CYCLING TRAINING OF TRIATHLETES

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Abstract
As the population of multisports continues to grow there is also a growing demand for the better strategic and practical time adjustment and training incorporation into a busy way of life. One cannot ignore the fact that it takes a lot of time for the correct training to complete triathlon and that this is the exact reason why many active people, trapped by the daily routine, do not support this sport. A lot of time and knowledge of the correct planning and programming of the training is a must. Therefore, this paper will deal with the basics which will make it easier to plan and programme the cycling segment for the triathletes.

Key-words: *athletics, triathlon, training, programming*

Introduction

It is an inevitable fact that it takes a lot of time for the correct training to complete triathlon and therefore many active people who are immersed in the daily routine, do not support this sport. It takes a lot of time and knowledge to execute adequate and correct planning and programming of the training cycle.

In this paper we will try to show the basics which will make it easier to plan and programme the cycling segment for the triathletes. The plan and programme of the triathletes is for Halfronman, therefore it is assumed that this type of the training programme is for those competitors who have been in triathlon for at least 3 years.

Heart rate and rpe zone determination
Heart rate taking is very important since sometimes poor willpower or bad motivation can prevent one from defining the exact Rate of Perceived Exertion (RPE). For the triathletes it is very important to know their lactate threshold (LT). Training zones chosen at LT are optimal because the percentage of maximal heart rate at which some athletes get into anaerobic state is different from one athlete to another. There are several procedures for the determination. Since the heart rate varies from sport to sport, one should test LT in each sport, or adjust it according to RPE.

Conconi test
The test is performed on a treadmill: the candidate warms up for 15 minutes, the treadmill starts at 5km/h, the heart rate is memorized every 5 seconds, the speed is increased 1 km/h every minute. The first two minutes the candidate walks, and when the mill starts moving faster than 7 km/h, she/he starts running easily. The end of the test is when the candidate can no longer follow the speed of the treadmill or when she/he reaches her/his maximum heart rate. The test is stopped and the cooling of the body begins – walking at 5 km/h for 3 minutes.

The analysis of the results
With high intesity activities, the heart frequency and the RPE are not linearly dependent. Linear dependence of these two parameters stops at the point of anaerobic threshold where the curve of the heart rate frequency turns right. By entering the graph of these two values it is possible to determine the point of deflection. In the given example the heart rate value is 172 bpm.
Z1 – (102-125) Zone 1 recovery
Z2 – (126-138) Zone 2 length endurance
Z3 – (139-144) Zone 3 muscle endurance
Z4 – (146-155) Zone 4 below lactate threshold
Z5a – (156-159) Zone 5a lactate threshold
Z5b – (160-164) Zone 5b above lactate threshold
Z5c – (165-170) Zone 5c maximum oxygen consumption

These are examples of trainings which can be used in this programme. This is not the final list of trainings, it is possible to add other types of trainings, or modify the existing ones in order to be prepared as much as possible for the race conditions.

RPE zone	HR zone	Description
0	Z1	Complete rest
1	Z1	Very easy, easy walking
2	Z1	Very easy, easy walking
3	Z1	Very easy, walking
4	Z1	Easy, the beginning of sweating
5	Z2	Medium exertion, a little larger sweating
6	Z2 upper	Tolerable exertion, able to talk
7	Z3	Great exertion, faster breathing but still can sustain the rhythm for several minutes
8	Z4	Exertion as at the 40 km time chronometer race
9	Z5	Exertion as at the 10 km race
10	Z5+	Great exertion, almost maximum

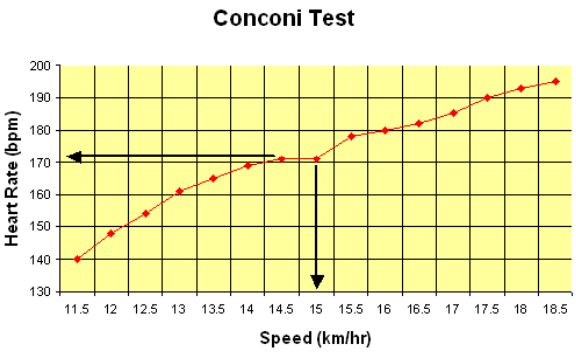

Figure 1 Conconi test

Trainings:

- B1: It is used for aerobic exercise, long rides on the flat terrain or rolling hills.
- B2: This type of training serves to improve the speed, cadence intervals are done which are performed on the small cogwheel, maximum cadence should be obtained and sustained during periods of 30 seconds.
- B3: Riding on the track which includes long hills. Mainly riding on the saddle, focus on the body position on the bike and smooth pedal spinning.
- B4: Aero position is very important for a good result, that is why this training is used to prepare the body for the ride with aero bars.
- B5: This training is performed on the small cogwheel and its aim is to produce a specific stimulus on the muscles and increase the strength and cadence during the ride.
- B6: Sprints of submaximum and maximum intensity lasting 60 seconds, are performed on the flat track. Their aim is to increase the anaerobic capacity.
- B7: Interval training with a precisely defined intensity, exercise time and recovery. Alternate exchange of exertion and recovery. The aim is to increase muscle endurance.
- B8: A training which demands riding during a specific period of time at a specific RPE scale, which is a little below anaerobic threshold.
- BRICK training when two sports are done one after another, swimming and cycling or cycling and running. Transition training.

TRAINING PROGRAMME STAGE BY STAGE

This programme is ideal for those competitors who want to transfer from the Olympic distance, that is, for those who have had several years of experience in endurance sports. It is also good for those who, in previous years, competed in Halfronman and want to keep their fitness level with a smaller range of training.

Although this programme gives a type of training day by day, it is to note that this programme can be changed, because every athlete has his own advantages, shortcomings, available time during the week and other limitations. Since there is no such plan that will suit all the fitness levels and types of athletes, we will introduce the plan which is not too generalised.

We divided the preparation period in 6 stages, as follows: Adaptation, Base 1, Base 2, Base 3, Building and Climax.

Adaptation

No competitions are planned in this period. This period is meant to be an introduction to the training of endurance building through exercise and recovery. In this period there will be approximately equal number of weekly hours and training schedule. The aim is consistency and body preparation for the long period that follows.

The exercises according to the structured programme will ask for more sleep and water than you are used to, so make the most of the rest days. Try to do as many trainings as possible outside, both in good and bad weather. The more rain, wind and cold you feel during trainings, the more confidence you will build on the race day.

Table 1 Adaptation

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	Running Swimm	Running B1 60min S.R.	Swimm	Running	Swimm B1 60min B.R.	Rest	B1 90min RPE 2-3
2	Swimm	B1 60min S.R.	Swimm	Running	Swimm B2 55 RPE 2 RPE 5	Rest	B3 90min RPE 2-3
3	Running Swimm	Running B1 60min B.R..	Swimm	Running	Swimm B4 90min (30min) RPE 3	Rest	B1 120min RPE 2-3
4	Running Swimm	Running B1 60min S.R..	Swimm	Running	Swimm B1 45min B.R.	Rest	B1 90min RPE 2-3
	ADAPTATION			Cycling 15 hours			

1 week: The primary point of this week is for the body to get used to the high frequency of trainings which are not going to be either long or difficult, but constant ones. In this period, RPE table should be completed so that the exertion would be easier to determine. If you use the heart rate monitor, add the heart rate values next to RPE values.

2 week: During this week we train the body to move faster and more efficiently, without any stress. We will do this with the help of acceleration which will be added to the running programme. By an easy acceleration from a normal to maximal rhythm for a short period of time, you should not feel fatigue, but your body will neurologically feel the change of the rhythm.

3 week: We keep the same structure of the training during this week. The only difference is a slight increase in the volume.

4 week: This is the last week of adaptation. It should be used for a good organization of life outside trainings. The main aim is to implement the trainings into a weekly schedule because a good organization will make the most both of the training programme and higher score in the competition. This week is completely the same as the first one.

Base 1

In this period a specific training that simulates the race conditions starts. Base 1 will serve to increase the volume of the training while the intensity remains the same. One difficult training will be added during the week , but not on the difficult day. It also starts to build a specific strength by adding hills in the cycling programme. Hours of training should be used to the maximum. It is not necessary to be in the top form in this period, but body weight and fat percentage checks should be started so that they can be more easily compared later on. Minor nutritional changes should also be made, not drastic ones, but these changes should be improved throughout the preparation period, one by one. Look for the adequate information about nutrition during this period and try to follow all the instructions. It is difficult to train alone, day in day out, so try to find company for some trainings. One strong traning a week with a group is an excellent thing; everything else do easily. Aero position on the bike and power thrust are contradictory to each other. If you ride in a lower position, you will have less power. One should start practicing flexibility of the back and legs in this period. On the day of the race your aim is to be as flexible as possible and sustain the power thrust as long as possible.

Table 2 Base 1

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
5	Swimm	B3 120min RPE 3 Swimm	Swimm Running	Running B1 90min RPE 3	Running	Rest	B1 160min RPE 3-5
6	Swimm B1 90min RPE 3	Running B3 120min RPE 3	Rest	Running Swimm	Swimm	**BRICK** B1 180min RPE 3 Running	Swimm Running
7	Swimm	B1 120min S.R. Running	B3 90min B.R. S.R.	Swimm Running	Swimm	B1 180min RPE 3 Running	Running B1 60min S.R.
8	Rest	B5 60min RPE 3 Running	Swimm B5 60min RPE 3	Running Swimm	Rest	**BRICK** Swimm B1 120min RPE 4-5	Running
	BASE 1			Cycling 24.2 hours			

5 week: This week emphasizes the body mass and fat percentage. It is much easier in this period to start making changes in nutrition and body weight. Do not wait a month before the race, it will be late then.

6 week: The main training this week should not be done maximally, but in a high rhythm – so as to build self-confidence.

7 week: Main trainings this week should be in running and swimming.

8 week: The week of recovery. Still many trainings, but short ones. Lower calorie intake so that you can fit in the decreased volume of work.

Base 2

Start with the visualization of the race – what the track will look like, how strong you will go at each of the three segments.

Again increase the weekly volume of training. In Base 2 trainings will be thematically divided with the increase of the volume in one sport, while there will be reduction in the other two sports. Week 9 will focus on swimming, week 10 will focus on running and week 11 will focus on cycling. Week 12 serves as a recovery as it has done so far. In this period there will be two difficult trainings during the week , but in the same sport. Be aware of injuries in this period because of the great volume increase. In this period one should have a shorter triathlon or duathlon race which will serve to build self-confidence.

Table 3 Base 2

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
9	Swimm	Swimm B3 90min RPE 3 RPE 8	Swimm	Swimm Running	Rest	**BRICK** Running B1 90min S.R. B.R. P 30min RPE 5	Swimm
10	B6 90min RPE 3	Running	Swimm Running	Running P10 2300м (1950м)	Running B7 120min (6x(12min+3min)) RPE 7 RPE 2	Swimm	B3 150min RPE 3
11	Swimm B3 90min RPE 4	B4 90min (40min) RPE 4	Б8 120min (90min) RPE 5-7	Rest	Swimm Running	B4 120min RPE 4 Running	B1 240min RPE 2-3
12	Swimm	B5 90min RPE 2-3 Running	Swimm Running	B6 60min RPE 3	Swimmi B3 90min RPE 3	Rest	Running
	BASE 2			Cycling 21.5 hours			

9 week: This week focuses on swimming with the reduction in two other sports.

10 week: This week focuses on running. Two difficult trainings - running on Tuesday and bike on Friday.

11 week: This week focuses on the bike, and both hard trainings are on the bike. Try, during these long rides, to use the equipment you are going to use in the race, also try to follow the hydration rhythm that you plan for the race.

12 week: The week of rest. This is a good time to do the triathlon of the Olympic distance or half marathon.

Base 3

If you live in the area with good mountain conditions, insert in your schedule 6-8 hours of walking instead of training. This long endurance training of low intensity will certainly leave you on the alert if the terrain is hilly. This is also a good moment to practice hydration and nutrition during greater exhaustion. This is the period when you turn to the maximum number of hours of training during the week. These trainings will be very long, so make sure you take enough food and sleep as much as possible. Do not bother if you have to skip the training because of fatigue or other obligations. You will not miss a lot if you miss any of these trainings. Just go on with the next day and do not change the schedule because of the missed trainings.

Table 4 Base 3

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
13	B5 45min RPE 3 Swimm	**BRICK** B1 120min RPE 4 Running	Rest	Running Swimm	Swimm	Rest	B1 260min RPE 3 Running
14	Swimm	**BRICK** Swimm B1 60min RPE 3 Running	Running	B5 90min RPE 3	Swimm Running	Rest	**BRICK** B1 300min RPE 3-4 Running
15	Swimm	Swimm **BRICK** B8 60min (30min+30 min) RPE 4 RPE 7 Running	Running B3 90min RPE 3-4	Running	Swimm Running	Rest	B3 330min RPE 3-4 Running
16	Swimm	**BRICK** Swimm B1 90min RPE 3 Running	Running	B5 120min RPE 3	Swimm Running	Rest	B1 360min RPE 3-5 Running
	BASE 3			Cycling 32.1 hours			

13 week: This week again increases the number of hours with a special emphasis on the bike training on Sunday and the preparation for the race.

14 week: Approaching maximum number of hours. Let yourself relax and think what you have put up with so far in the previous months.

15 week: Another increase of number of hours.

16 week: This is the longest week of the preparation period. A week of recovery follows.

Building
During this period of building, practice transition. Think also what you will wear on the day of the race and what you will eat and drink. Try on all the things on the training, well ahead of the race. The number of hours per week falls drastically since in this period some specific race things, which include relating trainings and transition practice, will be done. Injuries can be expected in this period. Stretch constantly and correctly, take a day off if needed.

Several short races in any sport will motivate you and create sporting spirit. It will also preseent a good opportunity to test the equipment for the race, meals before the race, and adjust the routine of physiologicl needs. Increase your advantage to the maximum by making sure that everything is in perfect shape on the bike, that critical parts are replaced, if it was necessary to be done. Any position changes should be done now and not in the last two weeks.

Table 5 Base Building

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
17	Rest	B7 75min (7x(5min+3 min)) RPE 5 RPE 2 Running	Swimm Running	B3 120min RPE 4-5	Swimm B1 90min RPE 3-4	Swimm	Running
18	Running	Swimm B3 120min RPE 3-7	Swimm B4 90min RPE 3	**BRICK** B5 60min RPE 4-5 Running	Rest	B1 180min RPE 3-4 Running	Rest
	BUILDING			Cycling 13.3 hours			

17 week: Recovery week. Take in less food compared to the last week.

18 week: From this week on we gradually decrease the number of hours per week while we raise the form for the race day. This is a good week for making plans for the race day. The whole day plan is noted down on a piece of paper with the schedule, rhythm, equipment, food for the race, the meal before the race, and other things needed for the race.

Taper
Bike – try to ride the second half of the bike segment faster than the first one. It means that you go slower in the first part. Do not start eating and drinking before the 15th minute of the ride, after that you can continue with the plan of nutrition and hydratation which you practiced during long rides.

Be careful with calorie intake during these two weeks because the volume is considerably smaller during this period. Good sleep will take you to the race, but do not worry the night before the race. In fact, do not do anything that can cause injuries, do not try new training techniques and do not have a massage, if you have not had it so far. It is the race now and you should be ready to do your best or it will be just the distance you rode on the training. Trainings during the last two weeks should be focused on more efficient moving without any pressure on the body.

Table 6 Taper

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
19	Rest	Swimm B8 60min (40min) RPE 7	B8 90min (40min) RPE 7	Running	Rest	Swimm B1 180min RPE 3-4	Running
20	Swimm B7 30min (3x10min) RPE 7 Running	Swimm B7 20min (5x2min) RPE 8 Running	Swimm	B8 45min (30min) RPE 7 Running	Rest	Running B1 20min RPE 2 Swimm	**RACE**
	TAPER			Cycling 7.7 hours			

19 week: Another two weeks left until the race. Enjoy the decrease of the volume, and fight the need to go further and faster. Do not relax now and go out and eat junk food although you have a lot of free time.

20 week: You practiced nutrition, did long trainings, had a rest from hard trainings and you know the track. Stick to your plan and to what others do.

Conclusion

Triathlon builds up concentration, motivation, discipline, respect, and self-confidence. Since it is the synthesis of the base sports, it develops all motor skills equally, but the most important ones are endurance, speed and strength. This plan stands as a base to start with, but it can be changed so that the coach along with the athlete, can adapt it to his needs in order to achieve maximum sports results.

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BICIKLISTIČKI TRENING TRIATLONACA

Sažetak
Kao što raste populacija multi-sportova tako se povećavaju i zahtjevi za boljom strategijom i vremenskom praktičnom prilagodbom treninga utjelovljenog u užurbani način današnjeg života. Nitko ne može ignorirati činjenicu da je potrebno mnogo vremena za ispravan trening triatlona i da je to točan razlog zbog kojega mnoge aktivne osobe, uhvaćene u svakodnevne rutine, ne podržavaju ovaj sport. Mnogo vremena i znanja za isprano planiranje i programiranje treninga je obveza. U tom smislu, ovaj članak se bavi temeljima koji mogu učiniti lakšim planiranje i programiranje biciklističkog segmenta u triatlonu.

Ključne riječi: *atletika, triatlon, trening, programiranje*

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