TRI-maX MAGAZINE

n°169

TRIATHLON - DUATHLON - AQUATHLON - PARATRIATHLON - BIKE AND RUN - SWIMRUN

PATRICK LANGE
THE NEW KING OF KONA
08:01:40

RACE REPORTS

Top1 of the nations for Germany in Kona
Amazing Challenge Peguera Mallorca

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PRO TIPS

What sports practice to do while **expecting a baby?**
TRAINING : How to improve with **plyometric work ?**
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PICTURE OF THE MONTH

Jacvan@Activ'images
pour TrimaX-mag

The season for Lionel Sanders was near the top in performance... He was the leader until 5 km to finishline... Before Patrick Lange, when the German take the first position and became Ironman World Champion !

70.3 Bahrein : an invitation to travel!

Fingerprint

Name : 70.3 Bahrein
Date : November 25th
Format : 1,9 / 90 / 21,1
Place : Bahrein
Number of editions : 3rd edition
Winners 2016 : Terenzo Bozzone and Sarah Crowley

Description :

This event which also is the Middle-East championship in Bahrain, is expected to be more than s sporting event. This is a celebration of the triathlon culture and the Middle-East tradition during a weekend, the perfect occasion for a family trip.

The event begins by the swim in the iconic “H” building of the Four Season Hotel.
The one-loop bike course is fast. It brings the athletes in iconic buildings and in attractions such as Bahrain Bay, Bahrain World Trade Center, Bahrain Financial Harbor and National Charter Monument. Then, the athletes will head towards the South of the island for an additional loop on the famous international Formula One circuit.

But the triathlon visit doesn’t stop there. Athletes will cross the animal park Al Areen, a birds and animals housing, before going back to the Bahrain Bay.
Finally, the running course will take place in the Bahrain Bay itself, where visitors and families will support their loved ones.

This IRONMAN 70.3 Bahrain is the first one in the region!

This event offers 40 slots for the 2018 IRONMAN 70.3 world championships which will take place in South Africa and 10 military slots for the 2018 IRONMAN world championships in Kona, Hawaii.

Patrick Lange, the victory, the record

Top1 of the nations for Germany

Jacvan

Jacvan et F.Boukla©Activ'images pour TrimaX-mag

Since 2014, German athletes follow each other on the first step of the IM World Champs podium. This year, Patrick Lange, 3rd last year, wins the race and breaks the record in 8:01:40 (former record by Craig Alexander since 2011 in 8:03:56). Germany becomes this year the first nation in terms of victories on the IM World Championships, in front of the USA and Australia.

Patrick Lange wins the title of IM world champion. A victory and a record in 8:01:40 which also allows Germany to become the number one nation in terms of IM world champion titles, 8 more than the USA and Australia (7 titles each). Germany is definitely the strongest nation in the sports. Germany has managed to keep the title since 2014 with the victory of Kienle and Frodeno who followed him the next two years (2015 and 2016). Last year, the podium in Kona was even a 100% German.

IRONMAN WORLD CHAMPIONSHIPS

Hawaii has existed since 1978 and has stayed for a while an independent event in a dreamy setting, but it was very directed to the American public... In 1990, the event took a new dimension with the creation of the WTC and the takeover of the race. The WTC created to IRONMAN circuit with a concept of qualification throughout the world, which put an end to the American domination... well, not really... Mark Allen was the winner of the last triathlon of Hawaii in 1989 and of the first World Championships in Kona in 1990... he reiterated it in 1991, 92, 93 and 95, and is still today the most titled triathlete of this event. This record is not going to change anytime soon regarding the current density and the ever-growing performances in this race. Hawaii is the Mecca of triathlon, the Grail for professional and age-group triathletes, this is the race of the season, the #1 goal for many triathletes.

In 1996, finally, a European won for the first time the IM World Championships, with the victory

of the Belgian Luc Van Lierde (who won again in 1999).

Germany had to wait for 1997 to win its first title, with the victory of Thomas Hellriegel. Seven years later, another German managed to be at the top of the IM international hierarchy, in 2004, with the victory of Norman Stadler. Germany began its sequence of IM victories with Faris Al Sultan the next year and again Stadler in 2006. Then, nothing during 8 years, despite a few podiums (Raelert and Kienle).

Then in 2014, Sebastian Kienle broke this period and won the title. Since then, the title of World Champion has only been achieved by Germans; which could make its neighbors jealous with only 3 victories for Belgium (Luc Van Lierde in 1996 and 1999 and Frederik Van Lierde in 2013). Yves Cordier, René Rovera, Patrick Vernay and François Chabaud... so many French athletes who tried the IM adventure and who could only be “the best French performance on the IM World Champs”. Today, Cyril Viennot is the one who holds this “title” with his 6th place in 2015. This year, the French was unlucky with a sunstroke during the

bike part, and he was forced to stop.

Can we explain this German domination? Why do the German succeed better than the other Europeans in the sports?

[Sports and national identity]

It's difficult to find a single explanation but many clues are offered to us.

First of all, sports in general. The relation to sports in Germany is special. For years, sport has participated to the reinforcement of their national identity, in a country where the geopolitics was special and with a hard historical past. But while RDA and RFA approached sports in a different way, with a very strong implication in high-performance sport (they sometimes crossed the line) in RDA, the importance of sports in Germany is a real trademark for this country. In 1912, the Scientific Research for Sports and Physical Education Congress took place... Today, there is in Köln a 85 000 m2 University of Sports Sciences, entirely dedicated to sports around 3 themes: public health, leisure sports and elite sports. Unique in Germany, very rare in Europe, this University has become a strong place of sports in Europe because it allows researches in very extensive sporting subjects without having to relocate some parts of the research towards better equipped locations....

[An exponential progression of triathlon]

In the counting of the Olympic medals of all times, Germany is third and considered as the best European nation.

For years, triathlon has also known an impressive progression. The Deutsche Triathlon Union counts 55 270 licensees (52 000 in France) with a development of 105% in 10 years regarding licensees and +18% regarding the number of clubs.
But the number of adepts is even more significative with 27 000 persons in competition in 2016 (100 000 in France) versus only 90 000 in 2003!!!

Two events also participate to this enthusiasm for the sport. Challenge Roth (in Bavaria, Germany) which gathers each year more than 100 000 spectators around this triathlon party. The city lives during a few days for triathlon, and every inhabitant is a 100% implied in this big celebration of triathlon. This exceptional atmosphere seduces each year more than 4000 triathletes for only 2700 spots, which are taken in a few minutes.

The IM Frankfurt, support of the IM European Championships in July, is also a successful event. The pro field is always very impressive and the race is thrilling...

France has also known an important progress regarding its licensees and its beautiful events but it's still a step behind Germany in triathlon. Sports in Germany is part of the culture and its supremacy in triathlon is not an exception. It's part of a general politics which makes sports an important aspect of the German national identity. When you take a look at the German names in long distance triathlon, we can only think that it still has beautiful years to come!

Top 10 men :

1.	Lange, Patrick	DEU	08:01:40
2.	Sanders, Lionel	CAN	08:04:07
3.	Mcnamee, David	GBR	08:07:11
4.	Kienle, Sebastian	DEU	08:09:59
5.	Cunnama, James	ZAF	08:11:24
6.	Bozzone, Terenzo	NZL	08:13:06
7.	Potts, Andy	USA	08:14:43
8.	Nilsson, Patrik	SWE	08:18:21
9.	Hoffman, Ben	USA	08:19:26
10.	Stein, Boris	DEU	08:22:24

IRONMAN WORLD CHAMPIONSHIPS

Top 10 women :

1.	Ryf, Daniela	CHE	08:50:47
2.	Charles, Lucy	GBR	08:59:38
3.	Crowley, Sarah	AUS	09:01:38
4.	Jackson, Heather	USA	09:02:29
5.	Sali, Kaisa	FIN	09:04:40
6.	Cheetham, Susie	GBR	09:16:00
7.	Lester, Carrie	AUS	09:19:49
8.	Lyles, Liz	USA	09:20:31
9.	Luxford, Annabel	AUS	09:20:58
10.	Mccauley, Jocelyn	USA	09:21:08


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CHALLENGE :
Amazing Challenge Peguera Mallorca !

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Incredible victories of the german Justus Nieschlag and the Canadian Heather Wurtele in the fourth edition of the Challenge Peguera Mallorca, on a day full of triathlon in the superb setting of Calvia.

A sunny day dawned in Peguera, with the weather becoming once more an ally for a magnificent event, converging in an epic and visual race. The sea, totally in calm was perfect to enjoy a great triathlon day.
In the men's race Justus Nieschlag was first out of the water (time: 23m:16s), after him, the spanish triathlete Iñaki Baldellou and Marco Akershoek (NED).

During the 90 km bike sector, Justus Nieschlag dominated a technically demanding and sinuous segment that combined coast, mountain, natural landscapes at the foot of the Serra de Tramuntana (UNESCO World Heritage), through traditional villages such as Capdellà, Calvià and some of the best known resorts in Europe such as Santa Ponça or Peguera, along with Toro.

The run took place entirely in the central area of Peguera, distributed over four laps that went along the town's boulevard with the promenade uniting the beaches of Palmira, Tora and Romana, with stunning views of the Mediterranean Sea.

The run course would prove decisive to define the second and the third place, with an unrivalled Justus , the rest of the podium places still had to be determined. An incredible comeback clinched Thomas Steger (AT) second place, while the third position went to Spain's Iñaki Baldellou (ESP), after yet another unbelievable run segment.

Top 3 men :

1. Justus Nieschlag (GER): 03:50:56
2. Thomas Steger (AT): 03:56:02
3. Iñaki Baldellou (ESP): 03:57:31

Heather Wurtele and her perfect race

In the women's race Heather Wurtele was fourth out of the water, before her, Anja Knapp (Germany) and Marta Sanchez (Spain). On the first kilometers of the bike course Wurtele got to the first position and from that moment on she maintained the lead and nobody couldn't stop her.

She increased her advantage kilometer to kilometer and only the good pace of the Belgian Katrien Verstuyft and the comeback of the Dutch Yvonne Van Vlerken could worry the Canadian. Finally, the half marathon was decisive and a smiling Heather Wurtele crossed the finish line with a time of 4:24:42, followed in second position by Katrien Verstuyft and Yvonne Van Vlerken.

Top 3 women :

1. Heather Wurtele (CAN): 04:24:42
2. Katrien Verstuyft (BEL): 04:29:10
3. Yvonne Van Vlerken (NED): 04:30:54

Challenge Peguera Mallorca concludes with great success and offering a high quality sporting event. This success, based on community support and the volunteers, consolidates the race as the most important deseasonalization sporting event for Calvia.
More details:
http://www.challenge-mallorca.com

THE GIRLS CORNER

What sports practice to do while expecting a baby?

A few professional triathletes won't be racing in Kona this year because of their pregnancy... We can mention Mirinda Carfrae who has just given birth to Isabelle Grace, or Jodie Swallow Cunnama...

The news broke... you will be a mum. In nine months, a cute little baby will arrive and definitely, nothing will be the same again. Your status has already changed... you are pregnant. This is a period that every woman will approach and live differently. But no question though to totally stop doing sports. If you are an athlete, your pregnancy will seem even longer if you stop moving. Sports, yes, but with medical advice and with some adjustments!

Obviously, it's the same for triathlon and you will have to adjust your training during your pregnancy.

Swimming ?

There's no problem about swimming, on the contrary, it's relaxing, it maintains your abdominal belt which is sometimes pushed around, while keeping a good level of cardiac output. It is advised to pregnant women to swim in order to relieve some pains due to pregnancy. But once again, it depends on everyone. While some future mums keep training till the very end, however, some others have difficulties, such as Nadia, amateur triathlete and mother of a little Emma, 30 months old. *"It was impossible for me to swim during the first months of pregnancy because of nausea. I had the feeling that it was stronger when I was in the water. Finally, I returned to the swimming-pool during the 7th month when I didn't have nausea anymore."*

In any case, you will have to adapt your training and swim more on the back than usual. Indeed, backstroke allows to reinforce your muscular resistance and relieve possible bad postures due to pregnancy. More than usual, you will have to think about hydrating as much regarding your skin (to avoid having stretch marks on your belly...) as your body water because when you swim, you sweat but you don't realize it.

And what about bacterias, mycosis and other bad things which hang out at the pool ? You should be careful, wear flip-flops around the pool, and not keep your wet swimsuit for too long. These advice are good for everybody actually. If you already apply them, don't change anything. It will only be forbidden to swim for you if you lose the "mucous plug" (do not mix up with your water). If you lose it, it doesn't mean that you will deliver now (some women do several weeks after losing the plug), but as the protection of the baby against germs is broken, it is forbidden to swim at the pool, in the sea or even to take baths

The bicycle ...

Cycling is more difficult for several reasons. At some point, you won't be able to maintain a convenient position because of your belly. However, while the bicycle is allowed for easy rides, the mountain bike can be deprecated.

ask the opinion of your gynecologist

It's better to ask your gynecologist to know more about the course of your pregnancy and if you present risks. However, if you are allowed to ride your bicycle, weeks after weeks cycling will be less and less pleasant. For Valérie, mother of Victor, 6 years old, and Léa, 3 years old, it was obvious. "*My gynecologist allowed me to keep cycling but warned me to stop if I felt tightness in my lower back. The first month, everything was fine. I was even stronger than usual. The following month, it was already harder in hills and this feeling of everlasting disagreeable breathlessness. The third month, hills and low hills were very hard. However, I kept watching everywhere around to avoid falling. Finally, I started cycling inside on the home-trainer in order to maintain my muscles strength!*" Cycling is not especially deprecated regarding your muscles but above all because of the risks of fall. Riding on the home-trainer seems to be a good compromise but you'll have to be rational.

pregnancy is not a barrier to any physical activity

Running, a necessary break...

The run, however, will quickly disappear, for a while. Because of the shocks and the accelerated heart rate, running is really not recommended, especially after the first trimester (sometimes once the first weeks). However, there's no reason to completely stop and you should also like a lot to walk. "*What I liked the most in triathlon was the run. I decided by myself to stop running from the 2nd month. I didn't do anything during one month and I realized that I couldn't remain like that during 6 months. Under my doctor's advice, I replaced the run by the walk. At first, I was not very convinced, but I finally enjoyed it. It allowed me to keep in touch with my training places, while approaching it differently,*" says Nadia.

As you've understood, pregnancy is not an obstacle to physical activities but it's just about adaptation. A word that you will often hear during the next nine months... In any case, it's important to see your gynecologist and to know all the risks linked to pregnancy, to control your heart rate during an effort (check if you can still talk while riding) and to listen to your body! Every woman and every pregnancy are different.

** This article only gives you advice but doesn't replace your doctor's personalized advice.*

5 advices to avoid tendinitis

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It's not uncommon as an athlete to suffer from a painful tendinitis one day. The tendinitis is an inflammation of the tendon, fibrous structure which attaches the muscle with the bone. It is mainly caused by excessive muscular constraints or an inadequate material. In this last case, we talk about «technopathy» because this is the material which is the origin of the pathology.

Main tendinitis

In the swim, the most common ones are in the shoulder and arm.

On the bike, the patella tendinitis (under the patella) is classical, caused by soliciting the muscle too much. The tendinitis within the knee and in the fascia (exterior of the knee, also called the iliotibial band syndrome) are very often caused by a bad position of the cleats (heel going too much inwards or outwards) or by a system of pedals which is not flexible enough.

On the run, the achilles heel tendinitis is very often caused by overpowering the muscles of the calfs. The iliotibial band syndrome is a classical tendinitis of the runner.

Some «small» tendinitis can make you suffer when inactive and disappear when you do an exercise with low or moderate intensity. Severe tendinitis make you suffer permanently, when you are inactive and of course when you do an exercise.

Causes

The first causes of tendinitis are: the use of an inadequate material such as too big swimming paddles, a bad setting on the bike or inadequate shoes.

On the bike, the material and/or a bad position on the bike can cause tendinitis, and the articulations of the leg are more subject to that (knee, ankle). This is often caused by a problem in the inferior fulcrum (pedals) or superior fulcrum (saddle). The main causes are :

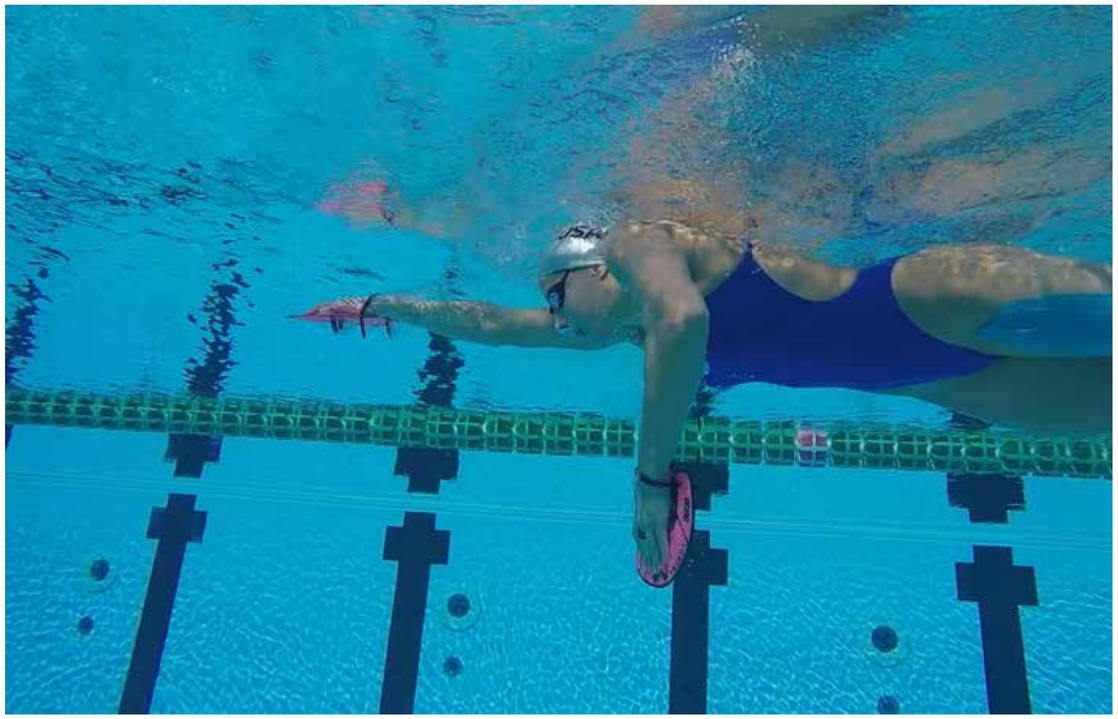
- A too high or too low saddle.
- A saddle which bends over too much forwards or too much backwards.
- An off-axis or bent saddle (at the level of the rails).
- A too low handlebar
- Twisted pedal shaft or crankset
- A bad setting of the cleats...

Tendinitis can also come from over soliciting the muscles and from a lack of progressiveness in your training. The classical example in swimming is the use of paddles : very often, if a beginner use them too quickly, it can cause an excessive constraint which becomes a tendinitis in the shoulder.

Tendinitis can also arise if the athlete is not prepared enough for an effort, such as a very long session or a difficult race. It's very important to be progressive in the load of work to prevent injuries. Without progressiveness, all the minor anatomical problems (shorter leg, hip imbalance...) can become tendinitis when the load of work increases too quickly.

Finally, tendinitis can arise after a crash, which can result in a musculo-tendinious injury or a bone displacement. Among the «classical», we can have the spine or pelvis displacement.

Prevention



In order to avoid tendinitis:
1) Material. In swimming, no paddles before at least one season of regular training. In cycling, be careful with your position on the bike, maybe take advice from a specialist of ergonomics. In running, choose carefully your running shoes with a specialist.

2) Warm up. It is indispensable to warm up (20-30 minutes) especially if it's cold (which fosters tendinitis). To promote the best musculo-tendinious structure, it's necessary that the temperature increases so that the articulation/ muscle/tendon complex is ready to do an exercise.

In swimming, begin your sessions with 5-10 minutes of articular mobilization. Insist on the reinforcement of the external rotating muscles of the shoulder which do the opposite action to the propelling muscles (pectoralis major and latissimus dorsi) to improve their braking efficiency.

On the bike, avoid to do strength and prefer velocity (cadency > 70 rpm in hills and > 90 rpm on flat roads). In running, begin your sessions with 5-10 minutes of articular mobilization. Then, try to reduce the impact of your stride by running on tiptoes.

3) Hydration and nutrition. Tendons are fibrous structures and they are very sensible to the hydration of the body. It's important to drink regularly to avoid tendinitis, especially in summer! You have to drink enough water all day long (a

simple sign is a clear urine). The quantity depends on the activity and temperature (between 1,5 to 3L). And if you are sensible to tendinitis, try to avoid acid food such as alcohol, coffee or black tea, red meat, cheese, cow dairy products, sodas, candies. On the contrary, it's better to eat basic food such as fruits, vegetables, fats rich in Omega 3 (mackerel, sardines, salmon and rapeseed and walnut oils.)

4) Teeth. Oral healthcare is important in prevention and to treat tendinitis. Experts all agree to say that a bad oral healthcare (caries or other) is a gateway to infections for the body. A dental checkup is necessary!

In addition, you should know that most of the energy drinks are very acid, dentists advise athletes to wash their mouth with water during exercise and to brush their teeth after training.

5) Posture and osteopathy. In case of posture imbalance, muscles are in tension in an imbalanced way. With training, overwork is established and can cause tendon damage. The cause can be a prominent scare, an ocular or mandibular asymmetry, a foot problem... You should see an osteopath to do a big work on it, and see him regularly, especially if you had a crash recently. It's a «scanning» of the athlete!

Conclusion

If you are likely to suffer from tendinitis, be very progressive in the use of new material and take care of your tendons for the future.
If the tendinitis appears, then it's better not to train on the pain. You must see it as a warning signal to make you slow down a little bit and rest!

How to improve with plyometric work

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Triathlon is an endurance sport which requires muscular power qualities especially for those who want to improve and perform.

In high season, the work of muscular reinforcement such as plyometrics is an excellent way to specifically improve your muscular power, but also your endurance.
For triathletes, plyometric training can be very interesting to take a big step, especially for the run.

Focusing on the different types of contractions

Before talking about practical modalities, it's important to remind you the mechanism of muscular contraction. Indeed, the skeletal muscular fibers can be contracted in various ways:
- **The static mode (or isometric)** which doesn't include bone segments. For example, we can see this type of contraction when we do an arm wrestle or in downhill skiing in the egg position.

- **The dynamic mode** includes a movement of the bone segments. There are three types of dynamic contraction:
o *Concentric* lwhen the muscle grows shorter during the contraction (as when we run up a stair, or on the bike when we push on the pedals).
o *Eccentric* when the muscle gets longer while being contracted (as when we jump with both feet down below or when we run downhill).

o *Plyometric* when an eccentric phase and a concentric phase are immediately followed. Physiologists talk about "stretching/shortening" cycle. The muscle stores energy during the eccentric phase of damping, and restitutes it during the expansion phase. The elasticity of the muscle and the stretch reflex explain this phenomenon. In swimming and cycling, the plyometric contraction mode almost doesn't intervene. On the contrary, it's at the heart of the running dynamic. Moreover, this is a type of work which is especially interesting for those who want to gain some muscular power.

The effects of plyometric training

Plyometric training improves the speed of muscular contraction, and develops maximal strength. In the end, there is a gain of transferable power.

From a physiologic point of view, plyometric work mainly allows:
o To develop strength levels superior to the voluntary maximal strength (150 to 200%).
o To decrease the linkage time, which is the time separating the eccentric phase from the concentric one. This time must be as short as possible in order to make the fast fibers intervene (<200 ms).
o To increase the muscular stiffness which is the elastic capacity of the muscle to store energy and to restitute it.

Into practice

Plyometric work is a very qualitative training which allows to have quick results regarding strength gain. Plyometric training can consist of simple routine of hops (with no charge), or jumps down below with an additional charge.

Here is a non-exhaustive list of exercises allowing to work on a plyometric mode.

The most common plyometric exercises are:

- Jumping Jacks
- On-site bounces (squats jumps, skipped slits)
- Multi-hops with mini-hurdles
- On-site vertical expansions
- jumps down below with vertical expansions the one after the other.

In addition to the run, some activities imply a plyometric work

- Team sports : volley-ball, basket, handball, football
- Sliding sports : Alpine skiing, kite, windsurf

Example of session + “easy” plyometrics
o Warm-up : 10 minutes bike
o 3 series of 20 jumping jacks with 2 minutes recovery
o 3 minutes bike in velocity
o 2 series of 10 squats jumps with 2 minutes recovery
o 3 minutes bike in velocity
o 2 series of 3 skipped slits with 2 min recovery
o Recovery : 10 minutes jogging + stretching

Example of “hard” plyometric session:
o Warm up : 10 minutes bike
o 5 series of 50 jumping jacks with 1 min recovery
o 3 minutes bike in velocity
o 4 series of 10 skipped slits with 1 min recovery
o 3 minutes bike in velocity
o 3 series of 3 jumps down below with vertical expansions the one after the other with 1 min recovery
o Recovery : 10 minutes jogging + stretching

Here are some additional advice to enhance the quality of work:
o Limit the flexion during the eccentric phase (don't exceed 80% of flexion of the knee) to avoid a too long time of coupling.
o Plan quite long recovery phases between series (5-10 minutes).

Be careful : Given the high muscular, tendinous and articular constraints, plyometric training can generate injuries. You must do it when you are close to your "fighting weight".

Moreover, you have to be very progressive. Indeed, it's necessary to have a sufficient muscular strength, and to perfectly control the gesture technique in order to obtain concluding results without taking any risk.

For example, we recommend to be able to do 5 squats on one leg (with no charge) before beginning a plyometric work at body weight loads. Plyometric work with an additional load is only for very fit athletes and mustn't exceed 20% of body weight.

This fall, we will talk in this column about core training in order to gain maximal strength.

The expert answers you

« I'm training 4-5 times a week (2 swim sessions, 2 jogs, 1 bike ride). Can I include plyometric work in my running sessions?"

That's an excellent idea! Indeed, a recent study* conducted by Prof. Ache-Dias's team (University of Florianopolis- Brazil) has compared the effects of 4 endurance running sessions (40 minutes jog - 3 sessions per week) versus the same training, with in addition 4 to 6 series repeated during 30 seconds. In the end, runners who included series of repeated "squats jumps" have improved their strength (+29,5%), their power (+9,5%) and even their VO2max (+9,1%).

The fact to include repetitions of jumps in "interval training" seems to be a good way to improve in terms of muscles and heart. In order to optimize the exercise, do not hesitate to finish your session by 10 to 20 minutes of indoor bike in order to have a neuromuscular transfer towards cycling.

Reference

* Effect of jumping interval training on neuromuscular and physiological parameters: a randomized controlled study. Ache-Dias J, et al. Appl Physiol Nutr Metab. 2016 Jan;41(1):20-5.

Chronobiological rhythms

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Weather you are an accomplished triathlete or not, your daily activities are influenced by the cyclic variations of your environment. Even though occidental societies have lost a little bit the link which units them with their ecosystem, we are still influenced by some phenomenon such as day/night alternating, moon cycles or seasons.

To be able to adapt to those environments variations, our body have several biological rhythms which control the basic functions of our body.

Let's see their role.

What is a biological rhythm?

Biological rhythms are like sinusoids, thus they are characterized by different parameters such as the time, the mean and amplitude. The time (or total duration of a cycle) is the most relevant parameter to classify different rhythms. The main biological rhythms are:

- Ultradian rhythms : short times from few minutes to few hours. (ex: sleep cycle from 1h30 to 2 hours, alternation of non-REM sleep (slow wave sleep) and REM sleep (paradoxical sleep), alternation of rest/activity, tiredness/efficiency...). Most of our biological functions are influenced by those rhythms: heart rate, breathing... our body temperature as well, our internal secretions, our mental and physical performances.

- Circadian rhythms: period of time from 20 to 28 hours. The body temperature depends on a circadian rhythm. Indeed, the lowest temperature (36.6°) is usually reached at the end of the night (sleep cycle) while the highest temperature (37.4°) is reached in late afternoon. We can observe this kind of fluctuation for many other hormonal secretions (growth hormone, adrenaline, cortisol, ACTH, erythropoietin...etc). As circadian variations have a big influence on human activities, they are the most studied.

- Infradian rhythms (or moon cycles): about a month. The menstrual and ovarian rhythms, specific to women, are related to an infradian rhythm (moon cycle).

- Circannual rhythms : one year time. Our capacity to adapt to seasons along the year depends on a circannual rhythm. Moreover, the insulin response of the body can change through the year, for example the response is stronger and faster in autumn (September) than at the end of winter (April).

Moreover, some synchronizers allow us to calibrate our circadian rhythms in a 24 hours period and to reset our biological clock, as follow:
- The natural synchronizers: alternation of light/darkness, seasonal changes, thermal and sounding variations...
- Social synchronizers: planning of the day, work, hobbies...and of course triathlon trainings!

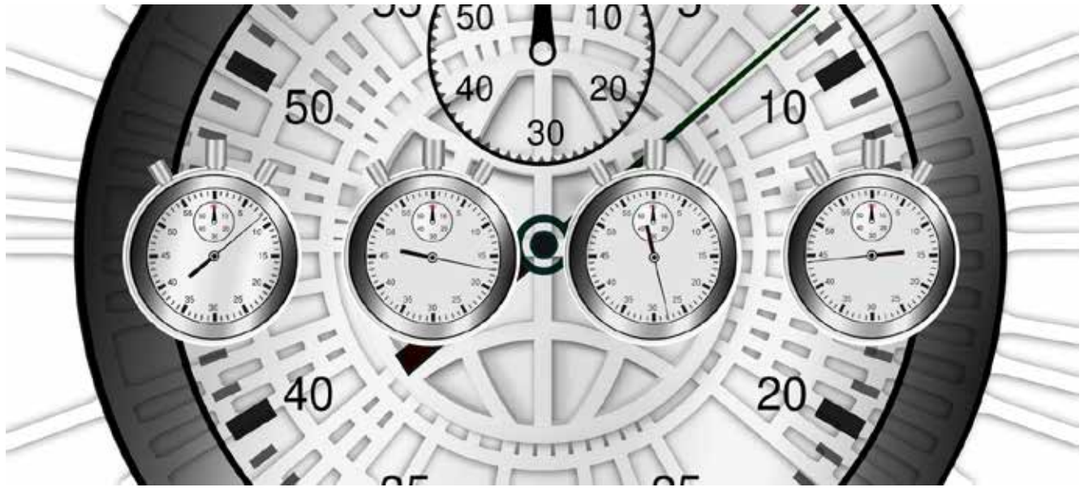
What is the influence of biological rhythms on our physical capacity?

On the physiological side, many performance's functions work according to a circadian rhythm. Some of the main functions (heart rate, oxygen consumption, ventilation) or peripheral functions (muscle and articulation flexibility, strength) change during the day. Those variations are more visible while resting but tend to decrease while the intensity of the effort increases.

The best performances are usually recorded in the afternoon (between 3P.M and 6P.M). Strength, speed, which means power, are way higher at the end of the day around 7P.M. Planning high intensity training sessions (interval training, weight-lifting, tests) between the middle and the end of the afternoon seems obviously a very good option. Moreover, the spike of adrenaline secretion (stimulating hormone) appears in the afternoon. More over, the spike of growth hormone secretion comes during the night, which promotes the muscular synthesis.

Performance is tightly linked to the body temperature. Indeed, the warmer the body temperature, the better the nerve conduction, the muscular contraction, and the muscular and articular flexibility. Most of the best performances such as sprint races are done in the late afternoon in very warm conditions (summer).

How to use biological rhythms to optimize my day?



In Chinese energetic medicine, one day is divided in 12 phases, as energy goes from one meridian to another every 2 hours. Each meridian corresponds to one “function” related to one main organ of the body. Those informations should help you for your thinking.

Meridian (Solar time)	Organ	« Function »
7-9 am	Stomach	Absorption
9-11am	Spleen -Pancreas	Energy storage
11am -1pm	Heart	Distribution and use of energy
1-3pm	Small Intestine	« spirit » nutrition
3-5pm	Bladder	Relieves of tiredness and stress
5-7pm	Kidney	Hormonal power
7-9pm	Heart	Sexual psyche
9-11pm	Cells	Cells nutrition
11pm-1am	Gall Bladder	Toxins treatment
1-3am	Liver	Toxins treatment
3-5am	Lung	Vital breath
5-7am	Large Intestine	Intestinal elimination

Our advice:

· 6 A.M
Until 7 A.M your body produces a lot of cortisol and catecholamines. That's the perfect moment to wake up your body: a good shower and then it's time to grab your breakfast. Moreover the insulin which controls the metabolism of carbohydrates is more efficient in the morning than during the afternoon.

· 8 A.M
If you are a morning person, it will be easy for you to start the day "hitting the ground running", if you are not a morning person there will be a little delay. Those differences between people are related to body temperature cycles: at 7 A.M, the temperature of early birds are between 36.8 - 37°C , while the others are around 36.5 - 36.7°C

· 9 A.M
Your cerebral cortex (the thinking side of your brain) is boosted by the first social contacts. If you have a big file to deal with at work, it's now or never! Until 11 A.M blood sugar and body temperature are optimal. If you can get some free time, this is the perfect moment for a bike ride.

· 12am
Don't wait until 1 P.M for lunch, 12.30 is the right time, respecting the natural rhythm of insulin and digestive fluids. If you have to train in the afternoon, go for low carbs.

· 2 P.M
With your cortisol level (stress hormone) getting lower, your alertness, attention and focus get lower too. If possible, don't plan any meeting around this time but go for a nap!

· 3 P.M
Blood sugar and body temperature go up again. Until 5 P.M it's your second optimum efficiency phase of the day. If you're at work, use those few hours to do as many things as possible, you will be very efficient, but don't forget to take a quick break each 90 minutes. 10 minutes will be enough to give you a little boost.

· 5 P.M
Have a snack to get some fuel for the training session to come.

· 6 P.M
You can feel your body getting warmer, the secretions of hormones (serotonin, adrenaline...) allow you to start your training in the best conditions.

· 7 P.M
Daylight gets darker. Your body starts to produce melatonin again (daylight stops the production of melatonin). In excess this hormone can cause depression. To avoid this, turn on the lights at home.

· 8 P.M
At dinner time, digestive and bile acids are not sufficiently secreted to break down fats. For a better sleep, a light dinner is a better option. Studies show that too much proteins for dinner is not good, it increases the REM sleep which decreases the total period of sleep, whereas eating carbs increases the amount of deep sleep and therefore the secretion of growth hormones. Go for carbs, you'll get a good night of sleep.

· 10 P.M
Usually, body temperature drops down between 8 and 11 P.M. It's bed time. You'll fall asleep quickly and you'll sleep well.

· 12 P.M
Still awake? Be careful with your internal clock. Sleeping is essential for the secretion of reproduction and growth hormones (anti-fatigue hormones).

· 2 A.M
· You are fully relaxed, in the dreaming period, while your brain activity is at the highest point, your body produce acetylcholine. This hormone totally relaxes the muscles.

The expert answers you

« I always feel better when I train in the afternoon than in the morning. But most of the triathlon races start in early morning. What can I do to be more efficient in the morning? »

Indeed, some of us are better on « A.M » while others prefer « P.M », so some of us will be be more efficient at one moment of the day and some at another. However it is possible to modify this by training in the targeted time. In this case, it will be needed to include swim training sessions early in the morning to get use to this new rhythm. Try to swim early a few times a week. But keep your quality training sessions for the afternoon, it will be more efficient.

Muscular strengthening and triathlon

In most sports, muscular strength plays a fundamental part in performance because it allows powerful movements.

It's the same for triathlon because each of the three sports of triathlon needs strength.

First of all, bike is an "exercise machine". The more strength you have on the bike, the more you can ride with a big gear.

Secondly, the swim needs a particular muscular strength to have a good maintaining of the shoulder of the trunk. So if the athlete has a good technic with solid and efficient thrust in the water, muscular power in the arms and shoulders should make him/her swim efficiently!

Finally, the run needs muscular strength in the extensor muscles of the leg to resist gravity.

During the off-season, one of the goals is thus to develop an optimal muscular strength in order to respond to the specific demands of triathlon.

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Development of strength

The development of strength first goes through an improvement of the neuromuscular system. It's possible to gain strength without taking mass, optimizing the stimulation of the motoneurons. It's especially interesting for athletes who want to stay "light".

Secondly, gaining strength needs muscle mass gain that you have to contain because triathlon requires to be light especially for the run.

The process of muscular synthesis can only be done with specific work and with a nutrition rich in proteins. Even if muscular hypertrophy is not what a triathlete is looking for, some athletes can be penalized by an insufficient muscle mass, which makes them more fragile with a lack of strength... This fact is true for cycling, mostly for rolling courses, where power is essential.

Training and nutrition are then the two single legal weapons of athletes to develop their strength and their muscles.

How to gain strength without taking mass?

The nervous system plays a big part in the production of muscle strength because it sends the nerve impulse. Without this impulse, there is no contraction. However, the quality and the power of nerve impulses determine the recruiting of activated muscular fibers and the way they will work

in the same direction. Thus, gaining strength first goes through a better recruiting of neuromuscular fibers. It's the first immediate effect of any strength training.

Standard exercises

- All the core exercises (board, lateral board, on the ball...) allow to gain strength of the trunk without really taking mass.
- Short and intense exercises such as sprint of 8 to 10 seconds with a long recovery (2-3 minutes).
- In a fitness room, this type of work is done with a very heavy load (90% of the max) on a small number of repetitions (2 to 6 reps). For example, you can do 3 sets of 5 movements on the press with a load of 72kg (for a max of 80kg).
- Plyometric work (see article trimaX-mag n°167)

Why should you develop your muscle mass?

The first interest is the fact that having a more important muscle mass allows to develop more muscle strength, so more power. Indeed, the strength that the muscle develops is proportional to the volume of the muscle.
The second interest is the preventive aspect because the muscles are also used to sheathe and to protect the articulations. The best example is the failure of the anterior ACL of the knee: thanks to a specific exercising of the muscular groups of the leg, we obtain a good maintaining of the articulation of the knee.

Finally, you mustn't forget that muscle mass also constitutes a stock of amino acids, and they will be used in case of important events to provide power and amino acids to the rest of the body: post-op stress, disease, and... ultra-endurance efforts such as long distance triathlon.

How to increase your muscle mass?

Skeletal muscles are mainly constituted of 2 muscle fibers types:
- Low fibers, which work on an oxidative mode and which are mainly used during endurance efforts. They are low-diameter fibers which won't really grow under the constraint.
- Fast fibers which work on an anaerobic mode and which allow to develop a high level of power. They are big-diameter fibers which can increase their volume consequently under the effect of an efficient constraint.

The skeletal muscle tissue has a very important plasticity. Depending on the constraints it receives, muscle mass will be able to increase or decrease. For an adult, two main determinants influence the plasticity of the muscle tissue: training and nutrition.

Many researches have demonstrated the fact that availability in energetic substrates, and especially in proteins, is a determining element of the muscle protein synthesis. However, the fact that a muscle adequately nourished, soaked by hormones atrophies when it is immobilized is the indication of the essential part that the mechanical activity plays in the plasticity of the skeletal muscle.

Muscle hypertrophy mainly goes through the increase of volume of fast fibers and by the development of associated structures (tendons, fascia...)

Standard exercises

Muscle mass gain requires a training which specifically solicits fast fibers and which will limit the energy expenditure. This efficient training requires a high intensity and a high volume of work. The work in fitness room then constitutes the reference exercise to develop muscle mass. Classically, the method of the 10x10 is the reference in strength training. It consists in doing 10 series of 10 repetitions at RM10 (or about 85% of the max) for an exercise (for example bench press). Then, the progress induces the variation of the choice of resistance, of the selection and of the order of the exercises, the number of series and repetitions, the duration of resting times, the execution of the movement, and so on...

Obviously, triathletes should do specific strength exercises to obtain a good transfer of strength towards the swim, the bike or the run.

In swimming, a repeated sprint work with paddles is a good example of specific strength work.
On the bike, a work of sprints on the big gear is a reference of specific strength training.

For the run, a work of sprint in hills or in stairs is the best way to solicit the whole fast fibers.

Moreover, it is important to reduce the volume of training because you could spend all the energy in the movement rather than in the muscular building.

What about nutrition?

Regarding sports nutrition, proteins are important nutriments and are sometimes left aside by endurance athletes. Indeed, while everyone knows it's important to eat carbs before training, all the athletes don't know proteins play several essential parts, especially to develop or maintain muscle mass.

Proteins are long molecular chains whose basic elements are amino acids. If we should compare this to a train, we could say that amino acids would be the wagons whose assembling constitutes the train (the protein). After the digestive process, our body uses the amino acids to fulfill their 3 main functions:

1. Muscle synthesis :
Indeed, for a medium-built man, the muscle mass represents 70% of the body weight. To maintain this important muscle mass, food intakes in proteins must be sufficient.

2. Energy supply :
We've known for 15 years that proteins play an energetic role in very long efforts (more than 4h), when glycogen reserves are about to be used up.

3. The production of neurotransmitters, enzymes, digestive juices, some hormones, red and white cells...

Each day, the needs in proteins must correspond to 15% of the total energy intakes, weather you are an athlete or not. As this way of calculating is not very convenient, we calculate the needs on the basis of the weight of the person and the type of sporting activity:
- Strength sports: 2g of pure protein per kg of body weight per day.
- Endurance sports : 1.5 g of pure proteins per kg of body weight per day.
- Non-athletic : 0.8 g of pure proteins per kg of body weight per day.

Consequently, a 70kg-triathlete who trains 5 times a week will thus have to consume 105g of pure proteins each day to cover his needs. Knowing that a 125g plain yogurt provides 4,5g of proteins and that a plate of 150g fish provides 30g of proteins, calculate what he needs to consume to cover his needs...

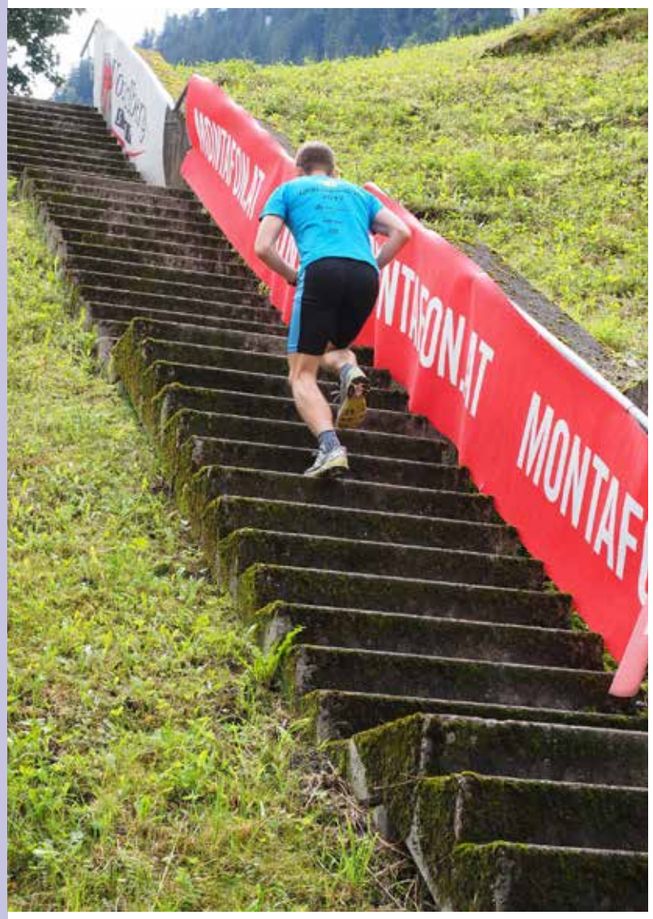
If this triathlete wants to develop his muscle mass, he should increase his protein intakes up to 140g per day.

Into practice

The goal of most triathletes is thus to foster muscle anabolism (construction) and to limit muscle catabolism (damage).

Many recommendations regarding nutrition and training can be given for athletes who want to maintain or even develop their muscle mass:

- Do qualitative training and not quantitative
- Eat proteins everyday up to 1.5 to 2g per kg of body weight, alternating the types of intakes (2/3 of animal proteins for 1/3 of vegetal proteins)
- Eat proteins at every meal, including breakfast
- Avoid to stay on an empty stomach in the morning
- Eat 3 meals (7am-12pm-7pm) and 3 snacks (10am-4pm-10pm) everyday.
- Drink an energy drink during each session
- Systematically eat a protein snack after each training. Using a "gainer" can be useful for those who have a hard time gaining weight
- Do a cure of BCAA, 1g in the morning and 1g in the evening.
- Drink 2L per day
- Sleep enough (7-9h per night)
- Avoid psychologic stress (source of catabolism).



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«High protein foods»

100 grams of each high protein food below...	... provide in proteins...
Baking powder	45 grams (proteins)
Soy	40 g
Veal, lean meat	36,2 g
Lamb, lean meat	35,5 g
Pork, lean meat	32,3 g
Goat cheese	32 g
Bœuf, lean meat	31 g
Stew chicken	30,4 g
Turkey	29,3 g
Gruyere	30 g
Chopped steak of lean beef	28,5 g
Salmon	27,3 g
Tuna	27 g
Halibut (fish)	26,7 g
Shellfish (mollusk, clams, etc.)	25,6 g
Swordfish	25,4 g
Cheddar cheese	25,4 g
Roasted chicken (skinless)	25 g
Lentils	25 g
Roquefort	25 g
Flat fish (soles, haddock, etc.)	24,2 g
Scorpionfish, redfish	24 g
Dry peas	24 g
Canned tuna	23,6 g
Hake, pole	23,5 g
Duck, lean meat	23,5 g
Arachid	23 g
Cod	23 g
Grilled chopped lean beef steak	22,7 g
Shrimps	21,4 g
Crabs, lobsters	20,4 g
Sardine	21 g

100 grams of each high protein food below...	... provide in proteins...
Camembert	21 g
Almond	20 g
Oat bran	17,3 g
Soy beans	16,6 g
Whole wheat flour	13,7 g
Dry couscous	12,8 g
Eggs	12,6 g
Buckwheat, complete oatmeal	12,6 g
Cottage cheese	12,5 g
White wheat flour	10,3 g
Barley	9,9 g
Whole wheat bread	9,6 g
Cooked lentils	9,1 g
Black beans	8,9 g
Chickpeas	8,9 g
Red beans	8,7 g
Cornmeal	8,4 g
Cooked split peas	8,3 g
White bread	8,2 g
Tofu	8 g
Canned white beans	7,3 g
Skimmed milk plain yogurt	5,7 g
Fat free yogurt	5,2 g
Canned Lima beans	4,9 g
Cooked macaroni	4,8 g
Cooked corn	3,4 g
Skimmed milk	3,4 g
Whole milk	3,3 g
Lentils soup	3,2 g
Broccoli	3 g
Soy milk	2,7 g
Cooked rice	2,7 g
Baked potato	1,9 g

EKOI AERODYNAMIC HELMET, *aerodynamics at hand*

This is the product of this re-entry. Launched in September, this helmet has already had a lot of success! It allows to mix in one helmet aerodynamics, lightness et comfort. So, what's not to like? It had already seduced the cyclists of AG2R la Mondiale on the Tour de France who were wearing this helmet before everyone else. Be careful with stock-outs! At €79,99, there's really everything to like about this product!

The design first :

Available in black/white or white/black.

Very clean, it suits well with any cloth.

It is light, roughly 250 grams, which we like a lot!

Aerodynamic helmets often lack of vents. The Ekoi helmet has 4 small air inlets in front of the helmet in order to allow the air to circulate and to evacuate from the rear where the majority of these air inlets are. Tested in wind-tunnel, their position has been studied to allow to evacuate the heat and sweating without leaving the main point of this helmet: aerodynamics.

Practical aspect

for those who remove their glasses in hills, you will be able to put the glasses legs on the back of the helmet stalling them in the air inlets.

MATERIAL CRUSH

The cool-max foams inside are appropriately situated to make this helmet very comfortable.

The many possibilities of adaptation also ensure a perfect maintaining.

As for many Ekoi helmets, the magnetic fastener is one of Ekoi's signature move. Very convenient, you just have to bridge the two straps so that the fastener can close. It's also very simple to open it. In the meantime, it's really secured when it's closed.

Price :

The perfect finishes and the price of €79,99 are big assets of this helmet, which might be quickly victim of its own success.

H3

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The Icon. The Standard. The wheel that evokes an inexplicable 'I-just-gotta-have-it' feeling.

The H3 has been around the block more than a few times. With countless wins at Grand Tours, World Championships, triathlons, time trials, and local weekend races, nobody can deny its speed or success. More than two decades later, professional road teams still ask us to use this wheel for their most demanding races.

New for 2016, we introduced the H3 Plus, bringing the clincher H3 into the modern era. It features a wide 25mm rim, suited for modern tire sizes - and even more speed.

GT3 BLADE CROSS SECTION

H3	H3 PLUS	GT3
RIM WIDTH: 19mm 860 - 990G F/R CNC ALLOY BRK TRACK CLINCHER	RIM WIDTH: 25mm 860 - 990G F/R CNC ALLOY BRK TRACK CLINCHER	RIM WIDTH: 26.5mm 750 - 880G F/R CARBON BRK TRACK TUBULAR

More informations : www.hedcycling.fr

Stay in touch!