

SPORTS MEDICINE: A HISTORICAL PERSPECTIVE WITH SPECIAL REFERENCE TO EASTERN EUROPE

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Important milestones in the development of sports medicine in eastern European countries are closely linked to the social and political background of the time, as well as sports-related science. At the beginning of the 20th century, after the First World War, medicine focused on the preservation of health and the prevention of disease. In this context, physicians emphasised the importance of exercise and gave attention to ideas of fitness and health, not only among the general population, but also for the young, fit male body – an unusual patient group, usually only encountered in sports or military medicine. At the same time, physical activity was becoming fashionable and the sports medicine specialisation began to prescribe exercise as medicine.

SPORTS MEDICINE HISTORY: THE BEGINNINGS

Many sources indicate that classical Egyptian, Greek and Roman physicians were well aware of the beneficial effects of physical exercise on the body and mind. The 5th century Greek physician Herodicus (500 BCE), a former teacher of Hippocrates, regarded as the original pioneer of sports medicine, was a physician who practiced dietetic medicine and utilised the therapeutic effects of exercise. Herodicus devoted the majority of his time to recommending exercise to aid recovery from athletic and gymnastic injuries. Hippocrates (460 to 370 BCE) is the earliest known physician and recognised as the father of medicine. He dissociated medicine

from magic, religion and philosophy and established it as a profession, basing its practice on objective observations and emphasising the physician-patient relationship. Today his postulate is more relevant than ever: “eating alone will not keep a man well, he must also take exercise” and “food and exercise, while possessing opposite qualities, yet work together to produce health”. It can also be proven that contemporary Greek medicine was as closely linked to the training and competitions of ancient athletes as modern sports medicine is to present-day athletes. The physician Celsus (25 BCE to 50 CE), also known as the ‘Latin Hippocrates’ postulated that medicine was a triad of emphasis between dietetics, pharmacology and surgery, with



Image: Historical sporting artefacts on display at the International Sports Fair in Belgrade, 2015.

dietetics becoming a composite of food and fluid consumption, exercise, bathing and relaxation. The most important physician of the Roman Empire was Galen (131 to 201 CE), a Greek physician to the gladiators and the Roman Emperor Marcus Aurelius. He was the first physician to document his medical observations and is known as the founder of experimental medicine. He stated that “the form of exercise deserving our attention is therefore that which has the capacity to provide health of the body, harmony of the part and virtue in the soul and these things are true of the exercise with the small ball”. Since Galen’s time, doctors have not only been treating sports injuries, but have also been instructing and preparing athletes.

It was not before the 17th and 18th centuries that doctors and scientists again referred to this wealth of ancient knowledge, which at last became the subject of scientific research. During these

and the following centuries, numerous scientists investigated the different roles of physical exercise. At the beginning of the 17th century, Italian physician Girolamo Mercuriale (1530 to 1606), wrote ‘*De Arte Gymnastica*’, which is now considered the first book of sports medicine, containing the principles of physical therapy. Pierre-Jean-Georges Cabanis (1757 to 1808), a French doctor and physiologist, provided a systematic description of the human organism and its sources of energy and proposed that the development of sports in Europe increased the development of exercise physiology and vice versa. Jan Evangelista Purkyně (1787 to 1869), a Czech anatomist and physiologist, presented the favourable effect of physical training on human health. Nathan Zuntz (1847 to 1920), a German physiologist and a pioneer of modern altitude physiology and aviation medicine, published studies on the biology

of the athlete, including: metabolism, respiration, circulation, nutrition, muscular work and altitude physiology.

By the end of the 19th century, parallel to the Industrial Revolution – which had provided the motive and means to create new tools and mechanisms – specific equipment and support devices were developed. These devices and equipment enabled the next phase in the development of medical support to sportspeople and healthcare for amateur and professional athletes. In 1883, the first manual ergometer was built and 6 years later, the first treadmill. In 1896, the first bicycle ergometer was presented at the World Exhibition of Technical Achievements in Paris, France.

In 1911, Claude Gordon Douglas constructed a gasbag which could store expired air for complex analysis of the metabolic changes in the human body under the influence of defined physical effort and

to determine physical working capacity. This and other new inventions made it possible to study the human organism's reaction to physical efforts and to determine its physical ability. The first sports medical laboratory for anthropological, functional and radiological examinations, managed by Arthur Mallwitz, was established during the First International Hygiene Exhibition, in Dresden, Germany in 1911. During that exhibition, which was open for 6 months, the visitors could – under medical supervision – check their physical ability based on parameters obtained before and after exercises.

SPORT FOR ALL AND THE MODERN HISTORY OF SPORTS MEDICINE

The First German Congress of the Scientific Investigation of Sports and Physical Education was organised in Oberhof, Germany in 1912. The topics covered included: 'the importance of physical education with a hygienic view', 'women and physical ability' and 'the impact of regular exercise on the cardiovascular system' among others. At the same time, the German Committee for Scientific Research of Sports and Physical Education was established. This was the first national organisation of sports medicine in the world. Sports medicine organisations weren't founded until decades later in other

countries. The expression 'sports doctor' was used officially for the first time in Berlin, Germany in 1913. The First World War (1914 to 1918) interrupted the development of sports medicine in Europe for more than 10 years. However, the period between the two world wars was absolutely crucial in its formation. August Bier (1861 to 1949) and Arthur Mallwitz (1880 to 1968), both German doctors, gave their first lectures in sports medicine at Berlin University in 1919. Arthur Mallwitz is considered the founder of modern sports medicine. August Bier was a director of the Akademie für Sport und Leibeserziehung (Academy for Exercise and Physical Training) in Berlin, latterly called the Hohenlychen Hospital, which became the first sports medicine clinic in Germany. Its director Karl Gebhardt (1897 to 1948) became the first professor of sports medicine in Berlin, expanding Bier's methods and adopting an academic approach to sports medicine and awarding degrees. At the same time, Arlie V. Bock (1888 to 1984), a researcher at the Harvard Medical School in the USA, was pioneering the field of blood research, especially in relation to exercise physiology. Archibald V. Hill (1886 to 1977), an English physiologist, (jointly) won the Nobel Prize in physiology in 1922 for explaining the production of heat and mechanical work in muscles in high-performance athletics.

BUILDING STRUCTURES, ORGANISATIONS AND INSTITUTIONS

The Association Internationale Médico-Sportive (AIMS) was established in Sent Moritz, Switzerland in 1928, with Wilhelm Knoll from Switzerland serving as the first president and Arthur Mallwitz the first secretary general. The association was established to exchange information and experience related to research and practice in sports medicine. In the same year, during the 9th Summer Olympic Games, in Amsterdam, the First AIMS International Congress of Sports Medicine was organised, with participation from more than 30 countries. This presented an opportunity to study a large quantity of athlete health data. The first AIMS statute determined three goals:

1. Promotion of scientific research in the fields of biology, psychology and sociology of sport,
2. promotion of medical research projects associated with athletes' training and competition and
3. organisation of international sports medicine congresses.

In 1934, AIMS changed its name to the International Federation of Sports Medicine (Fédération Internationale de Médecine du Sport – FIMS). FIMS started as a mostly European organisation, but later, from the 1960s to the 1980s, it grew to include



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countries from all five continents. Today, FIMS consists of continental and national sports medicine associations, multinational groups and individual members. It is the biggest federation of national medical associations in the world, with hundreds of thousands of medical doctors and other professionals from different fields of sports medicine. The primary aims of FIMS are to promote scientific research and development of sports medicine all over the world and to help athletes to achieve optimal competition ability by maximising their genetic potential, health, nutrition, quality of medical protection and training. It organises courses, international congresses, publishes scientific information related to sports medicine and promotes contact between sports medicine specialists throughout the world. The 1st FIMS European Congress was organised in Prague, Czechoslovakia in 1963. During the 20th century, international FIMS congresses were organised throughout Europe. For example, the 7th International FIMS Congress was organised in Prague in 1948, the 10th International FIMS Congress

was in Belgrade, Yugoslavia in 1954 and the 12th International FIMS Congress and the 30th Anniversary of FIMS was in Moscow, USSR in 1958. Since 1963, FIMS has organised FIMS European Congresses, in addition to the international ones – which changed their name into the FIMS World Congress in 1966. Since the 1980s, FIMS has developed relations with other institutions and countries throughout the world. The first joint meeting of FIMS and the World Health Organisation was held in Cologne, Germany in 1994. In 2003, FIMS celebrated 75 years of its existence in all five continents.

The second important sports medicine organisation is the European Federation of Sports Medicine Associations (EFSMA), which was founded in Porto, Portugal in 1997. Its goals are to:

- Establish sports medicine as a specialty in Europe.
- Develop and co-ordinate training and teaching of sports medicine at relevant educational institutions.
- Create a pan-European forum to co-ordinate activities between European

societies of sports medicine and sports science facilities.

- Promote the importance of physical activity and exercise for the prevention, treatment and rehabilitation of illness and injury.
- Exchange scientific results and experiences in the field of sports medicine.
- Work on joint research projects, the creation of licensed sports medicine centres and promotion of ethical principles in sports medicine.

MODERN SPORTS MEDICINE IN EASTERN EUROPE

One organisation played a key role in promoting sports medicine and spreading the spirit of physical education in Eastern Europe. This was a youth sport and gymnastics movement called *The Sokol*. The Sokol was founded in 1862 in Prague (then part of the Austro-Hungarian Empire) by Miroslav Tyrš and Jindřich Fungar. Miroslav Tyrš (1832 to 1884), a Czech art historian and sports administrator, introduced new



Image: Yugoslavian National Football Team. Library of Argentine Football Association at the first World Championship in 1930. Public Domain.

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gymnastic exercises and terminology. The Sokol established a versatile programme of physical, moral and intellectual training for the nation. It was the first physical education organisation in the Austro-Hungarian Empire at a time of political freedom in the 1860s. It grew from 2000 members in 1863 to over a million members in the period between the two world wars. The Sokol festival, held for the first time in 1882, was a mass gymnastic festival. The Sokol movement gained popularity in most of the Slavic countries, including: Poland, Serbia, Bulgaria, Russia (Ukraine, Belarus), Slovenia, Croatia etc. It established the basis for the 20th century development of a widely accepted approach of applying science to sport, rather than regarding it as a mere leisure or entertainment activity.

During the FIMS Congress of Sports Medicine held in Romania in 1969, the Turkish representative Dr Necati Akgn proposed the establishment of a Sports Medicine Association of the Balkans (BSMA). The BSMA was established in 1971 providing links between sports medicine doctors from Bulgaria, Greece, Romania, Turkey and Yugoslavia. Later, the association also included Albania, Bulgaria, Cyprus, Greece, Macedonia, Romania, Moldova, Serbia and Turkey. The 1st Balkan Congress of Sports Medicine was held in Athens, Greece in 1972. Unfortunately, due to the large number of annual sports medicine conferences and numerous historical and political reasons, the BSMA Executive Committee decided to freeze its activities and focus on work under

the auspices of the European Federation of sports associations. The 15th and last Balkan Sports Medicine Congress was held in Bucharest, Romania in 2008.

Germany may be considered the cradle of sports medicine worldwide. In 2012, the country celebrated 100 years of sports medicine – the first congress of the German Committee Scientific Investigation of Physical Activity was held in Oberhof in 1912 and the Committee for the Scientific Investigation of Sports and Physical Exercise was founded in the same year. The main topics of this first sports medicine meeting were:

- Influence of constant exercise on heart function,
- overtraining,
- sports and doping,
- evaluation of physiological characteristics in different types of sports,
- sport and sexuality,
- women in sport and
- practical experiences during the Olympic Games.

Although the terms 'sportarzt' and 'sportmedizin' were not used in German before the last century, their area of concern and their issues are among the oldest in medicine. Only a few years later, in 1924, the German Federation for the Promotion of Physical Exercise was founded. In the same year, the first journal of sports medicine *Der Sportarzt* (The Sports Physician) was published and, starting in 1925, an annual sports medicine congress was organised. After the Second World War, about 60 percent

of the sports facilities in East Germany were found to have been destroyed or used for other purposes, such as emergency and refugee lodgings and agrarian facilities. Nevertheless, sports medicine curricula were set up by various facilities of physical education for sport students and trainers in 1946. In the same year, Friedrich Wilhelm University in Berlin introduced sports-medicine teaching in the form of a class called 'sport biology'. In 1950, the Ministry of Health created a department of sports medicine and issued a decree stating that sports medalists had to be examined by a doctor. Thus, the necessity for doctors with sports medicine experience arose and such examinations were introduced as a paid 'additional activity'. Also in 1950, a decade-old demand that 'every doctor (be) a sports doctor' was reaffirmed by prominent sports medicine professor Arno Arnold. He believed that sports medicine should be a mandatory examination subject in the study of medicine. This created a pathway for the introduction of lectures in sports medicine or sports-related topics as a part of other subjects at the six medical university faculties in East Germany (Deutsche Demokratische Republik – DDR) and three medical academies (Erfurt, Dresden and Magdeburg), starting in the late 1950s. The German College of Physical Culture (Deutsche Hochschule für Körperkultur) was founded in 1950, with a Sports Medicine Department included from the outset. In addition to teaching sports medicine, the department was also in charge of student health. In 1961, the Institute for Sports Medicine was founded, followed by the Faculty of Natural Sciences and Sports Medicine in 1962. The Kreischa Rehabilitation Centre (near Dresden) was affiliated to the Institute in 1962. This Centre evolved into the Central Institute for Sports Medical Services in 1968. In Leipzig, as well as in Kreischa, there were courses and advanced seminars in sports medicine with national and international participants. The teaching was primarily by doctors with sports medicine experience at out- and in-patient health services and university facilities. The Research Institute for Physical Education and Sports (FKS) was founded in 1969 to meet the high-performance sports goals of the DDR. It was a combination of

the research facility and a major part of the Institute for Sports Medicine of the German University for Physical Education in Leipzig. The FKS was the only institution for high-performance sports research in the DDR and employed more than 600 people until it was closed down in 1990. As a result of the successful work at the FKS, sport-specific ergometers were introduced for a variety of sports by 1974. Among these were the current channel for swimming and the tiltable treadmill for cross-country skiing. With the establishment of Sports-Medical Consultation Centres in 1952 and the introduction of the sports medicine specialisation in 1963, the sports medicine management system became a centralised state-organised structure. Until the end of the 1950s, county sports doctors from health services had advised and assessed those participating in sport. However, from 1970, they were assigned clearly defined responsibilities in order to establish a high-performance sports system. The county sports doctors became responsible for the extensive care of young aspiring athletes enrolled in the training centres. Every activity in high-performance sport was kept strictly secret. Political party leaders and sports directors recognised the significance of athletic achievement for the international reputation of their country, so no expense was spared in upholding the impressive success of the DDR sports on the world stage. Preparations in some sports for the Olympic Games in 1972 in Munich included particular 'supportive measures' – as doping was euphemistically called. The DDR and its sports managers had always officially recognised the Anti-Doping Charter and doctors were not forced to carry out the measures imposed by the Sports Leagues, but anyone who refused could be certain of being judged unsuitable for employment in high-performance sports. These activities cast a shadow over the previously progressive and successful sports medicine work done in the state. By 1990, there were around 1800 people employed in the Sports Medical Department, 350 of them specialists in sports medicine. At the end of 1990, the Sports Medical Department was closed as a centralised institution by the Federal Ministry of Finance for the reunified Germany, although some of the doctors and

well-known university teachers strongly opposed the decision.

In the USSR, the term '*vrachebnyi kontrol*' (medical supervision) was sometimes used instead of the term sports medicine. Modern sports medicine started to develop in the countries of the former Soviet Union at the end of 19th century. Ivan Mikhaylovich Sechenov (1829 to 1905), the father of Russian physiology, explained how the partial pressure of oxygen in the alveoli changes with barometric pressure. At the end of the 19th century, Russian army doctors performed comprehensive assessments of the fitness of soldiers at high altitude and studied procedures for improving acclimatisation. The development of sports medicine in the USSR was closely linked to the work of N.A. Semashko, V.N. Moshkov, V.V. Gorenevskii, B.A. Ivanovskii, I.M. Sarkizov-Serazini, I.A. Kriachko, S.P. Letunov, R.E. Motylianskaia and others. These individuals laid the scientific foundation of sports medicine as an integral part of

the Soviet system of public health, physical culture and sports. In the Soviet Union, sub-departments, laboratories and departments of sports medicine were organised in the 1920s and 1930s at scientific research institutes and educational institutes of physical culture. Dispensaries and stations for medical supervision of all categories of physical culturists and athletes were established in the 1940s. There were more than 300 dispensaries and about 1500 stations in 1975. The USSR Federation of Sports Medicine was founded in 1946 and became a member of FIMS in 1952. It was represented at international congresses on sports medicine sponsored by FIMS. The All-Union Society of Medical Supervision and Kinesitherapy of the USSR Ministry of Public Health was founded in 1961 and the Kiev Scientific Research Institute of Medical Problems in Physical Culture and Sports was founded in 1967. Laboratory groups on different aspects of sports medicine were created in the 1970s at many



Image: Historical sporting artefacts on display at the International Sports Fair in Belgrade, 2015.



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scientific research institutes of the USSR Academy of Medical Sciences. Research in sports medicine was co-ordinated by the Commissions for Medical Problems in Sports and in Physical Culture. As an educational discipline, sports medicine was part of the curricula at institutes of physical culture, medical institutes and pedagogical higher educational institutions with departments of physical education.

Bulgaria started its first formal institution for physical education in 1942 as a higher school for physical education. Today, the same school exists as the National Sports Academy 'Vassil Levski'. It played a significant role in establishing the foundations of methodology and a multi-disciplinary approach to sports in Bulgaria. The school had four departments:

1. Health sciences: anatomy, biology, anthropology, general physiology and physiology of physical exercise, general hygiene and hygiene of physical exercise, first aid, correctional gymnastics and massage.
2. Physical education: history of physical education, theory of physical exercise, methods of physical exercise (including practice).
3. General education: general knowledge of Bulgaria (language, literature, ethics, history, culture and geography),

common psychology and psychology of physical exercise at different ages, common pedagogy and education by means of physical exercise.

4. Organisation of physical training: modern organisation of physical training in the world, legal matters concerning the organisation of physical training, the concept of organised camps, summer sports activities, children's playgrounds, fairs, competitions etc., construction and equipping of facilities for exercising, knowledge of exercise equipment and apparatus.

In 1967, the higher school for physical education was divided into the Sports-pedagogical faculty and the faculty for mass health and healing physical culture. Twelve departments replaced the four old ones, including general hygiene and hygiene for physical exercise, medical surveillance, study of the physical development of the human body and anthropometry. This was the beginning of important work completed over the following decades aimed at providing professional support to Bulgarian athletes in the field sports medicine.

The development of sports medicine in former Yugoslavia began when a group of doctors began to organise athlete health and sport facility hygiene in Belgrade in 1930. In 1936 the first sports outpatient department

was opened within the Clinic for Internal Medicine at the Medical Faculty University in Belgrade, under the leadership of Professor Vojislav Arnovljevic. The first doctor from Yugoslavia to specialise in sports medicine was Vojin Smodlaka, who studied at the Centre of Sports Medicine at the Academy of Physical Culture in Berlin in 1937. As early as 1940, Sports Medicine was introduced as an optional course, led by Dr Smodlaka, at the Faculty of Medicine in Belgrade. After the Second World War, in 1945, sports medicine teaching was introduced at the Federal Institute of Sports Culture in Belgrade (today – Faculty of Sport and Physical Culture) and the Department of Sports Medicine was established within the Medical Association of Serbia. Soon after, in 1952, the Institute for Sports Medicine was founded within the Yugoslav Institute for Physical Culture and Sports Medicine. A year later, in 1953, the Sports Institute of Vojvodina (today – the Regional Institute for Sports and Sports Medicine) was established in Novi Sad. The Sports Healthcare Centre was opened in Belgrade in 1957. In 1965, the Section of Sports Medicine was established in Novi Sad within the Society of Physicians of Vojvodina, a part of Serbian Medical Society. Today, the Section of Sports is a part of Serbian Medical Society. A crowning moment in the development of sports medicine in Serbia was the

graduation of the first specialist. Medical doctor Miodrag Petrovic passed the exam in sports medicine in 1966, thus paving the way for generations of sports medicine specialists who gave enormous support to the success of Yugoslavian athletes during the 1970s and 1980s. In 1975, Yugoslavian karateka and doctor of medicine Professor Vladimir Jorga became the head of the World Karate Federation, established by the Health Commission (Medical Board) and 6 years later an international symposium of sports medicine 'Medical and Biological Characteristics of Karate Training' was held in Belgrade. In 1977, the Congress of International Federation of Sport Medicine was organised in Belgrade. The Sports Medicine Association of Serbia (SMAS) was founded in 1995 as an association of specialists in sports medicine, doctors of other specialties, as well as other experts engaged in healthcare and improvement of participants in sports and recreation. The goals of the SMAS are:

- Education through training courses, publishing activity and organisation of regular conferences in the fields of sports medicine and sports science as well as dietary supplements.
- Developing and promoting technical and scientific practices.
- Providing adequate healthcare to all athletes.
- Protecting the professional interests and rights of doctors and medical staff involved in sports medicine
- Issuing certificates and licenses
- Co-operating with other national associations of sports medicine.

The SMAS is a member of the EFSMA and FIMS and has held the Serbian Congress of Sports Science and Sports Medicine every 2 years since 2003. The first Serbian Congress on Dietary Supplements was held in 2007 and is also held biennially. In 2015, the first Serbian International Sport Medicine Conference was held in Belgrade, in partnership with the Serbian Institute of Sports and Sports Medicine and Aspetar.

Modern sports medicine started to develop in the countries of the former Soviet Union at the end of the 19th century.

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