NORGES IDRETTSHØGSKOLE

DEPARTMENT OF SPORTS MEDICINE

ACTION PLAN 2011-2015

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INTRODUCTION

The Department of Sports Medicine (SIM) was formally established in June 2001 as a result of the sectioning of IFIB, but the group had already been established as an R&D group for a long time. In the autumn of 2004, the departments were divided into separate departments with employed heads of department, and SIM is today one of five academic departments at NIH. SIM is responsible for sports medicine – a broad field that includes several different areas in terms of research and teaching. The two most important are: 1) The association between regular physical activity and health (i.e. physical activity used to promote health and treat disease), and 2) Health problems related to sports practice (e.g. sports injuries, eating disorders, menstrual disorders, doping and asthma). The subject area is interdisciplinary, and seeks to establish knowledge that is of importance for the practice of sports in general and for the use of physical activity in preventive and health-promoting work and in treatment and rehabilitation at various levels inside and outside the health service.

Research conclusively documents that there is a close correlation between regular physical activity and good health. The paradox is that at the same time as we are gaining more and more knowledge about the health-giving effects of physical activity, there are strong indications that the population has become increasingly inactive. Over the past five years, SIM, commissioned by the Norwegian Directorate of Health, has conducted two large national studies of Norwegians' physical activity level. In 2005-06, physical activity and fitness were surveyed among 2299 9- and 15-year-olds using objective and valid measurement methods. The results showed that the 9-year-olds had a relatively high level of physical activity, but their activity level fell considerably during adolescence. Four out of five 9-year-olds, but only one in two 15-year-olds, met the recommendations of 60 minutes of moderate physical activity each day. In 2008-10, physical activity and fitness were surveyed among 3485 people aged 20-85 years. The results showed that the activity level was relatively stable in adulthood up to the age of 70, when a clear fall in activity level was seen. Only 20% of participants in the adult population met the recommendations. By comparing the results, one sees that the activity level is reduced by 31% from 9 to 15 years and further by 31% from 15 years to 20s. However, there are no data from similar previous surveys, but the intention is that similar surveys will be conducted regularly to follow the population's activity level in the years ahead.

Societal development, with increasing inactivity, obesity and inactivity-related health problems, consequently indicates an increasing interest in the field and an increased need for competent personnel. There is a great need for increased research efforts in a number of areas to obtain a better knowledge base for interventions involving the use of physical activity in health-promoting, disease-preventive and rehabilitative work. Nationally, there is also a great need for personnel with research expertise in the field and for strong centres of expertise. This places great demands on quality in terms of teaching, supervision, further research in the field, as well as networking to disseminate and implement the knowledge that is developed so that visible results can be achieved.

NIH's strategic plan for the period 2011-2015 states that NIH will further develop research of international quality relevant to sports, schools and society. The plan points to a particular challenge in developing knowledge that can form the basis for good measures for groups that are currently low-active or inactive, and that can help reduce social inequality. One of the plan's main focus areas is the relationship between physical activity, health and quality of life in the population, with a special focus on the low-active and inactive. Training and performance development in recreational and elite sports is another focus area.

STATUS - STUDIES

NIH currently offers courses at bachelor's and master's level in Physical Activity and Health (FAH), as well as a separate master's degree programme in sports physiotherapy with admission every other year. There has been a stable, high number of applicants to all the department's studies in recent years, and the fields of study in Physical Activity and Health and Sports Physiotherapy are among the most searched at NIH.

BACHELOR'S DEGREE PROGRAMME IN PHYSICAL ACTIVITY AND HEALTH

The Bachelor's Programme in Physical Activity and Health is a health profession-oriented education where emphasis is placed on both biological and social science perspectives on physical activity and inactivity. The programme aims to provide students with competence related to planning, leading, implementing and evaluating health-promoting and preventive measures with particular emphasis on measures that can promote physical activity in different population groups, and will provide a basis for work on health-promoting and preventive measures in the public, private and voluntary sectors. The programme qualifies for the title Physical activity and health advisor NIH.

The department has the capacity to admit 50 new BAFAH students each year within the current framework. Applications to the programme have been and are high, so that until recently there has been almost no room for admission of external students. As the table shows, student enrollment has been relatively stable close to the target figure of 50. The graduation rate for the 2-year course has varied somewhat, with an average of 69% for the period 2005-2010.

	Physical activity and health I			Physical activity and health II/ Bachelor FAH		
Cohort	Tot. ant. students	Completed program	Completed (%)	Tot. ant. students	Completed program	Completed (%)
1997-1998	32	25	78,0	18	16	89,0
1998-1999	43	27	63,0	21	8	38,0
1999-2000	49	34	69,0	26	13	50,0
2000-2001	46	38	82,6	32	23	71,9
2001-2002	50	39	78,0	25	20	80,0
2002-2003	46	31	67,3	39	28	71,8
2003-2004	43	38	88,3	40	32	80,0
2003-2005*	-	-	-	41	31	75,6
2004-2006	-	-	-	X	X	X
2005-2007	-	-	-	X	X	X
2006-2008	-	-	-	56	44	78,6
2007-2009	-	-	-	44	25	56,8
2008-2010	-	-	-	74	48	64,9

Table 1: Overview of the number of students and completion rate for the bachelor's programme in Physical activity and health in the period 1997 to 2010. *From 2003 the students have been admitted to a 2-year bachelor programme. so that the table shows the overall completion rate for this from 2004-2005. X: No statistics are available from 2006 and 2007.

The subject content of 2BAFAH (year 2) is mainly theoretical and forms the basis for the more practically oriented 3BAFAH (year 3). In the autumn semester year 3, 30 elective credits are planned. The department currently offers three recommended elective modules of 10 credits as well as two elective modules of 5 credits. This is a reduction compared to previous years; However, a high number of students indicate that the department offers 3-5 relevant elective modules. However, students are also free to choose other courses at NIH or at other colleges/universities in Norway or abroad. A few, 0-2 students per semester, have so far chosen to take this semester abroad. For the academic year 2010-2011, only one recommended elective course was not completed due to too few students

The FAH programme includes 6 weeks of professional practice in the last semester, 3 weeks in the private sector and 3 weeks in the public sector. In the latter period, students are placed in their own home county under the county medical officer's office with the public health adviser as supervisor.

Through continuous student evaluation and input from the academic communities, minor adjustments are made continuously. No major changes have been made since the last revision in 2008.

MASTER'S DEGREE STUDIES IN SPORTS SCIENCE AND SPORTS PHYSIOTHERAPY

The Master's Degree Programme in Sports Science with specialisation in physical activity and health shall qualify students for independent and scientific work with sports science issues and tasks within sports medicine disciplines. The department has the capacity to admit 15 new master's students each year within the current framework, but despite the fact that the number of applicants is very high, SIM has rarely had the opportunity to admit so many students in the period 2005 to 2010.

	Physical activity and health			Sports physiotherapy		
Cohort	Tot. ant. students	Completed program	Completed (%)	Tot. ant. students	Completed program	Completed (%)
2003-2005	15	15	100	-	-	-
2004-2006	12	8	67	-	-	-
2005-2007	8	7	88	-	-	-
2006-2008	10	9	90	17	15	88
2007-2009	12	11	92	19	18	95
2008-2010	16	13	81	-	-	-

Table 2: Overview of the number of students and completion rate for the master's degree programmes in Physical activity and health and Sports physiotherapy in the period 2005 to 2010.

As shown in Table 2, the graduation rate has been high, with an average of 86 % for the period 2005-2010. The proportion who complete within the standard time is also high, despite the fact that a relatively large proportion of students complete comprehensive studies of high quality, either independently or as project participants in larger surveys. A number of student assignments therefore have sufficient scope and quality to be published in international journals. The grade level is also consistently high.

The master's degree programme in sports physiotherapy started as a 2-year trial scheme with funding from the Fund for continuing education and training of physiotherapists. Based on a very positive evaluation of the pilot scheme, the NIH Board decided to establish this offer as an ordinary study program with the admission of 20 students every other year. The first ordinary cohort in sports physiotherapy was admitted in the autumn of 2009 with 20 students after the programme was established as a permanent master's degree programme at SIM.

FITNESS DELTID

NIH Fitness part-time was established at NIH Academic Year 2002/2003 as a flexible, student-funded course of study. Fitness part time is organized under the Centre for Continuing Education and Training, but has since 2007 been professionally anchored at SIM. Since the start with 30 students in the first semester, the development has progressed rapidly to today's implementations, with about 800 student places purchased per year spread over two semesters. The study program is mainly aimed at those who want to work in the fitness industry.

Since its inception, the education has included Basic Course (compulsory basic course), Training Guide, Personal trainer, Group exercise instructor and Cycling instructor. In recent years, Diet and exercise 1 and 2 have also been established as viable topics. Each of the courses is currently worth either 5 or 10 credits. In parallel with the increase in student volume, an increase in the number of completions has been forced so that there are currently more grades per course. The following courses were arranged during 2010: Basic Course (7), Training Supervisor (8), Personal Trainer (7), Group Exercise Instructor (2), Cycling Instructor (3), Senior Instructor (1), Diet and Exercise 1 (3) and Diet and Exercise 2 (1). The courses are conducted in Norway's four largest cities.

On average, students complete just under two courses per semester. The failure rate for the various courses usually varies between 15 and 25%, but is occasionally higher. This can partly be explained by the admission requirement, which is general admission qualification and not ranking by grade. Most of the students take a new exam if the exam is not passed at the first attempt. For many, passing the exam is a requirement for further work in the industry; 90% of our students are already looking for a job or already working in the fitness industry. There is currently a lower failure rate on home exams and exams with assessment to pass/fail than on practical methodological exams with graded grades.

CONTINUING EDUCATION (EVU)

In the case of EVU, there has been considerable continuing education in physical activity and health and sports medicine in recent years – primarily for doctors, physiotherapists, physical activity and health advisers and other health personnel. Although personnel from SIM and NIH often make up the bulk of the lecturers, these courses are mainly organized by external parties, such as the SIM and NIH lecturers. The Norwegian Association of Sports Medicine, the Professional Group for Sports Physiotherapy, the Directorate of Health and Social Affairs, the universities and the county medical officers. In addition, a number of courses and seminars are organized by other public bodies and NGOs where SIM personnel participate as lecturers.

SIM personnel are regularly involved in leading roles in major international congresses. For example, the World Congress on Sports Injury Prevention was held in Oslo in 2005 (600 participants), in Tromsø in 2008 (700 participants) and most recently in Monaco as the IOC World Conference on Prevention of Injury &; Illness in Sport (950 participants) with personnel from SIM in leading roles in terms of program and implementation. Other major congresses in the final planning period include the European College of Sport Sciences in 2009 with the NIH as organizer (2000 participants) and the European Society for Sports Traumatology, Knee Surgery and Arthroscopy in 2010 (2300 participants) with SIM personnel in leading roles.

STATUS - RESEARCH

During the period 2006-2010, research activities at the department have been concentrated on five main areas: 1) Physical activity and health, 2) Monitoring of physical activity and fitness, 3) Women, exercise and health, 4) Prevention of sports injuries, 5) Active rehabilitation of musculoskeletal disorders. During 2010, Fitness has also been added as a new research area. However, there is a high degree of overlap between the various areas, and projects in different fields derive their research theoretical and methodological basis from the same research tradition. This research tradition includes epidemiological studies to first establish the incidence of and risk factors for a condition/injury/disease and then use randomized controlled trials to study the effect of various intervention/exercise interventions. The research field is therefore based on tradition in epidemiology and evidence-based practice.

SIM has been a significant contributor to the NIH's overall production of scientific papers. In the period since the department was established in 2001, SIM has had a gradually increasing production in the category international journals with referee system: 2001 -18, 2002 – 10, 2003 – 30, 2004 – 35, 2005 – 45, 2006 – 39, 2007 – 41, 2008 – 47, 2009 – 66, 2010 – 74. At the same time, there has been a parallel increase in other publication categories. According to the latest update from the Database for statistics on higher education, SIM is ranked as Norway's fourth most productive research unit based on publication points per associate professor/postdoc/researcher (4.4 points). The proportion of publications at level 2 and in leading general medical journals with a high impact factor is also very high, 27% in 2010 (20 publications).

1) PHYSICAL ACTIVITY AND HEALTH

All major projects ongoing at the beginning of the previous plan period, HYRIM, MoRo, ODES, School Project at Sogn og Fjordane University College, Large & Active and ASTHMALIV, have been completed and a number of publications have been written. A total of 5 PhD candidates have defended their thesis during the period 2006-201 based on these projects.

Research activity in the area of physical activity and health has a long tradition at NIH. For the past ten years, the focus has been on the topics asthma, musculoskeletal injuries, weight, diabetes and cardiovascular disease. Several projects are currently underway to look at the effect of physical activity, endurance and strength training used for both preventive and therapeutic purposes at various levels in and outside the health service. The aim is to investigate the importance of different forms of physical activity and specific training (endurance, strength, mobility and motor skills - including balance) as health-promoting, preventive and therapeutic measures for various health problems, illness and quality of life. Larger studies include HEIA, FAM, FALC and EXCADI.

HEIA (The Health in the Adolescents study) is a 2-year randomized controlled trial among 11-year-olds that investigates the effect on healthy weight development through a comprehensive intervention. The FAM study is an interventional study of physical activity in Pakistani men investigating the effect on metabolic syndrome and risk factors for diabetes. FALC (Fitness, activity and lung cancer) is a randomized controlled trial where the purpose is to evaluate the effect of exercise on physical fitness and quality of life among patients who have undergone surgery for lung cancer. EXCADI (Exercise training in patients with coronary artery disease and type 2 diabetes) is a randomised controlled trial that aims to study the effect of one year of exercise on glycaemic control and atherosclerosis among patients with known coronary disease and type 2 diabetes. The project portfolio also includes two projects where the purpose is to study the effects of various lifestyle interventions with physical activity, dietary change and cognitive training among patients with morbid obesity. In a large study

(The Olympic Study) with participants from nine different European countries, elite athletes in both the Winter and Summer Olympics are examined for asthma, allergy and inflammatory markers from the respiratory system.

During the period 2006-2010, the group has received an average of about NOK 1.3 million per year in external funding, which among other things has funded 3 PhD positions in whole or in part.

The various projects mentioned above are carried out in close collaboration with other researchers both internally at NIH and at other institutions, such as NIH. Ullevål University Hospital, Sogn og Fjordane University College, Institute of Nutrition Research (UiO), Institute of Preventive Medicine (UiO), Voksentoppen Centre for Asthma and Allergy (Rikshospitalet) and the Norwegian Institute of Public Health. There are eight PhD fellows associated with the various projects.

Main supervisors in this area are Professor Sigmund Anderssen, Professor Jorunn Sundgot-Borgen, Associate Professor, Adjunct Professor Kai-Håkon Carlsen, Adjunct Professor Lars Bo Andersen and Adjunct Professor Ingar Holme.Trine Stensrud

2) MONITORING OF PHYSICAL ACTIVITY AND FITNESS

During the period 2006-2010, three large mapping studies of physical activity and physical fitness were conducted at SIM, commissioned by the Norwegian Directorate of Health. In 2005-2006, physical activity level and fitness were mapped objectively among a nationally representative sample of 2299 9- and 15-year-olds. This project has resulted in two PhD degrees. In 2008-2010, physical activity level (N=3464) and physical fitness (N=904) were surveyed among the adult and elderly part of the population (Kan1). Five PhD fellows are affiliated with this project and will defend their thesis during 2011-15. Both the child mapping and Kan1 are the start of a national surveillance system to follow the level of physical activity in the Norwegian population. Physical activity and fitness have also been mapped among 750 Home Guard soldiers. A PhD candidate is affiliated with this project. All three of the surveys mentioned above have resulted in national reports, and in addition a number of articles have been published in international journals. Several smaller studies have also been conducted during the period; Examples are Nordic monitoring of physical activity and several validation studies of accelerometers.

During the period 2006-2010, the group has received an average of about NOK 1.5 million per year in external funding, which among other things has funded 5 PhD positions in whole or in part. The group has income related both to commissioned research and to contributory research. The Norwegian Directorate of Health and the City of Oslo are two of the most important clients.

Main supervisors in this area are Professor Sigmund Anderssen, Adjunct Professor Ingar Holme and Adjunct Professor Lars Bo Andersen.

3) WOMEN, FITNESS AND HEALTH

Research in the field of women, exercise and health has in the period 2006-2010 consisted of two main areas:1. Basic and interventional research on the effect of specific and adapted exercise for women, controlled treatment studies and trials of preventive measures and. 2.Adverse effects of sports on female athletes.

Under point 1, a number of major collaborative projects were implemented during the period. An interdisciplinary pelvic centre has been established at Ahus and Professor Bø has served on the board of the centre. An NIH PhD candidate, a UiO PhD candidate and a master's student at NIH have been

associated with STORK Rikshospitalet on the projects Macrosome children, Physical activity and weight regulation in pregnancy and Pelvic pain and physical activity. The Norwegian Mother and Child Cohort Study (MoBa) at the Norwegian Institute of Public Health now has a database of 100,000 pregnant women and 80,000 fathers and follows pregnant women and their children until the age of 7. One PhD candidate from NIH and one from UiB are associated with this project respectively within physical activity and birth and, urinary incontinence. In addition, projects have been carried out in pelvic floor training and childbirth. The Pelvic organ prolapse (POP) study has been funded with approximately 1.6 million from the Extra Foundation Health and Rehabilitation. One PhD student from NIH and one from UiO/Ahus have been associated with the project. This project includes a lot of innovation in the use of 2/3/4-dimensional ultrasound to measure training effect on muscle morphology, in addition to a randomized controlled trial. During the period, NOK 9 million was also applied for and granted from the Research Council of Norway, the Programme for Clinical Research for a cohort study and randomized study of changing the pelvic floor and injuries after childbirth, as well as the effect of exercise after childbirth. The studies have been initiated at Ahus and are according to plan. One NIH research fellow and 2 UiO fellows are associated with the projects. A fourth collaborative project is STORK Groruddalen, where pregnant women with multiethnic backgrounds are followed through pregnancy until 6 months after childbirth. Data on physical activity, back and pelvic pain, and urine leakage were collected during the period. In addition, we include questions about physical activity in "Ahus about the birth", which is a cohort study with approximately 4000 pregnant women at Ahus. Data is collected during the period. A collaborative project with Modum Bad has also been conducted in which the motives for and effect of physical activity in long-term patients with eating disorders were investigated. A study aimed at testing the effect of two different weight reduction regimens on body composition was conducted in normal weight female athletes. For the latter studies, there have been a total of 2 NIH fellows, one of whom has been externally funded (NOK 1.8 million) and the projects have together had external operating funds of approximately NOK 1.2 million per year from NFR, OLT and Nycomed respectively.

Research under point 2 includes the projects: "Sport, health, body and performance", where an overall purpose is to test whether it is possible to prevent eating disorders in young elite athletes. Point 2 also includes the project "Low Energy Availability" among female athletes. The latest project is affiliated with the University of Copenhagen and aims to look at mechanisms related to the relationship between energy availability, exercise and menstrual status. The projects include an NIH PhD candidate and an external PhD fellow, as well as two master students from YWAM and NIH, partly funded by Olympiatoppen (NOK 1.8 million).

Main supervisors in this area are Professor Kari Bø and Professor Jorunn Sundgot-Borgen. Four PhD candidates and a number of master students graduated during the period. In addition to the Norwegian partners, PhD and master students have also been established at the University of Melbourne, Australia, University of Sao Paulo, Brazil, Stellenbosch University, South Africa and the University of Reykjavik, Iceland, the University Hospital of North Norway, the University of Copenhagen and the Bloomington Center for Counseling and Human Development, USA.

4) PREVENTION OF SPORTS INJURIES

Oslo Sports Trauma Research Center (The center) was established at NIH in 2000 as an interdisciplinary research environment in collaboration between the Department of Sports Medicine, the Norwegian School of Sport Sciences and the Department for Orthopaedic Traumatology, Oslo University Hospital. The centre's purpose is to prevent sports injuries through a long-term research programme focusing on risk factors, injury mechanisms and injury prevention measures with

particular emphasis on injuries in football, handball and alpine skiing/snowboarding. Since 2008, the goal has been expanded to include prevention of other health problems in sports.

During the previous planning period, the centre has had a steady budget increase from NOK 6.2 million in 2006 to NOK 10.3 million in 2010. Basic funding comes in the form of centre/environmental support from the Ministry of Culture (up to and including 2011) and the South-Eastern Norway Regional Health Authority (up to and including 2012), but the centre has also succeeded in attracting funding from other sources nationally and internationally. Among other things, the IOC has designated the centre as the IOC Research Centre for the Prevention of Injury and Protection of Athlete Health, one of four such research centres in the world, the only one in Europe.

Oslo Sports Trauma Research Center is led by Professor Dr. med. Roald Bahr and Professor Dr. med. Lars Engebretsen and currently involves 11 senior researchers and 16 PhD/postdoctoral fellows, as well as a number of master students and researchers from other institutions. At the end of 2010, there were about 100 projects at the centre, including the project on health problems such as eating disorders and heart disease. In the period 2006-2010, 8 candidates have completed their PhD degree.

The centre is a hub in the development of a national and international research network in the field, with project collaboration with research groups from Iceland, Denmark, Sweden, the Netherlands, Switzerland, Canada, Australia and the USA. The centre also has a significant dissemination initiative, including through the www.skadefri.no and www.klokeavskade.no websites.

Main supervisors in this area are Professor Roald Bahr, Adjunct Professor Lars Engebretsen, Adjunct Professor Lars Nordsletten, Associate Professor Tron Krosshaug, Associate Professor Thor Einar Andersen and Associate Professor Grethe Myklebust.

5) ACTIVE REHABILITATION OF MUSCULOSKELETAL DISORDERS

The Norwegian Centre for Active Rehabilitation (NAR) (www.aktiv-rehab.no) was established in May 2003 and is led by professor and physiotherapist May Arna Risberg. NAR's main objective is patient-centred clinical and translational research in active rehabilitation of patients with musculoskeletal injuries and disorders with emphasis on the thematic areas knee injuries, hip and knee osteoarthritis and osteoporosis. NAR has been established as a formal research collaboration between the Norwegian School of Sport Sciences, the Department for Orthopaedic Traumatology, Oslo University Hospital, and Hjelp24 NIMI. As of 31.12.10 there were 8 PhD candidates in NAR, two postdoc researchers, as well as a separate research coordinator. NAR had a budget of approximately NOK 6.4 million in 2010, including contributions from the three partners, as well as external funds from the South-Eastern Norway Regional Health Authority, the National Institutes of Health and Health and Rehabilitation.

Development and evaluation of the effect of rehabilitation programmes for patients with musculoskeletal injuries/disorders is the main focus area, in addition to evaluation and development of functional tests for patients with musculoskeletal injuries/disorders, and evaluation of predictive factors for development of functional ability after injuries. Furthermore, translational research through studies on mechanisms for functional change (biomechanical) related to active rehabilitation has been a priority area. NAR has an extensive national and international research collaboration, especially with the University of Delaware (Professor Lynn Snyder-Mackler) and the University of Southern Denmark.

6) FITNESS

The research field of Fitness is a new focus area at SIM; The area has been strengthened through an associate professor position (Lene Anette Hagen Haakstad) and a research fellowship. Research activity relevant to the field has been increasing, and in the period 2008-2010 4 master's projects have been completed with direct connection to Fitness. Recently, the study "Effect of new forms of activity" was started, a randomized controlled intervention study to look at the effect of exercise with BodyPump on strength and body composition in inactive women between 18-65 years. The project is internally financed by SIM.

The research field of Fitness is a new focus area at SIM; The area has been strengthened through an associate professor position (Lene Annette Hagen Haakstad) and a research fellowship. The aim is to conduct a) randomised, controlled trials that look at the effect of different forms of physical activity and specific training offered in the fitness industry (individual training, group activities, personal trainer, endurance/cardio training, strength, mobility, relaxation and mental training), and b) observational studies in relation to the industry to describe different aspects of participation, including exercise habits, motives and barriers to exercise, self-perceived physical fitness, social support and mental health.

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GOAL SETTING & MEASURES - TEACHING

SIM's main objective for the period 2011-2015 is to further develop the profession-oriented programme option at bachelor level in Physical activity and health and the master's and doctoral programmes that build on this to international top level. The goal for NIH Fitness part-time is to become the leading educational institution in the field in Europe by 2015 with 1000 students annually.

These goals are in line with NIH's Strategic Plan 2011-2015 for NIH, which states, among other things, that NIH will strengthen the quality and professional relevance of bachelor's programs and strengthen the quality of the master's programs. Another goal of the Strategic 2011-2015 is for NIH to conduct continuing education and training in priority fields relevant to society and sports. For SIM, this primarily applies to the Part-time fitness study.

BACHELOR'S DEGREE PROGRAMME IN PHYSICAL ACTIVITY AND HEALTH

In light of the ongoing work on NIH's revision of the first year of the bachelor's programme, which includes an optional specialization of 15 ECTS, SIM has initiated a revision of years 2 and 3 for the bachelor's programme in Physical activity and health. The aim is for the new curriculum to be further developed to strengthen professional orientation and to enter into force in autumn 2012. It is also a goal that the study revision should be adapted to the qualifications framework, i.e. describe the learning outcomes that all candidates who have completed the programme should have at the end of

their education in terms of knowledge, skills and general competence. The work on a new curriculum is expected to be completed by the summer of 2011.

In order to achieve the goal of a better learning outcome and clearer professional orientation, it is assumed that new and more student-active teaching methods will generally be introduced, such as problem-based learning, more case-based teaching, e-learning, discussion forums, etc. The goal is to develop problem-based learning methods based on "paper cases" and real clients, ideally also a number of cases that can be utilized in several courses to practically cover different issues and perspectives. We also see a need to give students more writing practice in the form of a comprehensive plan for assignments throughout the various FAH-related courses. Emphasis is also placed on evaluation in the form of presentations, to give students practice in collecting, evaluating and disseminating research-based knowledge based on principles from evidence-based medicine. One goal of the revision work is also to ensure a more comprehensive and efficient utilisation of different examination forms, adapted to the subject in question.

The module Vocational Practice is of significant importance in the profession-oriented bachelor's programme, and has in the previous plan period been extended from 2 weeks to today 6 weeks duration, 3 weeks in the private sector and 3 weeks in the public sector, added to the last semester. One goal is to strengthen the connection between practice and theory through critical reflection on one's own practical experiences.

Furthermore, efforts will be made to further develop interest in and competence in health-related physical activity among other teaching personnel at NIH. This also means that for new appointments in adjacent disciplines – e.g. physiology/exercise theory, psychology, nutrition and activity subjects – one must search for personnel with a background in health-related research and practice.

SIM will continuously work for a further development of the programme through continuous evaluation of all courses rooted in the quality assurance system. It is a priority to follow up the evaluations throughout the planning period to ensure that necessary measures are implemented without delay.

It is a goal to strengthen the marketing of the programme and graduates to potential employers in the public and private sectors, so that they are well acquainted with the candidates' qualifications. Furthermore, SIM will work to ensure that the bachelor's programme in Physical Activity and Health is approved as an authorized professional education as health personnel.

SIM aims to maintain a high bachelor's degree graduation rate of over 80% throughout the plan period.

MASTER'S PROGRAMMES

SIM has on several occasions had spare capacity for implementation and supervision of master's students. SIM aims to admit a minimum of 15 and preferably 20 master students in Physical Activity and Health each year, and 20 master students in Sports Physiotherapy every other year.

The department aims to maintain a high graduation rate on the master's programme of more than 80% throughout the planning period, without seeing a need for significant revision of the study or course description. The goal is also for several of the master's theses to have a scope and quality that indicates that they can be published in international journals.

INTERNATIONAL EXCHANGE

The department will work to make bachelor's and master's degree programmes attractive to foreign students. This means that throughout the planning period we will work for a gradual restructuring of teaching from Norwegian to English, which must be adapted without affecting Norwegian students' application to their studies. In particular, teaching in English is relevant for the most central FAH-specific courses, especially where we at NIH have special expertise and which will be of international interest.

Exchange of students and faculty will take place via established agreements with recognised international institutions, such as the Erasmus programme in Europe. It is an objective to focus on selected institutions where cooperation is carried out in both education and research.

FITNESS DELTID

In order to achieve the goal of strengthening NIH Fitness part-time, we will primarily focus on close follow-up and quality assurance of our lecturers and examiners through seminars, evaluation meetings and courses. We will hold at least one large gathering with all lecturers each year, examiner sessions for all courses each year and up to two seminars per year. We also work continuously to recruit professionally skilled and updated lecturers with both formal and practical competence, as well as to coordinate lectures/lecturers centrally and decentralized (cities other than Oslo). Continuous improvement and quality assurance of teaching, e-learning, curriculum and examination forms are also emphasized. It is a priority task to follow up the evaluations from the programme coordinator of the various course outcomes and initiate necessary measures to improve the student's learning outcomes and ensure that there is progression in all topics.

It is also a goal of Fitness part-time to get an increased collaboration with other disciplines at NIH, monitor / follow up the international market through participation in congresses / meetings, as well as have close industry contact with the major chains and the fitness association.

In the autumn of 2011, the NIH fitness convention will be held for the first time. The goal of the NIH Fitness convention is to make it possible for everyone who works in both organized fitness activities (the school sector, sports teams, corporate sports teams and various sports clubs) and non-organized fitness activities (self-training, private training parties/groups and commercial gyms) to annually have the opportunity to update themselves on the latest research, try out some of the latest in various training concepts and participate in an independent forum where they can meet others with similar interests and jobs. The goal is 1000 participants, and there are activities in three group gyms, a bike hall, PT zones, practical workshops, in addition to ongoing lectures with subject matter and news. There is no one else in Norway who has the opportunity to present such a professionally strong program and with so many of the very best researchers and professionals.

In addition, Fitness arranges part-time work every year in all cities in Norway with topics, a professional day or topic evening, where different speakers with different topics and current issues are invited to present. The professional day(s) is aimed at everyone who works with personal training, training guidance, and training of groups, either for music in the saddle, with indoor cycling or other group training concepts. There are also many exciting and relevant topics for physiotherapists, health and exercise therapists and several other professional groups working with health and fitness. The goal is to increase support and ensure satisfied participants at these academic days so that they appear as good marketing of NIH's study programmes.

GOAL SETTING & MEASURES - RESEARCH

For the period 2011-2015, SIM's objective of international excellence in research communities within the five key research areas – 'Physical activity and health', 'Monitoring of physical activity and fitness', 'Women, exercise and health', 'Prevention of sports injuries' and 'Active rehabilitation of musculoskeletal disorders' – is maintained so that these stand out as international leaders in both research and research-based dissemination. The department also aims to develop the new research area within Fitness to the same level during the next period.

These objectives are in line with the main objectives of the Strategic Plan 2011-2015, which states that NIH shall conduct research of high international quality and with clear societal relevance, and that NIH shall focus on research within: 1) Training and performance development in recreational and elite sports, 2) Relationships between physical activity, health and quality of life in the population with a special focus on the low-active and inactive, and 3) Content and effect of physical education and physical activity in everyday school life. Other objectives of the Strategic Plan are for NIH to increase the scope of externally funded R&D in the priority fields and strengthen the quality of doctoral education and increase throughput.

Oslo Sports Trauma Research Center has arranged semi-annual workshops for all involved employees since 2000, and since spring 2005 the seminars have included all SIM's employees. The purpose has been to quality assure the department's research projects, and to ensure mutual exchange of information about ongoing projects. Normally, 2-4 foreign and 4-6 Norwegian well-established researchers with relevant expertise have been invited as external critics. The seminars have been very successful and are considered to be a critical success factor in achieving good quality research. The PhD candidates also gain useful experience in presenting and discussing their own projects and results. In addition, the seminars have an important milestone function for each project manager. Such seminars will be an important measure to ensure the quality and progress of the department's research also in the next planning period.

1) PHYSICAL ACTIVITY AND HEALTH

The objective for the period 2011-2015 is to increase the scope of research activity, focus research activity on dose-response ratios and maintain high research quality.

Total amount of physical activity (a combination of intensity, duration and frequency) is related to various health variables in a dose-response relationship. The dose-response relationship between physical activity level and health benefit (risk reduction) appears as a continuum that does not appear to have a lower limit. Thus, it can be argued that all activity is better than none. However, the different health variables (e.g. in terms of insulin sensitivity, mental health and blood pressure) have somewhat different dose-response relationships, but this has not been sufficiently studied. The department will work to obtain greater knowledge about dose-response relationships and health benefits, primarily aimed at the so-called lifestyle diseases. Knowledge of this will form the basis for developing specific recommendations on physical activity for different age and patient groups. In the period 2011-2015, a comprehensive project will therefore be prepared with the aim of increasing knowledge about the dose-response relationship and various health outcomes. The project aims at a broad-based collaboration nationally (NTNU, UiO, HiSF) and multinationally. In addition, in the coming years, WHO and the UN will focus on the four largest non-communicable diseases (cancer, cardiovascular disease, diabetes and respiratory diseases). The studies mentioned above (HEIA, FAM, FALC and EXCADI) revolve around these.

In addition, a larger respiratory project for young athletes with collaborators from the University of Porto, UiO and the Norwegian Institute of Public Health is planned. The purpose will be to investigate how different environmental factors affect the development of bronchial hyperreactivity in athletes and possibly new treatment regimens for different phenotypes of asthma. The project will involve animal testing.

During the planning period, it is desirable to expand cooperation with national and international research environments such as the Faculty of Medicine at NTNU and UiO, as well as the University of Southern Denmark. Furthermore, it is desirable to continue cooperation with other departments at NIH. In recent years, the communication of the importance of physical activity and health has been extensive, but random and to some extent unclear. There is a clear potential for improvement, and it will therefore be a goal to prioritise dissemination. In this context, closer cooperation with the information department is desired.

Research activity in the field is mainly financed by funds from the Southeastern Norway Regional Health Authority, Health and Rehabilitation, RCN and the various institutions' contributions. In order to achieve the goals, it is essential to seek funding from relevant sources nationally and internationally. Strategically and economically, it is also important to develop cooperation with the larger companies in the private sector.

2) MONITORING OF PHYSICAL ACTIVITY AND FITNESS

Regular monitoring of the level of physical activity and fitness in the population is necessary. This is necessary, among other things, to assess the population's habits, to be able to evaluate the effect of various measures, and to be able to intervene if the activity level should decrease with time. The monitoring system that NIH – commissioned by the Norwegian Directorate of Health – started in the previous plan period is unique in that it provides objective data on physical activity and physical fitness in a nationally representative sample of children, adolescents and adults. As far as we know, such a system does not exist in any other country in the world.

In 2011-2015, the goal is to conduct two new mapping surveys; one among children and adolescents and one among adults and the elderly. These surveys will have a mixed design, where parts of the sample are followed longitudinally while new cohorts are included. In this way, both longitudinal and secular trends in activity and physical fitness will be mapped. It is also a goal to map activity in groups where there is little knowledge, such as among immigrants.

Good objective measurement methods for physical activity are important when the activity level is to be mapped. It is important to keep up with the development of measurement methods and to conduct good validation studies. The expertise of the group is in demand both from other academic staff and from society in general. Based on this, the goal is to establish a competence centre for mapping physical activity and fitness. This centre will carry out research projects that are both self-initiated and projects commissioned by external actors. In addition, the centre will develop web-based tools that can be of help to help researchers both with regard to choosing a method for measuring physical activity and the development of programs for reducing and analysing accelerometer data. There is a need to develop database solutions that make it easier to systematise and process data, and the department therefore prioritises its own funds for a project position as a database engineer at SIM. The goal is to become a leading competence center in measuring physical activity internationally.

The group has a large network of contacts both nationally and internationally, and this must be maintained. Moreover, from the survey of adults and the elderly, it proved difficult to recruit

participants. In the period leading up to a new survey of the adult population, it is therefore important to investigate different strategies for recruiting participants. In order to achieve the goals, it is also necessary to have more highly skilled employees. During this period, two senior researchers should be employed, one of whom will be externally funded. It is also a goal to graduate six PhD candidates and hire three new PhD candidates during the period. The aim is to increase the level of external research funding compared with the previous period, from an average of NOK 1.5 million annually.

3) WOMEN, FITNESS AND HEALTH

In the area of Women, exercise and health, the objective is to maintain and maintain the international top level in the two main areas: 1) Research on the effect of specific and adapted training for women, controlled training studies and treatment studies and testing of preventive measures as well as the effect of exercise aimed at promoting health and quality of life with particular focus on pregnancy and after childbirth and 2)Harmful effects of sport on female athletes mainly on the the female athlete triad; eating disorders, menstrual disorders and reduced bone mass.

Many of women's diseases and ailments occur in connection with pregnancy and childbirth (weight gain, back and pelvic pain, diabetes, high blood pressure, preeclampsia, depression and symptoms of pelvic floor dysfunction such as urinary and faecal incontinence, pelvic prolapse, pain and sexual dysfunction). Most women give birth and almost all are in contact with the health services both during pregnancy and in connection with childbirth and check-ups. This provides an opportunity to reach all women with early health education, physical activity and specific training and treatment. The women's health community has worked consciously for many years to include questions about physical activity in large Norwegian surveys such as "The Norwegian Mother and Child Cohort Study, Norwegian Institute of Public Health", "Embrace of Birth", Akershus University Hospital and STORK Groruddalen, UiO. It is an important objective for the period to be able to utilise this data with new masts and PhD projects. Another important objective is to carry out the large RCN study "Effect of pelvic floor exercises after childbirth on primiparous women with and without pelvic floor injuries" and provide new resources to utilize the collected ultrasound data on muscle morphology both in this study and in the previous POP study.

With regard to triad-related problems in female athletes, the women's health community has mapped the scope, identified high-risk sports and recorded consequences associated with the use of extreme weight reduction methods. Knowledge related to risk factors is very limited, and for this reason during this period special focus will be placed on a project where the purpose is to map the possible significance of perfectionism for the development of eating disorders (Collaborative project with the University of Nord Norway and the University of Lund). Knowledge is also limited when it comes to preventing triad-related problems. A comprehensive intervention project "Is it possible to prevent eating disorders in sport", which includes the total population of young elite athletes, could help to provide some answers to what might have a preventive effect.

Low energy availability has been the presumed most important factor associated with menstrual disorders and low bone mineral density (BMD). However, there is no research-based knowledge when it comes to recommendations regarding the lower level of the proportion of fat a female athlete may have to maintain a regular menstrual cycle. There is a need for research here, which is also ongoing via the project "Low Energy Availability", but there is also a need to find the most valid (and practically suitable) method for measuring fat mass in elite athletes. The women's health environment will therefore be part of an international multicentre study where we will compare an ISAK protocol (caliper) with ultrasound. This in turn in order to recommend which measurement

methods should be used in the assessment and assessment of practitioners, among other things. This project is carried out by an international expert group where the women's health community is represented (IOC BCHP-group).

Both of the two main areas are of great importance to health economics, and the potential for prevention and treatment with adapted training is great. The principles and models applied to elite athletes in weight management and triad issues will, if they have an effect, be applicable to other population groups. In addition, the use of evidence-based exercise science may also have an increased effect in the health sector, for example in all areas of pregnancy and postpartum. Six NIH research fellows and 6 defendants at other universities are planning their dissertation in the period 2011-2015.

Currently, about 35 projects related to Women, Exercise and Health are ongoing. In order to exploit and publish from ongoing projects, we depend on a large number of master's students, PhD candidates and, not least, postdoc positions. Specifically, there is a need for 6 PhD and 2 postdoctoral positions. There is a need for an adjunct professor position in gynaecology to provide the group with specialist expertise and strengthen their supervision capacity. Strategic measures to achieve the objectives will be to apply to Health and Rehabilitation, South-Eastern Norway Regional Health Authority and RCN for PhD and postdoc positions in exercise during pregnancy and pelvic-related pain (pelvic pain), pelvic floor dysfunction and the connection between physical activity and various conditions for mother and child. During the period, an application for strategic funding/Center of excellence will also be planned and submitted in collaboration with the Pelvic Centre at Ahus for more general research funding in this area.

In the coming period, we will further develop our work with our partners internationally. These include University of Mastricht, University of Iceland, University of Melbourne, University of Sydney, University of Montreal, University of Sao Paulo, Stellenbosch University, Stanford University, University of Utah, Lund University, University of Copenhagen, University of Graz and University of Bloomington. Nationally, we will continue our collaboration with Akershus University Hospital, St. Olavs Hospital, the University of Tromsø and Modum Bath.

4) PREVENTION OF SPORTS INJURIES

The goal for the period 2011-2015 is to increase research activity at the Oslo Sports Trauma Research Center from its current scope with an annual budget of about NOK 10 million while maintaining high research quality.

Injuries and illness constitute an important limitation for training and performance development, both in recreational and elite sports. Since its establishment in 2000, the Oslo Sports Trauma Research Center has generated new and important knowledge about risk factors and mechanisms for sports injuries, especially with regard to serious acute injuries of the lower extremities in handball, football and alpine skiing. The centre has also developed and documented the effectiveness of preventive training programmes for such injuries. However, a number of questions remain. We know little about which athletes are particularly vulnerable to injuries, what characterises these athletes, and whether and how they can be identified through screening tests. We also know little about which components prevention programmes should consist of and what properties they should focus on. In the coming planning period, we will therefore focus further on studies that can provide increased knowledge about risk factors, the effect of various prevention exercises and studies on injury mechanisms. This is done, among other things, through the continuation and development of two larger, ongoing cohort studies in football and handball. These and similar studies are also important for improving existing

loss prevention programmes. This will enable us to tailor exercises and training programs to the individual and better understand the mechanisms for changes.

Current methods for registration of injuries primarily capture acute injuries. We assume that repetitive strain injuries in some sports can be just as big a problem as acute injuries, but knowledge about them is limited. There is hardly any research on the prevention of repetitive strain injuries. Another main goal for the period is therefore to develop good methods for registering strain injuries in sports. Based on these, the aim is to conduct prospective cohort studies to map the extent and risk factors for repetitive strain injuries in different sports with the aim of developing effective prevention programmes and testing these in larger randomised trials. Initially, we will use shoulder problems among handball players as a model.

Since 2008, the centre has expanded its research portfolio to include the prevention of disease and other health problems among athletes, initially focusing on heart disease and eating disorders. It is a goal to continue and strengthen this investment in the coming planning period.

Since its establishment, the centre has carried out a number of projects with partly large and complex data sets, without having the capacity or expertise to establish good database systems for handling these. There is a need to develop database solutions that make it easier to systematise and process data, and that make it possible to 'reuse' solutions developed for a project in later, similar projects, and the centre will therefore contribute to the employment of a database engineer at SIM.

During the planning period, it is desirable to strengthen cooperation with international research communities in the form of project cooperation and exchange of personnel. It is desirable to continue and further develop the collaboration with the Department of Physical Performance and the Department of Coaching and Psychology. The department will continue to prioritise the dissemination of research-based knowledge on the prevention of sports injuries to sport and the general public, nationally and internationally. It is a goal to engage international partners such as the IOC to contribute to translating and adapting www.skadefri.no to multiple languages and sports.

Oslo Sports Trauma Research Center is largely funded through centre/environmental support from the Ministry of Culture and the Southeastern Norway Regional Health Authority. In order to increase the level of activity throughout the period, the Oslo Sports Trauma Research Center will continue to seek funding for the centre and individual projects from all relevant sources nationally and internationally. Part of this work will be an application to RCN as a Centre of Excellence (CoE) in collaboration with NAR and the cartilage research community at Oslo University Hospital. Strategically and financially, it is also important to further develop cooperation with major international sports organisations such as the IOC, FIFA and FIS.

5) ACTIVE REHABILITATION (NAR)

The objective of this research field within active rehabilitation in the period 2011-2015 is to develop the research field also to include health and lifestyle. Furthermore, the goal is to increase research activity within musculoskeletal disorders with an annual budget of approximately NOK 6 million in 2010, in addition to having a goal of focusing specifically with a postdoctoral fellow and a PhD candidate in health and lifestyle during the 5-year period.

Knee injuries (mainly ACL, meniscus and cartilage injuries) currently account for a large proportion of injuries in the musculoskeletal system, and knee injuries are one of the biggest risk factors for the development of knee osteoarthritis. Early rehabilitation of knee injuries appears to be of great importance also for long-term results, particularly for the development of knee osteoarthritis. One of

the major knowledge gaps lies in understanding what the various exercises and what dose-response means in the work to regain function after injury and prevent strain injuries. With the development of new measurement methods today within MRI (also with contrast: dGEMRIC) to measure changes in cartilage quality, we will in a completely new way be able to acquire new knowledge about the consequences of exercise and rehabilitation in the short and long term.

Another major knowledge gap today is the importance of exercise and rehabilitation for both hip osteoarthritis and knee osteoarthritis patients. Over the next few years, our large, ongoing prospective clinical cohort studies will be able to provide us with new knowledge about predictive factors for the development of knee and hip osteoarthritis. Translational research through the use of movement analysis and specific muscle function measurements (EMG and isokinetic strength) will increase knowledge about mechanisms for changes after injuries and strain injuries and the effect of various rehabilitation programmes.

Our contribution to active health and lifestyle rehabilitation will be linked to prospective clinical trials (including efficacy studies) of patients with cardiovascular disease and patients with morbid obesity.

Furthermore, it will be an overarching goal to further develop our national and international research network and work to disseminate our new knowledge so that it can be implemented to an even greater extent to the field of practice. To achieve this further development, we will continue to work on annual research applications, and in particular work to apply for funding through applications such as Centre of Excellence in collaboration with the Oslo Sports Trauma Research Center and the cartilage group.

6) FITNESS

The fitness industry is constantly changing and there is currently very little documentation on the effect of the various forms of training the fitness industry offers its customers, as well as knowledge about what characterizes those who train at a fitness center. There is currently ongoing research at NIH that is relevant to various topics in the field of Fitness. For the next period, however, the goal is to establish research on a larger scale that is even more fitness-specific.

The aim is to focus on three main areas: demographic research, activity-oriented research focusing on the effects of various activities, and monitoring of new forms of activity. The demographic research will include both organised and non-organised fitness activities at all levels, while the activity-oriented research will mainly focus on private gyms/groups and commercial gyms.

Under the aforementioned fields, we will have the following academic focus in the next period:

A) ACTIVE LIFE: Health behavior, activity habits and physical inactivity. Who, what and why?

The main objective of this research project is to conduct a comprehensive mapping of factors associated with health behaviour, activity habits and inactivity including: demographic and psychosocial variables, activity level and pattern, motives, barriers and preferences for physical activity. Who does not participate, what do they participate in/want to participate in, where, how often and why/why not? The goal is to understand and explain as many aspects as possible of being physically active/inactive, as well as being able to transfer and use this knowledge in practice.

This survey will also include members, as well as former members who stopped exercising at gyms to identify factors associated with being and not being regularly active at gyms. In addition, we will follow new members at the gym for 12 months to look at changes in both psychological (mental health and quality of life) and physiological variables, as well as what characterizes those who manage

to become regularly active (support) and those who stop exercising (dropout). A research fellowship is planned for this project, and funding is sought both internally and externally (Research Council, Health and Rehabilitation etc.).

During the next period, it is desirable to expand ACTIVE LIFE and also include an RCT that looks at dropout issues in the fitness industry, where the goal is to look at whether goal-oriented and motivating conversations to new members can reduce drop-out and the proportion of people who quit the gym. Here, too, a possible PhD candidate is being considered, and funding will be sought both internally and externally (Research Council, Health and Rehabilitation etc.).

B) Effect of various activities offered in the fitness industry

The first project in this field aims to look at strength effects and change in body composition for inactive women between 18-65 years of age after 16 weeks of training with BodyPump, which is compared to a similar inactive control group in a randomized controlled trial. The study will also measure energy expenditure during one session with BodyPump. At the same time, the project will investigate the effect of having a personal trainer. This project is already underway with a PhD candidate (Anne Mette Rustaden) who is internally funded by NIH, and during the period it is a goal to initiate several similar effect studies.

In total, the goal is to receive funding for 3 research fellowships associated with the field of Fitness during the period 2011-2015, at least one of these fully funded by NFR. During the period, efforts will also be made to further develop the research group, through increased collaboration with other departments at NIH, other academic groups on SIM, recruitment of students (master's) and an increasing number of PhD candidates.

SIM will earmark the profits from part-time fitness, 75% of which accrues to the department, for research on fitness through funding fellowships and other project costs. The goal for the period is that the profits in their entirety are transferred to SIM and fitness-related research, so that NIH can establish itself as the leading academic community nationally. For the research fellowships in the projects mentioned, funding is also sought both internally and externally (Research Council, Health and Rehabilitation etc.).