

CENTRUM MEDYCZNE KSZTAŁCENIA PODYPLOMOWEGO
THE MEDICAL CENTRE OF POSTGRADUATE EDUCATION



CONSULTANT IN SPORTS MEDICINE

Curriculum

Programme of study for senior consultants in paediatric surgery, general surgery, internal diseases, general medicine, orthopaedics and traumatology, paediatrics, medical rehabilitation and consultants in paediatric surgery, general surgery, internal diseases, orthopaedics and traumatology of motor organs, paediatrics and in medical rehabilitation

Warszawa 2003

Curriculum developed by expert team:

Professor Jerzy Smorawiński, M.D. – national consultant

Dr Witold Furgał – representative of the Polish Society of Sports Medicine (PTMS)

Professor Jan Orłowski – representative of the Medical Centre of Post-Diploma Studies (CMKP)

Dr Janusz Garlicki, M.D. – representative of the Supreme Medical Council (NRL)

Dr Wojciech Gawroński – representative of the Regional Consultants Team

Opinions and consultation provided by:

Prof. Anna Jegier, M.D., Prof. Krzysztof Klukowski, M.D., Dr Andrzej Bugajski, M.D.,

Dr Zbigniew Szyguła, Dr Jerzy Widuchowski, M.D.

1 – Aim

Definition

Sports medicine or medicine of sports activity is an interdisciplinary branch of medical knowledge, using the achievements of biology, physiology of effort, biochemistry, hygiene, nutrition, theory of sports training and clinical disciplines, particularly general surgery, orthopaedics and traumatology of motor organs, paediatrics, internal diseases, and cardiology. Its objective is to provide grounds for systematic physical exercise in order to sustain or improve health condition and use methods for the assessment of the impact of physical exercise and sports training on the body.

Educational aims

Studies in sports medicine aim to provide theoretical knowledge and practical skills described in this curriculum, sufficient to independently provide medical services of the highest possible standard.

Furthermore, studies in sports medicine develop desired personality features of the would-be consultant, develop ethical attitudes and the desire to continue education and improve, expand and deepen theoretical knowledge and practical skills, introduce new achievements into medical practice and share the acquired experience with others by disseminating knowledge in publications and participation in medical conferences.

Acquired competence and skills

Studies in sports medicine aim to give interested physicians special knowledge and skills in sports medicine, which will allow them to oversee people practising different forms of physical exercise, irrespective of their sex and age, in line with the contemporary medical knowledge and theory of sports training.

Furthermore, a consultant in sports medicine will be able to:

- make decisions regarding one's ability to practice different forms of physical exercise;
- prevent, diagnose, treat and rehabilitate disorders and diseases that have their source in various professional sport and recreational activities;
- actively contribute to the development of optimal physical training methods based on the knowledge of biomechanics, physiology and sports medicine;
- promote health aspects of physical exercise;
- offer consultation to family physicians, general practitioners and other consultants in sports medicine;
- offer opinion on any issues requested by any court, medical institution and insurance agency;
- offer opinion on any required rehabilitation, inability to work, loss of health and disability caused by different forms of physical exercise;
- issue opinions, certificates and motions regarding prevention, training and diseases originating from acute and chronic overexertion of individual systems of human body;
- independently manage sports medicine centres and institutions;
- provide specialized medical advice on sports medicine;
- manage programs of study in sports medicine;

- help other medical staff in improving their knowledge and skills;
- contribute to the prevention of diseases which have their roots in social problems;
- conduct and interpret physiological tests of effort capacity

Any physician aiming to become a consultant in sports medicine must develop and exhibit the following personality features:

- in anything s/he does, the consultant is guided only by the best interests of the patient;
- the consultant respects a socially accepted system of values;
- the consultant aptly evaluates facts, phenomena, processes and makes reasoned decisions on the basis of them;
- the consultant takes responsibility for his/her work and the work of the team under his/her control;
- the consultant skilfully organizes his/her work and the work of the team s/he supervises;
- the consultant builds good relations with the athlete and trainers and coaches;
- the consultant builds good relations with the mass media

2 – Required knowledge

It is expected that a physician, who wants to become a consultant in sports medicine, has sufficient knowledge of the following problems

Physiology of physical effort

- physiological classification of physical efforts;
- bioenergetic basis of physical efforts;
- mechanisms regulating the functions of the body during muscular work;
- specific adaptation of the body to different types of physical effort;
- physiological basis of effort capacity and its evaluation methods (including physiological justification for the methods applied);
- structural, biochemical and functional changes developing under the influence of different forms of physical exercise – the mechanism of the changes and their importance in increasing effort capacity;
- physical effort in water, including, *inter alia*, the physiology of diving;
- physical effort and training on high altitudes;
- physiological mechanisms of altitude adaptation;
- physiological foundations for the optimization of physical exercise in different sports;
- physical exercise and its importance in the prevention and treatment of civilizational diseases;
- ability to conduct effort tests required in sports medicine

Physiology of developmental age

- basic knowledge about somatic, functional and psychological development of humans and changes related to ageing;
- the importance of physical exercise at different stages of body development and ageing;
- methods used to evaluate physical and psychological development useful in sports medicine;
- different reaction to physical effort and training at different periods of body development;
- physical exercise and body ageing

Clinical problems

Surgery and traumatology of motor organs

- basic knowledge of biomechanics;
- sports traumatology – principles of diagnosing and treating sports injuries;
- overexertion of motor organs – diagnosis, treatment and prevention;

- sports dysfunctions in children and adolescents;
- injuries of muscles and tendons;
- injuries of muscles, tendons and capsules of joints;
- knee pain;
- instability of the knee joint;
- overexertion of the anterior tibial muscle;
- shoulder pain;
- tendovaginitis;
- increased intrafascial pressure;
- diseases of Achilles tendon;
- fatigue induced fractures;
- rachialgia;
- sports training or other forms of physical exercise from the point of view of orthopaedics – indications and contraindications;
- factors contributing to sports injuries

Internal diseases

- selected problems of physiology and pathophysiology of, *inter alia*, circulation, respiratory, and endocrine secretion systems;
- sports training or other forms of physical exercise in patients with internal diseases – indications and contraindications;
- evaluation of the body capacity for physical effort in case of selected internal diseases;
- causes of sudden death among athletes and ways of preventing it;
- response of people with chronic internal diseases to physical effort and physical exercise;
- clinical principles of effort tests;
- “athlete’s heart”;
- physical exercise in the prevention and treatment of ischemic heart disease;
- physical exercise in the prevention and treatment of arterial hypertension;
- physical exercise in asthma and other diseases of the respiratory system;
- physical exercise in diabetes and other metabolic diseases (obesity, lipid disturbances)

Sport and recreation of the disabled

- Types of disability and disability related limitations in professional sport and recreation:
 - injury of motor organs;
 - deafness and hearing impairment;
 - blindness and visual impairment;
 - hard and light mental disability
- Decisions on disability category and involvement in sport and recreation by the disabled

Specific problems of female sport

Gerontological problems in sports medicine

Ophthalmology and sport – contraindications

ENT and sport – contraindications

Neurological problems and sport – contraindications

Theory of sports training

- principles of staged training of the youth;
- periods of training;
- methodological bases of training of the main physical features in different periods of personal development, including individual sports;

Rehabilitation, physical therapy (physiotherapy) and biological regeneration

- the concept of fatigue in sport;
- body overtraining, its types and conditions;

- procedure following diagnosis of overtraining and methods used to prevent this process;
- basic principles of kinesic therapy, physical therapy (physiotherapy) and balneological treatment of athletes;
- methods of biological regeneration in sport and their physiological bases;
- principles of controlling processes of restitution after physical effort;
- the role of the physician – member of the rehabilitation and biological regeneration team

Ethics and deontology

- detailed knowledge of the Code of Medical Ethics and ethical and deontological principles of the Polish Society of Sports Medicine;
- selected problems of doping in sport:
 - legal aspects of fighting doping in sport;
 - doping fighting programme in the context of international regulations;
 - the Polish Anti-Doping Agency and its work;
 - doping pharmacological substances and methods;
 - pathological consequences of doping in people practicing sports and recreation
- abuse of medications by athletes;
- doctor-patient privilege (confidentiality) in sports medicine

Assessment of health condition for sports purposes

- principles of preliminary, periodical and ad hoc assessment of health condition of athletes, depending on sports discipline and age;
- qualification for recreational activities and other forms of organized physical exercise

Hygiene and safety in sport

- supervision over hygienic and sanitary conditions of sports facilities and equipment; selection of sports attire and personal hygiene of athletes

Nutrition of athletes

- bases of physiological nutrition in professional sport; special attention paid to sports discipline, training load and age;
- nutrition and effort capacity of the body;
- types of legal supportive therapy;
- physiological justification for the use of legal pharmacological therapy in professional sport;
- rational nutrition as an important method preventing civilizational diseases

Organization of health care for persons involved in systematic training

- organization of sports and therapeutic counselling;
- legal regulations governing health care of people practising different forms of physical exercise;
- responsibilities of sports and therapeutic centres

3 – Required practical skills

It is expected that upon the completion of the programme the physician will be able to:

- make reasoned decisions whether physical exercise should be avoided or not and give advice whether training should be started or discontinued, taking into account the age and sports discipline;
- make reasoned decisions about indications and contraindications related to recreation and sport;
- decide whether one is fit for sports events and recreation and sport exercises;
- diagnose, treat and prevent sports injuries and overexertion of body in people practising sport and other forms of physical exercise;

- recommend the intensity and amount of training loads based on physiological bases, including the health condition of the athlete in training;
- programme biological regeneration;
- diagnose overtraining and decide on the therapeutic procedure;
- determine the biological age of the candidate for sport at his/her development age;
- decide on nutrition programmes for athletes;
- administer first aid during sports events, training sessions and classes involving physical exercise;
- carry out resuscitation;
- conduct physiological examination of effort capacity by means of different methods, which represent and correspond to the latest knowledge of the field.

4 – Forms and methods of teaching

A) Courses

Note: participation in the course will count towards the overall grade only if a course has been approved by the national consultant and included in the list of courses maintained by the Medical Centre of Post-Diploma Studies. Every year the approved list of courses is published on www.cmkp.edu.pl

1) Introductory course: “ABC of sports medicine – introduction to sports medicine”

Course contents:

1. **History of sports medicine. Organization of sports medicine counselling in Poland.** The aims and objectives of sports medicine as medicine of physical exercise. Regulations governing medical decisions related to sport and physical exercise. Special nature and standards of sports medicine counselling in the context of regulations and latest knowledge. Indications and contraindications related to systematic physical exercise: physical education, health training and sport.
2. **Basic problems of internal medicine and cardiology related to sports medicine.** Physiological response of the circulatory system to physical effort. Clinical bases of effort tests. The athlete’s heart. Cardiological contraindications related to sport. Causes of sudden death among athletes. Differences in the circulatory systems of children and adolescents compared with adults. Physical effort in the prevention and treatment of diseases of the circulatory system. Physical effort and bronchial asthma. Physical effort and obesity, diabetes, and lipid disturbances.
3. **Orthopaedics, traumatology and sports rehabilitation.** Orthopaedic examination in sports medicine and its importance in prevention. Procedure in acute and chronic injuries of motor organs (first aid, diagnosis, treatment, rehabilitation).
4. **Doping and supportive therapy in increasing effort capacity of the body.** Modern understanding of supportive therapy. The role of nutrition and hydration during physical exercise. Organization of the anti-doping system. Prohibited substances and methods of their detection.

Course duration: 5 days (four one-day meetings + 1 test day) to be completed during the first year of studies.

Place: Uniwersytet Medyczny (Medical University) in Łódź, Wyższa Szkoła Fizjoterapii (College of Physical Therapy) in Wrocław, University Schools of Physical Education (course can be offered by other organizational units, which specialize in the topics outlined above).

Course completion criteria: a test comprising questions on the course syllabus administered by the Polish Society of Sports Medicine. PTMS certificate awarded.

2) Course title: “Sports orthopaedics and traumatology”

Course contents:

Introduction:

- a) Types of sports activity (professional sport, recreational sport, occasional sporting activity) of children, adolescents and adults and of the disabled;
- b) Anatomy and biomechanics of motor organs – basic information

1. Sports traumatology:

- a) definitions and basic concepts used in traumatology;
- b) types of injuries and their consequences, injury location, epidemiology in individual sports;
- c) injuries of the head, chest, pelvis and spine;
- d) acute and chronic injuries of motor organs (wounds, bruises, injuries of tendons and muscles, sprains and dislocations of joints, fractures): principles of diagnosis and treatment;
- e) acute and chronic shoulder injuries;
- f) acute and chronic injuries of the knee joint;
- g) acute and chronic injuries of the tarsal joint;
- h) acute and chronic injuries of the Achilles tendon;
- i) first aid and general procedure in case of sports injuries (sports arena, sports medicine outpatients clinic, family doctor, specialist clinic, emergency room, hospital, rehabilitation centres);
- j) therapeutic rehabilitation (types, principles) – basic information.

2. Sports orthopaedics: orthopaedic illnesses versus sports exercise

- a) basic orthopaedic examination;
- b) types of illnesses, congenital and acquired defects;
- c) orthopaedic contraindications related to sport

3. Orthopaedics and traumatology in the sport of children and adolescents - differences

Practical training:

- 1) examination and basic procedure following injury at the hospital admission centre and participation in consultations involving patients with orthopaedic problems and injuries and patients during ambulatory treatment;
- 2) training at a hospital ward – analysis of treatment of athletes;
- 3) training in an operating theatre – observation of most frequent operative procedures.

Course duration: 5 days

Place: Ośrodek Chirurgii Kolana i Artroskopii (Knee Surgery and Arthroscopy Centre), Wojewódzki Szpital Chirurgii Urazowej [Provincial Injury Surgery Hospital] in Piekary Śląskie (course can be offered by other organizational units accredited to offer programme courses).

Course completion criteria: a test comprising questions on the course syllabus administered by the course head.

3) Course title: “Sports cardiology”

Course contents:

Information on the main elements of the physiological adaptation of the circulatory system to physical effort, diagnosis of a trained heart and overexertion of the circulatory system connected with physical effort, principles governing decisions to allow physical effort of healthy people and people suffering from illnesses of the circulatory system;

- a) physiological adaptation of the circulatory system to physical effort;
- b) the athlete's heart;
- c) overexertion due to effort of the cardio-vascular system;
- d) sudden death connected with physical effort;
- e) sport related contraindications connected with problems with the circulatory system among children and adults;
- f) clinical principles governing performance and interpretation of effort tests;
- g) physical effort in the prevention of illnesses of the circulatory system;
- h) selected principles of using physical effort as a method aiding treatment of patients with cardio-vascular problems: ischemic heart disease, arterial hypertension.

Course duration: 5 days

Place: Zakład Medycyny Sportowej (Sports Medicine Centre), Uniwersytet Medyczny (Medical University) in Łódź (course can be offered by another organizational unit specializing in the topics covered by the syllabus).

Course completion criteria: a test comprising questions on the course syllabus administered by the course head.

4) Course title: "Nutrition and effort capacity of the body"

Course contents:

Current principles and views on the correct nutrition of athletes at different age, practising different sports and with respect to the training cycle. The role of proper nutrition in the prevention of civilizational diseases.

1. *Nutritional recommendations:* basal, rest and total metabolism, energy demand in different sports disciplines, sources of energy for muscular work and energy balance in athletes, the importance of hydrocarbons in the nutrition of athletes, the importance of proteins in the athlete's diet, the role of fats in the athlete's diet, water-electrolyte management and the role of sports drinks in sports effort, mineral ingredients and vitamins in the athlete's diet, oxidation stress in sport and the role of antioxidants in the diet, permitted ergogenic aids and criteria of their selection in sport.
2. *The uniqueness of nutrition for athletes:* nutrition during training, nutrition during the pre-start period, nutrition during competitions and extra meals while "on the road", nutrition during post-effort restitution, nutrition during trips to other countries.
3. *Adjustment of body mass in sport and disorders in nutrition:* consequences of fast increase and decrease of body mass, the triad of disorders in female athletes – improper appetite, lack of menstruation and osteoporosis.
4. *The role of diet and effort in the prevention of some civilizational diseases:* obesity, diabetes, and hypertension.

Required skills: ability to evaluate the nutritional status of an athlete and detect any irregularities, evaluation of the athlete's diet, preparation of proper diet in individual sports disciplines, in case of eating disorders and in the prevention of civilizational diseases, selection of legal, effective and safe supplements in individual sports disciplines.

Course duration: 3 days

Place: Zakład Medycyny Wychowania Fizycznego i Sportu [Department of the Medicine of Physical Education and Sport], Akademia Wychowania Fizycznego Kraków, Poznań and other interested university schools of physical education (course can be offered by another organizational unit specializing in the topics covered by the syllabus).

Course completion criteria: a test comprising questions on the course syllabus administered by the course head.

5) Course title: “Selected problems of doping in sport”

Course contents:

Basic information on pharmacological doping used in sport and on organizational and legal aspects of fighting doping. Practical procedure of anti-doping control.

1. *Basic information about doping in sport:*
 - a) history of pharmacological doping;
 - b) classes of doping substances and methods – list of prohibited doping substances and methods;
 - c) biological and ethical aspects of doping – impact of doping substances on the body, pharmacological supportive therapy and doping – psychological problems, doping versus drug addiction.
2. *Organizational and legal aspects of fight against doping:*
 - a) international legal acts governing fight against doping in sport;
 - b) organizational and legal system of fight against doping in Poland
 - legal acts
 - the work of the Polish Anti-Doping Commission
 - organization of doping control during and out of competition
 - the role of sports associations in fight against doping.
3. *Detection of doping substances:*
 - a) work of the Department of Anti-Doping Research, Sports Institute;
 - b) accreditation procedure for anti-doping laboratories.
4. *Preventing the use of doping in sport:*
 - a) education as the basic tool of doping prevention;
 - b) the role and responsibilities of physicians and sports activists in fighting doping in sport.

Required skills and abilities:

1. Practical interpretation of the list of prohibited substances and methods.
2. Organization of doping control at sports events.
3. Sampling urine for doping tests.
4. Doping prevention

Course duration: 3 days

Place: Zakład Badań Antydopingowych [Department of Anti-Doping Research], Sports Institute in Warsaw (the course can be offered by another organizational unit specializing in the topics covered by the syllabus).

Course completion criteria: a test comprising questions on the course syllabus administered by the course head.

6) Course title: “Bioregeneration of the body”

Course contents:

Physiological bases of physical effort and factors limiting the ability of physical effort. Fatigue, overtraining of the body and their biological markers, exhaustion and regeneration of the body – properties of rest processes. Regeneration methods and aids: biochemical, physiotherapeutic and psychological. Special procedure: training in the mountains and others. Discussion of the effectiveness of using different methods and means in support of

physical effort and the speed of body restitution (based on scientific evidence). Critical evaluation of non-conventional methods of accelerating rest processes.

Course duration: 3 days

Place: Zakład Medycyny Wychowania Fizycznego i Sportu [Department of the Medicine of Physical Education and Sport], Akademia Wychowania Fizycznego Kraków, Poznań and other interested university schools of physical education (course can be offered by another organizational unit specializing in the topics covered by the syllabus).

Course completion criteria: a test comprising questions on the course syllabus administered by the course head.

7) Course title: “Pathophysiology of diving”

Course contents:

Pathophysiology of hyperbarism, pathology and clinical aspects of decompression sickness, diving accidents. Indications and principles of hyperbaric treatment. Barotraumas – lungs, sinuses, ear. Diving equipment and types and use of decompression chambers. Seasickness. Regulations on preventive medical examination of divers; basic regulations related to vocational certifications. Free diving – indications and contraindications. Decisions related to recreational and sport diving.

Course duration: 5 days

Place: Zakład Medycyny Morskiej i Tropikalnej [Department of Naval and Tropical Medicine], Wojskowy Instytut Medyczny [Military Medical Institute] in Gdynia, Instytut Medycyny Morskiej i Tropikalnej [Institute of Naval and Tropical Medicine] in Gdynia (the course can be offered by another organizational unit specializing in the topics covered by the syllabus).

Course completion criteria: a test comprising questions on the course syllabus administered by the course head.

8) Course title: “Introduction to aviation medicine and selected medical problems of vehicle driving”

Course contents:

Environmental physiology: physiology of breathing, hypoxic hypoxia, hypobarism, aeropathy (motion sickness), altitude sickness, decompression sickness and sudden decompression, acceleration tolerance, spatial disorientation, the role of equilibrium sense, eyes, thermal regulation and its physiological range of tolerance.

Problems encountered during certification: bases for certification in aviation, certification after diseases. Entrance and periodical medical examination in case of paragliding, parachuting and gliding. Indications and contraindications. Basic clinical problems in selected medical fields. Chronobiology. Basic psychological problems.

Health factors important for vehicle driving: principles of “fit for driving” certifications in the context of sport, eye tests, hearing tests, equilibrium tests and neurological examinations of drivers. Methodology of psychological examination. Alcohol and drugs as hazard to traffic and health safety.

Course duration: 5 days

Place: Wojskowy Instytut Medycyny Lotniczej [Military Institute of Aviation Medicine] in Warsaw.

9) Course title: “Selected oncological problems in sports medicine”

Course contents:

Epidemiology of tumours; most frequent oncological diseases, which can be diagnosed by consultants in sports medicine – medical history, exposure, diseases, particularly autoimmunization diseases, immunosuppressive treatment, AIDS. Preventive oncological examination during sports medical examination. Physical effort, biological regeneration of athletes with neoplastic diseases – basic indications and contraindications. Neoplastic hazard due to the use of anabolic-androgenic steroids. The role of physical exercise in preventing neoplastic diseases. Probable mechanisms of such protection.

Course duration: 3 days

Place: Katedra Medycyny Społecznej i Zapobiegawczej [Chair of Social and Preventive Medicine], Medical University in Łódź (the course can be offered by another organizational unit specializing in the topics covered by the syllabus).

Course completion criteria: a test comprising questions on the course syllabus administered by the course head.

10) Course title: “Promotion of health and prevention of chronic diseases in sports medicine”

Course contents:

The concept of health and its conditions. Promotion of health and prevention of diseases – basic concepts, methods of operation. Organization of health promotion in Poland and in the world. Physical exercise in the National Health Programme. The medicine of physical exercise and physical exercise campaigns as the way of promoting the desired health behaviour. Health training as a duty of modern man. Preventive programmes with physical exercise in Poland and abroad.

Course duration: 3 days

Place: Katedra Medycyny Społecznej i Zapobiegawczej [Chair of Social and Preventive Medicine], Medical University in Łódź, CMKP, AM

11) Certification course “Progress in sports medicine”

Course contents:

- *New directions in sports medicine:* Professional sport and some chronic diseases: bronchial asthma, diabetes, and arterial hypertension. Sports arrhythmia. Selected problems of paediatric cardiology in sports medicine. Physical effort versus immunological system of professional athletes. AIDS and infectious diseases in modern sport. Selected endocrinological problems in sport. Legal supportive therapy and doping among children and adolescents. Genetic doping.
- Return to professional sport after reconstructive surgery, particularly surgery of shoulder and knee joints (operations on ligaments and cartilage). Painful back in athletes, including children and adolescents. Arthroscopy in children. Imaging diagnosis in sports medicine. Intensification of rehabilitation process of athletes.
- Medical aspects of professional sport among the disabled.
- Selected laryngological problems in sports medicine.
- Selected ophthalmologic problems in sports medicine.

- Selected neurological problems in sports medicine.
- Pregnancy and some gynaecological problems in female athletes.
- Selected dermatological problems in sport, *inter alia*, *tinea pedis* (athlete's foot).
- Sport and dental contraindications. Progress in preventing mouth and face injuries.
- The theory of sports training versus modern professional sport – health implications.
- Medical protection of mass sports events.

Course duration: 2 weeks

Place: Zakład Medycyny Sportowej [Department of Sports Medicine], Medical University in Łódź (with the involvement of specialists from other centres).

B) Internships

1) Basic internship in sports medicine – part I (sports medicine outpatients clinic)

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

Aims, objectives and organization of sports medicine. Funds and basic legal acts governing sports medicine examinations. Special requirements, indications, contraindications in individual sports and disciplines. Health requirements in different forms of physical exercise. Permanent and temporary, absolute and relative contraindications. Entrance and periodical medical examinations and medical examinations of persons requiring reinstatement of licences (e.g. pilot's licence, driver's licence) – their role and importance and aims. Examination of a healthy person: aggravation, dissimulation. Mandatory examinations and consultations for the purpose of certifications. Laryngological, neurological, ophthalmologic and dental diseases and dysfunctions significant in sports medicine certifications. Medical documentation. Physical capacity and factors affecting its level. Principles of monitoring body training. Prevention, diagnosis and treatment of diseases and overexertion of internal organs and motor organs due to excessively intensive or improper training load. Differential diagnosis of diseases and injuries connected with physical exercise; treatment, rehabilitation. Prevention of different pathologies in modern sports competitions: doping, intended dehydration, and starvation. Consultation on the principles of proper supportive treatment, including in particular nutrition of physically active persons. Adjustment of body mass. The specific nature of certifications in the sport of the disabled, the role of periodical checkups. The specific health problems in female sport.

Practical skills

The following skills should be acquired during the internship:

- ability to take medical history and conduct physical examination, including inspection of the main organ systems and orthopaedic examination;
- carry out anthropometric examination and different effort tests; measure physical capacity;
- decide what additional examinations and consultations are required to express an opinion on one's fitness for a particular sport discipline;
- decide whether there are any health problems preventing a person to start training and/or participate in sports competitions;

- decide whether there are any indications or contraindications to start health training; plan the extent of entrance and periodical medical examinations and medical examinations of persons requiring reinstatement of licences (e.g. pilot's licence, driver's licence);
- knowledgeably apply regulations pertaining to sports certifications

During the internship the physician will:

- take part in at least 600 examinations of persons requiring certification to practice sports (of which at least 300 entrance medical examinations);
- individually complete 12 comprehensive tests to check body efficiency;
- consult 12 patients with diseases or injuries in an outpatients clinic;
- decide on indications to prescribe physical therapy (physiotherapy) and bioregeneration procedures.

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: **6 months** (physicians employed at the sports medicine outpatients clinic)
 9 months (physicians employed at other health service institutions)

Place: an accredited sports medicine outpatient's clinic

2) Basic internship in sports medicine – part II (at the sports medicine outpatients clinic for children and adolescents)

Programme:

Theoretical knowledge:

During the internship the following knowledge should be mastered:

- Aims, objectives and organization of sports medicine examinations of children and adolescents. Funds and basic legal acts governing sports medicine examinations. Detailed knowledge of necessary examinations and consultations. Laryngological, neurological, ophthalmologic and dental problems significant in sports medicine certifications. Collaboration with the family doctors, consultants and organizers of the health care system. Indications related to physical education and readiness for sport and contraindications preventing practice of individual sports. Permanent and temporary, absolute and relative contraindications. The role and importance of entrance medical examinations. Aims of periodical examinations and physical examination, including inspection of the main organ systems and orthopaedic examination. The specific nature of examining children and adolescents. Approximate evaluation of psychological qualities. Dangers of dissimulation and aggravation. Requirements related to the maintenance of medical records. Physical capacity of children and its monitoring at individual periods of development. Prevention and diagnosis of diseases and body overexertion, particularly of motor organs, typical of children and adolescents due to too early or too intensive training load. Physical fitness qualification of children and adolescents with dysfunctional motor organs. Recommendations for the disabled interested in sport. Prevention of therapy supporting effort capacity of children and adolescents when it is premature or discouraged by a doctor. Prevention of the pathology of pharmacological doping, in particular the use of anabolic-androgenic steroids and dehydration and starvation. Consultation on the principles of proper nutrition of children and adolescents

practising sport. Obesity in children, adjustment of body mass and selection of appropriate physical exercises. Specific health problems in girls sport.

Practical skills

The following skills should be acquired during the internship:

- ability to take medical history and conduct physical examination, including inspection of the main organ systems and orthopaedic examination of children and adolescents - differences;
- carry out anthropometric examination and tests to define the response of the circulatory and respiratory system to physical effort and measure physical capacity by means of indirect and direct methods;
- decide what additional examinations and consultations are required to express an opinion on one's fitness for a particular sport discipline;
- decide whether there are any health problems preventing a person to start general development training, specialist training and/or participate in sports competitions;
- knowledgeably apply regulations pertaining to sports certifications

During the internship the physician will:

- take part in at least 150 examinations (50 in case of physicians employed at sports medicine outpatients clinics) of persons requiring certification to practice sports (of which at least 50 entrance medical examinations (30 in case of physicians employed at the sports medicine outpatients clinics));
- individually complete a comprehensive test to check body efficiency;
- consult 3 patients with diseases or injuries in an outpatients clinic;
- decide on indications to prescribe physical therapy (physiotherapy) for children and adolescents and compensatory exercises.

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: **1 month** (physicians employed at the sports medicine outpatients clinic)
 3 months (physicians employed at other health service institutions)

Place: an accredited sports medicine outpatient's clinic for children and adolescents

3) Internship – tests of physical capacity

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

The functions of the circulatory system during physical effort: the frequency of myocardial contraction and the impact of endurance training and resistance training, stroke volume and cardiac output. Supply of oxygen, distribution of blood flow and its changes during effort. Blood volume and arterial tension. Static efforts.

The functions of the respiratory system during physical effort: the relation between lung ventilation and effort intensity, alveolus ventilation, the relation of ventilation to blood flow in lungs, diffusion capacity of lungs. Fatigue of respiratory muscles, effort dyspnoea. Mechanisms of effort adaptation of the respiratory system.

The concept of physical capacity and factors, which decide about its level; methods used to define physical capacity. Aerobic efficiency, methods, diagnostic methods, diagnostic value; oxygen threshold. Thresholds of metabolic changes and methods used to identify them. Modern methods used to define body efficiency. Ergospirometry – comprehensive examination of physical capacity.

Practical skills

The following skills should be acquired during the internship:

- ability to programme and conduct a comprehensive efficiency test adapted to a sports discipline;
- ability to determine metabolic thresholds by different methods;
- ability to interpret test results and recommend a training programme

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: 4 weeks

Place: physical efficiency laboratory of an accredited sports medicine outpatient's clinic (or any other organizational unit specializing in the topics covered by the internship programme).

4) Internship – orthopaedics and traumatology

Note: *physicians, who are consultant orthopaedists and traumatologists of motor organs are exempted from the internship*

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

Congenital defects of motor organs, faulty posture, lateral curvature of the spine, scoliosis. Neoplasms of bones and soft tissues. Aseptic necroses of bones, overload and degenerative changes of the spine and joints. Injuries of extremities, joints and the spine. Differences between children and adolescents. Injuries of soft tissues of motor organs: muscle, tendon, ligament, meniscus, etc.

Practical skills

The following skills should be acquired during the internship:

- orthopaedic examination;
- assessment of efficiency and capacity of motor organs;
- examination of a patient after an injury, first aid treatment, ambulatory treatment and treatment at a hospital ward;
- surgical treatment of the wound;
- application of immobilization dressings (casts, splints, orthoses);
- application of local anaesthesia and intra-articular injections

Furthermore, the intern should participate and assist in the work of the ward, take part in orthopaedic procedures and injury treatment, particularly procedures involving damaged joint stabilizers.

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: 3 months

Place: hospital, orthopaedics and traumatology of motor organs ward licensed to offer and supervise internship programmes.

5) Internship – internal diseases

Note: *physicians, who are consultant orthopaedists and traumatologists of motor organs and general surgery consultants, paediatric surgery consultants and paediatric consultants are exempted from the internship*

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

Analysis of electrocardiograms, diagnosis of circulatory system diseases, congenital and acquired heart diseases, arrhythmia, heart failure. Cardiomyopathy. Pericarditis and myocarditis. Coronary heart disease (asymptomatic and subclinical). Arterial hypertension. Diagnostics and treatment of ischemic heart disease and arterial hypertension; including non-pharmacological treatment. Intervention therapy – indications. Physical exercise after operations of vessels and cardiosurgical operations. Chronic peptic ulcer disease and gastroesophageal reflux. Diseases of the respiratory system, including bronchial asthma. Diabetes. Hyperthyroidism and hypothyroidism and other endocrinological diseases.

Practical skills

The following skills should be acquired during the internship:

- physical examination – internal disease (special emphasis paid on the circulatory and respiratory systems);
- electrocardiography examination and electrocardiogram analysis and interpretation;
- performance of effort tests and their interpretation;
- analysis of Holter monitor recordings;
- performance of spirometry, gasometry and interpretation of results;
- analysis of chest x-rays;
- analysis and interpretation of basis analytical tests

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: **3 months**
 1 month (physicians who are paediatric consultants)

Place: hospital, internal medicine and cardiology ward licensed to offer and supervise internship programmes.

6) Internship – paediatric diseases

Note: *paediatric consultants are exempted from the internship*

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

Congenital and acquired diseases of children and basic methods of their treatment, diagnostic differences, diseases with neurological and motor disorders, circulatory and respiratory system disorders. The role of physical exercise in the treatment of some chronic diseases. Obesity, anorexia and bulimia in children and adolescents.

Practical skills

The following skills should be acquired during the internship:

- ability to examine children and diagnose irregularities in psychophysical development;
- ability to decide on physical exercises in case of diseases, which require physical exercise

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: **1 month**

Place: hospital, paediatric ward, and child cardiology ward licensed to offer internship programmes.

7) Internship – rehabilitation in sports medicine

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

Modern principles of kinesitherapy, physical therapy (physiotherapy) and massage used in sports medicine.

1. *Kinesitherapy:*
 - a) bases of kinesitherapy as a branch of medicine, which uses the properties of movement in treatment;
 - b) proper techniques of examination and evaluation of motor organs;
 - c) selection of exercises depending on the type of injury and the athlete's capabilities;
 - d) knowledge of basic equipment used in kinesitherapy;
 - e) classification and division of exercises used in kinesitherapy;
 - f) methodology of kinesitherapy movements and exercises and their control in sports medicine;
 - g) rehabilitation in orthopaedic diseases and injuries and application of orthopaedic devices (orthoses, stabilizers, taping, etc.).
2. *Physiotherapy:*
 - a) bases of physiotherapy as a branch of medicine, which uses natural and artificial physical factors;

- b) selection of procedures in treatment and prevention;
 - c) knowledge of basic equipment used in physiotherapy (light therapy, electrotherapy, water therapy, balneology, climatology);
 - d) impact of physical factors on human body;
 - e) assessment of athlete's response to kinesitherapy procedures.
3. *Massage:*
- a) types and use of massage in prevention and treatment;
 - b) biological foundations of massage;
 - c) massage induced functional changes in organs;
 - d) selection and application of massage depending on indications and athlete's needs;
 - e) principles of classical and sports massage, massage in water, etc.;
 - f) massage methods.
4. *Principles:*
comprehensive use of kinesitherapy and physiotherapy procedures and massage in sports medicine.

Practical skills

The following skills should be acquired during the internship:

- ability to evaluate and interpret athlete's behaviour during physiotherapy;
- ability to use the principles and techniques connected with the effect of physical factor in prevention, therapy and sports physiotherapy;
- ability to solve problems connected with:
 - selection of the right physiotherapy methods adapted to the individual needs of an athlete;
 - individual response to physical means;
 - need to modify methods, look for new solutions
- ability to diagnose following:
 - examination and evaluation of motor organs;
 - assessment of selected parameters of the circulatory and respiratory systems;
 - evaluation of the static and kinetic abilities of motor organs
- ability to recommend physiotherapy procedures adapted to the indications and contraindications;
- ability to collect and analyse data on the athlete, which provide information about the progress of physiotherapy processes; maintaining detailed records;
- ability to establish and maintain positive relations with the athlete;
- ability to show friendly attitude to the athlete and express interest in his/her problems;
- ability to tell the athlete and his/her coach that longterm physiotherapy is recommended and explain its effects.

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: 4 weeks

Place: Wyższa Szkoła Fizjoterapii (College of Physiotherapy) in Wrocław or any other accredited institutions (centre) offering rehabilitation in sports medicine.

8) Internship – sports psychology

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

Introduction to the sports psychology as applied science. Evaluation of the level of psychological development. Psychological methods used to examine athletes. Human behaviour in relation to physical exercise and professional sport. Motivation. Psychological principles and skills – identification of aims, maintenance of concentration and relation to task, imagination control. Imagination training in sport, coping with stress, building self-confidence and trust in one's abilities, monitoring of one's activity to avoid overtraining. Relaxation, positive thinking. Psychosomatic diseases, neuroses, hyperactivity, aggression. Inclination to cheating, being prone to injuries. Psychological factors as indicators of overtraining. The syndrome of an athlete forced to prematurely end his/her sports career – emotional response.

Practical skills

The following skills should be acquired during the internship:

- mastery of the principles of cooperation and establishment of good rapport with a psychologist as part of the examination to decide whether one is fit for sport;
- ability to tentatively evaluate, in an interview, the psychosocial development and mental health;
- ability to administer a battery of tests to conduct psychophysical evaluation of athletes, useful in the monitoring of the training status (psychological factors of overtraining)

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: **2 weeks**

Place: an accredited institution, where research on the sport psychology is conducted or at the departments of sports psychology, university schools of physical education.

9) Internship – “Resuscitation and rescue medicine”

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

Circulatory and respiratory resuscitation in adults and children. Sudden threats to life and first aid following injuries, internal factors and environmental factors. Sudden threats to children. Medicine of mass events and disasters. Specific hazards related to different forms of physical exercise and extreme sports; drowning, dehydration, hyperthermia, hypothermia, hyperbarism, altitude sickness – first aid.

Practical skills

The following skills should be acquired during the internship:

- skilful resuscitation compatible with applicable standards;
- first aid in life threatening situations;
- handling an injured patient

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: **2 weeks**

Place: Intensive Therapy Unit or Rescue Medicine Ward.

10) Internship – participation in a training camp

Programme

Theoretical knowledge

During the internship the following knowledge should be mastered:

Organization of the training process during preparation for competitions and during competitions. Organization of the first aid tent; health checks, specific and field tests of physical efficiency. A travelling athlete. Problems of nutrition and supportive therapy at training camps and trips abroad. Medical problems: training versus treatment of: minor injuries, infections of upper airways, travellers' diarrhoea, diarrhoea before a competition, heat disease.

Practical skills

The following skills should be acquired during the internship:

- ability to organize a first aid tent at a training camp;
- ability to conduct an entrance health check-up and assess physical efficiency;
- ability to monitor training status and markers of fatigue and overtraining;
- ability to offer medical advice and consultations;
- ability to prepare diets and monitor them;
- ability to prevent typical diseases and ailments in professional athletes

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: minimum **2 weeks** (at least at two training camps, once as accompanying physician and once as chief physician)

Place: with a sports club or sports group (team) (with which a sports medicine consultant usually works).

11) Internship at a selected institution (centre) specializing in sports traumatology or sports cardiology or in a highly specialized centre of sports medicine (indicated by the programme head)

Programme

The aim of the internship is to acquire or deepen knowledge and improve practical skills in a selected field of medicine corresponding to one's interests or to the

educational needs of the would-be consultant, in consultation with the programme head.

Theoretical knowledge

During the internship the following knowledge should be mastered:

Global and national trends, modern diagnostic methods, standard procedures and prevention of diseases and overexertion in:

- 1) sports traumatology, or
- 2) sports cardiology, or
- 3) sports medicine

Practical skills

The following skills should be acquired during the internship:

- ability to perform a comprehensive health examination;
- ability to apply modern diagnostic methods and therapeutic solutions,
- ability to apply preventive procedures in:
 - sports traumatology, or
 - sports cardiology, or
 - sports medicine

Internship completion criteria: a) test in theoretical knowledge covered by the internship programme; b) test of practical skills – confirmation that the physician has individual treated patients and/or completed the procedures of the internship programme or assisted in their application. Test results are approved by the internship supervisor.

Internship duration: 2 weeks

Place: at an institution (centre) specializing in sports traumatology or sports cardiology or sports medicine.

C) Learning practical skills and medical procedures

List of skills and medical procedures which the would-be consultant should be able to perform or administer independently

- interpretation of laboratory tests and medical images;
- performing electrocardiograms and interpreting electrocardiographs;
- performing efficiency tests by the direct method;
- interpretation of Holter monitor recordings;
- taking samples of venous and arterial blood;
- intravenous, intramuscular, hypodermic and intradermal injections;
- sand tests;
- intravenous transfusion of fluids;
- bladder catheterization;
- puncture of articular cavity;
- minor surgical procedures: incision, suture, puncture;
- immobilization of fractures during transport;
- application of casts;
- diagnosing fractures;
- diagnosing faulty postures and recommending or discouraging active involvement in professional sport and recreational activities

D) Forms of self-teaching

Literature study

Books:

1. Celejowa I. Żywnienie w treningu i walce sportowej. COS. Warszawa, 2001.
2. Dziak A. (red.) Zamknięte uszkodzenia tkanek miękkich narządu ruchu. PZWL. Warszawa, 1985.
3. Dziak A, Nazar K. (red.) Medycyna sportowa. PTMS. Warszawa, 1991.
4. Dziak A., Tayara S. Urazy i uszkodzenia w sporcie. Wydawnictwo Kasper. Kraków, 1999.
5. Dziak A., Trzaska T (red.) Rehabilitacja w uszkodzeniach więzadeł krzyżowych kolana. Medicina Sportiva. Kraków, 2002.
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7. Gawroński W., Szyguła Z. (red.) ABC medycyny sportowej. Medicina Sportiva. Kraków, 2002.
8. Gieremek K., Dec L. Zmęczenie, regeneracja. Odnowa biologiczna. Has-Med. Bielsko-Biała, 2000.
9. Golec L. Niedotlenienie wysokościowe. WIML, PTMS. Warszawa, 1998.
10. Górski J. Fizjologiczne podstawy wysiłku fizycznego. PZWL. Warszawa, 2001.
11. Hackney R., Wallace A. Sports Medicine Handbook. BMJ Books, London, 1999.
12. Kirsch R. Masaż sportowy. PZWL. Warszawa, 1965.
13. Kozłowski S. Granice przystosowania. Wiedza Powszechna. Warszawa, 1986.
14. Kozłowski S. Nazar K. Fizjologia kliniczna. PZWL. Warszawa, 1999.
15. Kreider R.B., Fry A.C., O'Toole M.L. Overtraining in sport. Human Kinetics. Champaign, 1998.
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17. Kuński H. Trening zdrowotny. Medsport. Warszawa, 2002.
18. Kuński H., Drygas W. Trening Zdrowotny. Medicina Sportiva. Kraków, 2003.
19. Lisiecka M. Odnowa biologiczna. PKOL. Warszawa, 1971.
20. MacAuley D., Best T. Evidence-based Sports Medicine. BMJ Books. London, 2002.
21. Mackinnon L.T. Exercise and immunology. Human Kinetics. Champaign, 1992.
22. Maughan R., Burke L. Żywnienie a zdolność do wysiłku fizycznego. Medicina Sportiva. Kraków, 2000.
23. Mellon M., Sports Medicine Secrets. Hanley and Belfus Inc. Philadelphia, 1999.
24. Micheli L., Smith A. (red.) et al. Team Physician Manual. Koppincott Wiliams and Wilkins. Hong Kong, 1999.
25. Raczyński G., Raczyńska B. Sport i żywienie. COS. Warszawa, 1996.
26. Rewerski W. Nazar K. Doping. Wydawnictwo Lekarskie PZWL. Warszawa, 1995.
27. Rost R. Athletic and the Heart. Year Book Medical Publ. New York, 1984.
28. Shamus E. Shamus J. Sports Injury. Prevention and Rehabilitation. McGraw-Hill. New York, 2001.
29. Sozański H. Podstawy teorii treningu sportowego. COS. Warszawa, 1999.
30. Widuchowski J. Kolano. G-Kwadrat. Katowice, 1997.
31. Williams M. Granice wspomaganie. Medicina Sportiva. Kraków, 1998.
32. Woynarowska B. Opieka zdrowotna w sporcie dzieci i młodzieży. AWF. Warszawa. 1989.
33. Zajączkowski Z. Medycyna sportowa w praktyce. PZWL. Warszawa, 1984.

Periodicals

1. Acta Clinica, Warszawa
2. British Journal of Sports and Medicine, Oxford
3. International Journal of Sports Medicine, Stuttgart-New York
4. Medicina Sportiva, Kraków
5. Medycyna Sportowa, Warszawa
6. Rehabilitacja Medyczna, Kraków

7. Sports Medicine, Auckland
8. Sport Wyczynowy, Warszawa
9. The Physican and Sportsmedicine, New York

Preparation of publications

A physician must prepare a review paper or paper supported with examples of one's own research in the field of sports medicine.

Participation in the work of medical societies

Active participation in the work of the Polish Society of Sports Medicine: reading two papers at the scholarly meetings of the Society. Active participation (once) or passive participation (twice) in a scientific conference organized under the auspices of the Polish Society of Sports Medicine.

Training at the place of work

Work placement at a sports medicine centre, systematic self-improvement, participation in seminars, consultations, duty periods, scientific meetings and other forms of self-improvement and training indicated by the programme head.

E) Duty periods

During the internship a would-be consultant must complete:

- 6 duty periods at the medical rescue ward
- 9 duty periods at the trauma and orthopaedic ward and 9 duty periods at internal diseases ward (paediatricians – 3 duty periods)

5 – Tests and examinations

Tests

- Sports medicine certifications, organization of the health service system for persons actively involved in sports, medical ethics and deontology, organization of the health service system – tests administered by the programme head
- Sports physiology and methods used to assess effort capacity, and
- Sports traumatology – at centres, which organized the internship periods in these fields
- Theory of sports training – administered by the head of the Department of Sports Theory, University School of Physical Education
- Medical law
- Course completion test (after completion of each course) – administered by the programme head
- Internship completion test (after completion of each internship period) – administered by the internship head

The Centre responsible for the programme can add other tests to the programme.

Practical tests

A candidate for a consultant in sports medicine takes a test in practical skills after each internship period – the internship head confirms that the physician has independently treated patients and/or applied relevant procedures listed in the internship programme and/or assisted in their application.

6 – Programme duration

The sports medicine consultant programme lasts 2 years (24 months) in the case of physicians employed at the sports medicine centre or 2.5 years (30 months) in the case of physicians employed at other health service institutions – including courses, internships and leaves.

7 – State examination in sports medicine

The programme ends with a state examination in sports medicine. The examination has two parts – theoretical and practical. The following sequence is observed:

- test examination (a battery of multiple choice tests covering the topics studied)
- practical examination (evaluation of one's fitness for and qualification for different forms of physical exercise and professional sport on the basis of records of the medical history and physical examination and additional examinations and consultations);
- oral examination (questions related to problems studied on the programme)

8 – Programme evaluation

The programme is subject to review and evaluation; it can be modified to reflect any progress of medical knowledge and to improve the process of training. Any modifications will be made upon the opinions expressed by the doctors' self-governing council, scientific institutions, Medical Centre of Post-Diploma Studies and the Ministry of Health. Physicians taking part in the programme and heads of the individual courses and internships must follow the new developments and incorporate them into their programmes. The most recent version of the sports medicine curriculum is available at www.cmkp.edu.pl.