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ABSTRACTS

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THE BRIDGE BETWEEN SCIENCE AND ATHLETES

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In this presentation I would like to introduce a new, quite revolutionary system that evaluates athletic readiness to perform; the Omegawave sport system.
Almost two years ago I first saw the Omegawave sport system. It measured VO2max, aerobic and anaerobic parameters and autonomous nervous system, all in only five minutes and without any exertion. My first impression was: 'Too good to be true. If only half of its promises are true, it is ten times better than we do testing now'.

There are two ways to investigate whether the system works as promised. First you can redo all the research, which would take several years or secondly you believe the manufacturers of the system and start using it in practise and evaluate the results.
We did a little bit of the first and quite a bit of the second.
We compared the VO2max of 40 rowers of national level on an ergometer with Oxycon measurements with the Omegawave system. Findings correlated .76. This is not the .90 the developers of the Omegawave system claim, but given the circumstances good enough to continue testing.
The experiences we have with swimming, field hockey and several individual athletes are very positive. Now we can design training programs that improve the adaptation of athletes for different systems. We can prepare the athlete for maximum performance. It is now possible to measure the adaptation time of different training sequences as often as necessary and without stressing the athlete.

A little bit more about the Omegawave system. The system evaluates six systems on which human performance relies: autonomous nervous system, energy systems, cardiopulmonary system, detoxification system and hormonal system. The analyses are done on the basis of ECG (HRV and differential ECG) and EEG (Slow cortical potential). These analyses are done mathematically and statistically. The interpretation of the findings is based on a large database of tests on athletes.

The Omegawave system is based on a simple principle. To be able to perform one's best the performance level must be high and the athlete must be ready to perform. This readiness is essential. An athlete can have a high aerobic capacity but if this system is exhausted it cannot be used. For top performance all systems should be ready to perform. The question is: 'How can we develop these systems and how can we measure the rate of adaptation of these systems?'.

In the training process, systems get triggered and need to recover from this trigger. We all know this as the 'super compensation curve'. The time to recover is determining when to plan the next training. But not all systems recover at the same rate, so the kind of training is also to be determined.

For instance when the anaerobic system is not recovered yet it would not be efficient to do anaerobic training, but it is possible to do an aerobic workout.

The best thing may be that it is designed as a tool for coaches and athletes and not for scientists and medical doctors, although they can benefit from it also. It makes the athlete less dependent on specialists.

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MONITORING THE CARDIAL FUNCTION AND THE ATHLETE'S POTENTIAL WITH A HEART RATE VARIABILITY TEST

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A heart rate variability test allows the doctor or trainer to monitor the athlete's current physical state and heart function.
The test is non-invasive and non-stressful.
The heart rate variability test monitors the heart rate of the athlete at rest during 130 seconds and records the change of length (in seconds) between each cardiac contraction over this course of time.
For this test we used the Omegawave Sport Technology System that utilizes information from a standard, three-lead Electrocardiogram and reports on the regulatory mechanisms that influence the functioning of the athlete's cardiovascular system.
The regulatory mechanisms of the heart rhythm at rest are the vagal and sympathetic system and the central nervous system.
The influence of the vagal, sympathetic system and central nervous system is calculated and decoded using a method of registration and mathematical analysis of the heart rhythm variability data.

Based on the results of the heart rate variability test the system describes the actual state of the cardiac system (low, middle or high functional reserve).
The training capacity is also analysed (rest preferred, not ready for ..., optimal readiness of the cardiac system for any level of activity).

We show examples of testing athletes at rest and we have measurements done after light or heavy training and after cycling races and football games.
We also show results of testing ill people.

We compare the results of the test to what the athlete feels at the moment.
We ask the athlete to evaluate the testing protocol.

The result of testing more than 400 athletes, during 2002, is: the heart rate variability test gives very accurate and fast information about the cardial functioning and training capacity of the athlete.

The test is very interesting and can be used for screening individual athletes and teams.
This can be done during the training period and after intensive efforts during the competition period.