

## **XXV-th Conference of the Romanian Sports Medicine Society June 16-18, 2016**

(Selected Abstracts from the Scientific Program)

### **Pre-participation Screening - The role of the clinical examination – The Stanford model (Case Reports)\***

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Sudden cardiac death in a competitive athlete is a tragic event that can have dramatic reactions in the community. The preparticipation examination (PPE) aims to prevent these sudden deaths in young athletes. The PPE should include a cardiovascular - oriented history and physical examination (American Heart Association - AHA; European Society of Cardiology - ESC). The use of screening electrocardiogram (standard) is recommended in European guidelines (ESC) and suggested to be done in specific cases in AHA guidelines. The history and physical examination components that compose the PPE, need to be revised to be more specific with a much lower rate of false positive responses. Screening guidelines that are too inclusive, result in a delay in participation and unnecessary cost. The Stanford 12 - Elements are a blend of the AHA - 12 Elements / ESC, but in general are more specific including the first and second family history, based on several updates from the recent literature.

\*The new guideline was published by Tim P Dunn, David Pickham et al and Victor F Froelicher. Stanford University Sports Medicine Clinic in *Clinical Journal of Sport Medicine*, Vol 25, Nr 6, November 2015.

### **The Overtraining Syndrome - the cardiologist point of view\***

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Any aerobic training in moderation has positive effect on health. Common stress from overtraining is linked with adrenal insufficiency. Successful training involve overload and must avoid inadequate recovery.

When athletes do not respect the balance between training and recovery the overtraining syndrome (OTS) can occur. OTS is a multi-systemic dysfunction, a prolonged maladaptation of the athlete and of several biological, neurochemical hormonal regulation mechanisms.

Stress from overtraining is direct linked with adrenal insufficiency. The hormones produced in these glands become depleted. This leads to a reduced ability of the athlete to cope with stress.

Low serum cortisol is a marker of adrenal depletion, the Syndromes Addison-like appears in the late stages of OTS. Immunodepression is characteristic of OTS.

The heart is not structurally directly influenced by the Overtraining Syndrome. The only direct marker is the heart rate variability, disrupted by the abnormal balance of the sympathetic/parasympathetic systems.

Orthostatic hypotension – a sign of late Addison - is unusual.

Three criteria must met the OTS diagnosis: decreased performance “despite” weeks/ months of recovery; disturbance in mood; lack of signs of other diseases. The OTS diagnosis is retrospective; requires the exclusion of an organic disease.

\*R. Meeusen et al. “Prevention, Diagnosis and Treatment of the Overtraining Syndrome: Joint Consensus Statement of the European College of Sport Science and the American College of Sports Medicine”. *The Official Journal of the Am Coll Sports Med*, 2012.

## **The borders and limitation of rehabilitation programs in posttraumatic ankle and foot sport injuries**

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Cinematic chain connection leg ankle foot is extremely vulnerable to all types of injuries, especially in athletes. Although they sustained activity of physical training and prevention programs for many trauma situations fall in the distal limb, develop posttraumatic squeals complicate the evolution of sports activities.

In the face of complex ankle injury in the leg, assessing complex structures by analyzing anatomical and functional integrity of talocrural joint, subtalar joint, midtarsal joint, tarsometatarsal joint, metatarsal joints.

Trauma can affect the ligaments, tendons or muscle groups predominantly periarticular, having multiple functional consequences. They concern the stability, muscle strength, joint mobility neighborhood but poor echo requests the proximal muscle groups and proprioceptive sensory training.

Clinical and functional first expression of trauma is strictly localized pain or ankle -foot complex global echo on driving stability influencing controlled, motor coordination and control of the entire body.

The rehabilitation program is based on physiotherapy, develops stretching exercises for ROM (exercises on the plate, towel, postural, by stretching manuals). In order to regain strength through isometric exercises (inversion, eversion, plantar flexion, dorsiflexion in driveline closed) proprioceptive neuromuscular stimulation exercises and rehabilitation of neuromuscular control.

This targeted program, add the training exercise to increase cardiovascular performance. Associate physical therapy program will be monitored physio - pathological manifestations (pain, inflammation, swelling, joint stiffness, hematoma). Use selective posture, bandage, ice, brace, rest dosed and return to training will be made depending on the type of trauma, complexity and risk of complications, especially as part of trauma in joints and periarticular have risk of relapse.

## **Athlete's Post-Traumatic Encephalopathy**

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Head trauma represents, through its diversity and seriousness of consequences, one of the most important factors affecting sports' activities. Post-Traumatic Encephalopathy has many clinical manifestations and requires a precise methodology to prevent complications, diagnosis and treatment.

Within the impact of head trauma we often meet intracranial pressure and hemodynamics change that occurs with vasoplegy in the initial exchanges with altered arterio capillaries, diapedesis of red blood cells with tissue acidosis, which causes capillary pore opening situated at capillary junction. The impact causes micro bleeds in cloth being the incipient phase of brain contusion or realizes the known type intracranial hematoma accumulations. In the head injury we meet Vasogenic Cerebral Edema, caused by the impact and the blood-brain barrier breakdown occurs (ex: Olympic Boxer Puiu Nicolae, died at 34 years old because of the irreversible brain edema with cerebella tonsils enrolment).

Clinical manifestations in head trauma are of particular importance because we have immediate signs after brain contusion represented by headache, dizziness, speech disorder, agitation, dilated pupil, memory loss, personality change and post-game signs represented by a consciousness loss, severe headache and coma (Glogosow scale).

The mechanism that we meet in head trauma's is represented by the head impact that breaks the head's emissary veins with subdural hematoma production. TC complications are: Parkinson's, epilepsy, pugilistic dementia, cognitive deficits and residual paralysis.

The emergency of therapeutic measures, investigations and specialist treatment represent the needed parameters. Late consequences are caused by repeated head trauma, followed by cognitive-motor disorders

and forms the arguments for rehabilitation treatment early instituted and continued in specialty health centers.

## **The psychology of injuries and medical conditions in high-performance sport**

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In sport performance at top-level, in which it concerns the psychic dynamics, there are permanently taking place phenomena of emotional flux-reflux. From this point of view, the drive generates the motor behaviors, the fundamentals of sport performance. In high-performance, the psyche-soma interdependency is obvious, their conjoint generating the efficiency, the added value and the basis for progress.

As performance involves going beyond own limits both from a physical and psychological point of view, trauma (of any form) becomes a symptom for the disjoint of psyche and soma or for the excess.

This paper aims to explore the psychological factors associated with injuries and medical conditions, the psychological causes for this phenomena, the role of crisis and conflict in the incidence of injuries, the psychological mechanisms previous to the injuries and medical conditions and the psychological impact and implications of injuries and medical conditions for the athlete. Also, we will focus on the manner in which the individual psychic dynamics facilitates or blocks the medical recovery.

## **Benefits of the exercise prescription in therapy**

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During the past years, the Sports Medicine was recognized as a specialty dealing with the prevention of chronic diseases caused by sedentary lifestyle therefore developing a recommended exercise in Europe is one of the EFSMA's goal.

Exercise physiology and its principles are the basis of a exercise prescription and it is not an alternative to drugs for BP, DM-II, obesity, hypercholesterolemia but a complementary form of therapy. Medication needs to be adapted to activity. In order to generate the expected outcome and not to produce adverse reactions, physical exercise must be exactly prescribed (drug!). Original prescription should contain **FITT**: Frequency /week, Intensity (METS), Type of exercise, Time/ minutes) and also warm-up, cool down and flexibility recommendations. The exercise prescription is signed by both doctor and patient. The patient is called-in after 6 weeks to evaluate his evolution and accommodation to the exercise.

Exercise prescription is strongly recommended in the elderly, diabetes mellitus type 2, coronary heart disease, obesity, cancer. It can reduce the number of required medications and/or enhance their efficacy. Sports Medicine doctors play a pivotal role but prescribing exercise is not enough! Motivate the patients to adopt healthy lifestyle and better exercise habits is the goal!

## **High performance between sports and human space exploration**

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Long term spaceflight experiences raised challenging problems from the beginning both in ensuring the health safety for involved crew but also in preserving their physical and mental capacity under special conditions, for which the human being is not ready.

Training for launch and flight for long periods of time spent in a confined space and given no gravitational attraction, as well as training for the extremely demanding conditions of returning to Earth gravitational field became complex and requires knowledge from different scientific disciplines.

The practice used by the countries with active participation in space programs shows that is becoming increasingly important to create collaborations between specialists trained in the context of sports science (especially in scientific assistance for high performance sports) and specialists responsible with astronauts training.

Collaboration aims fields like the space station equipment, nutrition and also daily exercises program that can reach to over two hours for each crew member.

Knowledge transfer from methodology, physiology and sports biochemistry areas to astronauts training programs can lead to important progress and improvements in both fields

Then to monitor the physiological state of the Space Station crew led to methods development used extensively today in preparing and even monitoring athletes in competitions. Romania's presence in space programs through the Romanian Space Agency (ROSA) opens significant opportunities for Romanian researchers to the extent that they want and understand the advantages of broadening their concerns from sports performance to human performance in other areas: spaceflight, military training, medical recovery and so on.

## **Fat-loading vs. carbo-loading: macronutrients manipulation in endurance exercise**

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Fat and carbohydrate are important fuels for endurance exercise; these macronutrients are oxidized in different proportion, as a result of interaction with intracellular and extracellular metabolic environments. The availability of substrate and exercise intensity and duration will affect these environments.

Regarding the exercise performance, it is clear that carbohydrate remains the most important macronutrient. It is now believed that periods of reduced carbohydrate and increased dietary protein intake may enhance training adaptations, whereas high carbohydrate availability and antioxidant supplementation may actually affect training adaptations.

Carbohydrate availability could be increased by consuming carbohydrate in the hours or days prior to the training or competition, intake during exercise and refueling during recovery between sessions. Carbohydrate intake during exercise should be scaled according to the characteristics of the event. In real life, athletes undertake training sessions with varying carbohydrate availability. During the past decade, different studies demonstrated that deliberately training in condition of reduced carbohydrate availability can promote training-induced adaptations of human skeletal muscle, which led to the concept of "training low, but competing high".

On the other hand, there is a growing interest in low carbohydrate high fat diets for sports performance. Although adaptation to such diet increases the muscle's capacity to utilize fat as an exercise substrate, there is no proof that this leads to a clear performance advantage, on the contrary there is a risk of impairing the capacity for high intensity exercise.

## **Structural elements in teaching First Aid Course regarding athletes**

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In a world of professional and amateur sport, where the number of training hours is constantly growing and the specialized medical coverage definitely can't be always present, it is extremely important to teach the people who take part to these training sessions to know and to give first aid.

Starting from a World Rugby (WR) idea, the international rugby board and its excellent support that it ensured, we started to give lectures and workshops targeted towards coaches, strength and conditioning coaches, referees, athletes, and last but not least, the spectators. These first aid courses are structured on 3 levels: Level 1 First Aid in Rugby, Level 2 Immediate Care in Rugby and Level 3 Advanced Immediate Care in Rugby of which only the first one is targeted towards persons without medical specialization.

For an efficient first aid in rugby and in sports teaching, it must exist an online resource (50%) and a practical and theoretical course of 520 minutes in one day, face to face representing the other 50% of the course.

A powerful practical touch is applied to the subjects of the course, every participant being engaged in practicing every maneuver we teach.

As WR licensed Medical Educators, we give these First Aid courses and we give the participants the possibility to learn BLS techniques and to obtain a certificate in this aspect.

## **Revisions of biotype's elements for modern tennis-players**

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The modern tennis game is characterized by powerful groundstroke, huge serves and deep court play. In fact, the modern tennis-player is taller, stronger, and maybe even faster, than players of the past. The most professional players have a lean, muscular physique with strong legs, broad shoulders and back, thanks to the explosive power used to dash around the court, volleying and serving.

Physical stature is critical in this game because dictates the power potential of first serve, the additional height enables taller players to have a more advantageous angle when serving. Feet are also a critical aspect of the game of tennis, not only their strokes and speed but also their strength because influence the balance and the equilibrium of the body. Other important physical parameters are: long arms, long foot, and body fat levels average around 16 to 18%.

Many players do not give adequate attention to their overall physical conditioning. Tennis is a mostly aerobic activity with short, sharp bouts of anaerobic activity. Even if the explosive power is very important for an improved tennis game, aerobic capacity is a critically ingredient in developing the physical foundation. A good training strategy is to develop a strong aerobic foundation before actually begin to train specifically on-court. The mental aspect of competing in tennis is also a key attributes of performance in this complex game. Tennis is a game of integrating many components in a positively synchronous manner.

## **The impact of Neurergin on markers' fatigue**

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NADH is considered as being a strong antioxidant in the body and it has a key role in restoring the energy levels. Our study presents comparative values of some biological markers of neuromuscular fatigue and metabolic recovery determined on 2 groups of Rowing female National Team (8 athletes for each group). Over a period of 30 days of training one group was received daily 25 mg Neurergin (12.5 mg NADH), sublingual administrated, on an empty stomach and the control group got vitamin C 50 mg daily. They, all, had similar conditions in terms of training, recovery, controlled medication, and food consumption.

The study took in consideration blood levels of 3 parameters, before and after Neurergin administration: GOT, LDH and CK. All the athletes were facing at the beginning of the observation, a period of intensification of training, so we were expecting the followed values to rise in both groups. This was confirmed by our determination, but the test group had the values less high than the control group. This was especially evident for CK, that had the values at half as the test group, but also for the other parameters.

So, we consider it is reasonable to assume that the administration of Neurergin daily, at a dose around 25 mg/day can improve the recovery after training and by this can help enhance the performance.

## **Leg length discrepancy in athletes**

Irina Gabriela Gaiu

The purpose of the presentation is to bring into question the importance of the Leg Length Discrepancy (LLD) diagnosis in athletes and to show when and how is important to interfere.

LLD means there is a discrepancy of length between the lower limbs which can be either anatomical, a difference in the length of the bones, or apparent, without any shortening of the bone structures.

Prevalence of LLD is very high but there are discussions worldwide about when it is clinically significant to treat. The range of values that people consider normal are between 3 to 60mm or, even, 150mm in some cases.

The sports in which LLD can interfere include all the sports that mean running, walking or standing for a long time. The most common problems caused by LLD are: low back pain, hip pain, stress fractures, trochanteric bursitis, patellar apicitis, meniscus ruptures, patellar joint incongruencies, myofascial pain syndrome of the peroneus longus and, in time, scoliosis.

There are many causes for LLD but two are rarely considered causes for LLD. One is an asymmetry of pressure on the lower limbs, also called as DELPECH's law which says that "any increased pressure on a limb will slow the growth of the limb"(4) which can be given by an eye muscle discrepancy, the visual system being one of the contributors to our balance, and the second one is an issue with the tone of the psoas major.

The method we use for measurement is very important and there are many problems that can happen. We can use clinical techniques or imaging methods but today there isn't one perfect method. In this situation, the most frequently used are the ones using the tape measure or blocks with known height to put under the shorter leg.

The conclusion is that the cause of LLD should be more exactly diagnosed, giving our athlete the chance to less accidents and a smaller degree of asymmetrical development.

## **Diagram of the muscular and articular functional equilibrium of the spine**

Daniela Schor, Schor V, Radutu J

The aim of this study is to present a graphical model which permits everybody to understand better the dynamic of the muscles' equilibrium state that stabilize and holds in place the spine. It starts from the idea that the muscular imbalances/disequilibrium are the cause of the most spinal affections, idea that is more and more appreciated in the specialized field and confirmed by the over 15 years of authors' experience.

Using the symmetry coefficients CETAP (coefficient of antero-posterior thoracic equilibrium) and CETOLO (coefficient of thoracolumbar equilibrium), and also the values of the mechanical work associated, the diagram of the muscular and articular functional equilibrium of the spine permits to highlight some functional relationships between the values of the coefficients and the symptoms of the affections of the spine.

It permits a unitary vision over the variation of the capacity to maintain a correct posture from normality to pathology, according to the values of the CETAP and CETOLO coefficients. As an example it is presented the influence of the values' modification of the CETAP and CETOLO over the performance (personal best) of an athlete, national team level, at the air pistol shooting 10m