CARBOHYDRATE COMPOSITION AND ABSORPTION OF FLUIDS IN SPORTS DRINKS

Luis F. Aragón V.

Senior Scientist, Gatorade Sports Science Institute
Professor of Physical Education, University of Costa Rica, Costa Rica

The main objective for including carbohydrate in sports drinks has been shifting back and forth between an ingredient which facilitates fluid absorption, to a source of energy during exercise. In an effort to provide more energy, higher carbohydrate concentrations have occasionally resulted in impaired fluid absorption. Efforts to provide the highest fluid absorption have resulted in sub-optimal carbohydrate delivery and hence less exogenous fuel oxidation. Even some efforts to provide higher amounts of carbohydrate have resulted in slower intestinal absorption of not only fluid but also carbohydrate, resulting in smaller amounts of carbohydrate being delivered.

Carbohydrate is an essential fuel for exercise of moderate-to-high intensity, when ATP must be produced at rates high enough to meet the energy needs of vigorous activity. Carbohydrate intake during exercise has been shown to improve performance during prolonged running and cycling at moderate intensity. Studies from the past 15 years have shown that this performance improvement also occurs during shorter-duration (about one hour) exercise of higher intensity (around 80% $\dot{V}O_2max$), and during intermittent, high-intensity exercise, both in cycling and running activities. This performance improvement depends on how much of the ingested carbohydrate is actually oxidized or used as fuel.

Studies of the utilization of exogenous carbohydrate during exercise rely mainly on the analysis of labeled carbon after ingesting different forms of carbohydrate. Different methodologies cause some difficulties in the estimations, but there is basic agreement that ingested carbohydrate may provide between 10% and 30% of total carbohydrate oxidation. In the early stages of exercise, the amount of exogenous carbohydrate oxidized is very small: only about 32% of the carbohydrate emptied from the stomach is oxidized during the first 80 to 90 minutes of exercise. Later in exercise, the situation is different, as blood glucose becomes the major carbohydrate fuel source. However, there is an upper limit to how much of the ingested carbohydrate can be utilized (about 1.0 g CHO/min.). This upper limit of exogenous carbohydrate oxidation seems to be dictated by the speed of carbohydrate delivery from the ingested fluid. Rates of gastric emptying and intestinal absorption are crucial here: other things being equal, the higher the caloric content of the drink, the slower the gastric emptying. Once the fluid reaches the small intestine, key factors will be osmolality and the presence of several carbohydrates which are absorbed by different mechanisms (mainly glucose and fructose). Markedly hypertonic fluids are absorbed more slowly, as are those formulated mainly with fructose. Overall, neither too much nor too little CHO will be ideal.

Many authors agree that glucose, sucrose, and some complex carbohydrates are similarly effective when included in fluid replacement solutions, increasing exogenous carbohydrate oxidation, delaying fatigue, and improving performance. The exception is clearly fructose, which alone results in lower carbohydrate oxidation rates and is clearly not as effective in improving performance. Fructose may even cause gastrointestinal distress leading to impaired performance. More recently, research has confirmed that drinks formulated with combinations of several carbohydrates (glucose, fructose, sucrose, maltose) are absorbed more quickly and will deliver the carbohydrate faster to the working muscles, allowing for faster oxidation rates of about 1.25 g CHO/min.

The ability of a sports drink to improve exercise performance will be directly related with its ability to quickly deliver fluid (to replace lost fluids from sweat) and to deliver carbohydrate to the exercising muscles. This seems to be optimized at concentrations of about 6% carbohydrate, with a mixture of several absorbable carbohydrates which does not result in a markedly hypertonic drink.

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DEVELOPMENT OF EXERCISE PHYSIOLOGY

Per-Olof Ĺstrand

Karolinska Institute, Stocholm, Sweden

400 years BC Hippokrates emphasized the importance of good nutrition and exercise for positive health... I will concentrate on historic notes about the “discovery” of oxygen in the later part of the 1800th century (Lavoisier, Priestly, Scheele), studies in the 1900th century on metabolism, direct and indirect calorimetry, RQ methods to measure oxygen uptake which were at the beginning of the 2000th century enhanced by Haldane (analyses of gases in the air) and the Douglas bag technique to collect expired air volumes. Very important contributions were provided by groups in Copenhagen under the leadership of the Nobel price winner (1920) August Krogh. They studied pulmonary ventilation, cardiac output, temperature regulation, muscles’ choice of substrate during exercise launching 1939 the “carbohydrate loading” principles to enhance endurance. In 1962 the technique to take muscle biopsies was introduced by Jonas BergstrŘm which opened the possibility to study human skeletal muscles, fiber types, enzyme activities etc. Another important institute in this connection was the Harvard Fatigue Laboratory in Boston under the leadership of Bruce Dill. It attracted many exercise physiologists from all of the world including professor Missouri from Poland! One important contribution was studies on the effects of dehydration. One interesting question is: Why have world records in sport events improved? I will concentrate the discussion on whether the potential of peak oxygen uptake in the middle distance runners can explain. I will end my discussion with historic notes just up to the middle of the 1960th.

REGULAR PHYSICAL ACTIVITY AS AN IMPORTANT PREVENTIVE MEASURE AGAINST CHRONIC DISEASES

Norbert Bachl

Institute of Sports Science University of Vienna, Department for Sports and Exercise Physiology, Austria, President of EFSMA, IOC-MC Member

From a worldwide perspective there is an increasing need in the promotion and implementation of appropriate forms of physical activity and sports as health enhancing measures. This is due to a lot of interactions between physical activity during every days life and sports in leisure time and various physiological, biological and psychological parameters that change in an active organism, focusing on health benefits, improvement of fitness, mobility during aging and therefore quality of life. Results of opinion polls in different European Countries show a very high priority of 95 % in ranking health as a very important influencing factor for the quality of life. Although leisure time was ranked with 36 % as very important and 45 % as a important factor of quality of life, there seems to be a discrepancy concerning the missing knowledge, willingness or readiness to use leisure time as an active measure to enhance the health quality.

Epidemiological data have established that physical inactivity increases the incidence of a great number of so called “unhealthy conditions”, almost all of which are chronic diseases or considered risk factors for chronic diseases. On the other hand physical activity decreases the incidence, prevalence, morbidity and mortality of cardiovascular diseases, metabolic diseases like type II diabetes, hypercholesterolemia, obese related disease, osteoporosis, back pain, breast and colon cancer, depression and others, with respect to an so called “active lifestyle” including occupational activity, regular physical activity during every days life and sports in leisure time.

These results and discussion are supported from molecular biology research which shows an increasing evidence that genes respond to an altered environment in a way that there is an interaction between environmental factors like chronic physical inactivity to result in phenotype expression of chronic diseases. That means that our genes expect the body to be in a physical active state for a normal function. Therefore it is an important task of sports medicine to create initiatives fully devoted to promoting an active life style, physical

activity and sports in a regular, better daily practice in a way of “pro-active prevention strategies”, to increase the individual well being, a good health state, mobility and quality of life.

GENE-DOPING – FACTS AND FICTION?

Norbert Bachl

Institute of Sports Science University of Vienna, Department for Sports and Exercise Physiology, Austria, President of EFSMA, IOC-MC Member

“Gene engineering“ is a world wide challenge! It´s use will be very helpful in the treatment of many diseases or for a preventive screening to avoid the onset of diseases, it´s misuse may lead to unforseenable developments like the use of clones as a spare part reserve for organ transplantation, designer babies or designer-athletes. In sports since ever, the “altius, citius, fortius” leads to manipulation of the human performance. It is obvious, that molecular biology and gene engineering may misused in the way of “gene doping”. In the moment it is not easy to differentiate the facts and fictions in this area, because there are a lot of gene technologies ready, which allow gene transfer for occasions. On the other hand, detecting various marker genes is only the first step, because the switching on and off of the genes to express proteins is unclear especially under the preconditions that the human performance is such multifactorial, that only an ensemble acting of a lot of genes in a special time course enables specific performance enhancing effects. At the present, there are a lot of scientific papers dealing with gene detection responsible for different performance characteristics, papers dealing with the possibilities of a gene therapy in sports medicine and papers detecting specific growth factors which are responsible for anabolic and catabolic pathways of metabolism. The use of all these techniques and research findings may lead to present or future misuse in sports. This may be considered as facts, however in the moment the cloned athlete can be estimated more as a fiction. Anyway, knowledge about use and misuse of gene engineering is important because we all have to deal with it´s ethical aspects in our daily life, and especially in application to sports and human performance. Beside governmental restrictions it is a duty of respective sports organisation to follow up very distinct the developments of gene technology to set up regulations which forbid and control the misuse of gene engineering as the “doping of the future”

ACUTE KNEE INJURIES – CONTROVERSIES AND CHALLENGES

Kai Ming Chan

Department of Orthopaedics & Traumatology, The Chinese University of Hong Kong
President, International Federation of Sports Medicine (FIMS)

ACL injury has been an enormous challenge in orthopaedic sports medicine, in particular with increasing recognition of the condition in a growing population participating in various levels of recreational and competitive sports. A world epidemic is being considered with increasing popularity in soccer and skiing. In the female, there is also interesting observation that both anatomical and hormonal factor, e.g. the peculiar notch size and the finding of estrogen receptor on ACL with a circulating high estrogen level during pre-ovulation phase of the menstrual cycle may pose a so-called “at-risk” period for female athletes. In the adolescent group, there is also increasing recognition of the incidence because of the popularity of contact and organized sports among this age group.

The ACL has always been regarded as the “watch-dog ligament” of the knee, which governs the stability of the knee, in particular pivoting and cutting. For most of the time, an ACL deficient knee is one of the significant factors leading to early retirement in the athletic career. The main aim of ACL reconstruction is to restore stability and enhance functional capability. It has also been proven with evidence based study that ACL reconstruction and stabilization will help protect meniscus and even articular cartilage of further injury because of uncontrolled pivoting and cutting.

The key to success of ACL reconstruction surgery depends on 4 parameters:

1) the strength of the graft
2) the appropriate positioning of the tunnels
3) stable fixation of the graft
4) concomitant surgical repair for articular cartilage and meniscal injury

The choice of graft is now shared between the use of bone-patellar tendon-bone and hamstrings. In recent years, it has almost come to a 50/50 situation. The bone-patellar-tendon bone graft has the advantage of being a strong graft which can be fixed rigidly in the tunnel to encourage bone to bone healing. On the other hand, it has a major drawback in that there is significant disruption of the extensor mechanism with possible high incidence of patellofemoral pain. Hamstring has the outstanding advantage that the harvesting procedure incurs a much better cosmetic scar in the front of the knee with no infringement on the extensor mechanism. The major

drawback at the moment is to identify a well-proven technique that the tendon, as a soft tissue graft will be fixed in the bone tunnel which heal in the same way as the bone to bone situation. The correct tunnel placement is a key to success and is now been very much enhanced with technological advances of the various aiming devices and proper understanding of the exact position of the tunnel. If the tibial tunnel is placed too anterior, it will lead to impingement. If the femoral tunnel is too anterior, it will lead to constraint in the knee movement and if too posterior position will lead to blowout of the cortex.

Minimal invasive technique should be used in almost every case of ACL reconstruction without opening up the knee joint. There is a lot of varieties of graft fixation, both in the femoral and tibial tunnel, depending on the site and type of graft used. It can range from interference fixation, either metal or bioabsorbable, endobutton, or newer fixation technique of cross-pin in the case of hamstrings.

ACL rehabilitation is very important part of the entire functional outcome. But at the moment, relatively little scientific basis on the exact mode which will produce the best results. There are still controversial areas, for example, the range of weight bearing, the need for continuous passive motion and the use of protective braces. In the rehabilitation arena, there are also debatable topics on the specific muscle training regarding their strength and endurance, the combination of use of close and open chain, and the modalities of muscle training, such as isometric, isotonic and isokinetics. One of the more recently recognized parameter in rehabilitation is to introduce early proprioceptive training to enhance the capability of the knee, but there are still problems in the quantitation of proprioceptive control which will need further research in order to realize the practical implication.

The future of ACL surgery will be very much directed to:

1. The need for revision surgery as the number of re-injury is on the rise
2. Possible further technological development along the lines of navigation-guide and robotic surgery
3. The search for tissue engineering application to enhance the biological incorporation of the grafts

SPORTS MEDICINE AND HEALTH PROMOTION – MUSCULOSKELETAL PERSPECTIVE

Kai Ming Chan

Department of Orthopaedics & Traumatology, The Chinese University of Hong Kong
President, International Federation of Sports Medicine (FIMS)

One of the major global concerns is economic growth and sustainable development. It has been well-recognized that wealth, productivity and health in the society are closely interdigitated with quality of life. Under the consideration of health economics, the emphasis on preventive medicine has always been a priority on the agenda of the governmental bodies. Growing evidence also indicated that physical inactivity, among other environmental and genetic factors, is an important determinant to the well-known diseases such as cancer, diabetes, hypertension and cardiovascular diseases. In recent years, the promotion of exercise for health has made sports medicine relevant to the need of the community. The vision of FIMS has clearly stated sports medicine for excellence, health, productivity, culture and peace. This presentation highlights our partnership with the global institutions and organizations with a specific emphasis on the musculoskeletal perspective, i.e. how sports medicine contributed to the prevention and management of osteoporosis, arthritis and back pain. This work stems from the co-operation with the Bone and Joint Decade which is an international initiative with the endorsement of United Nation, World Health Organization and UNESCO.

Osteoporosis is predicted to dominate the world health care issue with an anticipated increase of complication like hip fracture from 1.7 million in 1992 to 6.3 million in 2050. The phenomenon is in a dramatic growth especially in the region of Asia and Latin America. The benefit of exercise on osteoporosis has been well-research and indicates that it will increase the bone density, strengthen the major muscle and enhancing neuromuscular coordination, thereby reducing risk of fall and subsequently minimizing the morbidity of hip fractures. Weight-bearing moderate exercise fits well to this recipe and one example, with the cultural characteristic, is the promotion of Tai Chi in Asia which has demonstrated clear advantages in both research and clinical studies

Arthritis and related condition also dominate the scene with a projected increase of five to ten times in both the developed and developing countries. The economic implication is enormous. In the medical arena, there is a significant move to promote individuals affected with arthritis in the moderate stage to live with the arthritis knee through a well-organized program of exercise to improve muscle strengthen, examples would be aquatic exercise, breeze walking, Tai Chi and other statistic may have a relevant social and cultural implication.

October, 12 has been designated by the Bone and Joint Decade as the World Arthritis Day in recent years. It has been coupled with various promotion programs, such as Nordic Walk in Berlin, 2003, and Walk for Your Health on the Great Wall in Beijing 2004.

Chronic low back pain constitutes a significant economic burden in modern society in particular occupation related to sedentary jobs with significant impact on sick leave and loss of working days.

Physical activity in a well-organized setting can be promoted in working place with efficient program to strengthen the muscle and enforce adequate stretching and weight loading and work adjustment to alleviate the morbidity of back pain. All these measures will demand a multidisciplinary approach with the contribution of

various professional groups such as the medical doctor, paramedical professionals and sports scientists and occupational health experts, etc.

In our promotion on sports medicine, the trend will be to deliver a clear message of exercise for health with specific emphasis on musculoskeletal system with the collaborative work of various international professionals.

PHYSICAL ACTIVITY CAMPAIGN "REVITALIZE YOUR HEART": EFFECTIVE METHOD TO COUNTERACT SEDENTARY LIFESTYLE IN EUROPEAN COUNTRIES

Wojciech K. Drygas

Department of Preventive Medicine, Medical University, Lodz, Poland
National Institute of Cardiology, Warsaw, Poland
WHO Collaborating Centre for Noncommunicable Disease Prevention and Control

In most developed countries above 60-70% of all adult men and women are sedentary and only 10 –20% are regularly involved in exercise or other leisure time physical activity. Poland and Portugal are European leaders of sedentary life style (Drygas et al. 2001, Martinez-Gomez et al 2003). Thus elaboration and implementation of effective methods to promote physical activity in European countries is of particular importance.

Great National Physical Activity Campaign "Revitalize Your Heart" (Postaw Serce na Nogi) is innovative method to promote physical activity in population scale. The idea of this 3-months duration campaign is to combine nationwide educational program with a contest with attractive prizes. Main goals of the campaign are :

– to educate the whole society about health benefits of regular physical activity

– to propagate a minimum dose of exercise necessary to improve health , quality of life and prolong life

– to mobilize local organizers, institutions, politicians etc to create new, attractive and harmless possibilities to exercise for young, middle-aged and older citizens

– to create a strong coalition of NGO's, scientific societies, professional associations, media etc. in order to propagate healthy lifestyle

– to elaborate an original universal approach to promote physical activity in other regions and countries with similar burden of sedentary life style

Honorary patronage of the Polish President Mr Aleksander Kwaśniewski as well as involvement of most famous Polish sportsmen guarantee a high visibility of the campaign.

The lecture presents evaluation of the effects of national campaigns performed 2001-2003 in Poland. On the ground of methods applied it seems that Great National Physical Activity Campaign " Revitalize Your Heart" is an innovative and effective method to promote physical activity in countries with high percentage of sedentary population. Organizers of the Polish physical activity campaign are very interested to share their experiences with colleagues from other countries and to spread idea of " Revitalize Your Heart" to other regions or countries. In 2003 Czech Republic and Romania realized successfully their national PAC with identical or similar basic conceptions.

EXERCISE AND AGING IN THE 21ST CENTURY

Walter R. Frontera

Department of Physical Medicine and Rehabilitation, Harvard Medical School, USA

The 20th century was characterized by a dramatic increase in the number and percentage of people joining the group of men and women older than 60 years. Life expectancy has increased around the world. Aging, as a biological process, impacts all physiological systems in the human body. One of the most typical findings in the elderly is the loss of functional capacity including significant losses in muscle mass, strength, and power. As a result, simple daily tasks, such as rising from a chair and climbing stairs, require a larger percentage of the voluntary strength and lead to early fatigue. Longitudinal studies show that muscle strength is lost at a rate of approximately 1% per year but women appear to maintain the strength of the muscles of the upper limbs. Muscle power is lost at a faster rate. Muscle atrophy contributes to these losses but there is scientific evidence suggesting that muscle quality (strength adjusted for size) is also affected. The molecular mechanism underlying these losses is unknown but it could include changes in the biochemistry and function of the motor protein myosin. Exercise has been shown to significantly enhance muscle strength and mass in the elderly. Typical exercise programs require progressive resistance, 3-4 sets for various muscle groups, 8-10 repetitions per set, and a training intensity of 60-80% of the maximal capacity. Free weights as well as special weight training devices can be used. Strength training increases muscle strength, cross-sectional area, and muscle fiber specific

force. Muscle protein synthesis is activated. Strength training also enhances cardiovascular function and joint flexibility and restores functional capacity in frail elderly.

USE AND MISUSE OF REHABILITATION MODALITIES AND CLINICAL APPLICATIONS

Walter R. Frontera

Department of Physical Medicine and Rehabilitation, Harvard Medical School, USA

Sports participation is associated with the risk of injury. These injuries have a negative impact on tissue integrity and function capacity. If not treated and rehabilitated, athletic performance may also be adversely impacted. Rehabilitation can be defined as the restoration of form and function and is guided by goals set by the medical team in collaboration with the athlete and the coach. The main goals are to restore joint range of motion and flexibility, increase muscle strength and local endurance, and to enhance cardio-respiratory fitness. The rehabilitation process can be divided, by convenience, into three stages: acute, functional restoration, and return to training and competition. Physical modalities can be used in all phases for different purposes. In phase one, the goal is to reduce pain, swelling, and limit tissue damage. This can be accomplished with, among other things, medications, ice, rest, compression, and electrical stimulation. The use of anti-inflammatory agents in general and local steroid injections in particular is controversial but the evidence raises important questions about its efficacy and safety. Acupuncture is gaining some support but more research is needed. Phase two requires mobilization of tissues and the beginning of therapeutic exercise. Exercise programs to increase range of motion and muscle strength are most useful. Heating modalities such as ultrasound can help increase blood flow and reduce swelling in the injured area. Ultrasound can also enhance the effects of stretching exercises. Electrical stimulation may be useful to maintain strength and muscle mass. The use of massage to increase muscle blood flow is controversial. Phase three requires the use of functional exercise training programs characterized by exercises that simulate sports actions. Rehabilitation is not complete and return to competition is not safe until full range of motion and strength has been recovered and coordination and skill training has been accomplished.

WHAT WE HAVE BROUGHT TO EUROPEAN UNION IN THE FIELD OF SPORTS MEDICINE

Gawroński Wojciech

Department of Sports Medicine, University School of Physical Education, Krakow, Poland

Sports Medicine in Poland has its roots in the years between the World War I and II. Polish people took active part in organization of sports medicine in Europe. Dr Władysław Dybowski was one of the founders of an International Association of Sports Medicine, which was established on 14th February 1928 during the Olympic Winter Games in St. Moritz. First International Congress of the AIMS, where Dybowski was a speaker, took place in Amsterdam in August 1928 during the Olympic Summer Games. Additionally, Poland was represented by his wife Dr Dybowska and Prof. Missiuro, chief of the medical department of the Polish Olympic Committee.

In 1929 the first course for physicians in sports medicine was organized in Krakow. In 1937 during the first Polish Sports Physicians Congress in Worochta the Polish Sports Physicians Association was established. After World War II (in 1958) its name was changed into the Polish Society of Sports Medicine. Scientific Congresses were organized in three years period. Last one Jubilee 25th Congress was organized in Warsaw in 2002.

Sport medicine in Poland is recognized as a medical specialization since 1983. Since 1999 sports medicine is a particular specialty (subspecialty).

Nowadays we understand sports medicine very widely. It is kind of preventive medicine called the medicine of physical activity. Sports medicine is interdisciplinary branch of medical knowledge which used achievement in biology, exercise physiology, biochemistry, theory of sports training and clinical discipline like; orthopedics and traumatology of musculosceletal system, surgery pediatrics, cardiology and internal medicine. Sports medicine tasks are practical and scientific necessity reasons of exercises and their initiate methodology , as well as sports training affectivity. The crucial goal of sports medicine is to protect health of all people involved in any kind of physical activity; from high performance sports to the recreational activities and healthy training, from prophylactic to the treatment of sports addicted illnesses, overuses, injuries and their rehabilitation when occurred. From preseason examinations, medical supervising training and recovery process. Naturally, health of the athletes and their best performance are fundamental basis of sports medicine. Sportsmen are also the subject of references for studies that would be later bring to practice in different branches of medicine and sports sciences.

Specialization in sports medicine can be achieved by doctors, who completed basic specialization in: internal or general medicine, pediatrics, orthopedics and traumatology, as well as surgery and child surgery. Contemporary we included into the specialization program some specific topics connected with doping, ovetraning, etc.

In early 90. of the 20th century we had in Poland 49 District's Sports Medicine Centers and lawful regulation which obliged to make medical examination before the beginning of training process in particular sports and competition. This hopeful development of sports medicine was interrupted about 10 years ago by transformation of political system in Poland. During the 90. we saw some adverse circumstances in relation to sports medicine:

First - public health and sport weren't important for politicians, second - Physical Culture Act (1996) obliged to issue new disposition of regarding medical examination in sport, physical education and recreational activities is permanently delay. During 8 years approximately 10 propositions were prepared but Prime Minister didn't publish the act till today and third- reorganization of Health's System (1998) didn't cover sports medicine by the general health insurance. It were the main reasons for closing most of District's Sports Medicine Centers and as the result - reduction of availability to make medical preseason examination for the athletes.

Fortunately, since 3 years we have seen in Poland some important developments in relation to sports medicine through the intensive activities of the Polish Society of Sports Medicine and the National Consultant in Sports Medicine. The law ordinance for free health services in sports medicine for each insured person under the age of 21, who is involved only in amateur sport was re-established and only for preliminary examinations and periodical exams (two times a year)or occasionally in case of diseases or trauma. Patients receive these services at health care providers (specialist out-patient care in Sports Medicine Polyclinic) who have concluded contracts on providing health services with the regional branch of the National Health Fund (NFZ). In this case a referral of the doctor (primary health care physician) who practices within health care system is required. People without referral and over the age of 21 (or their teams) have to pay for this service. Costs of health services related to care of athletes who are the members of National and Olympic Teams is covered by the Government.

Nowadays we have in Poland several Sports Medicine Centers recognized by Health Ministry (full range service) for training in sports medicine; one in Bydgoszcz, Gdansk, Katowice, Lodz, Nowy Sącz, Tarnobrzeg, Poznań, Warsaw, Wrocław and two in Krakow. That is how it is possibile to make specialty (training) in sports medicine in each 3 years period for approximately 40 to 50 physicians.

Besides of them there are several Sports Medicine Polyclinics which have concluded contracts with the National Health Fund. Physicians without specialization can't obtain the contracts. So for this reason Polish Society of Sports Medicine with the National Consultant in Sports Medicine in accordance with Disposition of Health Ministry organize from 3 years special 4 courses called ABC in sports medicine. After completing all of them and passing the examination physicians get the Certificates in sports medicine on elementary level. This certificate is valid for two years and could be prolonged only for physicians who are continuously trained. Obtaining of the Certificate of Polish Society of Sports Medicine gives possibility to get contracts on providing health services with the regional branch of the National Health Fund and it's references during opening specialization in sports medicine.

I hope we brought some examples in organization sports medicine to EU in May 2004.

The main goal of this report (lecture) is to show our achievements and solutions in this field. Polish example may help to develop and harmonize training in Sports Medicine throughout Europe and to have Sports Medicine recognized as a Specialty within the EU. To find realistic solutions for this goal which is coming to realization, the EFSMA and FIMS should discuss all relevant problems and try to organize the essentials of sports medicine in Europe in close cooperation with us and our experiences.

Dybowski's lectures in Amsterdam 1924: "Unification of sports medical examination sheets" is still valid. The history circle comes back to its own roots!

RESISTANCE EXERCISE AND HEALTH: MYTHS AND FACTS

Dusan Hamar

Department of Sports Medicine, Institute of Sports Sciences, Comenius University, Bratislava, Slovakia

Myths neglecting the most recent facts are responsible for still rather conservative attitude of general population as well as medical community to resistance exercise. The main concern is an augmented cardiovascular risk due to pronounced blood pressure response to strength exercise. However, evidence accumulated over the last decade has shown that blood pressure reaches dangerously high values only under special circumstances. These include resistance exercise performed with extreme weights, i.e. those close to 1RM involving large muscle groups. On the other hand, pressure response to resistance exercise performed with moderate weights (up to 70 % of 1RM) does not differ substantially from the one occurring during common forms of aerobic exercise. Slightly more pronounced increase of diastolic pressure is considered as a positive feature, as such a response is fostering coronary perfusion taking place in diastolic phase of a heart cycle. Valsalva maneuver has been traditionally accused to contribute substantially to an excessive blood pressure response during strength exercise. However, it should be taken in account that Valsalva manuever involves mechanisms, which can, at least in part, compensate potentionally dangerous increase of blood pressure. If applied only for a short period of time, so that no serious impairment of venous blood return occurs, higher intrathoracic pressure

may actually enhance systolic contraction applying concordant “outside” force to ventricular walls. In addition, higher intrathoracic pressure, transmitted through spinal nerve foramina into the cerebrospinal fluid in medullar space and cerebral chambers and further on also to cerebral tissues resulting in reduction of mechanical stress on artery walls due to increased blood pressure. However, though such a compensation may be sufficient at lower intensities, extremely high values of intracranial and intraocular pressure accompanying maximum strength effort are still a source of concern and should be avoided. Another myth, a long term increase of resting blood pressure has not been supported by any solid scientific evidence. On the contrary, some studies have shown a positive effect, i.e. reduction of resting blood pressure after resistance training programs. Neither further myths, e.g. that resistance exercise is of no value for body weight reduction or managment and is, namely in children, associated with excessive risk of acute and overuse injuries has not been proved to be true. There is enough evidence that regular resistance training performed at even moderate intensities, i.e. with weight around 70 % of 1RM not only increases strength and power, but also positively affects lean body mass, resting metabolic rate, bone mineral density, insuline resistance and proprioceptive functions. These adaptation changes can be of preventive as well as therapeutic value in diabetes mellitus, obesity, cardiovascular disease, osteoarthrosis, and osteoporosis. It can be concluded that resistance exercise can be considered as a safe and effective means, which can enhance health promoting effect of aerobic activities in general population including middle aged and elderly persons.

STATE OF THE ART OF STRENGTH TRAINING FOR SPORT PERFORMANCE ATHLETES

Dusan Hamar

Department of Sports Medicine, Institute of Sports Sciences, Comenius University, Bratislava, Slovakia

In current practice of strength training attention is largely paid only to weight lifted or force produced. The fact that force applied at given velocity yields power, is usually neglected. Nevertheless, power represents an important biomechanical characteristic of muscle contraction, which may be of importance not only for the assessment of strength capabilities, but also efficiency of resistance training.

It is well known that in weight training repetitions in an exercise set with a given weight can be performed with different velocities depending namely on fatige, motivation and involvement of stretch shorthening cycle. It has been demonstrated, that although the same weight is lifted, different force and power is produced and hence different physiological mechanisms, e.g. muscle fiber recruitment, firing frequencies, hormonal response, etc. involved. Such a different acure response may cause a different adaptation processes with accented effects on particular strength qualities, e.g. exposive power and strenght endurance can be expected. Therefore, feedback monitoring of velocity, force and power by means of either expensive resistance exercise machines or weights eqipped with simple gadgets enables more precise specification and control of strength training stimuli respecting specific requirements of particular sports.

In conclusion, experience gained so far indicate that monitoring of power produced during weight expecise can improve diagnostics of strength capabilities and enhance efficiency of weight training.

PROMOTION OF PHYSICAL ACTIVITY IN CARDIOVASCULAR DISEASE: FROM FANTASY TO REALITY

Anna Jegier

Department of Sports Medicine, Medical University of Lodz, Poland

The main effects of regular physical activity (Ph.A.) in CVD are cardio– and vasoprotective effects, accompanied by other benefits. Cardio- and vasoprotective effects consist of direct effect on heart and vessels and indirect effects, eg. reduction of cardiovascular risk factors. Other benefits of Ph.A. include: improved function of respiratory system, preserved bone mineral density, strengthening of sceleto-muscular system, and reduced risk of falls and hip fracture.

Cardio- and vasoprotective effects of Ph.A. can be useful in prevention and treatment of coronary heart disease, hypertension, heart failure, and peripheral arterial disease. Many up-to-date recommendations describe this activity as beneficial, examples being: Centers for Disease Control and Prevention (1995), ACSM (1998), AHA and ACC (2001), from USA, accompanied by their European counterparts: ESC (2003), and particularly Poland.

European recommendations assess, that all individuals, who decide to increase their Ph.A., should be professionally encouraged and supported to increase their Ph.A. safely up to the level associated with the lowest

risk of CVD. Healthy people should be advised to choose enjoyable activities which fit into their daily routine, preferably 30-45 minutes, 4 to 5 times weekly, at 60-75% of the average max. HR.

Ph.A. for individuals with CVD is described in AHA recommendations, with the ACC for Healthcare Professionals and for Patients. Last recommendations from AHA with the ACSM were published in 2003 (P.D.Thompson et al.)

European Recommendations for patients with CVD, dated 2003, focus on patients with established CVD, for whom the advice must be based on a comprehensive clinical judgment including the results of an exercise test.

Taking all of the above into account, the emerging picture of the Polish reality is rather grim. Only 16% of adult Poles engage in regular Ph.A. according to recommendations for CVD prevention. 23% of adults in Poland take part in recreational sports activity on levels insufficient for CVD prevention, whereas as many as 61% of adult Poles are physically inactive.

Why are the Poles inactive in leisure time? The main reason quoted during interviews are lack of time (41%), lack of interest/motivation (24%), health status - illness or disability (20%), hard occupational work (12%). If one looks closer at the "lack of time" argument, however, it appears that an average adult Pole spends 3.1+/- 1.9 hours watching TV every day.

What can we do to improve physical activity in CVD prevention? Main areas are: providing good self motivation/interest in Ph.A. in CVD prevention, incorporating physical activity into daily life, counseling and psychosocial support for Ph.A., more effective health education, appropriate promotion/marketing of Ph.A., recommending Ph.A. to patients by physicians and suitable professional medical qualification to Ph.A.

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EXERCISE AND INTRACELLULAR REGULATION OF CARDIAC AND SKELETAL MUSCLE

M. I. Kalinski

Kent State University, Kent, USA

ß-Adrenergic-adenylate cyclase (ß-AR-AC) signal transduction system is a significant mediator of the increased cardiovascular performance in response to exercise. Several beneficial functional myocardial effects could be mediated by modifications in ß-adrenergic (ß-AR) and acetylcholine muscarinic receptors (MAchR). Endurance training results in depressed sympathetic/parasympathetic ratio and in numerous adaptations of myocardial contractile function. The purpose of presentation is to examine data available on the effects of acute exercise and exercise training on the signal transduction system in cardiac and skeletal muscles. The effect of endurance training on ß-AR and MAchR is controversial. No differences, a decrease or an increase in the receptors densities in hearts have been observed. Most recent simultaneous study shows that treadmill training alters specifically the left ventricle beta AR isoforms densities but not the M2 AchR. Data on the entire ventricular ß-AR-AC system provided some new insights on the mechanism of exercise conditioning on cardiac muscle. Some data suggest that manifestations of decreased sympathetic activity present in the hearts of trained animals could be related to a diminution in the number of ß-AR and decrease in the coupling between those receptors and G-proteins. Systematic data from our laboratory demonstrated that the alterations in tissue's cAMP, adenylate cyclase (AC), cAMP-phosphodiesterase and cAMP-dependent protein kinase (A-kinase) activity depend on the duration, intensity of exercise and exercise training. It is established that AC system is affected by exercise differently in different tissues, the adaptation of this system to chronic exercise seem to be complex and tissue-specific. Studies established that ß-AR-AC signal transduction is decreasing with age. With exercise, an increase in ß-AR-AC signal transduction in the young rats reported and no change was observed in older rats. Some studies found that exercise actually increased the deficit in signal transduction in the young and old rats. Other investigators found the opposite results: in young rat's ß-AR-AC signal transduction decreases and in senescent –increases, partially offsetting the age-related decline in signal transduction. The discrepancies of the results in different studies' are addressed. We have found that physical training induces significant changes in the activity of A-kinase and the rate of cAMP-dependent phosphorylation of the membrane proteins of sarcoplasmic reticulum and sarcolemma of cardiac muscle. The knowledge of c ß-AR-AC-cAMP-A-kinase system of skeletal muscle is much more modest than that for cardiac muscle. Some studies noted differences in the effects of acute and chronic exercise on the ß-AR density in different types of skeletal muscle. Findings suggest that AC activity and ß-AR density in skeletal muscle can be increased in red muscles fibers through endurance training. It has been shown in our studies that acute and chronic exercise induces important changes in cAMP metabolism, in the activity of A-kinase, in cAMP-dependent rate of phosphorylation of kinase phosphorylase ß of skeletal muscle and in the ability to regulate lysosomal cathepsin D release in skeletal

muscle. Many questions concerning the effects of acute exercise and exercise training on the ß-AR-AC-cAMP-A-kinase and MAchR systems remain unanswered.

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IT WAS SEVENTY FIVE YEARS AGO IN CRACOW A PAGE IN THE HISTORY OF SPORTS MEDICINE IN POLAND

Henryk Kuński

The separation of sports medicine as a medical speciality took place in the beginning of the XXth century as a result of needs, stormily developing modern sport inspired by the olimpic idea and of health-promoting direction of physical education, framed by Hjalmar Ling, accepted and enriched in Poland by Eugeniusz Piasecki (1872-1947). This scientific essentials of sports medicine were formed among others by the progress of physiology of exercise which took place on the turn of the XIXth and XXth century. A significant impulse was also the creation of International Association of Sports Medicine (Association Internationale de Medicine Sportive, later Federation Internationale de Medicine Sportive [FIMS]) during Medical Congresss acompanying the II Winter Olympic Games in St. Moritz (1928). In the reborn Poland the idea of the necessity to school physicans in the field of elements of physical education and sport was uttered *ex cathedra* by professor Stanisław Ciechanowski (1869-1945) from Cracow and doctor Władysław Osmolski (1883-1935) during the XII Conference of Polish Physicians and Naturalist in Warsaw (1925). Also there doctor Władysław Dybowski (1892-1969) presented the first report on the activity of Laboratory of Sports Medicine, created in 1924, attached to the Department of General and Experimental Pathology in the Jan Kazimierz University in Lvov.

After the structural changes in Poland, since 1927 this new branch of medicine has had a special support of state institutions which has brought financial and organizational conditions to school sports physicians and to create other sports-medical outpatient clinics. In 1928 and 1929 the first three medical cources, specified by uniform instructions of Medical Board, were held in the State School of Hygiene in Warsaw, Cracow and Lvov.

From the 12th to the 19th of January, 1929, with the assistance of intellectual potential of professors from the Jagiellonian University in Cracoww and the Jan Kazimierz University in Lvov, there was held - organized by the College of Physical Education in the Jagiellonian University in Cracow - the all-Polish course of physicians controlling physical education and sport, completed by 65 of its participants. The course programme included professor Ernest Maydell's (1878-1930) lectures on physiology of physical exercises and sport, lectures and

classes on sports medicine with doctor Władysław Dybowski and on sports surgery with doctor Mieczysław Kosiński (born in 1883). Besides, there were also assistant professor Władysław Bujak's (1883-1969) lectures on the effect of physical exercise on infantile development and professor Jan Piltz's (1870-1930) lectures on the selected selections in the field of neurology and psychiatry of adolescence. Professor Stanisław Ciechanowski, the then dean of Medical Faculty in the Jagiellonian University, delivered a lecture on the organization of physical education in Poland. The participans acquainted themselves with methodology of exercise and sports during classes demonstrated by instructors from College of Physical Education under the supervision of Zygmunt Wyrobek (1872-1939), inspector of schools.

The significant event in the development of Polish sports medicine was carrying out (from the 5th to the 10th of February, 1929) medical examinations of participants of International Ski Contest (FIS) in Zakopane. Comprehensive programme was realized with the assistance of experience from sportsmen's examinations during the Olimpic Games in St. Moritz and Amsterdam (1928). The examinations were organized by Medical Board of Scientific Council, with considerable assistance of the College students. The direction of methodology and results of these examinations influenced the evolution of Polish medical thought, going beyond the range of interests of sports medicine.

Two week later, on the 25th of February, 1929, realizing the efforts of sports circles, there was held an organizational meeting of Sports-Medical Outpatient Clinic in Cracow, under the supervision of the outstanding scientist and sports worker professor Stanisław Ciechanowski. In the Outpatient Clinic for men in the premises of Regional Association of National Health Service doctor Marian Tokarski (1862-1942) advised sportsmen and doctor Helena Bobkowska-Czerwińska (born in 1882) advised women in the premises of the College of Physical Education. The examinations were carried out and documented according to the needs after the minimal or normal pattern of the recommended General and Medical Instruction of the 22th of May, 1928, which was defined in reports as scrupulous as opposed to causal examination. In the mid-1930s the Outpatient Clinic, managed in those days by a well-known athlete doctor Wacław Sidorowicz (1905-1982), was moved to the promises attached to Regional Centre of Physical Education. In the beginning of 1939 also Air-Medical Outpatient Clinic developed its activity in the common premises and under the same supervision.

OVERTRAINING: WHICH WAY OUT OF THE LABYRINTH?

Romain Meeusen

Professor Exercise Physiology, Training, Sports Physiotherapy. Fac. Physical Education and Physiotherapy, Dept. Human Physiology & Sportsmedicine, Vrije Universiteit Brussel, Brussels, Belgium

The 'Overtraining syndrome' (OTS) occurs when excessive training load is not compensated with a sufficient amount of recovery for a sustained period of time. OTS is characterized by fatigue and severely reduced performance.

The symptoms associated with overtraining, such as changes in emotional behaviour, prolonged feelings of fatigue, sleep disturbances, and hormonal dysfunctions are indicative of changes in the regulation and coordinative function of the hypothalamus. The hypothalamus, is under the control of several 'higher' brain centers and several neurotransmitters (1, 2). Therefore, study of the neurobiological aspects of exercise may add to a more complete understanding of the aetiology and treatment of overtraining.

In overtrained athletes, several signs and symptoms have been associated with the imbalance between training and recovery (3). However, reliable diagnostic markers of distinguishing between well trained (T), overreached (OR) and OTS athletes are lacking.

We, therefore, devised a test protocol consisting of a computerized logbook, registering trainingdata, as well as psychological, and physical parameters in combination with neuroendocrine tests. With this test protocol we try to establish a difference in hormonal responses between T, OR and OTS athletes (4).

We report the results of Overtrained athletes from different disciplines and performance level, where the hormonal response to a second exercise test are different between the OTS and T athletes.

These results provide evidence of an altered and dysfunctional hypothalamic-pituitary axis response to two bouts of maximal exercise in OTS athletes. These findings can be used to develop markers for diagnosis of OTS and to begin to address the pathologic mechanism operative in OTS, as well as, provide an outcome measure to evaluate possible therapeutic regimes.

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ERGOGENIC AIDS AND ANTI-DOPING POLICY: CURRENT ISSUES

Fabio Pigozzi

University Institute of Movement Sciences, Rome, Italy
Member, IOC Medical Commission

Nutritional supplements are often used by athletes in an effort to optimize their performance. New substances claimed to have ergogenic aids continue to appear on the market, however, often these claims are not supported by solid scientific evidence. Therefore, it is important to define the substances that are beneficial for athletes and clarify the rationale for their safe use.

Furthermore, many concerns have been expressed about positive results that could be linked to the use of nutritional supplements. It has to be taken into consideration that there is at present a lack of regulation concerning these products in many European countries, and a need of common rules in the European Union. For this reason the IOC warned on several occasions, alerting the athletes and stressing the need of introducing quality controls for these products like those applied to drugs. A recent study reported the extent of the problem, so it is advisable an extreme care in the selection of the firms that produce these nutritional supplements.

In conclusion, although many substances are based on reasonable claims, the recommendation for their use by the athletes should always be supported by scientific evidence regarding their effect and safety.

HARMONIZATION AND STANDARDIZATION ON THE FIGHT AGAINST DOPING IN SPORT: THE EUROPEAN PERSPECTIVE

Fabio Pigozzi

University Institute of Movement Sciences, Rome, Italy
Member, IOC Medical Commission

Sports Medicine is a broad area of health care which includes: exercise as an essential component of health care throughout life; medical management and supervision of recreational competitive athletes and others who exercise on a regular basis, exercise for prevention and treatment of diseases and injuries. As its activity includes social and preventive aspects, sports medicine has to be considered mass medicine, as it meets the needs of a population at an auxological, psychological and educative level.

We can recognise two main different operational areas: sports medicine devoted to teach the principle of wellness, so educative and preventive, and sports medicine which deals with the professional sport world. The first intends to reach a precise goal of public interest, the health care, the second one is a sports medicine devoted to top level athletes, based on basic and applied research. From this preamble, it is evident how this discipline gathers together many other disciplines from the applied physiology to rehabilitation.

Training for professional physicians interested to this branch of medicine is extremely different in the world, so as the professional and academic dignity of this specialty itself. At present, initiatives in favour of the protection and improvement of the athlete's health, and for the promotion and development of sports medicine in the world, are supported in many countries mainly by the respective Sports Medicine Associations affiliated to the International Federation of Sports Medicine (FIMS). FIMS is an important international organisation recognised by the IOC and OMS. With more than 60 years of experience, it represents about 110 national associations, with a number of 200.000 individual members.

In Europe, continent with the ancient and strong sports medicine tradition, the current issues are focused on the development of sports medicine in education, in particular on the recognition in the EU of the specialisation in this discipline. With this regard, we can state that the way is still long and difficult. Besides the existing and strong traditions as the Italian (activation of the specialisation in Milan, in 1958) and Spanish ones, do exist more recent realities such as Portugal and Finland, but still not in number sufficient to guarantee a mobility of specialists in the EU countries. Such a possibility could be effective by a number of six countries or by an advancement to a level of sub-specialisation, or by the entrance in the EU of countries like Turkey and Hungary which already prepare sports medicine specialists.

The way for the recognition of a specialisation in the EU goes through Bodies like ACTM (Advisory Committee on Medical Training, UEMS (Union Européenne des Médecins Spécialistes) and the CP (Comité Permanent des Médecins Européens). As per the Directive 93/16, a specialty can only be recognised if the

training curriculum last at least 4 years. Sports Medicine, recognised since 1998, is enlisted in the art. n.7 of this Directive which mentions all the specialties not recognised in the all the European countries.

The European Federation of Sports Medicine (EFSMA), is a continental group recognised by FIMS. Among its aims, the recognition of the specialisation represents one the most important. Its strategy for getting this result is to promote contacts at a national level; to propose the harmonisation of the curricula studiorum; to develop projects of continuous education for physicians. The global trend is to reduce specialties to a maximum of 10, structured in modules, and in this case, in a common trunk of 2 years, a second biannual level in modules (physiology, cardiology, traumatology, rehabilitation etc.) and an additional sports specificity.

The realization of such a project could be helped, in a way which seems not to be easy, by all those continental initiatives, promoted by Academic and Sports Bodies, aimed to make sensitive the political world on the positive consequences for the public health.

PHYSIOLOGICAL BASIS FOR STRETCHING

Martin P. Schwellnus

MRC/UCT Research Unit for Exercise Science and Sports Medicine, Department of Human Biology, Faculty of Health Sciences, University of Cape Town, Republic of South Africa

It is common practice that an observed decreased joint range of motion in athletes is treated through a stretching program. This is because of the hypothesis that decreased flexibility reduces the risk of injury and may reduce performance. In this presentation the scientific basis of stretching will be examined. Firstly, the relationship between reduced joint range of motion and increased injury risk will be examined. Secondly, the scientific basis for static stretching techniques will be presented. In particular evidence to indicate that the optimum passive stretching routine should consist of 3 stretches, lasting 30-90sec three times daily will be presented. Finally, the scientific basis of other forms of stretching, such as peripheral neuromuscular facilitation (PNF) techniques, will be discussed briefly.

PREVENTION OF SPORTS INJURIES

Martin P. Schwellnus

MRC/UCT Research Unit for Exercise Science and Sports Medicine, Department of Human Biology, Faculty of Health Sciences, University of Cape Town, Republic of South Africa

The key to the prevention of injuries in sport is to identify the extrinsic and intrinsic risk factors associated with the injury, and then to correct or minimize these risk factors. Intrinsic risk factors are those that are inherent to the athlete and can be either 1) correctable (muscle weakness, muscle imbalance, altered neuromuscular control, altered proprioception, inflexibility, lack of proper warm-up, altered psychological state, poor nutrition), or 2) not correctable (age, height, gender). Intrinsic risk factors can also be classified as inherited or acquired. Extrinsic risk factors refer to those that are external to the athlete and include incorrect or poor sports equipment, altered environmental (weather) conditions, type of sport, and incorrect training methods. In this presentation, the identification and correction of intrinsic and extrinsic risk factors for sports injuries in tendons, bones and muscles of athletes will be discussed.

DEVELOPMENT AND CURRENT ISSUES OF SPORTS MEDICINE IN EUROPE

John B.M.Wesseling

The Netherlands

Already 1500 BC Athletic Competitions - Festivals were an important part of a Greek youth's education and had an religious significance. (Fresco from Thera: two young boxers).

Around 950 BC: *Mythological or Homeric Medicine* started.

The works of Homer, the Iliad and the Odyssey and the epic Theogony of Hesiod are the sources of information about this period. These poems were based on the legends, traditions and testimonies of mythical heroes (Asclepios = Aesculapius: the God of healing).

Sports Medicine in Europe has its roots in ancient Greece.

In 776 BC the First Olympic Games took place in Olympia.

During the 6th Century BC - after the Trojan War- Asclepius' sons dedicated sacred healing shrines (sanctuaries) to their father, the so-called Asclepeia (religious "hospitals"). The practising physician-priests were called Asclepiads. These Asclepeia had a Gymnasion and a Palaestra, where the Asclepiads prescribed exercises and training. Famous is the Asklepeion of Kos.

The first sports medicine doctor in Europe was Herodicus (500 BC). He believed in a tight bond between athletic exercises and therapeutics. He explained this in a paper, recommending walks, athletic games, hot spas and massages. "Eating alone will not keep a man well, he must also exercise". He also was Hippocrates' teacher.

With Hippocrates (460-375 BC), the "Father of Medicine", the "Father of Medical Science" and still famous by the "Oath of Hippocrates", the *Hippocratic Medicine* had been introduced.

A contempory of Hippocrates was Plato (429-343 BC), student of Socrates and teacher of Aristotle. He introduced the concept of "Soul and Body"; The body is the temple of God. The goal is to strive to have a "perfect body". Balance and Harmony (=Health) are necessary.

Galen = Claudius Galenius (129-201), born in Pergamon, a greek doctor went to Rome. He had to take care for the Gladiators and so became the first "Team-Physician". During this period the Therms (Spa's) were very important. The devices were: "In balneus salus" and "Mens sana in corpore sano".

At the end of the 19th CENTURY we see in Europe some important developments in relation to sports medicine:

- Institute of Gymnastics in Sweden
  Per Henrik Ling: Swedish Gymnastics = Medical or Remedial Gymnastics
- First Bicycle-ergometer constructed in Germany (1886)
- Teaching of Physical Education (mandatory) in Italy
- Beginning of Sports Science
- Revival of the Olympic Games (Athens 1896).

20th CENTURY

1911 Dresden (Germany): First International Hygiene Exhibition. A Sports Laboratory, managed by Arthur Mallwitz was present. Everyone could test here his own fitness under medical control.

1912 Oberhof (Germany): First German Congress for the Scientific Investigation of Sports and Physical Exercises. Founding German Committee for Research of Sports and Physical Education.

1913 Paris (France): First French International Congress on Physical Education.

1913 Lausanne (Switzerland): Olympic Congress on Physiology and Psychology of Sports.

1915 Arthur Mallwitz appointed as the first Sports-Physician, the first specialist in the new area of the Medical Science: Sports Medicine.

The first World-War interrupted the further development of Sports Medicine for a long period. The first Sports Medicine news after the first World War came from France, where in January 1921 in Paris the French Society of Sports Medicine was founded. Soon followed by the foundings of the Netherlands Medical Association for Physical Education (Amsterdam April 1921) and the SwissAssociation for Physical Education (1922).

In 1922 The French Society (SMEPS) published the first European Sports Medical Journal: "Revue Médicale d'Éducation Physique et de Sport".

The so hopeful started early development in 1913 in Germany had been interrupted by the first World War for more than 10 years.

As a new stimulation the 2nd German Sports Medicine Congress was organised in 1924 in Berlin During this meeting the organisation changed its name into German Medical Association for the Promotion of Physical Education.

After the first World-War the idea of creating an International Association of Sports Medicine started almost simultaneously in France, Switserland, Germany, Poland and Holland and brings together the concept of protecting the health of the athlete as well as making the athlete a point of reference for the studies that would later on be the fundamental basis for the development of many Sports Sciences (De Rose 2003).

During the Olympic Congress on Pedagogics in1925 in Prague-Czechoslovakia a proposal to found a Medical Commission of the IOC was not accepted by the IOC.

At a meeting in Berlin (October 1927) sports medicine interested physicians from 12 countries (invited by Schnell, new-elected president of the German Association) reached agreement to establish an international organisation of Sports Medicine.

On initiative of Francis Messerli (secretary general of the Swiss NOC) and Wilhelm Knoll (chairman of the Medical Commission for the Winter Games in St. Moritz) an invitation had been sent in April 1927 for an International Conference on 20 February 1928 (date later changed to 14 February) in the City Hall of St. Moritz during the Olympic Winter Games.

33 Physicians from 11 countries founded on 14 February 1928 the " Association Internationale Médico-Sportive" (AIMS) later FIMS. First President: Wilhelm Knoll (Switserland); First Secretary General: Arthur Mallwitz (Germany). Wladyslaw Dybowski from Poland who was one of the initiators and promotors in 1925 and 1927 was one of the founding members.

In August 1928 the First International Congress of the AIMS took place during the Olympic Summer Games in Amsterdam (The Netherlands) under the chaimanship of Frederik Buytendijk. Dybowski was also a speaker in Amsterdam: “Unification of sports medical examination sheets” Poland was besides Dybowski represented by his wife Dybowska and Missiuro, chief of the medical department of the Polish Olympic Committee.

In 1937 Dybowski organised the first Polish Sports Physicians Congress, which established the Polish Sports Physicians Association (today the Polish Society of Sports Medicine).

FIMS Presidents: Wilhelm Knoll (Switserland) 1928; Frederik Buytendijk (Holland) 1928-1933; André Latarjet (France)1933-1937; Leonardo Conti (Germany)1937-1939.

The Election of Conti as FIMS president had fatal consequences on the further development. He was sentenced to death as a war criminal by an international military court. This period are black pages in the history of FIMS.

After the end of the 2nd World War Albert Govaerts (Belgium) and Jiri Kral (Czechoslovakia) initiated the Rejuvenation of FIMS (1946 – 1951), followed by an extensive development of FIMS as a prevalently European organisation (1952-1964).

After 1966 FIMS expanded world-wide including all continents.

FIMS Presidents after the 2nd World War: Albert Govaerts (Belgium) 1947-1964; Paul Chailley-Bert (France)1964-1968; Giuseppe La Cava (Italy)1968 –1976; Ludwig Prokop (Austria) 1976-1982; Ejnar Eriksson (Sweden) 1982-1986; Wildor Hollmann (Germany)1986-1994; Eduardo De Rose (Brasil)1994-2002; Kai-Ming Chan (Hong-Kong) 2002-2006.

Besides the FIMS World Congresses, FIMS organised “FIMS European Congresses”. The first in Prague (Czechoslovakia) in1963.

Multinational Regional Groups in Europe.

1956 Paris: Founding Latin Group of Physical and Sport Medicine; from1985: GLMMS: *Latin and Mediterranean Group of Sports Medicine*. First Congress 1957 in Napels.

1969 Bucharest: Founding *Balkan Association of Sports Medicine*; First Congress 1972 Athens

13th congress 2004 Drama (Greece).

1980 Ystad (Sweden) Founding *North West European Chapter of FIMS*. Initiators Ejnar Ericsson and Per Renstrom. The NWEC had no president, only an elected secretary general. There were annual meetings in one of the member countries but the NWEC didn’t organise Congresses.

1990 XXIVth FIMS World Congress in Amsterdam. During and after this FIMS World Congress discussions started to strive to the constitution of an European Federation of Sports Medicine, because Europe was the only continent without a Continental Federation. After a lot of discussions and lobbies Wesseling, Secretary General of the NWEC invited - with support of the Standing Committee of the EU on Sports Medicine (CP) - representatives of all the known Sports Medicine Groups in Europe for a meeting on 17 December 1994 in Brussels.

The first constitution for an European Federation was formed. After Constitutive meetings in Granada (1995) and Nice (1966, during the first congress of the ECSS) the European Federation had been founded on 26 September 1997 in Porto (Portugal) during the 9th FIMS European Congress. The first Council of Delegates approved the draft Statutes and elected the first Executive Committee. Norbert Bachl (Austria) as President and Fabio Pigozzi (Italy) as Secretary General.

The main objectives are to develop and harmonise Education in Sports Medicine throughout Europe and to have Sports Medicine recognised as a Speciality within the EU and in all of Europe.

The 10th FIMS European Congress was the 1st EFSM European Congress and took place in Innsbruck (Austria) in 1999. The EFSMA Congresses are biannual: 2001 Oviedo (Spain), 2003 Hasselt (Belgium) and 2005 Limasol (Cyprus).

The EFSMA (European Federation of Sports Medicine Organisations) now is recognised and has very good cooperations with many organisations. Besides their special European tasks the EFSMA thinks and acts global using their Global Network: FIMS, EU, IOC, EOC, ECSS, ACSM, WHO, UNESCO etc.

On 5 july 2002 the Medical and Scientific Commission of the EOC had been established with Fabio Pigozzi as President and Norbert Bachl as Secretary.

The EFSMA has organised two Inner Europe Travelling Fellowships in 2001 and 2004.

For the coming years Sports Medicine in Europe has: to contribute to Public Health, to create new strategies against diseases caused by chronic physical activity, to supervise health stability of competative athletes to support their performance, to support physical activity and leisure time sports to maintain health, life-quality and mobility in older age, to counteract doping and drugabuse.

To find realistic approaches for all the challenges which are coming to us, the EFSMA will act as the Platform in Europe to discuss all relevant problems and to organise the essentials of Sports Medicine in Europe in close cooperation with their partners in the global network.