

Introducing the National Institute for Sports Medicine in Hungary: a complex sports medical healthcare and screening system

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ABSTRACT

The Hungarian National Institute for Sports Medicine (NISM) was founded in 1952 to provide medical coverage for national teams, screening and periodic health evaluation (PHE) for all Hungarian athletes. The system of 'all in one and ASAP' evolved by now to a specific state-funded healthcare provider with complex sports medical and sport-related services available for athletes. The NISM created a countrywide network to make health clearance available for all athletes close to their place of residency. This centralised system guarantees the uniformity and financial independence of the network, as it is directly financed by the government and free for every competitive athlete. Thus, it leaves no chance for conflict of interest in evaluating athletes' eligibility. In 2013, NISM established an online registry for preparticipation screening and PHE. This made the registry available for sports physicians and certain data for both sports physicians and athletes themselves. Furthermore, NISM created a nationwide, centrally coordinated, out of turn care with central coordination for elite athletes nationwide. Outpatient and inpatient clinics of NISM provide sports-specific care. Most of the minimally invasive techniques used at the Department of Sports Surgery are applied only here in the country. The medical staff of NISM has special experience in Sports Medicine and sport-related conditions. All tasks are managed within the same system, within institutional frames by professionals at Sports Medicine, which guarantees institutional expertise, competence and responsibility. Our aim is to introduce the complex system, the services and the recent achievements of the Hungarian NISM.

INTRODUCTION

Undertaking regular sports activities is important for health. However, non-appropriate types or levels of sport activities can lead to severe health deterioration. Several elite athletes have died due to sudden cardiac death or have suffered sports injuries that led to long-term injuries. It is well documented that professional athletes and lower level or

recreational athletes face similar problems. Other major concerns are the increasing number and severity of sports injuries among young active people and these conditions may cause relative or absolute contraindication/withdrawal from sports.

Although the role of prevention is growing, only very few nations have a well set-up sports medical system to prevent and treat sport-related conditions. With its 65 years' history, the National Institute for Sports Medicine (NISM) in Hungary is the trustee of the health of athletes at every age and activity level. It works in close collaboration with the ministries responsible for healthcare and sports, the Hungarian Olympic Committee, the Hungarian Non-Olympic Committee, the Hungarian Paralympic Committee and all the national teams and sport federations.

The aim of this paper is to introduce the details of our complex screening and therapeutic system specially designed for athletes of every age and sports activity level.

THE ORGANISATIONAL STRUCTURE AND FUNCTIONS OF THE NISM IN HUNGARY

The NISM was founded in 1952. The main aims of NISM were to provide medical coverage for national teams; to deliver medical care, mandatory preparticipation screening/clearance and periodic health evaluation (PHE) for all Hungarian athletes; to offer training in Sports Medicine for physicians; to conduct clinical and exercise physiological research in order to expand the knowledge of treating and preventing injuries; to study the beneficial effects of regulated physical activity; and to optimise the performance of athletes.

Besides the outpatient departments (poly-clinic), the institute had several inpatient departments at that time. This institute

Table 1 Health clearance and periodic health evaluation according to legal regulation and national guideline in Sports Medicine ¹

Field of sport in alphabetical order	Physical examination		12-lead ECG	Secondary care				
	History	Physical examination		Urinalysis	Ophthalmology*	ENT†	Neurology‡	Orthopaedics§
Archery	x	x	x	x	x			x
Athletics (jumping activities)	x	x	x	x				x
Athletics (running, race walk)	x	x	x	x				x
Athletics (throwing activities, heptathlon and decathlon)	x	x	x	x	x			x
Autosport and motorsport	x	x	x	x	x	x	x	x
Badminton	x	x	x	x	x			x
Basketball	x	x	x	x	x			x
Baranta¶	x	x	x	x	x		x	x
Baseball, softball	x	x	x	x	x			x
Biathlon	x	x	x	x	x			x
Body building, fitness	x	x	x	x				x
Bowling	x	x	x	x				x
Boxing¶	x	x	x	x	x		x	x
Climbing	x	x	x	x	x	x		x
Cross-country skiing	x	x	x	x	x			x
Curling	x	x	x	x				x
Cycling	x	x	x	x				x
Dancing	x	x	x	x				x
Diving	x	x	x	x	x	x		x
Dog sports	x	x	x	x	x			x
Dragon boat	x	x	x	x				x
Equestrian	x	x	x	x	x			x
Fencing	x	x	x	x	x			x
Field hockey	x	x	x	x	x			x
Floorball	x	x	x	x	x			x
Football	x	x	x	x	x			x

Continued

Table 1 Continued

Field of sport in alphabetical order	History	Physical examination	12-lead ECG	Secondary care			Neurology†	Orthopaedics§
				Urinalysis	Ophthalmology*	ENT†		
Football tennis	x	x	x	x			x	x
Frisbee	x	x	x	x	x			x
Handball	x	x	x	x	x			x
Ice hockey	x	x	x	x	x			x
Judo¶	x	x	x	x	x	x		x
Karate¶	x	x	x	x	x	x		x
Kayaking-canoeing	x	x	x	x				x
Kempo¶	x	x	x	x	x	x		x
Kendo, iaido, jodo¶	x	x	x	x	x	x		x
Kickboxing¶	x	x	x	x	x	x		x
Korfball	x	x	x	x	x			x
Kung fu¶	x	x	x	x	x	x		x
Mixed martial arts (MMA)	x	x	x	x	x	x		x
Modern pentathlon	x	x	x	x	x	x		x
Nanbudo¶	x	x	x	x	x	x		x
Orienteering	x	x	x	x	x			x
Pole vault	x	x	x	x	x			x
Powerlifting, arm wrestling	x	x	x	x	x			x
Rhythmic gymnastics, gymnastics, trampoline	x	x	x	x	x			x
Rifle	x	x	x	x	x			x
Rope skipping	x	x	x	x	x			x
Rowing	x	x	x	x	x			x
Rugby	x	x	x	x	x			x
Sailing	x	x	x	x	x			x
(Ice) skating	x	x	x	x	x			x
Ski jumping, alpine skiing, bobsled, sled	x	x	x	x	x			x
Snowboard	x	x	x	x	x			x

Continued

Table 1 Continued

Field of sport in alphabetical order	History	Physical examination	12-lead ECG	Secondary care				
				Urinalysis	Ophthalmology*	ENT†	Neurology‡	Orthopaedics§
Shot put	x	x	x	x	x			x
Sport diving (until 40 m)	x	x	x	x		x		x
Squash	x	x	x	x	x			x
Sumo¶	x	x	x	x	x		x	x
Surfing	x	x	x	x				x
Swimming	x	x	x	x	x	x		x
Table tennis	x	x	x	x	x			x
Taekwondo¶	x	x	x	x	x		x	x
Tennis	x	x	x	x	x			x
Triathlon	x	x	x	x		x		x
Volleyball	x	x	x	x	x			x
Water polo	x	x	x	x	x	x		x
Water ski, wakeboard, kite surf, surfing	x	x	x	x	x			x
Weightlifting¶	x	x	x	x	x			x
Wrestling¶	x	x	x	x	x		x	x

*Pre-exercise ophthalmologic examination required followed by biannual check-ups under the age of 16 and above the age of 35/biyearly check-ups between the ages of 16 and 35.

†Pre-exercise ENT examination required.

‡Pre-exercise neurological examination required followed by annual check-ups under the age of 16 and above the age of 35/biyearly check-ups between the ages of 16 and 35.

§Pre-exercise orthopaedic (traumatology) examination required.

¶Health clearance is to be carried out prior to regular periodic health evaluation. This health clearance does not approve for 'fit to compete' health clearance (exception: technical minimum tests of combat sports) but is to be repeated according to the same protocol. The minimal time lapse between these two tests is the so-called 'waiting time' that is meant to be for acquiring the technical elements of the sport (for details see table 2).

ENT, ear-nose-throat examination.

Table 2 The protocol for health clearance in combat sports and weightlifting

Type of combat sport	Fit to training	Fit to compete	Waiting time
Baranta	From 8th calendar year	From 10th calendar year	6 months
Kendo (iaido, jodo)	From 6th calendar year	From 7th calendar year	1 year
MMA	From 17th calendar year	From 18th calendar year	1 year
Kung fu	From 6th calendar year	From 7th calendar year	1 year
Nanbudo	From 7th calendar year	From 8th calendar year	1 year
Sumo	From 8th calendar year	From 10th calendar year	6 months
Taekwondo	From 6th calendar year	From 7th calendar year	1 year
Wrestling	From 8th calendar year	From 10th calendar year	6 months
Judo	From 8th calendar year	From 10th calendar year	6 months
Karate	From 6th calendar year	From 7th calendar year	1 year
Kempo	From 5th calendar year	From 6th calendar year	6 months from 5 to 8 years of age 1 year from 8 years of age
Kickboxing	From 7th calendar year	From 8th calendar year	1 year
Boxing	From 10th calendar year	From 13th calendar year	6 months
Weightlifting	From 10th calendar year	From 13th calendar year	3 months

MMA, mixed martial arts.

became an excellent alloy of sports and medicine. As the discipline of medicine developed and healthcare system changed, the number of inpatient departments was reduced, and, in parallel, the number of specialists at the polyclinic increased, and the activity of the Research and Human Performance Laboratory was augmented.

The establishment of the National Sports Medical Service (NSMS) was a great step forward which meant the integration of all sports medical offices into a central institute.

The medical/sports medical care of the national teams is provided by the National Service for Elite

Athletes (NSEA). All these tasks of the NISM are regulated by legislation.

The National Sports Medical Service

Aims

According to Hungarian law, medical screening in Sports Medicine is a series of medical tests or examinations conducted by a sports physician, performed regularly as part of a check-up or used prior to the recruitment of an athlete. It is used to determine if there are any potential problems, injuries and any other pre-existing conditions present or susceptible.

Table 3 Number of visits for health clearance in the National Sports Medical Service in 2014–2016 according to type and age of athletes

Type of athletes	Age of athletes								
	<18 years			≥18 years			All		
	In 2014	In 2015	In 2016	In 2014	In 2015	In 2016	In 2014	In 2015	In 2016
Competitive athlete	183 839	207 354	230 390	110 761	102 734	97 712	294 600	310 088	328 102
Referee	99	124	104	2641	2819	2472	2740	2943	2576
Elite athlete*	289	560	147	975	1177	1568	1264	1737	1715
Other†	19 613	18 607	17 712	12 738	10 703	8457	32 351	29 310	26 169
All	203 840	226 645	248 353	127 115	117 433	110 209	330 955	344 078	358 562

*Including senior (previous) elite athletes.

†Leisure time athlete requiring occasional clearance (for certain competitions only).

Act No. I of 2004 on Sport and Regulation No. 215 of 2004 on Sports Medicine and sports medical service lays down the regulation that every athlete participating in organised competitions requires a license (to do sport). Athletes can only be licensed if they have the so-called Clearance Form ('fit to compete'). Above all, athletes (requiring license) can only start regular training if they have the 'fit to train' form which is not always a certification for the license to sport. It is both the right and the task of the NSMS to decide if an athlete is fit to compete or to train. Snooker, bridge, darts, golf, chess and model making require no such certificate.

Sport professionals exposed to increased physical exertion during their work are also obliged to undergo regular (annual) screening by the NSMS.

The NISM screening system is part of the broader effort to ensure safe sports activity. It is designed to provide a level of guidance so that those who begin a regular physical activity are directed in an appropriate way to increase their safety and to help them enjoy the experience.

Tasks

Via its network of sports physicians, the NSMS provides a pre-exercise/preparticipation health clearance and PHE for every athlete (including para-athletes) participating in the organised competition system. After a detailed medical check-up, sports physicians decide if a person is fit or is at high risk for the sport chosen, and, if necessary, they recommend medical clearance before embarking on an exercise programme. The screening system also helps to identify those at low or moderate risk during exercise and directs them to begin a tailored physical activity programme without the need to seek medical clearance. This is the most common route for the majority of the population.

Basic medical services are provided by the sports physicians of the network. Athletes are referred to specialists (many times within the NISM) in case further investigations and treatment are required.

In 2010, comprehensive changes were introduced aiming to improve the system. NISM developed an online registry of all athletes requiring health clearance with medical records available for every sports physician in the NSMS. All sports physicians have 24/7 access to the online registry and are able to function on the site locally at sport clubs. From 1 July 2013, athletes, sport clubs and federations can check the validity of the certificates online with the help of this registry.

Sports physicians of the NSMS have magisterial power. The NSMS is directly financed by the government and is free for all amateur competitive athletes, assuring the financial independence of the network and thus leaving no room for conflict of interest while evaluating athletes' eligibility.

Screening in detail

The NISM is the centre of the NSMS. The system is operated on 113 sites, that is, on 113 clinics across the country, including the national sport centres and the special 'training camps' that are isolated training centres for elite athletes. The NSMS comprises 136 sports physicians, all of whom are registered by the NISM. The Clearance Form can be issued by sports physicians of the NSMS only. Certifications are valid for 12 months between the ages of 18 and 65 and for 6 months under the age of 18 and over 65.

The following elements are mandatory for health clearance and PHE irrespective of sports, as defined by the national guideline¹: history by a sports medical questionnaire, physical examination, 12-lead ECG, urinalysis (dipstick, sediment), visual acuity test and pupil examination. In case of any abnormalities or in conditions contraindicating sports, athletes are to be seen by an ophthalmologist. In every sport with moderate or high ophthalmic risk (contact sports like baseball, squash, field hockey, contact types of combat sports, ice hockey, basketball, football, lacrosse, boxing, volleyball, tennis, badminton, fencing, water polo) athletes are required to be seen by an ophthalmologist for pre-exercise clearance followed by annual controls.

Examinations required for different fields of sports are displayed in [table 1](#).

In the simplest case, a physical examination, 12-lead ECG, urinalysis, orthopaedic examination, visual acuity test and pupil examination are carried out. Several sports require more attention in certain aspects, therefore in these cases further examinations in ophthalmology, ENT (ear-nose-throat) or neurology are also carried out.

In combat sports and weightlifting, a health clearance is to be carried out prior to regular PHE. This health clearance does not approve for 'fit to compete' health clearance (exception: technical minimum tests of combat sports), and it is to be repeated according to the same protocol. The minimal time lapse between these two tests is the so-called 'waiting time' that is meant to be for acquiring the ability to do the technical elements of the sport. The details regarding this special regulation are presented in [table 2](#).

Above the age of 35, more detailed examination is required for screening: history by a sports medical questionnaire, a physical examination including blood pressure, weight and height measurement, body mass index (BMI), 12-lead ECG, urinalysis (dipstick, sediment), blood tests: full blood count, glucose, cholesterol, triglyceride, uric acid, glomerular filtration rate. Athletes are referred to a cardiologist to perform echocardiography and exercise stress test ECG, in case of the presence of at least one of the following cardiovascular risk factors: increased level of blood cholesterol, systemic high blood pressure, diabetes mellitus, obesity (BMI>35), present or past smoking, suspected coronary disease, positive family history of

sudden cardiac death under the age of 50, myocardial infarction, cerebrovascular event and peripheral vascular disease.

As mentioned earlier, for athletes aged >65 years, screening is mandatory every 6 months as well as annual cardiology control even without any risk factors.

Issuing the Clearance Form, that is, limitations, relative and absolute contraindications are regulated by acts/legislation and guidelines, but describing that in details reaches beyond the scope of this manuscript. The NISM provides consultation for sports physicians on the problematic issues of health clearance.

The Budapest Sports Medical Centre, the central part of the NSMS, is located within the outpatient clinics of the central institute (NISM). Screening is organised in a way to enable all examinations required for health clearance to be carried out at the same attendance within a few hours.

Statistics

Table 3 shows the number of visits in the NSMS according to the type and age of athletes.

In case of athletes aged less than 18 years, the overall number of visits increased from 203 840 in 2014 to 248 353 in 2016. On the other hand, there was a decrease in the overall number of outpatient visits in the case of adult athletes from 127 115 in 2014 to 110 209 in 2016.

The proportion of athletes who failed clearance was approximately 0.1% in 2014, and less than 0.05% in 2015 and 2016 (data not shown). About 0.1% of the visits resulted in temporary interdiction, and 0.03% of the visits in 2014 and 2015, and 0.02% of the visits in 2016 resulted in permanent interdiction (data not shown).

In 2016, there were 161 902 children and 99 345 adults, altogether 261 247 athletes registered in the online NSMS registry, which represents 2.66% of the total Hungarian population of almost 9.9 million people.² Football players are the largest population among both children (76 498 athletes) and adults (55 187 athletes). In both populations, handball ranked the second and basketball the third place (data not shown).

The National Service for Elite Athletes

Aims

'The sooner, the better.' There are two features that determine the care of elite athletes: one is the need of special care by experts and the other is the lack of time for recovering in case any conditions require treatment or medical consultancy. Waiting lists are significant obstacles in this situation but instant and proper medical response can save a lot of time—and promote recovery.

Tasks

The NISM has established the NSEA to provide out of turn and comprehensive care for all elite athletes of the national teams (including junior athletes and para-athletes) and their coaches all over the country. Eleven healthcare providers (university hospitals, larger county hospitals and institutes providing specialised care) were contracted for this reason and the service of a 24/7 call centre with a toll-free number is available for coordinating the out of turn care of every kind (not only acute).

A dedicated committee determines the list of elite athletes annually—that is, which athletes are eligible for the special and out of turn medical care. In 2012, it was available for 350 elite athletes, by now it has increased to approximately 2000, including athletes of non-Olympic sports as well.

The so-called 'Olympic Outpatient Clinic' at the NISM provides health clearance and PHE, special care and management of elite athletes in case investigation or treatment is needed. This was established in 2010 in order to make the out of turn care of elite athletes possible within the institute. On top of the 2000 elite athletes, 1500 more athletes are eligible for this service.

As a specific part, all elite athletes are included in the online registry of NSMS, thus their medical records are available online, even from abroad. These medical records are recorded on data medium and—just in case—always accompany elite athletes during international championships and Olympic Games.

The Department of Performance Diagnostics at the NISM has been serving athletes ever since the institute was established in 1952; it has the longest history, the largest turnover of athletes and the most experience in the country. Laboratory and field testing is carried out in 42 different sports at the Human Performance Laboratory by the help of the Periodical Functional Sensor System. These tests comprise the following examinations: body composition, heart and circulatory system, autonomic nervous system (ECG-heart rate variability, blood pressure and arteriography), pulmonary system (spirometry, vital capacity, forced expiratory volume in 1 s, maximum voluntary ventilation), metabolism (eg, blood gas, complete blood count—haematocrit, haemoglobin, creatine kinase (CK), CK_{MB}, urinalysis), static system (static and dynamic foot pressure, spine functions and performance), nervous system (reaction time at rest and during exercise), ergometry and spiroergometry (cardiopulmonary exercise test), biomechanics (hand-grip force, sport-specific relative and absolute performance), cognitive system (functional pc tests like physical-perceptual-cognitive reflexes), agility test under laboratory circumstances, sport-specific physiological exercise, biomechanical field test.

In addition to digital reporting, results are discussed with the athlete and the coach by personal consultancy.

Blood tests are carried out during the performance diagnostic examinations by the use of a mobile blood test system from a very little amount of capillary blood and within a few minutes (we strictly avoid arterial or venipuncture). As an exception among the care provided by the NISM (which is cost free for every athlete in general), these special tests are available free of charge for elite athletes only and are financed by the ministry responsible for sports.

The NSEA is the professional supervisor of the chief medical officers and the medical personnel (psychologists, physiotherapists, masseurs) of the various national teams. Several colleagues of the NISM act as the chief medical officers of national teams at the same time. The NSEA is responsible for the medical support of the Hungarian national teams during international sport events and operates a 24/7 on-call system locally at the Olympic Village during the Olympic Games.

Screening and exercise physiology test in detail

There is a compulsory health clearance and PHE annually and before national and international sport events for all elite athletes. This complex preparticipation screening comprises medical history, physical examination, evaluation of a special sports medical questionnaire, body composition analysis followed by personalised consultancy, complex blood tests, 12-lead ECG, echocardiography, exercise stress test ECG, ophthalmologic examination, ENT examination, orthopaedic examination, psychological screening, dental screening, evaluation of questionnaire and personalised consultancy in gastrointestinal symptoms, allergic symptoms, dietetics and sports nutrition. As this specific and complex screening of all athletes takes place at the NISM, the complete screening is organised to be carried out within a few hours in every case.

Inpatient and outpatient departments

The NSMS and the NSEA fulfil their tasks by the help of the public inpatient and outpatient diagnostic and therapeutic departments of the NISM. Besides these tasks, the inpatient and outpatient departments offer care for the complete active population, for athletes at every activity level.

For decades, the NISM has been providing the medical coverage of national and international sport events in Hungary, and it will do so in the future, for instance, at the Youth Summer Olympic Games and the Judo World Championship in 2017.

Though sports injuries and sport-related conditions requiring surgical treatment are not exclusively treated at the Department of Sports Surgery of the NISM in Hungary, this department has remarkably the largest patient (athlete) population, and the most/largest number of experts with (the most) long-standing experience and impressive track record. The Department of Sports Surgery applies minimally invasive techniques (predominantly arthroscopic) to promote short return

to play. Many of these techniques are exclusively applied at the NISM and routinely not used elsewhere in the country. With the highest proportion of all operations, the most arthroscopic operations are carried out by this department in Hungary. From 2000 to 2016, the department performed more than 42 000 operations with a slightly increasing tendency annually in the past few years. Sixty-three per cent of these operations were knee surgery, 12% hand surgery, 11% ankle and foot surgery and 10% shoulder surgery. The Department of Sports Surgery is the Teaching Centre of the European Society of Sports Traumatology, Knee Surgery and Arthroscopy.

As a support of Sports Surgery, the Department of Sports Rehabilitation is responsible for enabling short return to play. It developed the national rehabilitation protocol of elite and amateur athletes.

The following outpatient care is provided at the NISM: Orthopaedics and Sports Surgery, Traumatology, Hand Surgery, Rehabilitation, Physiotherapy, Physical Therapy, Rheumatology, Internal Medicine, Cardiology, Endocrinology, Diabetology, Otorhinolaryngology, Ophthalmology, Neurology, Paediatrics, Pulmonology, Dermatology, Psychiatry, Psychology, Gynaecology, Urology, Dentistry, Maxillofacial Surgery, Sports Medicine, Radiology, Clinical Laboratory, Exercise Physiology. The annual number of outpatient visits (cases excluding exercise physiology tests) was 329 265 cases in 2016.

Education and training

Specialisation in Sports Medicine was introduced in 1952 in Hungary. The NISM is the centre of the postgraduate education and training for those who want to claim specialisation in Sports Medicine. After specialisation, sports physicians (specialists), sports dietitians and sports masseurs are obliged to participate in mandatory postgraduate courses at stated intervals. The NISM develops the guidelines in Sports Medicine, for example, about the preparticipation health clearance, PHE and the certification system, as well as regarding the medical coverage of sport events.

In addition to Sports Medicine, the NISM is accredited for postgraduate training in several other fields. Resuscitation courses, and basic and advanced life support courses are available free of charge for the medical and non-medical personnel of the sport federations and clubs.

Funding and management of care

Healthcare services such as preventive examinations, primary healthcare, specialised inpatient care, specialised outpatient care, certain dental care and rehabilitation are available free of charge for every insured person in Hungary. Healthcare providers are contracted with the National Health Insurance Fund, the only health insurer operated by the Hungarian

state. Funding predominantly comes from general taxes.

The care provided by the NISM is partially funded by the National Health Insurance Fund. The services of the NSMS are funded directly by the ministry responsible for healthcare. The services of the NSEA are funded directly by the ministry responsible for sports. All types of care are funded at the same rate as in every public Hungarian hospital. All services, except exercise physiology tests, provided by the NISM are available cost free. Exercise physiology testing is available cost free for elite athletes only.

The annual budget of the NISM is approximately €6.5 million (2 billion HUF (Hungarian forints)). As a reference, in 2015 the National Health Insurance Fund covered the complete national specialised inpatient care with €1.19 billion (357 billion HUF), specialised outpatient care with €374 million (112 billion HUF) and rehabilitation and chronic inpatient specialty care with €213 million (64 billion HUF).³ The NISM has been in financial balance since 2010.

There is a strong effort of healthcare leaders through constant projects and arrangements to reduce waiting lists for inpatient and outpatient care in general. The care provided by the NISM is organised in order to minimise waiting periods which are very short compared with other hospitals, or, in several cases, there are no waiting lists at all.

DISCUSSION

The Helsinki Olympic Games in 1952 was the most successful Olympic Games for Hungary with 16 gold, 10 silver and 16 bronze medals. The NISM was founded in the same year; the aim was to maintain health and safety in sports and to legally enhance performance.

The institute changed over time, the system of 'all in one and ASAP' evolved by now: a specific state-funded healthcare provider with complex sports medical and sport-related services available for all athletes. As these services are not included in the general healthcare system, the care is much more easily accessible. Furthermore, the NISM created an out of turn care for elite athletes nationwide. The NSMS is a countrywide network to provide preparticipation screening and PHE for all athletes in Hungary close to their place of residency. This centralised system guarantees uniformity and financial independence of the network, as it is directly financed by the government and it is free for competitive athletes, thus leaving no chance for conflict

of interest in evaluating athletes' eligibility. E-health has not been available in Hungary so far, but in 2013 the NISM established an online registry for preparticipation screening and PHE making the registry available for sports physicians and certain data for the athletes themselves. The medical staff of the NISM is specifically experienced at Sports Medicine and sport-related conditions. All sport-related healthcare tasks are managed within the same system and within institutional frames by professionals at Sports Medicine, which guarantees institutional expertise, competence and responsibility.

We make constant efforts to improve our system. Currently, we aim at recruiting more paediatricians for the sports physicians' training to establish the National Paediatric Sports Medicine Service within the NSMS.

Services provided by the NISM are in accordance with the proposal of the International Olympic Committee Consensus Statement⁴ and are available for all athletes. In this manuscript, we wanted to describe the complex system, the services and recent achievements of the NISM in Hungary.

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