

Triathlon – an Individual Multidiscipline Sport with a Multidisciplinary Approach for the Athletes' Health

Triathlon – ein multidisziplinärer Individualsport mit einem multidisziplinären Ansatz für die Athletengesundheit

Triathlon is a competitive sport that combines swimming, cycling and running into a single event. Since the beginnings of “modern triathlon” in the late 1970s, it has grown into a popular sport among recreational and elite athletes and triathlon made its debut on the Olympic program in Sydney 2000 over the Olympic Distance. In 2013, USA Triathlon had more than 150.000 members and worldwide an estimated number of 2.3 million athletes completed a triathlon in 2010. The numbers are constantly growing. Apart from the well-known Ironman Hawaii, one of the world's biggest triathlon events is the ITU World Triathlon Series in Hamburg (Germany) with over 10.000 participants and 250.000 spectators (2).

Triathlon competitions are held over different race distances (Table 1). However variations of these distances often exist with the Super-Sprint (250-300m swim, 8-10km bike, 1.5-2km run) being a common example.

Triathletes tend to train the whole year round and the training content is adapted to the aimed distances. Training in three disciplines simultaneously, triathletes usually have a higher total training volume and intensity than single sport athletes. Athletes typically train an average of 15 to 25 h/week. Elite athletes, especially in long distance triathlon, complete up to 40 h training in peak weeks. The large number of training sessions and overall training volume realized by triathletes mainly aims to improve fitness, endurance and performance. On the other hand this high training volume can increase the risk of injury, illness or excessive fatigue. Many triathletes suffer from an overuse injury during a

season, but they may be able to avoid aggravating the injury by switching their focus to the other two disciplines. Thus, they have the opportunity to avoid significant loss in cardiovascular fitness and can focus on improving their deficits in one of the other disciplines. In general terms it is important that load has been applied and increased in a way that a positive adaptation can occur and injury and overuse can be prevented. Athletes probably are prone to injury when their weekly workload and training volume is increased rapidly.

Individualized training plans, periodization strategies, work/rest balance and optimized recovery are necessary to minimize interruptions to training due to injury, illness or maladaptation (1). Even in the absence of health concerns, it is unclear if the multiple training stimuli themselves or the different training contents (e.g. endurance or strength training) can interfere with each other. Both internal (perceived stress) and external loads (training modalities) should be considered when training loads are monitored, interpreted and adapted (1).

Besides the physical demands, other aspects like energy and fluid intake or mental well-being are essential for endurance athletes, especially when the training load becomes higher and the aim is to train more professionally. One area of concern for many female athletes is the pressure to meet unrealistic weight or body fat levels. Some may respond with excessive dieting and develop eating disorders such as anorexia nervosa or bulimia nervosa. The syndrome of Relative Energy Deficiency in Sport (RED-S) refers to impaired physiological function including, but not limited to: >

Table 1

Overview of triathlon competitions over different race distances. m=meter; km=kilometer.

COMPETITION	RACE DISTANCES		
	SWIM	BIKE	RUN
Sprint	750 m	20 km	5 km
Olympic / Short	1.5 km	40 km	10 km
Half-Ironman / 70.3	1.9 km	90 km	20 km
Ironman / Long	3.8 km	180 km	42 km

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metabolic rate, menstrual function, bone health, immune system, protein synthesis, cardiovascular health which is caused by relative energy deficiency and is not limited to female athletes.

Triathlon is prime example for an individual sport that needs teamwork for optimal results. Expertise in different disciplines, combining information from biological, psychological and social aspects seems to be a key factor for success. Integrating clinical expertise, research evidence and athlete preferences will lead to a team performance enhancing the overall output. Such a team can or should include sport medicine doctors, orthopaedics, physiotherapists, athletic trainers, exercise physiologists and/or sports scientists, researchers, psychologists and coaches (3).

Since at least Triathlon Mixed Team Relay (MTR) has been included in the official program for the Tokyo 2020 Olympic Games and will make its Olympic debut, the athletes and staff have to face the idea of acting and working as team.

The MTR triathlon includes distances of a round about 200-300 m swim, 6-9 km bike, and 1-1,5 km run before tagging off to a teammate in the given order of female-male-female-male. It is commonly held 2-3 days after the single race in the same event. The fundamental change in triathlon races from a single to a multistart event requires high demands in terms of recovery, prevention and can be considered as a perfect example of teamwork.

The current issue of this journal tries to pick up several important topics with regards to triathlon which highlight the multidisciplinary approach in this individual sports. ■

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