

INFORMATION ABOUT THE HOST INSTITUTION

Host institution

Norwegian University of Science and Technology (NTNU)

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ABOUT THE CENTRE

Name of Centre

SCOPE – Center for Excellence in Medical Education

Is the Centre already established at the time of the application (yes/no)? \Box Yes \boxtimes No

Please name any consortium partners for the Centre

Faculty of Medicine, NTNU (host faculty) and Faculty of Health and Social science, NTNU (these two will merge into The Faculty for Medicine and Health Science from 1/1-17). NTNU Educational Development Unit



ABSTRACT

The vision of SCOPE is to foster lifelong learning for improved public health and patient care. Our aim is to develop educational models to strengthen students' awareness of how practices can be reshaped by research and give students confidence and capacities needed to challenge established practices. In short, we will enable the students to initiate change. Our strategy is to facilitate student involvement and learning in how to ensure that clinical practice is continually updated, based on new knowledge. The Centre will focus especially on skills in receiving and giving supervision and assessment methods mirroring real life situations. The result will be practitioners that are even better at regenerating their skills, who are highly motivated and able to update their knowledge to cope with widely varying work situations. Our work will be relevant for the health sector in general, other health education providers and for higher education in other fields.



APPLICATION DOCUMENT

The application must be written in English and follow the requirements set in this template. It must not contain more than 10 pages in Times New Roman, 12-point types, with lines spaced 1.5 and margins of 2 cm. Within this format, the applicant must provide:

a) Documentation of educational quality in existing provision

The applicant must comment and critically reflect on themes and questions set out in the criteria, and compare their existing provision with similar provision within the same subject/discipline area, both nationally and internationally. Through this, the applicant must document that the academic community qualifies as a Centre for Excellence in Education.

b) A centre plan

The applicant must comment and critically reflect on themes and questions set out in the criteria. The Centre Plan must outline the vision of the Centre, its strategy and plans. It must present the plans for the dissemination of knowledge and practices to its own institution(s) and to other educational communities as well as an evaluation and impact framework.

Appendices

The following appendices must be included (and no other):

- 1. A list of references
- 2. A budget for the Centre for the first five-year period, including motivation for costs (see guidelines at <u>www.nokut.no/SFU/utlysninger</u>)
- 3. An action plan for the Centre, including milestones (no more than three pages)
- 4. CVs of the proposed Centre Leader and two to five key members of the Centre team (each CV must not exceed two pages)

All appendices must be in English.

Practical information

The rector of the host institution must sign the application.

The deadline for submitting applications is set in the announcement of the call.

All applications will be published on the NOKUT website, alongside the expert panel's feedback.

APPLICATION DOCUMENT

Vision: Fostering lifelong learning

This application concerns a central aspect of all professionally oriented programmes in higher education: how to foster lifelong learning. Having had a focus on transformative learning for more than two decades, we are in a position to stimulate teaching excellence and take educational activities in this area to a new level. We will first argue for the need to focus on fostering lifelong learning in higher education, present our vision and then specify why this is important in medicine and what we want to achieve.

The future is unknown and this creates constraints and possibilities for what we do. In their future workplaces, students from professionally oriented programmes will need to acquire an unforeseeable range of new knowledge and skills. Thus, we must prepare students to cope with the unknown and build their capacity to learn in situations beyond the safe boundaries of traditional teaching formats. Traditional teaching formats tend to drive compliance, not initiative. They can foster learners' dependency on teachers and the teaching situation, and also risks making the students reluctant to look beyond the current orthodoxy, rather than becoming confident in finding new solutions. This is, however, a backward looking perspective, where students are exposed to past achievements, rather than what is needed or unknown.

The vision of SCOPE is to achieve excellence in practice, research and innovation in medical education, in order to foster lifelong learning for improved public health and patient care.

The medical field changes on a daily basis. New research replaces old knowledge, with a consequent need for constant professional updating. Societal changes, such as the ageing population, increases in chronic conditions and migration require adaption to new working situations. As will be described below, we have long experience in transformative learning with a Problem Based Learning (PBL) curriculum, and our medical students are, therefore, already well versed in the skills needed for lifelong learning. However, we still see a need to take this further. We want to extend lifelong learning by developing and deploying innovative educational activities. **The expected result from this will be medical practitioners that are even better at learning and regenerating their skills, who are highly motivated and able to update their knowledge to cope with widely varying work situations. We must therefore strengthen our activities for building students' capacity, and refine our educational practices accordingly.**

Our teaching today has one major limitation. Students are extensively exposed to established best practice, but do not learn how to drive the evolution of practice on the basis of new knowledge. Our aim is therefore to develop our educational model to strengthen the students' awareness of how established practices can be reshaped by research and to give them the confidence and capacity to challenge these practices.

In short, we will enable the students to initiate change.

DOCUMENTATION OF EDUCATIONAL QUALITY IN EXISTING PROVISION Input factors

The Faculty of Medicine (DMF) at NTNU was established in 1975 and has offered a full 6-year medical doctor programme since 1993. DMF has 720 medical students, 800 students in other programmes and 400 PhD candidates (the ongoing merger, with three university colleges offering a range of health care courses, will add 2000+ students). The medical doctor (MD) programme is one of the most sought after study programmes in Norway and NTNU has the highest grade point average for admission of all Norwegian MD programs. Our campus is integrated into St. Olav's Hospital and primary health care services, providing learning spaces for students, research facilities and staff offices within the clinical spaces. Thus, research, clinical and academic functions are intertwined, exposing students to the work field on a daily basis. The learning environment also includes a self-developed electronic schedule linking e.g. learning outcomes and learning materials from our own repository to each scheduled activity. The students have access to the same extensive range of international journals, e-books, databases etc. as the staff.

DMF has 1200 employees with 315 in permanent scientific positions, comprising 156 full time equivalent staff (66% are professors). The Faculty has a long tradition of excellence in research, including the 2014 Nobel Prize in Physiology/Medicine. DMF currently hosts two Centres of Excellence in Research (SFF) and one Centre of Excellence in Innovation (SFI) in addition to six other major research centres. In 2015, 1012 scientific papers were published and an average of 70 PhDs are awarded annually. The Faculty has a long history of engagement in medical education research, on which the Centre will build.

The majority of the teachers at DMF have combined positions as academics and clinicians, ensuring close connection with the field of practice. Formal pedagogical training is a requirement for permanent employment. A self-developed course in facilitating PBL groups has been run for more than 20 years, training 30 staff members and 40 students annually, as well as external participants. We offer a number of courses for staff to enhance their pedagogical competence, such as Team Based Learning (TBL), how to write cases for Multiple Choice Questions (MCQ), etc. We are currently building a standardised patient pool for clinical examinations and have developed a programme for training volunteers, including children, to enact patient situations. DMF hosted the large AMEE (Association for Medical Education in Europe) conference in 2007 and we present several papers at this conference every year. Through cooperation with all Nordic MD programs

and 27 other international MD programs, 40% of our students go on exchange in the fourth year, which is taught in English to accommodate international students. We collaborate with Dhulikhel Hospital in Nepal on a summer school where 15 students have clinical rotation.

Due to our study model and the large number of staff in combined positions, 400 teachers are involved in delivering the MD programme (excluding practice placements etc.). Maintaining the comprehensive quality of the programme is a continuing challenge, and the success of our study model is greatly dependent on managerial competence. After a programme evaluation in 2014, we increased the Programme leader position from 25% to 100%, and appointed leaders for each study year in 50% positions. The Faculty has also allocated more resources to the development of assessment and PBL quality, and the Centre will build on and extend this work.

The vision and plans for the proposed Centre have grown out of a joint initiative from management, students and the academic community, mainly based on an analysis of the current situation following the programme evaluation in 2014. Educational quality is part of the Faculty's long-term strategic plan. In 2015, more than 1m NOK was allocated to educational development projects, and 2 PhD positions in medical education research were funded from the Faculty's budget. The Centre will be placed within our Teaching and Learning Centre, PLUS, which was established in 2015 to facilitate pedagogical development and educational quality across all the Faculty's study programmes (including the new 6 new health professional programs after the NTNU merge). **Process factors**

The MD programme employs a complex integrated curriculum model with spiral learning, and subject and discipline integration. The programme has from the start been oriented towards transformative learning, actively engaging students in identifying problems and finding answers. To achieve this, PBL in small groups constitutes the backbone of the pedagogical model. In a PBL-session, students choose their own learning objectives, organise the work and identify relevant research literature in order to solve the problem. Instead of a fixed syllabus, there is a set of comprehensive learning outcomes and all learning activities must be linked to these. All academic staff are researchers as well as teachers, and the majority are also clinicians. Teachers base their teaching on the desired learning outcomes, published research and prevailing clinical methods, and suggest reading material. Consequently, students are exposed to research through lectures and reading, and thus have to decide for themselves what to take from the literature. Importantly, we have an integrated research programme, which admits 10% of the students annually. This adds one year to the MD programme, during which time the students complete half of a PhD.

Traditional lectures are designed to provide overviews of new and complex topics. We are, however, working to reduce the number of lectures, and student-centred methods, such as team

based learning and flipped classrooms, are gradually being integrated. Single-topic lectures are also gradually being replaced by seminars in which two or more lecturers from different specialities collaborate.

Many MD programmes will not allow students early patient contact. At NTNU, however, early patient contact has been a key feature from the beginning and is highly appreciated by the students. Our students meet patients from day one in our Doctor-Patient Course and they learn to communicate, examine and prescribe treatment for real patients with an increasing degree of independence throughout the programme. We are among the best when it comes to giving our students practice based training, but we want to be even better. We also employ simulation exercises and training on mannequins, to allow the students to practise skills in a safe environment. Simulation exercises are also used to bring students from different health professions together to practice collaboration in realistic clinical settings.

Student assessment reflects our study model of subject integration; i.e. summative assessments integrate basic science with clinical cases. We have changed to the method of MCQ with single best answer, as research has shown this to be a reliable way of testing medical knowledge when done correctly (100 MCQs with 40 on knowledge and 60 on reasoning in each exam counting for 60% of the grade). A 'short cases' component allows for more testing of reasoning skills. For clinical skills, we have recently conducted a pilot replacing practical exams with Objective Structured Clinical Examination (OSCE), which is more reliable and tests a broader set of clinical skills. Additionally, communication skills, inter-professional group work, public health and clinical long cases are also subject to summative assessment, along with a research paper equivalent to a master's thesis.

In terms of formative assessment, PBL provides students with continual feedback on group dynamics and acquisition of methodology skills. A central aspect of PBL methodology is self- and peer assessment of teamwork skills, which is included and reported on, by fellow students and supervisors, in every PBL session. Similarly, the doctor-patient course provides feedback and supervision on communication and clinical skills, in addition to a mid-term evaluation. The doctorpatient course and other activities also involve self- and peer assessment, e.g. using taped student consultations with real and simulated patients. During clinical rotation and practice placement, the students receive feedback and supervision on clinical skills acquisition.

Although scoring very high on student satisfaction, our programme, in common with the other MD programmes in Norway, has been criticised for the amount and quality of feedback to the students, particularly feedback on clinical skills acquisition. We have taken steps to address this, and are implementing improvements in the practice placement periods, in collaboration with local

hospitals. Supervision and feedback are among the issues the Centre will address.

Student involvement is central. Reference groups, which are part of NTNUs quality system, are the main vehicle for student feedback. The reference group reports are a significant part of the annual quality report to the programme board, which is responsible for overall programme quality. The students also systematically evaluate each PBL case, the practice placements and assessment quality. They have permanent places on the Faculty Board, the Programme Board, and on the Dean's and the Programme leader's advisory boards, and there are student representatives on a range of other committees, including all committees working on curriculum development.

Outcome factors

Our study programme, as with other medical education programmes in Norway, has a very low dropout rate. Approximately 95 % of our students graduate and about 90% finish within the estimated time. Nearly all students go on to work as doctors or continue with a PhD.

Our students and alumni report that our programme has a very high relevance for the practice field. This is in line with feedback from employers who have high regard for students from NTNU, especially because of their experience in identifying their own learning needs, specifying learning objectives and researching relevant literature in order to find solutions to medical problems. They also say that that our students communicate efficiently and empathically with patients and their relatives, as well as with colleagues. We have won educational awards and been candidate to NOKUT's "utdanningskvalitetspris". Our medical students are more likely to go into general practice (GP) than students from any other Norwegian university. We think this is partly because we prepare doctors to undertake clinical practice immediately upon graduation, and to engage in continuing professional learning, as GPs work more independently and with more responsibility for the totality of patients' treatment than other doctors.

CENTRE PLAN

Strategies and plans for educational development and innovation

The magnitude of the task we have set ourselves, and the nature of our plan (see figure below), is established by 1) the challenge of keeping up to date on new research findings and 2) the variety of practices within the specialities and jobs that students can choose after graduation. Every year, more than one million new research papers are published in medicine and the number is increasing rapidly. Health care must constantly adapt to new knowledge, and students thus need to learn to identify the most relevant new knowledge in their area of specialisation, ranging from laboratory work, via clinical work to public health, amongst others. Thus, students must be exposed to different research traditions. Our strategies and plans must also tackle 3) the challenge of empowering students to facilitate the changes required to implement new evidence-based standards in practice. This includes initiating change, not only in their own practice, but also in the practice of the organisations where they will be working. This is a huge task in a field with a very strong tradition of master – apprentice learning. And it is relevant for higher education in general.

The key step to realising these ambitions is for us to make large-scale changes across the whole study programme. We will integrate the Centre into our teaching and learning centre, PLUS, and organise the work into work packages (the boxes in the figure below). Integration into PLUS, which works with all the study programmes at the faculty (including nursing, physiotherapy etc. after the merger), will ensure that the Centre, and its activities after the end of the funding period, are part of the Faculty's ongoing efforts to continuously improve educational quality from day one, rather than being a 'bolt-on' project.



The overall work package (WP) structure is presented below, while the milestones and more details are presented in Appendix 3. As the Centre is a large undertaking we will ensure the necessary attention by establishing a steering committee. The Centre management will be physically co-

located with employees at PLUS and management of the study programme. We will have **two advisory councils; national AC** with the other medical education programmes, focusing on cooperation and dissemination, and **international AC** with national representation, focusing on



strategy and research. We will also have **two reference groups;** staff and students from the faculty only, meeting more frequently, and having closer involvement in daily work, together with an extended group including representatives from the practice field and other health professions. We will have a management group overseeing the day to day work. For each WP we will have separate working groups with representatives from the students, staff and other stakeholders. NTNUs Educational Development Unit will be a close collaborator to further strengthen the pedagogical competency in our work.

The strategy of the Centre is to enable students to initiate change, through facilitating student involvement and learning in how to ensure that clinical practice is continually updated, based on **new knowledge**. This requires skill in receiving and giving **supervision** and the use of formative and summative **assessment**, mirroring real life situations.

There are some prerequisites for making it all happen. One aspect is the **Management** of the Centre and **Coordination** between the different WPs and projects e.g. to ensure synergies. Another central aspect is buy-in from both students and staff. This can only be achieved by involving them in a comprehensive process of **Faculty development**. Due to the scale of our intended changes to the study programme and the large number of teachers, this is a huge task needing systematic long-term work and student and staff involvement.

The limited time available to students for direct patient contact poses a challenge. In order to give students more time on task, we will use **Learning technologies**, such as virtual reality and simulation, as tools to better prepare students for practice. Better-prepared and involved students are more open to learning, and thus more time can be spent on showing them how practice has evolved due to new knowledge.

However, this is not enough to fully prepare the students for good clinical **Practice**. We will therefore establish student-led clinics where the students themselves are in charge and where they are challenged to use current and emerging research to direct their clinical actions. Student-led clinics also provide a very important arena for student involvement.

To run these clinics effectively, students need to be confident that they can identify and apply the best available knowledge resources. To achieve this, they need to be exposed systematically to critical reasoning and how **Research** is used in practice. We will provide them with opportunities for rotation in research groups and expose them to how staff members use research, and research methods, in their daily work and in different areas of medical practice.

The core of our work is improving students' skills in using new knowledge and applying it in practice, but this does not in itself enable students to change the practices or cultures they will encounter after graduation. We believe that the best way for students to prepare for the challenge of changing established practice and promoting collaborative practice is through improved skills in receiving and giving **Supervision**. Thus, we will use supervision as a tool to strengthen the students' confidence and ability to be good team members, role models and to take the lead in driving change through personal example. It is also a tool for student involvement.

Assessment is an important driver for behaviour. To succeed, we need sustainable

assessment methods that have lasting impact on the students' skills for lifelong learning. Sustainable assessment methods developed in the Centre will have the same focus as our overall strategy: enabling students to be involved and to initiate change, through awareness of the need to continually update practice on the basis of research.

The success of the Centre may be measured by the extent to which others have been able to use the knowledge and methods we will develop. This is within the tradition of the Faculty: new knowledge is only valuable when it is shared and used by others. Thus, our focus for **dissemination** is on involving others who can benefit from the work of the Centre.

Importantly, we are conscious that study programmes at the Faculty must mirror the process of changing practice. We must empower the students to shape their own learning by giving them real influence and the ability to challenge what is done. As such, **our education will be a living lab in preparing the students to be involved and to initiate change**.

Education for the health professions faces more or less the same challenges across the western world. In 2010, The Lancet Commission issued "*Transforming Education to Strengthen Health Systems in an Interdependent World*". The report calls for reforms in health professional education guided by two outcomes: *Transformative learning* and *Interdependence with the practice field*. By placing these issues at the heart of the Centre, we will be able to make a significant contribution to health professional education, nationally as well as internationally. We will also be able to take on some of the significant challenges that face society, and thus healthcare, in the future.

Thus, **our contribution will address how large-scale changes, focused on lifelong learning, can be developed and implemented so that they permeate the whole study programme.** I.e. we are not implementing separate, innovative new subjects, but **are shifting the culture**. All professional education should focus on preparing students for change through fostering lifelong learning. The work of the Centre will thus also have significance for higher professional education outside the field of medicine and health.

The students are involved and active partners in the analysis and evaluation of the curriculum and take part in all developmental work. Two of the five members of the core group for writing this application are students, and **student involvement** will be continued in the Centre, where students will be employed in paid work (see budget). They will have office space in the Centre and PLUS and will be integral members.

The additionality of receiving the SFU Centre Award comes from the extra resources and prestige it will bring. This will be used to expand projects and involve more of the staff and other education programmes, especially those for the health professions. We will be able to introduce

more extensive changes to our curriculum and introduce new learning activities more rapidly. With more resources, we will be able to buy time for engaging staff in developmental work and, not least, conduct more research on educational activities and their impact and be able to disseminate to a larger community, nationally as well as internationally.

Evaluation and impact framework

With all Centre activities, we will develop sustainable solutions to facilitate long lasting changes. Normalisation Process Theory (NPT) will be used as an evaluation and impact framework and also to estimate value for money. NPT is a framework for understanding the processes by which complex interventions are naturally integrated and sustained in daily work, or not. It has been tested, refined and applied in studies conducted across diverse settings.

There are four core constructs in NPT, defined as essential conditions and processes for new working practices to become a natural part of daily work: **Coherence, Cognitive participation**, **Collective action**, and **Reflexive monitoring**. The relationship between the constructs is not linear, they influence each other, and implementation work is necessary within all four constructs. The table gives an overview of the questions to be investigated to assess the interventions, building on:

NPT components	Questions to be investigated
Coherence	Does the intervention have a clear purpose?
(Makes sense)	Who will benefit from the intervention?
	Are the staff and students likely to value these benefits?
	Will the staff and students understand the intervention?
Cognitive participation	Will the intervention fit the overall goals and activity?
(Engagement and	Are the staff and students likely to think it is a good idea?
commitment)	Are the staff and students prepared to invest time and work in this?
Collective action	How will the intervention affect staff and students?
(Facilitation for use)	Is it compatible with existing practices?
	Will the staff and students need extensive training before they can use it?
Reflexive monitoring	Are the staff and students likely to appreciate the intervention after a while?
(Appraisal of value)	Can the intervention be improved on the basis of experience and feedback?

In order to ensure that its activities can be sustained after funding ends, the Centre will be integrated with our established teaching and learning centre, PLUS. The knowledge gained will be used within an established structure whose task is to work with institutional educational development over time.

Our legacy, some years after completion, will be in the form of innovative models for transformative learning and interdependence, which will foster lifelong learning and enable students to initiate change in their practice after graduation. This will be evidenced by publications, as well as by changed curricula in health care education programmes.

Dissemination

Our dissemination strategy is built around our target groups. Our primary target groups will be 1) students and staff at the Faculty of Medicine (primarily medicine, followed by the other study programmes) and 2) other MD programmes in Norway. Both groups will be involved directly in the work, through joint projects and representation, as we consider this the best method of dissemination. Locally, the NTNU merger, which brings all the health education programmes together in one faculty, and our position within the Faculty's teaching and learning centre, PLUS, will give us increased opportunities to directly involve other health education programmes in our projects. The medical faculties in Norway already have close collaboration, both at management and student level, as well as on educational projects. We will build on this collaboration to spread knowledge from the Centre, and to support related changes they may wish to implement.

Several of the planned activities of the Centre will be carried out in the field of practice. They will also have relevance for the health sector in general, and particularly those institutions providing students with practice placements. These institutions will form a stakeholder group for many of our activities. Furthermore, realising the full effect of our efforts within the Faculty to foster lifelong learning will depend on the students encountering supportive environments after graduation. Therefore, building on our close cooperation with St. Olav's Hospital, other hospitals and primary care, we will target these settings, include them in our work, and create improved environments for continuing learning.

Medical schools outside Norway will be targeted through research publications in journals for medical and health education and a range of activities at international meetings. Our international advisory board and our existing international partners will be used for network dissemination.

Our work will be relevant for other health education providers and for higher education in other fields. These groups, and the general public, will be reached through our website, newsletters and social media. We will also arrange (and take part in) conferences and workshops, which will be open to external participants.



COMMENTS

[Body text (150 words)]

Appendix 1: References

The list includes references used in the application and references to research papers conducted by our academic staff on our own medical model published in peer review journals (i.e. not conference proceedings from e.g. the AMEE conferences where we have several presentations each year)

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Appendix 2. Budget

Type of cost	2017	2018	2019	2020	2021	Total
Payroll*	8 047 714	8 916 032	9 686 062	8 665 887	8 019 311	43 335 007
Indirect expenses	4 317 061	4 895 583	5 424 761	4 648 670	4 196 915	23 482 989
Procurement of R&D services	-	-	-	-	-	-
Operating expenses **	3 170 000	3 150 000	3 150 000	3 150 000	3 150 000	15 770 000
Total	15 534 776	16 961 615	18 260 823	16 464 557	15 366 225	82 587 996

* Payroll covers on average 10.7 full year equivalents each year: 1 for employment of students, 4.5 for permanent scientific staff (teachers) including 0.5 for centre leader, 1 for permanent administrative staff, 1 for centre manager, 0.2 for information manager and 3 for PhDs (a total of 5 PhDs for 3 years each). NB! If needed to ensure a **massive student involvement**, we will consider after the first year whether it may be necessary to turn one of the PhD positions into increased funding for employment of students.

** Operating expenses covers costs for operational activities and tasks in the WPs, for dissemination and for the reference groups and advisory boards such as travel, procurement for minor equipment, publications fee (open access), conferences, workshops etc.

Finance plan

Source	2017	2018	2019	2020	2021	Total	Percentage
NTNU *	7 534 776	8 961 615	10 260 823	8 464 557	7 366 225	42 587 996	51 %
NOKUT	8 000 000	8 000 000	8 000 000	8 000 000	8 000 000	40 000 000	49 %
Total	15 534 776	16 961 615	18 260 823	16 464 557	15 366 225	82 587 996	100 %

* Own funding from NTNU covers 51% of the total cost of the centre

NTNU, Faculty of Medicine

SCOPE

Motivation for the level of costs

The main motivation for the cost is the scale of the developments we will implement. These developments require involvement of a large number of staff, both scientific and administrative.

In our view, it is important that the Centre leader continues to be involved in daily work as a professor at the faculty, so this will be a 50% position. It is also necessary to have a person with full-time responsibility for day to day operations, and we will employ a senior advisor with relevant academic credentials as the Centre manager, working as an administrator, but also being involved in some of the projects and especially in dissemination. We will also have a dedicated part time position as information manager to ensure professional communication and dissemination.

The main cost will be pay roll expenses to the staff involved. It is important to notice that the MD programme alone has +400 teachers, meaning that most teachers cover a limited but specialised topic area. Thus, when doing large scale changes, we need to involve many teachers. Although each teacher might be involved on only a part of a project for a limited time, it is important for the success of our undertakings that they are given time and resources to do the developmental work.

Our students are generally very active in extracurricular work and in the student democracy. As **we will have massive involvement of students in our work**, we are conscious that we must not "steal" students from other activities. We will therefore **pay students** for work at the Centre. As suggested by students, we will offer both long and short-term positions, with the main activities taking place between October and April and as summer jobs. We will also have fixed work plans that fit with students' schedules.

We will have a strong emphasis on research. We will employ 5 PhDs within the Centres budget, and we will also apply for additional research funding from various research programmes. As PhD projects involve several persons, we see this as an important way of further increasing research activity on educational issues among the academic staff.

Finally, some of our activities will generate both pay roll and operating costs. The main activities are establishing student led clinics part time which needs both equipment and staff (WP Practice). The development and implementation of OSCE includes IT purchase and development, piloting, case development and training of standardised patients (WP assessment). Learning technologies such as simulation and virtual reality will also be an undertaking where there are developmental costs and costs for equipment (WP Learning technologies). All these cost are in addition to the running costs covered over the ordinary Faculty budget.

SCOPE

Appendix 3: Action plan

The actions outlined below have arisen from a joint initiative from students, management and the academic community. The Faculty of Medicine has over time prioritised more and more resources for pedagogical and developmental work, and this has resulted in a range of developmental projects of various sizes, which engage students and staff. Plans for the Centre build on those projects that correspond with our vision and strategy. In this way, the Centre's activities are a natural but strongly reinforced extension of existing activities within our academic community, ensuring commitment and follow up from staff and students.

We have chosen to present our plans in the form of a few large deliverables, instead of a detailed action plan for how to achieve our goals. We hope this conveys the coherence between the activities. To ensure that the activities of the centre are initiated quickly, most milestones are to be reached after 3 to 4 years. The reason is that the milestones concern activities that are needed to transform the curriculum, and we want to leave time to implement and maintain the changes at full scale throughout the first five-year period. Thus, we have a conscious plan for ensuring that we not only deliver project objectives, but also enable actual changes to be implemented and become a natural, integrated and sustained part of daily work across the whole study programme.

WP Management, coordination and dissemination.

We will have a WP dedicated to the crucial role of **management, coordination and dissemination.** This WP will ensure that the projects run as planned, the synergies between them are realised and a focus on innovation and student involvement is maintained throughout. The overall responsibility for research on the Centre's activities is also within this WP. Specifically, by making dissemination part of this WP, we will ensure that spreading knowledge is at the centre of all activities.

Milestone activity	Deadline
Confirmation from an external reviewer that the dissemination activities after three years	1/3-19
of activity have been relevant for internal and external educators in medicine in Norway	
and health care education at the faculty	
A publication on aligning educational activities to enable students to initiate change to	1/12-20
foster lifelong learning	
Four Ph.D candidates will have defended their theses, based on research into the	31/12-21
activities at the Centre	

WP Faculty development

To deliver high quality and sustainable changes, staff and students need to be included. The

WP **Faculty development** will ensure this. Teachers at the medical faculty belong to different communities of practice; they are simultaneously medical doctors, researchers and educators. In this WP we will focus on making them more aware of, and including them more strongly in

the "community of educators". This also includes those supervising students in practice

placements, where the focus will be on how established practices can be changed.

Milestone activity	Deadline
Completed a pilot course for strengthening competencies in transformative learning	1/7-19
among supervisors in practice	
Presentation of a systematic programme for maintaining and improving the	31/12-19
transformative learning study model amongst faculty and students	

WP Learning technologies.

The WP on **learning technologies** will build on our long experience in simulation (our simulation centre was established in 2003) and our recent achievements in developing virtual reality as a learning arena (<u>http://virsam.no/index.html</u>). Learning technologies will be employed to give students skills training in a safe environment, which will increase and optimise students' time on tasks relevant for their work situation after graduation. One example is the use of virtual reality together with simulation training in preparing students for practice in situations where training cannot take place in the clinic. Another example is preparing the students for clinical rotation (one-week practice in one ward) by having them role-play a typical patient trajectory in a virtual setting. Experiences from these activities are used as a starting point for the clinical learning process, providing the students with better entry skills. The flexibility of virtual settings also allows for students learning at their own convenience, further increasing their self-regulated learning.

Milestone activity	Deadline
All projects on developing and integrating learning using virtual reality and simulation to	31/12-20
prepare for practice (chosen after piloting) are ready for full scale implementation	
WP Research	
The knowledge base in medicine increases rapidly. Students therefore need a firm h	asic

The knowledge base in medicine increases rapidly. Students therefore need a firm basic understanding of research methodology, both during their education and as practicing clinicians. The WP focus will be on teaching relevant methodology at the right point in time and also on increasing knowledge and understanding of evidence generation in general. Alignment of relevant teaching activities and increased active learning by students are

important tools.

Milestone activity	Deadline
Introduce a new topic on shared decision making (presenting research based knowledge	1/6-18
to patients in a discussion about patients' preferences for treatment)	
Students in the fourth year report an increase in their exposure to how faculty and	1/7-19
clinicians use and assess research in their daily work compared to earlier cohorts	
All students are offered the possibility of having a "clinical rotation" in a research group	1/1-20
W/D Dreastics	

WP Practice

Efficient medical education requires optimal use of the time when students are in contact with

patients. The quality of **practice** is therefore crucial in educating professionals. It is

acknowledged that this can be a challenge as supervisors in practice are not faculty members

Enabling students to initiate change to foster lifelong learning

and therefore not necessarily aligned to the curriculum. We want to focus on the largest part of the early clinical training, which is clinical rotation (year 3 and 4). The next step is to let students learn to take full clinical responsibility in a safe environment. We will therefore develop student led clinics, focusing both on the medical profession and inter-professional work.

Milestone activity	Deadline
A student driven clinical practice is established	31/12-19
The structure and content of the two year clinical rotation is revised and the changes	31/12-20
implemented	

WP Supervision

Doctors and health personnel encounter numerous situations that require receiving and giving **supervision.** The main purpose of clinical supervision is to transform evidence based medicine into practice. Supervision skills are crucial in facilitating change, and consequently significant in reaching a vision of fostering lifelong learning. Students must learn how to take advantage of the power of clinical supervision - both as a supervisor and as a supervisee. The students need to learn how to receive supervision in order to utilize feedback. They need to understand the role of the one being supervised in order to develop the skills to supervise others. This is however a new topic area for us in particular, and for medical education in general. We will cover the whole area from looking over a student's shoulder to monitoring performance standards and ensuring patient safety, as well as looking after students to facilitate professional development and stimulate lifelong learning.

Milestone activity	Deadline
Established an integrated curriculum of learning activities on how to supervise others in	1/7-20
changing practice in order to adapt to new knowledge.	
WP Assessment	

Assessment drives learning. We want to develop our formative and summative assessment programme to better test knowledge, skills and attitudes that rely on evidence-based medicine. This includes mirroring situations where new knowledge is used to improve practice. We will focus on preparing students for future work life, where emerging research constantly changes how we evaluate and treat patients and improve public health.

Milestone activity	Deadline
Established a new method for quality assurance of Multiple Choice Questions (MCQ)	1/7-19
based on external peer review by independent clinicians.	
Replaced current practical exams with Objective Structured Clinical Examination	1/7-19
(OSCE).	
Established a sustainable and effective system for formative feedback to students from	31/12-20
supervisors in clinical practice.	

Curriculum Vitae Professor Aslak Steinsbekk

Born:26. February 1966Nationality:NorwegianMarried since1987, two children born 1989 and 1990.

Aslak Steinsbekk is a professor in behavioral sciences in medicine and health service research at the Department of Public Health and General Practice, Norwegian University of Science and Technology. He is leader for the research group for health service research and he has built up a research group in patient education and user involvement. His main research activities at current centers around health service research with a focus on the patient perspective and how patients experience the complete package of services they use. Aslak has mainly published in the areas of health care utilization, communication, patient education, patient participation and complementary and alternative medicine, and have been PI for studies using different methodologies (randomized controlled trials, qualitative methods, epidemiology, and systematic review). Aslak has broad educational experience. He has initiated and headed a joint educational activity where more than 700 students from 9 professional educations participate (TverrSam). He has also been in charge of coordinating a semester at the medical programme which includes practice placement in primary care and headed the examination commission. He has developed educational modules at master's and PhD levels. Furthermore, he has initiated and headed several processes where a range of partners from different organisations have cooperated in applications and in setting up centres / networks. He thus has a broad experience from research, education and collaborative processes.

Address work

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Øvre Alle 7 N-7030 Trondheim Norway Tel +47 73 51 56 83 Mobile +47 41 55 90 76

Education

- 2011 Project management. Norwegian University of Science and Technology, Trondheim.
- 2005 PhD Clinical medicine. Norwegian University of Science and Technology, Trondheim.
- 2004 Educational development program, Norwegian University of Science and Technology, Trondheim.
- 2000 Sociologist, Norwegian University of Science and Technology, Trondheim.
- 1999 Evidence Based Health Care. Norwegian Institute of Public Health / University of Oslo.
- 1998 Clinical research methodology courses, The Faculty of Medicine, Norwegian University of Science and Technology, Trondheim: Medical research in theory and practice, SPSS, Randomised Clinical Trial, Quality of Life Assessment, introduction and advanced, Epidemiology
- 1992 Homeopath, Norwegian Academy for Natural Medicine
- 1989 Business administration, Trondheim Business School, Sør-Trøndelag University College

Longer courses last years

- 2013 Assessment in Communication Teaching. T-EACH, Cambridge
- 2012 Experiential Communication Skills Teaching in Health Professional Education. T-EACH, St. Andrews
- 2012 Curriculum Development in Communication Skills Teaching. T-EACH, Cambridge
- 2012 What to Teach in Communication Skills Teaching: Skills and Structure. T-EACH, Cambridge
- 2012 Research management Master Class. Copenhagen Business School. Copenhagen.
- 2011 Epidemiology and Health service research, Erasmus Summer Programme
- 2011 Research supervision. Norwegian University of Science and Technology, Trondheim.
- 2011 Research management. Norwegian University of Science and Technology, Trondheim.

2009 Research management. Copenhagen Business School. Copenhagen.

Employment record

- 2012- Professor in Behavioural sciences in medicine and Health service research, Department of Community Medicine and General Practice, Norwegian University of Science and Technology
- 2010-12 Project manager Trondheim Helseklynge (Trondheim Health Cluster)
- 2005-12 Researcher. Department of Community Medicine and General Practice, Norwegian University of Science and Technology
- 2006-09 Post. Doc. Department of Community Medicine and General Practice, Norwegian University of Science and Technology
- 2002-04 PhD student, Department of Community Medicine and General Practice, Norwegian University of Science and Technology
- 2000–01 Researcher. The Norwegian Cancer Society.
- 1999–01 Research co-ordinator (part time). Norwegian Homeopathic Association
- 1997–98 Researcher (part time). Institute of Community Medicine, University of Tromsø
- 1991–03 Private homeopathic practice.

Funding for research

- 2015 EEA grants. Enhancing human capital and knowledge in health science by institutional cooperation and mobility between the University of Latvia and three Norwegian universities. EUR 12.000,-2014 Central Norway Regional Health Authority. One PhD. Administration of medication to children -Opinions on, and parent/child interactions using a medication aid. NOK 3 mill 2012 Regionalt forskningsfond Midt-Norge, Forprosiekt, Ett telefonnummer for alle uplanlagte helseog omsorgsproblemer med beslutningsstøtte i form av en kjernejournal Research Council of Norway. Researcher project with funding for Post.doc and researcher on 2012-15 the project "Keeping patients out of hospital by improving patient trajectories in primary care methodological development and effect". 2011 Regionalt forskningsfond Midt-Norge. Forprosjekt. Ett telefonnummer for alle uplanlagte helseog omsorgsproblemer med beslutningsstøtte i form av en kjernejournal 2009 Kontaktutvalget St.Olav - DMF "Implementering av brukermedvirkning i et distriktspsykiatrisk senter" Central Norway Regional Health Authority. Observational study of content and effect of patient 2009-10 education programs at hospitals in Central Norway 2009-12 Research Council of Norway. Researcher project with funding for Post.doc and research assistant on the project "Implementation of user participation in a community mental health centre - process and effect on staff and users" 2009-11 Helse og Rehabilitering. PhD candidate on the project "Implementation of user participation in a community mental health centre - process and effect on staff and users" 2008 Nasjonalt Kompetansesenter for læring og mestring ved kronisk sykdom ved Aker Universitetssykehus HF. Funding for arranging a national research conference for patient education and organising a national research network. 2007-08 Central Norway Regional Health Authority. Observational study of patient reported outcome of patient education programs at hospitals in Central Norway 2007 - 11Research Council of Norway. Researcher project with funding for two PhD candidates. Patient education in patients with chronic obstructive pulmonary disease (COPD) and rheumatic disease - effect, experiences and costs. 2006–10 Research Council of Norway. Post. Doc. Kem e CAM - a 20 year longitudinal study of CAM use in a total population in Central Norway. Research Council of Norway. Funding for one year stay at University of Arizona, USA. 2007-08 2006-07 Nasjonalt Kompeansesenter for læring og mestring ved kronisk sykdom ved Aker Universitetssykehus HF. Why do patients with chronic obstructive pulmonary disease (COPD) who have taken part in patient education exercise or not?
- 2005 Samarbeidsorganet Helse Midt-Norge og NTNU. Long term effect of a patient education and

training program for patients with chronic obstructive pulmonary disease (COPD)

- 2003-04 Research Council of Norway. Funding for six months stay at University of Southampton, England.
- 2002-04 Research Council of Norway. PhD. Homeopathic treatment for upper respiratory tract infections in children effect, economy and parents view
- 2000–01 The Norwegian Cancer Society. Cancer patients view of the consultations with practitioners of alternative and conventional medicine.
- 1999 Ekcbos legacy. Patient reported outcome of treatment by homeopaths in Norway. Two year follow up.
- 1996–98 Research Council of Norway. Patient reported outcome of treatment by homeopaths in Norway. A prospective observational study.

Funding for education development

2015	Use of Virtual arenas NOK 500.000,-
2015	Evaluation of master thesis. NOK 50.000,-
2015	Equipment Qualitative research. NOK 10.000,-

Publications

Total career research publication		(78 since 2005	f PhD, 50 since	50 since 2010)	
- Peer review journals:	74	(first author:	23	last author:	39)
- Book chapters:	3				
- Other:	12				

Since 2014

- Rise MB, Steinsbekk A. Long term effect on professionals' knowledge, practice and attitudes towards user involvement four years after implementing an organisational development plan - a controlled study. PLoS One. 2016 Mar 14;11(3):e0150742. doi: 10.1371/journal.pone.0150742. eCollection 2016
- Lara-Cabrera ML, Gjerden M, Gråwe RW, Linaker OM, Steinsbekk A. Short-term effects of a peer co-led educational programme delivered before mental health treatment: A randomised controlled trial. Patient Educ Couns. 2016 Feb 9. pii: S0738-3991(16)30067-2. doi: 10.1016/j.pec.2016.02.006. [Epub ahead of print]
- Svavarsdottir M.H., Steinsbekk A., Sigurdardottir A.K. Knowledge and skills needed for patient education for individuals with coronary heart disease: The perspective of health professionals. Eur J Cardiovasc Nurs. 2016 Feb;15(1):55-63. Epub 2014 Sep 10
- Rise MB, Eriksen L, Grimstad H, Steinsbekk A.The long-term effect on mental health symptoms and patient activation of using patient feedback scales in mental health out-patient treatment. A randomised controlled trial. Patient Educ Couns. 2016 Jan;99(1):164-8. doi: 10.1016/j.pec.2015.07.016. Epub 2015 Jul 19
- 5. Svavarsdóttir MH, Sigurdardottir AK, Steinsbekk A. What is a good educator? A qualitative study on the perspective of individuals with coronary heart disease. Eur J Cardiovasc Nurs. 2015 Nov 20. pii: 1474515115618569.
- 6. Berntsen GKR, Gammon D, Steinsbekk A, Salomonsen A, Foss N, Ruland C, Fønnebø V, How do we deal with multiple goals for care within an individual patient trajectory? A document content analysis of health service research papers on goals for care. Accepted for publication in BMJ Open Oct 2015 Dec 10;5(12):e009403. doi: 10.1136/bmjopen-2015-009403.
- Rise, M.B., Steinsbekk, A. Does implementing a development plan for user participation in a mental hospital change patients' experience? A non-randomized controlled study. Health Expectations. 2015; 18(5): 809-25. doi: 10.1111/hex.12105. Epub 2013 Jul 9.
- 8. Grønning, K., Bratås, O., Steinsbekk, A. Which Factors Influence Self-Efficacy in Patients with Chronic Inflammatory Polyarthritis? Musculoskeletal Care 2015. DOI: 10.1002/msc.1114
- Dahl Unni, Steinsbekk Aslak, Johnsen Roar. Effectiveness of an intermediate care hospital on readmissions, mortality, activities of daily living and use of health care services among hospitalized adults aged 60 years and older; a controlled observational study. BMC Health Services Research.2015, 15:351 DOI: 10.1186/s12913-015-1022-x URL: http://www.biomedcentral.com/1472-6963/15/351
- Trine Stub, Agnete E. Kristoffersen, Terje Alræk, Frauke Musial, Aslak Steinsbekk. Risk in Homeopathy: Classification of Adverse Events and Homeopathic Aggravations - A Cross Sectional Study among Norwegian Homeopath Patients. Complement Ther Med. 2015 Aug;23(4):535-43. doi: 10.1016/j.ctim.2015.06.004. Epub 2015 Jun 10.
- 11. Svavarsdóttir Margrét, Sigurðardóttir Árún, Steinsbekk Aslak, How to become an expert educator: a qualitative study on the view of health professionals with experience in patient education. BMC Medical Education.2015, 15:87 DOI: 10.1186/s12909-015-0370-x URL: <u>http://www.biomedcentral.com/1472-6920/15/87</u>
- 12. Bell HT, Steinsbekk A, Granas AG. Factors influencing prescribing of fall-risk-increasing drugs to the elderly: A qualitative study. Scand J Prim Health Care. 2015 May 12:1-8. URL: http://www.tandfonline.com/eprint/TcxYBWiFCbnJv3ENrXEb/full
- Klara Borgen, Line Melby, Ragnhild Hellesø og Aslak Steinsbekk. Elektronisk meldingsutveksling mellom hjemmetjenestene og fastlege. Sykepleien forskning 2015; Vol 10 (1): 44-51

- 14. Tove Røsstad, Helge Garåsen, Aslak Steinsbekk, Erna Håland, Line Kristoffersen and Anders Grimsmo. Implementing a care pathway for elderly patients, a comparative qualitative process evaluation in primary care. BMC Health Services Research 2015, 15:86 doi:10.1186/s12913-015-0751-1
- Dahl Unni, Johnsen Roar, Sætre Rune, Steinsbekk Aslak. The influence of an intermediate care hospital on health care utilization among elderly patients - a retrospective comparative cohort study. BMC Health Services Research.2015, 15:48. DOI: 10.1186/s12913-015-0708-4 <u>http://www.biomedcentral.com/1472-6963/15/48</u>
- Hilde Solberg, Aslak Steinsbekk, Marit Solbjør, Randi Granbo and Helge Garåsen. Characteristics of a self-management support programme applicable in primary health care: a qualitative study of users' and health professionals' perceptions. BMC Health Services Research, 14:562 (08 Nov 2014) <u>http://www.biomedcentral.com/1472-6963/14/562</u>
- 17. Unni Alice Dahl, Aslak Steinsbekk, Svanhild Jenssen, Roar Johnsen. Hospital discharge of elderly patients to primary health care, with and without an intermediate care hospital a qualitative study of health professionals' experiences. Int J Integr Care 2014; Apr–Jun; URN:NBN:NL:UI:10-1-114778
- Rise MB, Solbjør S, Steinsbekk A. Experiences from the implementation of a comprehensive development plan for user involvement in a mental health hospital: A qualitative case study. Int J Soc Psychiatry. 2014, Vol. 60(4) 387–395 E-pub: 2013 Jun 28. DOI: 10.1177/0020764013491739
- 19. Marit B. Rise, Heidi Westerlund, Dagfinn Bjørgen and Aslak Steinsbekk. Safely cared for or empowered in mental health care? Yes, please. Int J Soc Psychiatry. International Journal of Social Psychiatry 2014; 60(2): 134-138
- Grønning, K., Rannestad, T., Skomsvoll, J.F., Rygg, L.O., Steinsbekk, A. Long-term effects of a nurse-led group and individual patient education programme for patients with chronic inflammatory polyarthritis - a randomised controlled trial. J Clin Nurs. 2014 Apr;23(7-8):1005-17. doi: 10.1111/jocn.12353.

Supervision

Current supervision: 24

Main supervisor PhD	4	Co supervisor PhD	6	Others (mainly	14
candidates:		candidates:		master thesis):	

Completed supervision of candidates who have completed their degree since 2005: 52

Main supervisor PhD	4	Co supervisor PhD	2	Others (mainly	46
candidates:		candidates:		master thesis):	

Supervisor for PhD candidates who have passed their public defence

2016	Unni Dahl	The impact of an Intermediate Care Hospital in the chain of care for hospitalized elderly
		people
2016	Margret	Competence in patient education; The perspective of health professionals and patients with
	Svavarsdottir	experience in patient education in cardiac care.
2014	Ane Djuv	Co-use of drugs and herbal remedies in general practice and in vitro inhibition of
		CYP3A4, CYP2D6 and P-glycoprotein by the common herb Aloe vera
2012	Lisbeth Ø. Rygg	Group education for patients with type 2 diabetes - needs, experiences and effects
2012	Kjersti Grønning	Patient education and chronic inflammatory polyarthritis – coping and effect
2012	Marit By Rise	Lifting the veil from user participation in clinical work – what is it and does it work?

Committee work last 10 years

- 2015- Working groups Norwegian Directorate of Health. New specialist education
- 2014-15 Deputy member of the board of Department of Community Medicine and General Practice, Norwegian University of Science and Technology
- 2012 Section editor, BMC Complementary and Alternative Medicine
- 2011- Associate editor, BMC Complementary and Alternative Medicine
- 2010- Associate editor, BMC Public Health
- 2009- Chairman Advisory council for National Centre for Research in Complementary and Alternative Medicine and National Information Centre for Complementary and Alternative Medicine, University of Tromsø, Norway
- 2008-12 National network for researchers in patient education and patient participation.
- 2006-07 Deputy member of the board of Department of Community Medicine and General Practice, Norwegian University of Science and Technology
- 2004-14 Member of the board of Helsebygg Midt-Norge, building of a new university hospital in Trondheim



Curriculum Vitae Ivar Skjåk Nordrum born 22 May 1953



Positions (current)

Programme Leader for Medical Curriculum, Faculty of Medicine, NTNU, since 1. November 2015

Part time positions: Professor in Forensic Medicine, Faculty of Medicine, NTNU and Senior Consultant in Surgical Pathology at St. Olavs Hospital - Trondheim University Hospital.

Education

Social sciences (one-year foundation course 1980), MD (1981), certified surgical pathologist (1990) and PhD (2002).

Former workplaces and positions

MD and PhD at the Artic University of Norway (University of Tromsø). Surgical Pathologist and Forensic Pathologist at the University Hospital of Northern Norway in Tromsø, National Hospital (today Oslo University Hospital) and the Institute of Forensic Medicine at the University of Oslo (today Division of Forensic Medicine and Drug Abuse Research at The Norwegian Institute of Public Health). Associate professor and professor at the Faculty of Medicine, NTNU since 2000.

Education experience and qualifications

I have taught mainly general and systemic pathology, forensic pathology and legal medicine for medical student, but also students from high schools and different post graduate groups, for almost 30 years. I have held numerous lectures at meetings and congresses domestic and abroad. I have experience with different teaching modalities as problem based learning (PBL), team based learning (I piloted TBL with B. Lillebo at our faculty), lectures, seminars and different specialized courses (microscopy, autopsy pathology and dissection). A selection of courses and congresses I have attended: 1. Course in University Pedagogy (100 hours during one year in 1991), PBL (1999 and 2015), 2. Assessment Course (by K. Boursicot, T. Roberts and R. Fuller in Tromsø 2014). 3. Medical Education & All that Jazz: A Focus on Faculty Development in the Health Professions (McGill University, Montreal July 2016) and 4. AMEE congresses (the Association for Medical Education in Europe) in 2014 and 2015. Further, I have authored book chapters in textbooks and produced an instruction video on the autopsy for medical students.

Awards and nominations

1. Education award 2015, Faculty of Medicine, NTNU. 2. Nominated to the Best Teacher Award in 2008, the Faculty of Medicine, NTNU. 3. The SINTEF award outstanding teaching at NTNU in 2007 was awarded 6 professors at the Department of Morphology for the Course in General Pathology. The course was initiated and drafted by me when the medical curriculum was revised in 2003. 4. The Telenor Nordic Research Prize was in 1999 awarded "The Telepathology Group" (Tor J. Eide, Bjørn Engum, Ivar Nordrum, Birger J. Nymo and Eivind Rinde).

Work abroad

1. Lecturer at Kathmandu University and Dhulikhel Hospital in Nepal February 2009 (Collaborating partners in the global health research programme at our faculty). 2. Forensic pathologist. DVI-team Norway. Tsunami disaster in Pukhet in Thailand May 2005. 3. Visiting doctor at the Office of Chief Medical Examiner, Manhattan, City of New York. April 2005. 4. Mortuary team member in Bosnia August 2000. Employed by ICTY (International Criminal Tribunal for the Former Yugoslavia), United Nations.

Leader- and membership (current)

1. Head of the Medical Museum at the Knowledge Centre, St. Olavs Hospital -Trondheim University Hospital and the Faculty of Medicine, NTNU. 2. Member of the Faculty Board, Faculty of Medicine, NTNU (until 2017). 3. Member of the Norwegian Board of Forensic Medicine (until 2017). 4. Member of the National Disaster Victim Identification Team (until late 2016).

Leadership former (selection)

 Head of the Committee for Renewing the Medical Curriculum, Faculty of Medicine, NTNU (began work 1. November 2013 – delivered report 1. October 2014).
 Head of the Teaching Group in Surgical Pathology and Forensic Medicine. Faculty of Medicine, NTNU.
 Head of the Unit of Morphology, Faculty of Medicine, NTNU.
 Head of the Unit of the Quality Assurance Committee in the Norwegian Association of Pathology.
 Vice Chairman. The Norwegian Association of Pathology.

Scientific qualifications

I have been first, last or co-author on 46 studies, 13 reviews and book chapters, and a larger number of abstracts, proceedings, letters, reports and chronicles. The studies and 10 other publications are retrievable in the database PubMed (if searching use: Nordrum I). I am and have been supervisor for three PhD candidates and eight medical student thesis. I have lead R&D projects in forensic medicine and telepathology. In telepathology, 25 years ago when telemedicine germinated, we were in the very forefront and established in Northern Norway the first remote frozen section service in the world, published a number of studies and received attention accordingly.

Motivation for becoming a programme leader

Late in 2013 I was asked to be head of the committee of renewing the medical curriculum at our faculty. I co-headed this committee together with Anne Nylund, adviser at the faculty, who was administrative head. The work was very interesting, meaningful and inspiring. When the faculty later established a new full-time position as programme leader I applied. In that position I am responsible for the daily operation, quality and renewal of the programme. As a consequence of my new position I have retired as an acting forensic pathologist and by the end of this year I will also have withdrawn from other activities related to forensic medicine.

Leisure activities

Playing saxophone in marching band and saxophone quartet.

CV Eva Skovlund

Born August 11, 1959 in Oslo, Norway. Private address: Arnebråtveien 58A, 0771 Oslo. Three children born 1986, 1988 and 1996.

Affiliations

1980-1985	Student, School of Pharmacy, University of Oslo.
	Teaching assistant PSM090, Statistics for pharmacists.
1985	M.Sc. pharm., University of Oslo. Department: Pharmacology.
	Project: Sequential two-sample tests in controlled clinical trials.
1986-1990:	Research fellow in biostatistics (Norwegian Research Council). Department of Informatics,
	University of Oslo. Lecturer in statistics, Department of Pharmacy, University of Oslo. Exam:
	Italian for science students, University of Oslo. Course in educational science.
1990	PhD dissertation biostatistics: Sequential two-sample methods in controlled clinical trials.
1990-1991	Biostatistician, Medical Department, Glaxo Norway.
1992-1995	Associate professor. Department of statistics and insurance mathematics, Department of
	Mathematics, University of Oslo.
1995-2001	Research co-ordinator, Norwegian Cancer Society. The Norwegian Radium Hospital.
1995-2006	Professor, Dept of biostatistics, Institute for basic medical sciences, University of Oslo.
2001-2010	Senior adviser, Section for Safety and Clinical Evaluation, Department for Medicinal Product
	Licensing, Norwegian Medicines Agency.
2006-2015	Professor II, Dept of Pharmaceutical Biosciences, School of Pharmacy, University of Oslo.
2010-2011	Scientific director, Norwegian Medicines Agency
2011-2013	Director, Department of Pharmacoepidemiology, Norwegian Institute of Public Health
2013-2015	Acting director, Division of Epidemiology, NIPH.
2015-	Professor Department of Public Health and General Practice, NTNU.
2015-	Senior researcher, NIPH

Teaching experience (most courses given in Norwegian)

School of pharmacy, UiO

PSM090, Statistics for pharmacists, 1982-1990 Statistics KFFE (farmasøytisk etterutdannelse) 1984 Statistical metods. Master level course 10 hours. 1989-90. "Diplomstudiet i apotekfarmasi". Statistical methods. 1993-1996 PVS440. Pharmacoepidemiology and statistics. VETT. Yearly 5 day course. 1993-1996 PBF356. Statistical methods in clinical trials, 2003-2005 FRM4010 2007 FRM3040 Drug development 2006-2009 FRM5730 Clinical trials, statistical methods 2006-2008 FRM4110 Applied statistics 2008-

Department of Mathematics, UiO

ST001 V1992, H1992, H1993 ST002 1992

ST301 1993, 1994

ST001 video lectures in elementary statistics, 45 lectures, 1994

Faculty of medicine, University of Oslo

PhD courses – Legers videre- og etterutdannelse

Elementary statistics

Biomedical research 1992-2006.

Epidemiological and psychiatric research 1993.

Advanced courses

Non-parametric metods. 1991 Controlled clinical trials. Head course arrangement 1995 Variance component models. 1995 Survival- and event history analyses. 1995-1999

1. semester students in medicine and dentistry, UiO

Lecturer 1997, 1999, 2001, 2004, 2005

MSc course HiOA

Statistics 1997-2004

SPSS-courses

Statistical metods in SPSS. 3 day course, 3 hours.The Norwegian Radium Hospital1995-2000.Haukeland hospital1997RiTø1997, 1999

NTNU

PH3003 Statistical methods for public health research SMED8002

Pedagogical education

Universitetspedagogikk, Kurs for nyansatte ved Universitetet i Oslo, 1989/1991.

PhD students

Michael Bretthauer, Colorectal cancer screening by flexible sigmoidoscopy. Dissertation 2004 Morten Wang Fagerland, Performance of significance tests with emphasis on three medical research issues. Dissertation 2009 Kjersti Bruheim, Radiotherapy for rectal cancer, a long term follow-up. Dissertation 2010 Anna Törner, Statistical models on data of long-term follow up after infectious diseases. External mentor. Dissertation 2014. Lars Jøran Kjerpeseth. Efficacy and safety of anticoagulants in patients with atrial fibrillation. 2015-

Boards, committees

Board member, Norwegian Cancer Registry 2016-Board member CDDF (Cancer Drug Development Forum) 2014-Board member, BDA Oncology 2012-14 Alternate member NEM 2014-Editorial board, Scandinavian Journal of Pain, 2012-Member of the scientific board, Hjerte- og karregisteret, 2012-Chair Biostatistics Working Party, CHMP/EMA 2011 Vice chair Biostatistics Working Party, CHMP/EMA 2009-10 Board member, Norsk Farmaceutisk Selskap, 2009-11 Vice chair board Norsk Regnesentral, 2010-2014 Board member, Norsk Regnesentral 2009-10 Board member, Programstyret for klinisk forskning, Norges forskningsråd 2006-10 Norway's member CHMP (Committee for Medicinal Products for Human Use) 2004-11 Norway's member CPMP (Committee for Proprietary Medicinal Products) 2002-04 Board member NORCCAP (NORwegian Colorectal Cancer Prevention), 1999-

Curriculum vitae for Maria Radtke

Date Prepared: April 6th 2016

Office Address: Dept. of Nephrology, St. Olavs Hospital, Trondheim University Hospital

Work Phone: + 47 72825510 Work Email: maria.radtke@ntnu.no

Date of Birth: December 29th 1967

Current position:

Senior Consultant at Dept. of Nephrology, St. Olavs Hospital, Trondheim University Hospital

Associate Professor at Institute of Cancer Research and Molecular Medicine and Faculty administration, Faculty of Medicine, NTNU.

Work experience:

Since 2008 - current: Senior Consultant at Dept. of Nephrology, St. Olavs Hospital, Trondheim University Hospital

2005-2008: PhD scholarship at Faculty of Medicine, NTNU

Since 2004- current: Lecturer (assistant and associate professor) at Institute of Cancer research and Molecular Medicine, Faculty of Medicine, NTNU.

1997- 2005: Resident at Dept. of Medicine, St. Olavs Hospital, Trondheim University Hospital

1996- 1997: Resident at Dept. of Rheumatology and Dept. of Medicine, Nordland Hospital, Bodø

Education:

2009: PhD in clinical medicine2005: Specialist in nephrology2003: Specialist in internal medicine1995: Cand.med. at Freie Universität, Berlin

Publications:

Fleiner, Hanne Fiskvik; Radtke, Maria; Ryan, Liv; Moen, Torolf; Grill, Valdemar Erik Robert. (2014) Circulating immune mediators are closely linked in adult-onset type 1 diabetes as well as in non-diabetic subjects. Autoimmunity. volum 47 (8).

Radtke, Maria Anita; Nermoen, Ingrid; Kollind, Magnus; Skeie, Svein; Sørheim, Jan Inge; Svartberg, Johan; Moen, Torolf; Hals, Ingrid; Dørflinger, Gry Høst; Grill, Valdemar. (2010) Six Months of Diazoxide Treatment at Bedtime in Newly Diagnosed Subjects With Type 1 Diabetes Does Not Influence Parameters of beta-Cell Function and Autoimmunity but Improves Glycemic Control. Diabetes Care. volum 33 (3).

Grill, Valdemar; Radtke, Maria; Qvigstad, Elisabeth; Kollind, Magnus; Bjorklund, A. (2009) Beneficial effects of K-ATP channel openers in diabetes: an update on mechanisms and clinical experiences. Diabetes, obesity and metabolism. volum 11.

Radtke, Maria Anita; Nermoen, Ingrid; Kollind, Magnus; Skeie, Svein; Sørheim, Jan Inge; Svartberg, Johan; Grill, Valdemar. (2009) A 6-month treatment with diazoxide at bedtime in newly diagnosed subjects with type 1 diabetes does not influence measured parameters of beta cell function, but improves glycaemic control. Diabetologia. volum 52.

Radtke, Maria; Midthjell, Kristian; Nilsen, Tom Ivar Lund; Grill, Valdemar. (2009) Heterogeneity of Patients With Latent Autoimmune Diabetes in Adults: Linkage to Autoimmunity Is Apparent Only in Those With Perceived Need or Insulin Treatment Results from the Nord-Trondelag Health (HUNT) study. Diabetes Care. volum 32 (2).

Radtke, Maria; Nilsen, Tom Ivar Lund; Midthjell, Kristian; Grill, Valdemar. (2009) Urinary albumin excretion in latent autoimmune diabetes in adults (LADA) is more similar to type 2 than type 1 diabetes: Results of the Nord-Trøndelag Health Study 1995–1997. Diabetes & Metabolism. volum 35 (4).

Radtke, Maria; Kollind, Magnus; Qvigstad, Elisabeth; Grill, Valdemar. (2007) Twelve weeks' treatment with diazoxide without insulin supplementation in Type 2 diabetes is feasible but does not improve insulin secretion. Diabetic Medicine. volum 24 (2).

Radtke, Maria; Nilsen, Tom Ivar Lund; Midthjell, Kristian; Grill, Valdemar. (2007) Close similarities in urinary albumin excretion between type 2 diabetes and LADA versus type I diabetes - results from the Nord-Trondelag Health Study 1995-97 (HUNT2). Diabetologia. volum 50.

Curriculum Vitae

Børge Lillebo

Born:February 26th 1982E-mail:borge.lillebo@ntnu.noPhone:91775142

Current positions

Associate Professor Faculty of Medicine, NTNU

Resident in internal medicine St. Olavs Hospital, Trondheim University Hospital

Education and courses

PhD in Medical Technology NTNU

Medical Doctor

Group facilitator in Problem-based learning NTNU, Faculty of Medicine

In-service educational training for university staff NTNU, UNIPED

BEST facilitator (facilitation of trauma team simulation) BEST foundation

Cooperation at the scene of an accident The Norwegian Civil Defence

Projects/Responsibilities

Clinical clerkship in medical education NTNU, Faculty of Medicine

Problem-based learning in medical education NTNU, Faculty of Medicine

Team-based learning in medical education NTNU, Faculty of Medicine

E-learning in medical education Collaboration between NTNU, UiO, UiB and UiT

Work-based learning in health educations The Norwegian Association of Higher Education Institutions

Publications

[Kvalitet i praksisstudiene i helse- og sosialfaglig høyere utdanning: PRAKSISPROSJEKTET] Universitets- og Høgskolerådet, March 4, 2016

Continuous interprofessional coordination in perioperative work: an exploratory study Journal of Interprofessional Care, August 26, 2014

Designing privacy-friendly digital whiteboards for mediation of clinical progress BMC Medical Informatics and Decision Making, April 4, 2014

Presentation of clinical laboratory results: an experimental comparison of four visualization techniques J Am Med Inform Assoc, October 6, 2012

Piloting Team-Based Learning in a Problem-

Based Curriculum AMEE, September, 2012

Avoidable emergency admissions? Emerg Med J, September 14, 2012

What is optimal timing for trauma team alerts? A retrospective observational study of alert timing effects on the initial management of trauma patients.

J Multidiscip Healthc, August 23, 2012

Creating real-time transparency in hospital processes POMS 21st Annual Conference, Vancouver, Canada, 2010

A Framework for Transparency POMS 21st Annual Conference, Vancouver, Canada, 2010

On-line evaluation of PBL AMEE, August, 2004

Honors and Awards

Faculty of Medicine Education Award 2013 Winner

For developing and piloting Team-based learning for the medical students at NTNU.

Faculty of Medicine Education Award 2004 Winner

For development and implementation of digital learning objects in Problem-based learning.

CURRICULUM VITAE TOBIAS S. SLØRDAHL MD Ph.D.



Born: February 3rd 1982 Molde, Norway Engaged, one child



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PERSONAL STATEMENT

I am very dedicated to my work, either it is my clinical, research or teaching job. I believe that doctors should engage in clinical work, strive after new evidence in medical research and contribute in medical education - all to promote best possible patient treatment. One of the things I value most in my work is meeting patients and also their family and the good conversation between doctor and patient. In a world where medical knowledge is increasing rapidly, it is important to remember that good patient information is even more important than previously. I am very grateful and privileged to have the opportunity to practice medicine in a country where all have the same access to health services. I also think that it is our duty to share our knowledge and skills with countries where people do not have such opportunities and thus promote better global health.

EDUCATION

From mai 2011 to june 2014 PhD in molecular medicine Norwegian University of Science and Technology (NTNU), Trondheim, Norway

From august 2004 to june 2011 Various university courses in administration, immunology and africa studies. Courses chosen based on personal interests.

Norwegian University of Science and Technology (NTNU), Trondheim, Norway

From august 2001 to june 2009 Medical school - M.D. with research program Norwegian University of Science and Technology (NTNU), Trondheim, Norway

From august 1998 to june 2001 High School Fræna High School, Elnesvågen, Norway

LANGUAGES



Norwegian Oral: Very good Written: Very good

English Oral: Very good Written: Very good



German Oral: Very good Written: Very good

WORK EXPERIENCE

	From april 2013 until today Resident - Internal medicine (from 04.2014 50 % position) St. Olavs University Hospital Trondheim, Norway
	From august 2014 until today Associate professor (20 % position) Norwegian University of Science and Technology Trondheim, Norway
	From april 2014 until today Postdoctoral fellowship (50 % position, temporary) Norwegian University of Science and Technology Trondheim, Norway
*	From december 2009 to april 2013 General practionar and emergency clinic doctor (Part time work nights, weekends and holidays In the communities Eide, Fræna, Volda, Orkdal and Surnadal
	From august 2010 to february 2011 Internship general practice Fræna legekontor Elnesvågen, Norway
	From august 2009 to august 2010 Internship internal medicine, surgery & psychiatry Molde Hospital Molde, Norway
	From june 2008 to august 2008 Temporary doctor Department of oncology, St. Olavs University Hospital Trondheim, Norway
	From june 2007 to august 2007 Project assistant - Section for Educational Affairs Norwegian University of Science and Technology Trondheim, Norway
	Summers in period june 2004 to august 2006 Research assistant - Myeloma Research Group Norwegian University of Science and Technology Trondheim, Norway
	Summers in period june 2001 to august 2003 Nursing assistant Fræna sjukeheim Elnesvågen, Norway

POSTGRADUATE MEDICAL COURSES

- April 2016 Trondheim, Norway Basic Course of Endocrinology
- June 2015 Bergen, Norway Basic Course of Illnesses of the Digestive System
- September 2014 Trondheim, Norway
- Basic Course of Pulmonary diseases January 2014 - Bergen, Norway
- Echocardiography I
- September 2013 Trondheim, Norway Basic Course of Cardiology

MEMBER OF BOARDS & COMMITTEES



MEDICAL LICENCE



Full drug prescription rights (full rekvisisjonsrett) since 15th of August 2009



Unrestricted right to practice medicine (autorisasjon) since 23rd of February 2011

HOBBIES



Skiing (alpine touring)



Mountain climbing



Travelling

PEER-REVIEWER

Peer-reviewer for

- Scientific Reports
- Recent Patents on Anti-Cancer Drug Discovery
- Leukaemia & Lymphoma Research (UK Cancer Charity)

RESEARCH SUPERVISION (PhD/master)



Currently co-supervisor for PhD-students Pegah Abdollahi and Magnus Aassved Hjort. Main supervisor for masterstudents (hovedoppgave) Daniel Vatn and Anders Barli Colberg. Co-supervisor for Medical Research Student Esten Vandsemb.

CHARACTER REFERENCES



Professor Magne Børset, MD PhD

Head of Department of Cancer Research and Molecular Medicine at NTNU and Consultant Physician at St. Olavs Hospital E-mail: magne.borset@ntnu.no Phone: 72 57 30 38 Mobile: 911 94 488



Professor Anders Waage, MD PhD

Professor of Hematology at NTNU and Head of Department of Hematology at St. Olavs Hospital E-mail: anders.waage@stolav.no Phone: 72 82 51 74 Mobile: 416 15 123



Doctor Ane Cecilie Dale, MD PhD

Consultant Physician at Clinic of Cardiology at St. Olavs Hospital E-mail: ane.cecilie.dale@stolav.no Phone: 72 82 80 26

LIST OF PUBLICATIONS (2011-2016)

R = Peer-reviewed research paper C = Peer-reviewed clinical case paper F = Peer-reviewed feature paper

- Lillebo B, <u>Slørdahl TS</u>, Nordrum IS Team-basert læring - en studentaktiviserende og lærerstyrt undervisningsform Ready for submission, March 2016 (R)
- <u>Slørdahl TS</u>, Abdollahi P, Rampa C, Misund K, Baranowska KA, Westhrin M, Waage A, Rø TB and Børset M The Phosphatase of Regenerating Liver-3 (PRL-3) Is Important for IL-6-mediated Survival of Myeloma Cells. Oncotarget. 2016 Mar 27. doi: 10.18632/oncotarget.8422. [Epub ahead of print] (R)
- Vandsemb EN, Bertilsson H, Abdollahi P, Størkersen Ø, Våtsveen TK, Rye MB, Rø TB, Børset M and <u>Slørdahl TS</u> Phosphatase of regenerating liver 3 (PRL-3) is overexpressed in human prostate cancer tissue and promotes growth and migration. *J Transl Med. 2016 Mar 15;14(1):71.* (R)
- Valestrand EA, <u>Slørdahl TS</u>, Bærheim A, Schirmer H, Andersen S, Aabelvik HG and Frich J Mot en nasjonal delprøve i medisinstudiet *Tidsskr Nor Laegeforen. 2016 Mar 15;136(5):390-1* (F)
- <u>Slørdahl TS</u> and Berntsen EM Halssmerter grunnet tarmperforasjon. *Tidsskr Nor Laegeforen. 2015 Sep 22;135(17):1560* (C)
- <u>Slørdahl TS</u>, Amundsen BH, Størkersen Ø, Stensæth KH, Slette MK, Wiseth R, GrenneB, En 60 år gammel mann med brystsmerter og funksjonsdyspné. *Tidsskr Nor Laegeforen. 2014 Nov 25;134(22):2167-71* (C)
- <u>Slørdahl TS</u>, Wader KF and Berntsen EM Ung kvinde med hovedpine, opkast og uklart syn Ugeskr Laeger. 2014 Sep 15;176(38) (C)
- Rampa CS, Tian E, Våtsveen TK, Buene G, <u>Slørdahl TS</u>, Børset M, Waage A and Sundan A Identification of the source of elevated hepatocyte growth factor levels in multiple myeloma patients. Biomark Res. 2014 Apr 9;2(1):8. (R)
- <u>Slørdahl TS</u>, Denayer T, Moen SH, Standal T, Børset M, Ververken C and Rø TB. Anti-c-MET Nanobody® - A New Potential Drug in Multiple Myeloma Treatment. Eur J Haematol. 2013; volum 91 (5) s.399-410 (R)