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(selected abstracts)

Trends in electrocardiographic changes in elite junior athletes in Romania

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Introduction. The Italian experience suggests that large-scale electrocardiographic (ECG) screening reduces the incidence of sudden cardiac death in athletes. In Romania, athletes undergo a pre-participation screening including a 12-lead ECG every 6 months. Whereas there is a significant amount of information regarding senior athletes, there is a slightly lack of data on ECG changes in junior athletes. The purpose of this study is to describe normal and abnormal ECG findings among competitive elite junior athletes, as defined by contemporary athlete ECG interpretation criteria.
Material and Method. 532 competitive junior athletes (aged 7-18 years, 64% male) undergoing standard 12-lead ECG during pre-participation screening between January 2019 and May 2019 were enrolled. Data were collected from the National Institute of Sports Medicine in Bucharest, Romania. *Results.* Applying the current Seattle criteria, we found training-related ECG patterns in the following proportions: incomplete right bundle branch block (28%), sinus bradycardia (24%), sinus arrhythmia (22%), ectopic atrial rhythm (6%), juvenile T wave inversion (6%), first degree atrioventricular block (0.2%). Borderline changes were found in 0.95% cases (0.75% - left axis deviation; 0.2% - complete right bundle branch block). 0,95% of our subjects showed abnormal ECG changes requiring further investigation – 3 cases of ventricular pre-excitation, one Mobitz Type II second degree atrioventricular block and one case of premature ventricular contractions. PR interval duration was < 120ms in 4% of our group study; 14% of them requiring further evaluation. *Conclusion*. The diagnostic accuracy and clinical implication of ECG is an important part of the pre-participation screening among junior athletes and should be dictated by the future refinement of ECG interpretation criteria for the paediatric athlete`s heart.
Key words: *junior athletes, electrocardiographic examination, pre-participation screening.*

The anti-aging effect of vascular endurance exercise

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The Physical Activity Guidelines of 2018 highlight the importance of intensifying physical activity from moderate to intensive stage and reducing sedentary periods in adults. The benefits of regular physical activity are visible in all age groups and represent the fundamental of a healthy aging. Older adults will improve physical function and engage easily in daily living activities by replacing sedentary lifestyle with multi component physical activity comprising aerobic, muscle-strengthening, and balance exercises. In time, the type and amount of exercise performed by adults or elders with or without chronic conditions or disabilities would suffer changes, but the target remains aerobic activity all days, and moderate-intensity activity (MPA) ranging from 150 to 300 minutes, or vigorous-intensity aerobic physical activity (VPA) from 75 to 150 minutes per week, or combinations. Along the process of human aging, especially the cardiovascular aging, leukocyte telomere length (LTL) came forth as a new indicator. Although genetically determined, LTL is mainly influenced by the oxidative stress, but also reshaped by a variety of environmental and behavior factors such as smoking, inflammation, obesity, and perception of life stress. The leukocyte telomere dynamics should be seen as a protective mechanism that can balance the rate of telomere shortening due to cumulative risk factors and morbidities during the life time. Endurance training, sometime having the role of leisure time physical activity, has anti-aging effects by modifying LTL and telomerase activity. The beneficial effects of regular physical activity begin in youth, with differences of MPA versus VPA influenced by race, ethnicity, sex.
Key words: *endurance exercise, leukocyte telomere length, telomerase activity*.

Regenerative medicine – option in posttraumatic athletes rehabilitation

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Return to sport activity is an important goal of rehabilitation program, after injuries, at athletes. This means to have good tissue structure with mechanical and physical properties indistinguishable from the original one. Regenerative treatments are today a way for restore these proprieties and the main regenerative technologies currently being investigated in the context of sports injuries are cell therapies, and specific blood derivatives on the basis of their concentration and physiological balance of healing and/or anti-inflammatory factors. The tools use for this treatment could be: tissue-specific cells based on transplant living cells to engraft the muscle or conjunctive tissue, that could generate extracellular matrix and, the second method, adult mesenchymal stromal/stem cells that can be applied using heterogeneous cell mixtures with low abundance of mesenchymal stem cells (MSC) like bone marrow concentrate (BMC) and stromal vascular fraction (SVF) of adipose tissue.
The MSC therapies can assist tissue regeneration first engrafting the tissue, and inducing a pro-regenerative environment through the secretion of cytokines. Blood derived products mean PRP (platelet rich plasma) is use for muscle injuries but are limit of protocols depend of kit that is used. Today is need to have a specific description of procedure to relationships between formulations and clinical indications.
Heterogeneous cell formulations: BMC and SVF are represented by mesenchymal stem cell therapies which can offer a native microenvironment that contains different cell phenotypes and molecular signals, which drive the fate of MSC.
Conclusions. The biological therapies are an option for sports injuries treatment but don't exist without sufficient clinical research substantiating their effectiveness. In sports musculoskeletal injuries, use the cell-based therapies and regenerative medicine are safe and efficacious.
Key words*: treatment, tissue, stem cells, injuries.*

Benefits of physical exercise on the prevention of metabolic, neuropsychic and hormonal dysfunctions

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Introduction. Menopause is a physiological stage in the natural biological cycle of woman that corresponds to the end of ovarian activity marking the permanent stopping of the menstrual cycle. Physical exercise has an important impact on the whole body, mediated by the endocrine and neuroendocrine system. *Material and method*. Studies conducted in the period 2014-2019 regarding the implication of physical activity on endocrine and cognitive disorders during menopause. *Results*. Physical exercise causes a number of stimuli that can induce a cascade of biochemical and hormonal changes. Aging is accompanied by alteration of the neuroendocrine system response to physical exercise-induced stimuli. Physical activity has a beneficial effect on carbohydrate, cardiovascular, nervous and endocrine system. *Conclusions*. Given that one third of woman's life is spent in menopause, through the magnitude of clinical manifestation secondary to estrogen deprivation, this physiological period becomes a real public health problem; physical activity in this critical period is an imperative necessity.
Key words: *menopausal women, lifestyle, physical activity*.

Avulsions of the pelvic apophyses in adolescents

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Introduction. Avulsions of the pelvic apophyses in children are a specific group of pelvic fractures. According to the Torode classification, avulsions of the apophyses are type I pelvic fractures. These fractures are rare and are encountered in children involved in sports activities. *Material and Method*. The aim of this paper was to evaluate the avulsions of the pelvic apophyses in children treated in our service in the period 2015-2018. The study included 5 patients, 4 boys and 1 girl, aged between 11 and 14 years. All patients were involved in sport activities as follows: 2 patients – soccer, 1 patient – basketball, 1 patient – martial arts and 1 patient – athletics.
The symptomatology at admission was not specific, including hip pain, decrease of hip ROM, and limping. The pelvic apophyses involved were: ASIS – 2 patients, AIIS – 2 patients and ischiadic apophysis – 1 patient. *Results.* The

treatment was conservative in 2 cases and surgical in 3 cases (excision of the involved apophysis). The evolution was favorable in all cases, with return to the sport activity.
Conclusion. Due to the hypertrophic calus in the post-acute period, these fractures must be recognized and treated in order to avoid the confusion with the malignant tumors. The prognostic in these fractures usually is favorable, most of the children being able to return to the previous sport activities.
Key words: *pelvic fractures, children, sport activities*.

Anterior ankle impingement in adolescents soccer players – a case report and review of the literature

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A unique case of combined anterolateral, anterior, and anteromedial ankle impingement in an adolescent soccer player is presented in this article. To the best of our knowledge, this is the only report of circumferential, massive, anterior ankle impingement in children described in the literature. The importance of proper diagnosis and treatment of such a lesion is illustrated in this case report. We also emphasize that clinical exam combined with 3D CT scan reconstruction is an excellent and cost-effective imaging modality that can help with the diagnosis of anterior ankle impingement. Finally, open surgical treatment showed excellent results in an elite athlete.
Key words: *anterior ankle impingement, open surgery, adolescent, soccer.*

How to supplement the diabetic athlete – a real challenge

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Interest in dietary strategies and nutritional supplementation by athletes has grown dramatically. The multitude of nutritional supplements available today is staggering, all claiming to offer performance health benefits. The extent of misinformation conveyed through deceptive or false advertising for these products is quite alarming. Unfortunately, little scientific research exists that addresses the specific physiological and performance effects in diabetic individual. Probably, the best ergogenic aid for most diabetic athletes is maintaining a good glycemic control during exercise. Premature fatigue and sluggishness cause by hypo/hyperglycemia are proven detriments to several aspects of performance, including recovery. Several dietary supplements might help in protection against the blood glucose (BG) variations (Thiamin, Biotin, Zinc, Magnesium, Chromium, Vanadium). Nowadays, of great interest is the impact of antioxidant supplementation on ameliorating the oxidative stress often seen with strenuous exercise, especially in the presence of hyperglycemia. Several additional ingredients (dietary fiber, American ginseng, cinnamon, fenugreek, garlic and taurine) have shown promise in promoting glucose homeostasis through improvements in insulin sensitivity. Regarding of the specific reason for supplementation (sports or diabetes-related) it is recommended to select a product without fillers like sugar, artificial colors and flavors or common allergen (gluten, wheat, dairy, yeast, corn).
Because supplements are poorly regulated and taking several may affect glycemic control and interfere with kidney function, is essential for every athlete with diabetes to consult with physicians or registered dieticians before implementing a supplementation protocol.
Key words: *diabetes, athletes, supplements, performance*.

Efficiency of Fascial Tehniques using I.A.S.T.M. in elite sports rehabilitation after hamstrings injury

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In sport rehabilitation and physiotherapy, we often see athletes with a negative impact over the optimal condition because of the overload, poor posture, high- intensity exercises.

Fascia has several mechanical properties that dictate how it functions. The main three are thixotropy, piezoelectricity and viscoelasticity (connective tissue's ability to extend and then rebound rather than stretch and recoil). An athlete making an explosive movement puts extremely high loads through the contractile and non-contractile musculo-tendinous units. Hamstring injuries are described as the third most common orthopedic problem after knee and ankle injuries, and often have a long recovery time. Fascial therapy using IASTM offers a different approach to mobilizing soft tissue, reduce the pain, increase active range of motion (R.O.M.).

Key words: *fascial therapy, injury prophilaxy, soft tissue mobilization.*

The science behind sports performance - tracking biomarkers in elite athletes

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There is a growing trend towards a personalized approach of professional athletes when it comes to health monitoring. Of particular interest was metabolic monitoring and therefore leading the training program and the diet of elite athletes with science. The aim of this paper is to present a review of the literature regarding the monitoring of biomarkers in elite athletes and the ways it can influence sports performance. Recent studies of exercise physiology related biomarkers have enabled a more comprehensive characterization of how to improve the effectiveness of training and prevent injuries based on the metabolic signature of athletes. The evaluation of athletes is an ongoing process. Each athlete has its own optimal range of biomarkers. When it comes to precisely assess the performance of athletes, researchers draw attention to the fact that a single biomarker measurement does not provide accuracy. Tracking athletes requires an integrative and dynamic approach. Several measurements will allow sports medicine clinicians to personalize training and diet programs based on each athletes' results. It is suggested to test athletes during off season in order to establish their own range, then, during the pre-season to evaluate their general health before competition, during competition and several times after that to assess the potential of recovery. Studies have indicated that regular monitoring of team and individuals sports athletes and also individuals within a team can identify inadequate recovery, nutritional deficiencies, inappropriate hormonal and immunological responses, assess bone and muscle health, monitor the balance of electrolytes, track cognitive function and finally optimise match play-peak performance. A better understanding of the dynamic metabolic changes could result in an early diagnosis of relative energy deficiency in sport. Monitoring the trends of biomarkers could be, in future perspective, integrated in the periodic health evaluation of athletes and of great importance in the research related to the biological passport.

Key words: *biomarkers monitoring, sport performance, recovery*.

Cardiovascular Evaluation of Elite Athletes: F-MARC versus IOC recommendations

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Football is the most popular sport with professional and recreational players and possible unknown cardiac diseases with high risk of sudden cardiac death (SCD). In 2006, FIFA implemented a mandatory, complex assessment Pre-Participation Evaluation for Cardiovascular diseases (PPE.CV) to detect cardiac pathologies. In 2009, The International Olympic Committee (IOC) Consensus Statement for health evaluation of elite athletes recommended a classic clinical evaluation and 12 lead electrocardiography (ECG) as athletes' check ups. The study' aim is to compare the results of the PPE.CV policy for professional football players, according to the FIFA (F-Marc) program comparing to the IOC health evaluation.

Material and Method. Since 2016 to 2018, 320 highly trained professional players (National Team/Clubs) were examined. Study Group: 211 athletes (ath.100% males), 17-37 years: 178 (84.4%) Caucasians, 33 (15.6%) Africans. Prior primary care medicine (history; physical exam) done in sports clubs. PPE.CV during off - season, yearly, and before major competitions according to: IOC PPE. CV: Recommended protocol comprising physical exam, personal symptoms / family history (FH), ECG.

F - Marc (FIFA) PPE.CV (1) In the Cardiology Institute, to the Football Teams requests, as a double-checking evaluation: mandatory protocol, self imposed: comprising physical exam, personal symptoms/ FH, ECG and echocardiography (ECHO). *Results.* Average athlete's height 174±2 cm, weight 78 ± 1kg, BSA1.94 m^2, systolic blood pressure 125 ±5 mmHg. IOC and F-Marc. 211 athletes, clinical and ECG evaluated: 195 (92.4%) normal clinical exams and ECG, 16 (7.6%) isolated borderline ECG changes associated to normal clinical exams.

F-Marc ECHO (mandatory) from 211 athletes: 200 (94.7%) normal; 11 (5.3%) abnormal: 3, hypertrophic cardiomyopathy (HCM); 2 right ventricular dilatation, 1 abnormal origin coronary artery, 1 dilated cardiomyopathy, 3 stenosis bicuspid aortic valve, 1 mitral prolapse. Dead, one HCM African player, disobeying the sport interdiction. Discussion and conclusion. F-MARC, a mandatory complex PPE.CV program, identified potential lethal cardiac diseases in asymptomatic players. The recommended (clinical exam, ECG) IOC PPE.CV was an insufficient tool for cardiac diseases diagnosis.
Key words: *athletes, cardiac pathologies, cardiovascular screening*.

Catheter ablation of ventricular arrhythmias

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Sudden cardiac death of an athlete is a catastrophic event and the mechanism is almost certainly a ventricular arrhythmia. Ventricular tachycardia arises from an abnormal electrical focus or circuit in the myocardium of the ventricle and is usually manifested as a tachyarrhythmia with a wide QRS complex on the ECG. Premature ventricular complexes are most commonly benign, short runs of non-sustained ventricular tachycardia may be normal, but the potential for significant abnormalities must determine the workup decision making.
Sustained monomorphic ventricular tachycardia may be a benign arrhythmia, but it has a higher probability of reflecting an underlying structural disorder. Ventricular tachycardias in endurance athletes most frequently originate from the right ventricle, suggesting that exercise-induced remodeling of the right ventricle may promote the development of an arrhythmogenic substrate. Catheter ablation is especially considered for the treatment of ventricular tachycardias when drugs are ineffective or have side effects. The evidence for ablation in athletes must be extrapolated from trials in non-athletes and observational data,
Key words: *athletes*, *ventricular tachycardias, sudden cardiac death, catheter ablation*.

The ketogenic diets in elite sports

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The ketogenic diet is well known as a high-fat diet that restricts carbohydrates and keeps the protein at a moderate percentage. Due to low carbohydrate intake, insulin levels are low, resulting in increased serum glucagon and induction of lipolysis by facilitating the availability of fatty acids. Fatty acids are metabolized at the level of liver mitochondria and transformed into ketone bodies. The diet induces physiological ketosis and the body is forced to use lipids as the main source of energy. The proven benefits in epilepsy, neurological diseases (Alzheimer's disease, Parkinson's disease, migraine, brain tumors), cancer, severe enzyme deficiencies (pyruvate dehydrogenase deficiency, glucose transport deficiency) and type 2 diabetes suggest that ketogenic diet is more than a weight loss diet and may be indicated as adjuvant treatment. Elite athletes adhere to a ketogenic diet with the desire to maximize their performance, increase muscle mass and get extreme thinness. In weight-dependent sports, the diet is used as a safe weight-loss method that preserves strength and does not adversely affect the athlete's physical and cognitive performance.
The ketogenic diet is proposed as a method of improving lipid oxidation, which seems to bring benefits to endurance athletes participating in moderate and prolonged intensity competitions (given that lipid deposits are significantly higher than those of glucose). The limitation of the ketogenic diet occurs at intense physical activity when athletes depend on anaerobic glycolysis for energy supply.
Key words: *ketogenic diets, elite sports, performance, sport nutrition.*

Management of ACL tears. Update on graft choice, fixation and surgical technique

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Introduction. Anterior cruciate ligament (ACL) tears are some of the most commonly seen injuries in sports, especially those involving pivoting motions. In active individuals surgery is usually indicated in order to restore stability and normal knee function. The aim of this review is to evaluate the current trends in ACL reconstruction surgery, the changes seen over the years, both from the author's experience and literature data. *Material and Method.* A literature

review was performed and studies were evaluated over a ten year period looking at graft choice for ACL reconstruction, fixation methods both on the femur and on the tibia as well as surgical techniques modifications. *Results.* Arthroscopic ACL reconstruction is still considered gold standard but with primary ACL repair being performed more frequently in selected cases. Among graft choice, patellar tendon and hamstrings are most commonly used. In the last few years quadriceps tendon autograft has gain end much attention. The fixation methods have changed very little, interference screw and extracortical button fixation remaining on top. Resorbable screws have been associated with cyst formation and are slowly replaced by PEEK screws. With regard to surgical technique, single bundle (SB) is still the number one method of reconstruction but the major change is the transition from non-anatomic trans-tibial technique to anatomic reconstruction emphasizing on correct tunnel placement.
Conclusion. ACL reconstruction has evolved over the years but still there is room for improvement as the return to sport of patients undergoing this procedure is less than 80%
Key words: *ACL reconstruction, graft, surgical technique.*

Exercise prescription for the treatment of depression and anxiety

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Depression and anxiety are the most common psychiatric conditions, affecting millions of individuals worldwide. The treatments for depression and anxiety are multiple and have varying degrees of effectiveness. Physical activity is associated with a range of benefits on health and well being. There is a growing evidence that physically active people are at a reduced risk of developing depression anxiety disorders and that exercise interventions are associated with significant benefits for patients with mild to moderate forms of depression as well as in reducing anxiety.
The mechanisms responsible for exercise-related improvements in depression and anxiety disorders are not completely known and it is most likely to be a complex interaction of psychological (increased self-esteem, sleep improvement, changes of self-concept) and neurobiological mechanisms (increased central norepinephrine neurotransmission, changes in the hypothalamic adrenocortical system and increased secretion of endorphins, atrial natriuretic peptide, amine metabolites, serotonin synthesis and metabolism)
These findings have led to the proposal that exercise may serve as an alternative or a supplement to traditional forms of therapy, both aerobic and strength training being recommended. Implementation and further optimization of exercise training programs for patients with depression or anxiety disorders need a multidisciplinary approach involving practitioners in psychiatry, psychology, sport medicine and health care providers.
Key words: *physical activity, depression, anxiety*.

Creatine, carbohydrate and protein, the key supplements for a better recovery at football players

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Adequate dietary and caloric intake, hydration, and nutrient timing are paramount for optimal an athletic performance and recovery. However, there are a number of dietary supplements that have been shown to improve performance beyond training alone, including creatine (CR), protein and carbohydrate, but they seem to be underused by football players. Nutrient timing incorporates the use of methodical planning and eating of whole foods, fortified foods and dietary supplements. The timing of energy intake and the ratio of certain ingested macronutrients may enhance recovery and tissue repair, augment muscle protein synthesis (MPS), and improve mood states following high-volume or intense exercise. Restore glycogen stores after a competition (e.g. football match) lasts between 2 and 3 days. Without following specific recovery glycogen instructions, after 2 days of effort, the reserves of glycogen are 50% unreacted. Several studies has showed that creatine helps to enhance recovery between successive days of training in endurance athletes. The recovery of lost muscle glycogen operates as a key nutritional goal, and post-exercise ingestion of carbohydrate continues to be a popular and efficient nutrient timing strategy to maximize replenishment of lost muscle glycogen, however Consuming carbohydrate in combination with protein during resistance exercise increases muscle glycogen stores, ameliorates muscle damage, and facilitates greater acute and chronic training adaptations.
Key words: *athletes, dietary intake, nutrient timing*.

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Efficacy of Platelet Rich Plasma via epidural route for low Back pain in professional athletes

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Introduction. Low back pain in professional athletes is the most common cause of lost playing and training sessions in professional players. The aim of this study is to evaluate the efficacy of PRP treatment for LBP in professional athletes. *Material and Method*. Ten professional athletes (footballers, handball players) were injected 6mLs of autologous platelet plasma rich via epidural injection under fluoroscopic guidance into the affected area (confirmed with MRI). The patients were followed up using NRS and Oswestry Low Back Pain Disability Questionnaire. *Results*. Patients who had received epidural PRP showed improvement in their scores at the 3 months follow up with no complications. *Conclusion*. PRP injection is a good tool to be used for the management of LBP in professional athletes, without the side effects of cortisone injections.
Key words: *athletes, low back pain, autologous platelet plasma.*

Risk factors for anterior cruciate ligament injury – the scientific evidence with focus on prevention strategies

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It is today recognized that a large share of manifestations of injury associated with sports participation is preventable and that a focus should be on implementation of effective prevention programs. The most common ACL injury mechanism is the non-contact type injury. New meta-analysis found that potential extrinsic non-contact ACL injury risk factors include: dry weather and surfaces and artificial surface instead of natural surfaces (clay, grass, etc.)
The cited intrinsic factors were: generalized and specific knee joint laxity, small and narrow intercondylar notch width, pre-ovulatory phase of menstrual cycle in females not using oral contraceptives, decreased relative (to quadriceps) hamstring strength and recruitment, muscular fatigue by altering neuromuscular control, decreased "core" strength and proprioception, low trunk, hip, and knee flexion angles, and high dorsiflexion of the ankle when performing sport tasks, lateral trunk displacement and hip adduction combined with increased knee abduction moments (dynamic knee valgus), and increased hip internal rotation and tibial external rotation with or without foot pronation and higher posterior tibial slope. Neuromuscular and biomechanical risk factors may be addressed through neuromuscular preventative training programs. Though some extrinsic and other inherent physiological factors tend to be non-modifiable, attempts to improve upon those modifiable factors may lead to a decreased incidence of ACL injury
We conclude that longitudinal research combining diagnostic procedures, surveillance, and targeted interventions is needed to enable the introduction of prevention programs for athletes in the beginning of their sporting career, as well as suitable prevention measures for the adult elite athletes.
Key words: *athletes, ACL injury, prevention programs.*

Prevention of Childhood Obesity: Selection and Prescription of Physical Exercise

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In preventing overweight and obesity in children and adolescents, as well as in reducing the consequences of obesity or in reducing the risk of developing obesity in adulthood, exercise has a primary role. For infants and young children, parents are recommended to promote outdoor activities, in parks or recreational areas. The age range of 10 to 16 years often is accompanied, unfortunately, by a reduction in physical activity. Adolescence is recognized as a particularly vulnerable period for the development of obesity due to puberty, sexual maturity and repeated attempts to self-define the psycho-social role. Somatic and cognitive developments interrelate permanently. Thus, children who are active for at least 60 minutes per day have lower rates of obesity, superior results in literature and mathematics school tests (by increasing neuronal connections), an improvement in school and extra-school behavior, a better emotional response (with reduced symptoms that indicate depression and anxiety); they are also more likely to become active adults (having a higher physical fitness), and, last but not least, they develop greater self-esteem.
As for medical treatment, exercise should be individually prescribed: choice of sporting branch, dose, mode and duration of administration, contraindications, and careful watching for the alarm signs, or adverse reactions. Although

physical exercise as well as an active lifestyle should be promoted by society, institutions, associations, national and world health organizations, the school has the fundamental role, and the model is the family.
Key words: *physical exercise, overweight, obesity, children.*

What is new in orthotic insoles

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Foot and associated lower body pain is very common and can have a substantial impact on everyday life. Many different areas of the foot can experience pain, including toes, ball, arch or heel of the foot; associated pain and discomfort can also be experienced in the ankle, leg, knee and lower back.
Excess pronation, when the arch of the foot collapses excessively downward or inward during walking, can cause pain and discomfort and make individuals prone to injuries.
Insoles and orthotics can provide support and shock absorption to reduce pressure on different areas, helping to relieve pain and discomfort that starts at the foot.
Clinical evidence indicates benefits of orthotics and insoles, including reduced pressure, improved stability and effective management of pain/disability.
Key words: *insole, orthotics, foot, pronation, back pain*.

Nutritional Implications in Female Athlete Triad

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The Female Athlete Triad was defined until recent as "the combination of disordered eating and irregular menstrual cycles eventually leading to a decrease in endogenous oestrogen and other hormones, resulting in low bone mineral density". In the light of the new researches, it was stated that the etiological factor underpinning the Triad is an energy deficiency relative to the balance between dietary energy intake (EI) and the energy expenditure required to support homoeostasis, health and the activities of daily living, growth and sporting activities. In this regards, IOC Consensus Statement proposed a new term, RED-S, which is the acronym for Relative Energy Deficience in Sport. The syndrome of RED-S refers to impaired physiological function including, but not limited to, metabolic rate, menstrual function, bone health, immunity, protein synthesis, cardiovascular health caused by relative energy deficiency.
The treatment of low energy availability should involve an increase in EI, reduction in exercise or a combination of both. The only strategy to have received scientific scrutiny is the addition of an energy-rich supplement (eg, liquid meal product) to habitual intake and a small reduction in, or introduction of a rest day to the weekly training programme. As bone density reduction is one of the most important concerns associated with RED-S, weight gain with or without the subsequent resumption of menses restores the coupling of bone formation and resporption and improves bone mass density. The team and athlete entourage should be aware about RED-S risks and must intervene when they observe signs related with this syndrome.
Key words: *female, athlete, triad, menstrual, dysfunction, energy, reduction, RED-S.*

Acute vertebral medullary trauma in athletes - therapeutic considerations

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The medullary implications of spinal trauma in athletes impose through their severity diagnosis and emergency therapy. Identification of the injured area and the severity of the trauma is done when such trauma occurs considering that transporting the patient in unsuitable conditions can aggravate the injuries.
Spinal column immobilisation, cardio-respiratory rebalancing, volemic rebalancing, pain relief and shock treatment are immediate therapeutic measures. Radical and meningeal involvement in the trauma amplifies the level of severity. The cross-section of the medullary section causes a 21-day diaschisis. The subsequent therapeutic measures include various procedures adapted for each particular case.
Athletes' injuries apply to a limited extent to the particularities of the trauma. Mountain biking is known to cause 1% of the cervical vertebral injuries, while deep diving causes cervical vertebral compression. High diving causes injuries to the first two cervical vertebrae with odontoid fracture, and football leads to 56% of the radicular cervical-brachial injuries or superior cervical and thoracic vertebral injuries.

The return of the athlete to activity requires a complete assessment by a medical team, consisting of various medical specialties.
Key words: *athletes, vertebral injuries, emergency therapy.*

An incidental diagnosis of Wolff-Parkinson-White syndrome with normal PR interval in a young athlete

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Wolff-Parkinson-White (WPW) syndrome is a rare congenital heart disorder involving irregularities in the electrical system of the heart. The Consensus statement regarding the International criteria for electrocardiographic interpretation in athletes concluded that WPW is an abnormal ECG finding in that requires further evaluation due to sudden cardiac death (SCD) risk associated. A 15-years-old junior male karate athlete presented at National Institute of Sports Medicine for the periodic health evaluation. The athlete denied having any kind of symptoms. Also, he had no relevant medical history, no family history of SCD and all physical examination findings were normal. However, a 12-lead electrocardiography revealed a PR interval of 122ms, a wide QRS complex of 136ms and slurred QRS upstrokes called delta waves in standard leads at a heart rate of 62 beats per minute, without arrhythmias. During inspiratory apnea, ECG uncovered also a left bundle branch block. The initial step was to perform an echocardiography, an exercise treadmill test and a 24-hour Holter ECG. Further, he was also referred to a heart-rhythm specialist for electrophysiology study. Finally, radiofrequency catheter ablation of left-sided accessory pathway was conducted. The recovery period lasted 1 month, afterwards the junior athlete successfully returned to high level sports training. In conclusion, ECG screening is of great importance to identify asymptomatic abnormalities in elite athletes. In addition, to confirm or exclude conditions associated with SCD a proper management of the secondary investigations is required.
Key words: *Wolff-Parkinson-White, radiofrequency ablation, athlete.*

Intestinal microbiome, the missing-link of energy homeostasis

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Intestinal microflora seems to be a key factor affecting energy homeostasis by the involvement in the host nutrition, metabolism and energy storage. Many authors considered that composition of intestinal microbiome influence the energy extraction and storage, underlying the development of metabolic syndrome including dyslipidemia, elevated fasting glucose levels and insulin resistance, but also for targeting obesity management. The intestinal microbiome structure may be influence by composition of the diet, but also, there are other local environmental factors like food timing or how long the fasting periods last. Also, physical activity behaviors may also influence gut microbiota diversity and improves the ratio between certain bacterial genera. In this presentation, by thoroughly reviewing the specialty literature, we intend to systematize the current knowledge about associations between the gut microbiota and the development of obesity through many levels of causation or determinants (e.g. dietary habits, daily physical activity, genetic factors etc). Because the intestinal flora is extremely complex, in the intestinal lumen existing a real ecosystem characterized by diverse interactions and interdependencies, the therapeutic interventions aimed at reshaping the gut microbiota should take into account both, the type of the selected strains and the necessity to create an environment which promotes survival and development. For this reason, an efficient therapy should also include other therapeutic agents such as prebiotics, even an antibiotic and changes in diet and physical activities in order to reset a compromised microbial flora.
Key words: *intestinal microflora, diets, physical activities, obesity, probiotics.*