to motorsports to cycling has led me to an overview that might be a good starting point for you. My experience with endurance training spans 20+ years with a curiosity centering around increasing performance through competition within myself.

After 50+ books read ...



Becoming your own Coach - Why?

- 1) Understand how your body reacts to 'damage' or stimulus.
- 2) Experiment with inputs & outputs of your training to find what works for you.
- 3) Breaking limitations that your past and your mind has to offer to progress.



Endurance Athlete Training Overview

Speed/Intervals/HIIT

lessons and learning, use it and share it if you like.

I do not receive any compensation for any these products, yet I have Disclosure:

- I am not a doctor nor do I play one on the internet or anywhere else.
- This is my purchased them with my own earnings.
- Please be careful with ‘interval’ training, these are at a much higher heart rate & cause strain on the mind & body. At a minimum they damage your system at a faster rate needed more recovery time. I suggest at least two sleep cycles between ‘intervals’ and limiting to twice per week.
- Thank you!



Endurance Athlete Training Overview

Speed/Intervals/HIIT

Background:

This is not hard.

Let's skip the hype and get to the key points.

Let's keep this simple.

Outline:

- 1) Periodization - Build & Rest (DB#22)
- 2) Base Building - Also Fat Burning for steady strength without sickness (DB#22)
- 3) Speed - Tempo & HIIT training for speed
- 4) Yearly Rest - at least two weeks off to heal (DB#22)
- 5) Other Factors - Tracking progress and feelings along the way (see p14 for journal & future 'deeper blog post' for testing your fitness.

That's it.

I will work to create a one-page summary at the end of these Deeper Blogs on being an Athlete, a checklist you can reference & carry.



Endurance Athlete Training Overview

Speed/Intervals/HIIT

When to transition from BASE & add intervals?

EXAMPLE:

Each winter while others are couch sitting, I am sitting on a trainer at the gym building base.

For me this starts with 3 X 30 minutes of steady riding & ends at 7 X 30 minute.

Steady riding = holding heart rate at $180 - \text{Age} + 5$ bpm. (see prior on establishing zone 2 heart rate)

Timing: Each '30 minute' takes approximately 36 minutes due to pauses, bathroom breaks, etc.

So, 3 X 30 minute will take 3 X 36 minutes or ~ 1.8 hours, I will plan 2 hours & 7 X 30 will be ~4.2 hours, so plan 4.5 hours

Sweat: Inside on a bike without a fan (at a gym) you will likely drench two sets of clothing, so plan at least a change of shirt $\frac{1}{2}$ way thru.

Standing: Plan to stand consistently to get blood flowing to your pelvic region. I stand every 1.5 miles for at least 0.1 miles.

Key: Start @ about 1.5 hours & progress to 4+ hours, add speed when your heart rate holds for a steady effort of 2 hours. There is minimal heart rate drift, say no more than 5 to 10 beats '30-minute average' from start to finish.

When to add Speed/Intervals/HIIT?

When you see no or minimal 'heart rate drift' for at least two hours of steady riding.



Endurance Athlete Training Overview

Speed/Intervals/HIIT

Speed/Intervals/HIIT:

What is this?

It is an effort that you can only sustain for a shorter period.

It is a harder and painful effort.

It is meant to strain the system in a shorter period of time.

Typically, the higher the intensity, the shorter the time.

My experience is that you need to add Speed/Intervals or HIIT on top of an existing platform of BASE build over several months. (see Deeper Blog post #22 for an overview on base. If you decide not to do this you will likely get sick.

Most of this terminology comes from running. H.I.I.T. = High Intensity Interval Training.

This science is constantly evolving & you might want to read the actual academic papers instead of popularized summaries.

This is my attempt to SIMPLIFY of it to get an interval that you could start now.



Endurance Athlete Training Overview

Speed/Intervals/HIIT

Speed/Intervals/HIIT:

Q - What type should I use or more specifically what Intensity, Duration & Frequency should I use?

Just starting: Heart Rate Zone 4 for 4-6 minutes with 1-3 minutes rest repeated 4-6 times.

This is supported by many research studies.

Stay in the Peloton: Heart Rate same as the above repeated 8-10 times, the more times the more 'matches' to burn

Time trial: Heart Rate low Zone 4 for 10 -25 minutes with ½ interval time in rest.

These are all good starting points that you would increase the duration over time.

H.I.I.T are actually much shorter counted in seconds rather than minutes and intensity is Heart Rate of zone 7 or all out sprint.

Your body many or may not respond to these, so experiment & try them checking your fitness.

Deeper Blog post for references of supporting Endurance Athlete Training Overview in the future.

If you crave complexity & cannot wait, start reading *The Time-Crunched Cyclist* by Chris Carmichael & Jim Rutberg. p29

This can get very complicated very quickly, my intent is to start you out & get you going, now.



Endurance Athlete Training Overview

Speed/Intervals/HIIT

Here is a simple method to calculate the total 'Simple Damage' you have done in each training session. It is nothing compared to the more complicated POWER METER calculations, but it is effective for training planning and it is something you could calculate in your head. The point is a simple & consistent method to plan with & track. To better understand range of this 'Simple Damage' number I typically have numbers of 1000+, yet get to 2000+ as training for a key event approaches.

'Simple DAMAGE' = For entire workout (ZONE) X (TIME in MINUTES) + Time for Interval if any (ZONE) X (TIME of individual INTERVAL) X (Total Number of INTERVALS)

EXAMPLE: I worked out for 2 hours in Zone 2 and did an interval of 5 minutes in length and repeated it 6 times in Zone 4. What is the total 'Simple Damage'?

$$(\text{zone } 2) \times (60 \text{ min} \times 2) + (\text{zone } 4) \times (5 \text{ min}) \times (6 \text{ repeats}) =$$

$$2 \times 120 + 4 \times 5 \times 6$$

$$240 + 120 = 360 \text{ 'simple damage' points.}$$

The interval 'simple damage' causes more fatigue than this, yet I wanted the math to be simple.



Endurance Athlete Training Overview

Speed/Intervals/HIIT

There are both Heart Rate and Power meter zones for cyclists. Heart Rate works most of the time for any steady training, such as BASE training. Power meter or Watts excels for shorter & harder efforts, such as intervals. You might look at Heart Rate as the effort or input & Power as the output of that effort. Yes, your heart rate to power ratio will vary for your condition and the environmental conditions.

As you get into better shape your heart rate will be lower for a given power, as it is hotter outside your heart rate will be higher for a given heart rate. I will not get into your Power zones here, yet. Just look up 'FTP and determining power meter zones or see one the books by Hunter Allen & Stephen S. Cheung, PhD.

Zone 1 Very Light or Recovery

Zone 2 Health Zone or Aerobic BASE long endurance & max 'fat-burn'

Zone 3 Aerobic or Intensive Aerobic shorter endurance

Zone 4 - 7 Improved Performance or Lactate threshold to Anaerobic

This is simplified to get you started -
You want to do your workouts in two
Heart Rate zones:

Zone 2 for BASE Endurance

&

Zone 4+ for INTERVAL Performance

Most people are working out in ZONE 3 for most of their workouts, I believe this is incorrect. Why? It is too hard & yet not hard enough on the body, but it is 'easier'.

That's it.



Endurance Athlete Training Overview

Speed/Intervals/HIIT

How to calculate estimate Zone 4 *(I use the lower end of this range for my Zone 4 training)*

Simple - Slightly ~5% below your Lactate Threshold or the point you begin to transition from aerobic to anerobic:
Interval average Heart Rate = 80 to 85% of max Heart Rate

Example: active endurance 45-year old male at 150 lbs.

Using Sally Edwards method for Max Heart Rate: $210 - (0.5 \times 45) - (0.05 \times 150) + 4 = 184$

Zone 4 training range =

$0.85 \times 184 = 156$ beats per minute (bpm)

$0.90 \times 184 = 165$ bpm

More complicated method based on Lactate threshold:

LTHR = $0.9 \times$ Max Heart Rate Assumption for starting point see Joel Friel for testing methods

Zone 4 training rate =

0.94 to 0.99 of LTHR

Same example: active endurance 45-year old male at 150 lbs.

$0.94 \times 0.9 \times 184 = 155$ bpm

$0.99 \times 0.9 \times 184 = 164$ bpm

Both methods have very similar results, yet ...

As your condition improves your LTHR will also improve. As you condition improves this zone 4 range will increase.



Endurance Athlete Training Overview

Speed/Intervals/HIIT

Periodization - during *INTERVAL* training overview

BUILD WEEK 1
w intervals

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	
Week1	OFF	120 min Included interval 6 reps X 5 min w 1 min rest	OFF	180 min Included interval	OFF	240 min Included interval 10 reps X 30s on hills	OFF		
w intervals		120 Zone: 2		180 Zone: 2		240 Zone: 2		9.0	
		2 Damage		2 Damage		2 Damage			
		4		0		7			
									Damage Time
									Intervals 155 35
									Total 1235 540
									% 13% 6%

BUILD WEEK 2
w intervals

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	
Week2	OFF	150 min Included interval 8 reps X 5 min w 1 min rest	OFF	180 min Included interval	OFF	270 min Included interval 10 reps X 30s on hills	OFF		
w intervals		150 Zone: 2		180 Zone: 2		270 Zone: 2		10.0	
		2 Damage		2 Damage		2 Damage			
		4		0		7			
									11% % increase
		300		360		540			1395
		160		0		35			13% % increase

REST WEEK

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total	
Rest week	OFF	OFF	OFF	120 min	OFF	240 min	OFF		
		0 Zone:		120 Zone: 2		240 Zone: 2		6.0	
		0 Damage		2 Damage		2 Damage			-40% % decrease
		0		240		480			720
									-48% % decrease

(Blow-up of each next →)



Endurance Athlete Training Overview

Speed/Intervals/HIIT

Periodization - during *INTERVAL* training

EXAMPLE - Two week Build and one-week Rest

BUILD WEEK 1 with intervals

Holding both
Damage points &
Time of Intervals
below 20% of Totals

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Week1	OFF	120 min	OFF	180 min	OFF	240 min	OFF	
w intervals		120 Included interval 6 reps X 5 min w 1 min rest Zone: 2 2 Damage		180 Included interval 0 Zone: 2 2 Damage		240 Included interval 10 reps X 30s on hills Zone: 2 2 Damage		9.0
		Zone: 4 4		0		Zone: 7 7		

	Damage	Time
Intervals	155	35
Total	1235	540
%	13%	6%

Zone 7 is just as hard as I can go - Sprint/Anerobic



Endurance Athlete Training Overview

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Periodization - during *INTERVAL* training

EXAMPLE - Two week Build and one-week Rest

BUILD WEEK 2 with intervals

Holding both
Damage points &
Time of Intervals
below 20% of Totals

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total														
Week2	OFF	150 min	OFF	180 min	OFF	270 min	OFF															
w intervals		Included interval 150 8 reps X 5 min w 1 min rest Zone: 2 Zone: 4 2 4 Damage 300 160		Included interval 180 0 Zone: 2 0 2 0 Damage 360 0		Included interval 270 10 reps X 30s on hills Zone: 2 Zone: 7 2 7 Damage 540 35			10.0 11% % increase 1395 13% % increase	<table border="1"> <tr> <td></td> <td>Damage</td> <td>Time</td> </tr> <tr> <td>Intervals</td> <td>195</td> <td>35</td> </tr> <tr> <td>Total</td> <td>1395</td> <td>600</td> </tr> <tr> <td>%</td> <td>14%</td> <td>6%</td> </tr> </table>		Damage	Time	Intervals	195	35	Total	1395	600	%	14%	6%
	Damage	Time																				
Intervals	195	35																				
Total	1395	600																				
%	14%	6%																				

Zone 7 is just as hard as I can go - Sprint/Anerobic



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Periodization - during *INTERVAL* training

EXAMPLE - Two week Build and one-week Rest

REST WEEK

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Rest week	OFF	OFF	OFF	120 min	OFF	240 min	OFF	
		0		120		240		6.0
		Zone:		Zone: 2		Zone: 2		-40% % decrease
		0		2		2		
		Damage		Damage		Damage		
		0		240		480		720
								-48% % decrease



Endurance Athlete Training Overview

Speed/Intervals/HIIT

Some important notes:

Intervals done without careful monitoring is a path to destruction.
[You need a training journal.](#)

What?

When I first learned of interval training many decades ago, I applied what I thought I learned.
I wanted to be faster, so I did them 3 to 4 times a week.

They **destroyed** me. This led me to all the classic signs of overtraining: tired all the time; sickness; listless ...

In a future 'deeper blog' post - Recovery, Overtraining & signs that you are tired.

TIPS - Your training journal might contain:

- 1) Date & Type of Training (BASE/SPEED/RECOVERY)
- 2) Basic stats - Avg Heart rate, Distance, course taken, fluid & nutrition taken during & after. Did you meet your effort goal? What data did you take: Garmin; Fitbit; Power meter; etc. or if 'it' was not working or no data.
- 3) Feeling - "Started felt awful, yet felt great 1 hour in, tired at 3 hours."

Note: I no longer keep a separate training journal, the summary is in my daily planner.