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MoT for Professional Riders

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Before the new cycle racing season begins, all professional riders are given medical checks. That happens at lotto-belisol as well. A reporter for VISIONS Magazine was allowed to see what goes on during these checks.

The riders from the Lotto-Belisol WorldTour team undergo their initial check measurements of core stability and muscle strengthening in the radiology department of the CHC Clinique St.-Joseph in Liège (Belgium). Tests are also conducted in the Académie Robert Louis-Dreyfus, the training centre of the Standard Liège football club, and in the Centre Cardiologique Orban. "Our winter programme consists of various elements", explains Lotto-Belisol team doctor Jan Mathieu. "First of all core stability and muscle strengthening. Injury prevention concentrates mainly on the stability of the neck, back, knees, pelvis and abdomen. It's very important to take up the correct posture on the bike, on racing bikes as well as time trial models.

Difference in strength

We look at two levels in strength training. On the one hand is the muscle mass. Here we check how many muscle fibres are present in the body, what types of muscle there are and whether fat infiltration has to be removed.

On the other hand there is the strength of the muscles. We measure this using an isokinetic test in order to get an idea of the difference in strength between the muscles for the same joint in the left and right legs. Furthermore, we look at the response of those joints under the influence of forces. The test data are recorded in the computer by the dynamometer and by means of graphs and calculations give a reliable and repeatable picture of the strength of the muscles and the joints.

We perform initial measurements of all riders in November, and take those measurements as the baseline. There is dissimilarity in nearly all riders at that stage, especially where the leg muscles are concerned. One leg is more developed than the other. In the case of Jurgen Van Den Broeck we saw a considerable difference between his left and right leg after his knee operation. If you don't deal with that loss of volume, you automatically compensate and you get injuries in the longer term. The physiotherapists therefore give all riders a programme that they have to follow for three months. In the meantime they get together every week to perform exercises, to see how their bodies are evolving, and to make adjustments where necessary. Then there are medical tests at the end of January to see whether their bodies are better balanced." The connection between core stability and muscle strengthening is not unimportant. Doctor Mathieu explains: "A pedalling motion has to be regarded as a lever action. It is therefore very important for your lower back to be stable.

If that isn't the case, then you can't apply maximum force. Compare it with a barrier at a level crossing. If the arm is unsecured, the barrier can't close."

Then there is the cardiological test, which is required by the UCI. "Professional riders' heart muscles are subjected to very heavy loads", acknowledges Mathieu. "The UCI requires an exertion test - during which a cardiogram is made - or an ultrasound test of the heart, to check that all the valves are working properly. We do both. We can't take risks. It would be terrible if a rider fell of his bike because of a heart abnormality."

Most heavily-stressed muscle

Current team leader Mario Aerts had to give up cycle racing in 2011 because of cardiac arrhythmia. "It doesn't occur often, but you have to act upon it every time there is a signal. Unfortunately, performing preventive checks is the only thing we can do. In the case of major abnormalities we can only recommend stopping. You certainly don't become a professional rider in order to lead a healthy life, that much is clear. The heart is a rider's most heavily-stressed muscle."

A fourth test is the calcium measurement. "At Lotto-Belisol we have a lot of riders with broken bones", Mathieu points out. "That's often caused by a lack of calcium in the body. There has been research into the possible cause of this, and it turns out that riders' sustained riding motion causes calcium to be deposited in their muscles and to remain there, instead of going into the bones. You can achieve the desired calcium level by walking a lot, but that's not something for riders. We therefore give them dietary supplements such as vitamin D."

Finally, a blood test is also part of the medical testing. "We check whether all the parameters in the blood are correct, such as for the liver and kidneys."



CT scan in operation.

Knees and lower back

"Because we have little influence on traumatological problems, we concentrate mainly on chronic complaints", says physiotherapist Tim Aerts. "Studies show that 50 percent of all professional riders suffer with their lumbar region, and one in three with their knees. We as a team are therefore focussing on those places, because limited time and budgets mean you can't investigate everything. By tackling those two areas we can increase the riders' capacities quite a lot. It is important that we find the weak spots preventively and improve them in a subsequent phase. This can be done by screening the riders individually in clinical tests. Our medical think



The results of a CT scan.



Maxime Montfort goes through the Aquilion ONE CT scanner.

tank then examines all the results. As the physiotherapist I look after the static dynamic evaluations (SDE). The series of weak links we find in the knees or the lumbar region determines each rider's preventive programme. A lower back complaint can be caused by, for example, a less than optimal cycling posture as well as by an underdeveloped gluteus or a hip bending muscle that is too short. The last situation occurs because riders lean forward when sitting on their bikes, which in time can shorten the muscle. The cause of a back complaint can also be a slipped disc or the after-effects of a fall that occurred years ago. The tests therefore serve to discover the cause of the complaint.

As far as the knees are concerned it's mainly about differences between muscles. If you have a pain in one knee you use more force in the other knee. This leads to a significant imbalance, which can continue to increase if it is not noticed and treated. It's often a case of the quadriceps being too strong and the hamstring too weak. One explanation could be that there is much more pushing than pulling. Hamstrings are in any case less strong than quadriceps, but the 2/3 ratio does have to be respected, otherwise the imbalance causes injuries. To measure the difference between the quadriceps and the hamstring, and also between the left and right legs, we sit the rider on a Cybex, a seat for measuring strength, where he can move only his lower legs backwards and forwards.

Fat infiltration

"What we also look at very closely are fat infiltration and muscle structure", says Aerts subsequently. "Fat infiltration means that there is too much fat around the muscle, as a result of which it

doesn't develop fully and therefore cannot apply maximum force. Increasing muscle training is the only remedy for this. We look at the musculature mainly when there are problems. The result is that some muscles have to be trained more and some muscles less. What is important here is knowing the relevant muscles. Too much attention was paid in the past to passive solutions such as changing the posture on the bike. Now we intervene actively by training the muscles. The number of complaints has fallen sharply as a result. We also try to investigate whether there is a link between the SDE and the Cybex tests on the one hand and the imagery (in which the condition of the muscles is investigated, for example too much or too little fat infiltration, Ed.) on the other. The multifidus and the abdominis transversus are very important muscles for a cyclist's lower back. In everyday language these are the small muscles deep in the abdomen and the back. In the past there was too much training of superficial muscles, for example by doing sit-ups. These can make you better, but can cause even greater imbalance. A lot more muscles have to be optimised for the knees. In general terms we can talk about stabilising muscles. These are possibly even more important than the motion muscles. Thanks to these preventive measures and the training, riders can pedal at higher wattages than previously, and they can withstand the loads required in modern cycle racing. If your body is not fully balanced, you can never achieve a peak pedalling power of 2000 watts, such as Greipel managed recently in Australia. If he'd had a weak back he would have been completely destabilised." //