

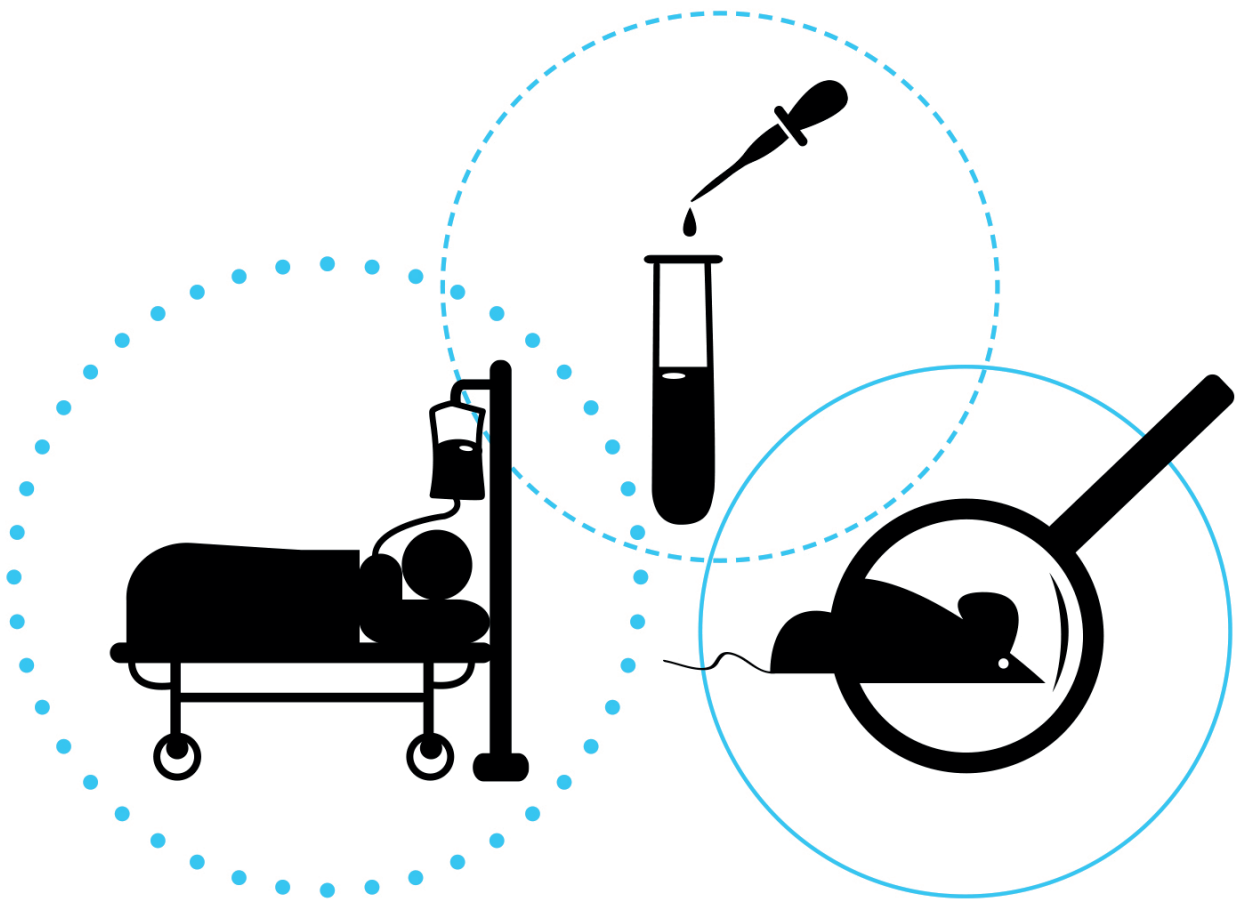
8<sup>th</sup> EDITION: 2019

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FROM IDEA TO PUBLICATION

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# THE RESEARCH HANDBOOK



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**ANNETINE STAFF & KARIN C. LØDRUP CARLSEN**

Harald Arnesen, Anne Grete Bechensteen

Anne Flem Jacobsen & Ernst Omenaas

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Published by Oslo University Hospital  
-in collaboration with Haukeland University Hospital



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## **Preface, 8<sup>th</sup> edition 2019, English online version,**

This English translation of the 8<sup>th</sup> version of "The Research Handbook, From Idea to Publication", is updated November 2019. The homepage for the Research Handbook is regularly updated in both Norwegian and English (<https://oslo-universitetssykehus.no/forskningshandboken>).

The Research Handbook is also available as a national research resource on the homepages of The Norwegian Electronic Health Library ([www.helsebiblioteket.no/](http://www.helsebiblioteket.no/)) and of NORCRIN (Norwegian Clinical Research Infrastructure Network: <http://www.norcrin.no>). The editors ([Annetine Staff](#) and [Karin C. Lødrup Carlsen](#)) and web editor ([Michael Pilemand Hjørholm](#)) welcome any tips for improvement of the Research Handbook. We thank those who have contributed ideas for updates to the 2019 edition, and the research administrations at Oslo University Hospital (OUS) and Haukeland University Hospital for their support. Significant contributors are acknowledged in the Appendix. A special thanks to Erlend Smeland, Director of Research, and assisting Director of Research Lillian Kramer-Johansen at Oslo University Hospital, for their support.

We hope that the Research Handbook will be useful for both experienced and less experienced researchers at any stage of the research process, at Oslo University Hospital, Haukeland University Hospital, Helse-Sør-Øst or at other research institutions in Norway.

Oslo, November 2019

*Annetine Staff and Karin C. Lødrup Carlsen*

Editors of the Research Handbook

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Co-authors of the Research Handbook



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## **Chapter 1**

### **Introduction: From idea to scientific publication**

#### **Aim of the book**

This Research Handbook is designed to provide guidance to hospital personnel, health researchers and biomedical researchers who would like to convert an idea into a high quality research project. Many of the suggestions presented here are based on the authors' own experiences in basic and clinical research in hospitals.

#### **Target group**

The general section of the book is designed for personnel at Norwegian hospitals and biomedical and health research institutions, who are interested in research. The book can be adapted for each clinic, hospital and research institution, and in this version provides several local tips from Oslo University Hospital (OUS) and Haukeland University Hospital.

#### **Format**

The Research Handbook was published in paper from the first to sixth editions (2003-2012) and as well as web format from 2014. From the 7<sup>th</sup> edition (2017) both the English and Norwegian editions of the book are published online in pdf-file on OUS's websites (<https://oslo-universitetssykehus.no/forskningshandboken>). There is a link to the Research Handbook from The Norwegian Electronic Health Library website (<http://www.helsebiblioteket.no/>), and the Western Norway Regional Health Authority ("Helse Vest") website (<https://helse-vest.no/forsking>) as well as several other institutions. In order to limit the amount of text in the Handbook itself, references are made to relevant websites (links remain active after downloading the pdf file to a computer with internet access).

## **Contents**

The Handbook is designed as an aid for both inexperienced and experienced researchers looking for easy access to information. The Handbook covers a variety of topics that are essential to researchers when translating an idea into a research project with publishable results. URLs to websites where the reader can access detailed information are listed in alphabetical order in the appendix, together with the English translation of some Norwegian research terms and bodies of interest.

### **National Research Handbook, local advice and practical suggestions**

Since 2007, the Research Handbook has been available as a national research resource at Helsebiblioteket (<http://www.helsebiblioteket.no/>), with a link to the electronic version at OUS, <https://oslo-universitetssykehus.no/forskningshandboken>). Health Authorities and research institutions are welcome to adapt the online Handbook by adding links to websites describing their own local practice guidelines. Information about local research support within Helse Sør-Øst and OUS can be found on the website ([Regional forskningsstøtte](#)), and for Helse Bergen at the website (<https://helse-bergen.no/fag-og-forsking/forsking>).

Any comments from the reader, including ideas or suggestions for Handbook improvement, would be appreciated. These are invaluable to us in our efforts to improve and update the Handbook on a continuous basis. Comments can be sent to Web Editor ([Michael Pilemand Hjørnholm](#)) or Editors [Annetine Staff](#) or [Karin C. Lødrup Carlsen](#).

The updated 2019 edition of the book can be downloaded and also printed (pdf format).

## Chapter 2

### Why perform research at Norwegian hospitals?

Medicine and health sciences are developing rapidly, and there are many good reasons to actively pursue research at Norwegian hospitals:

1. To increase our *level of knowledge* and hence our *clinical competency*.

We can acquire new knowledge directly through our own research. Such knowledge may be of a general nature or more specifically related to Norwegian or local conditions. The stability of our population and general good resources make conducting clinical research in Norway particularly feasible. Good resources in the form of comprehensive Norwegian national health registries have a considerable epidemiological potential as a basis for developing diagnostic and therapeutic guidelines.

Studies of disease mechanisms and intervention effects facilitate optimal diagnosis and treatment. Basic science medical research studying pathological conditions or diseases, so-called patient-related basic science research, or translational research, is crucial to the process of improving how we practice medicine in an evidence based manner. In addition, basic science research in hospitals provides training in academic thinking. By carrying out our own research, we become more skilled in interpreting international research results and applying them locally. Research requires a high level of documentation and precision. Clinical research influences the precision and quality of clinical work and contributes significantly to quality improvement.

2. Ongoing research in a hospital leads to *improved diagnostics and treatment of patients*.

3. Self-initiated research involving literature searches and publication makes the researcher(s) more attentive to front line thinking, and ensures up-to-date knowledge of the latest research results. This contributes to improvement of clinical skills both in diagnostics and patient management, and also increases the *researchers' qualifications for teaching posts at the highest academic level.*

4. Under the Act of 2 July 1999, no. 61 on Specialist Health Services (<https://lovdata.no/spesialisthelsetjenesteloven>) hospitals are obliged to conduct research.

5. We are as *members of an international research community* obliged to contribute to research. Norway, with its good economy, has a *moral obligation* to participate in generating new knowledge that can improve health and quality of life for individuals both in Norway and globally.

6. Finally, an important point to be made is that research *is fun!* It gives us the pleasure of satisfying our academic curiosity through systematic research work. Presenting our own research results at international meetings will also enable us to gain valuable international research contacts.

Research provides professional satisfaction and pleasure.

## **Chapter 3**

### **How to develop ideas for a research project**

Hospital staff engaged in clinical activities must constantly be aware of unsolved problems or suboptimal diagnostic methods in patient management. Are the disease mechanisms sufficiently understood to ensure that medicine is practiced in a firmly evidence-based manner? Are current methods adequate? Do we have new methods that could shed light on problems to which there were previously no solutions? Could there be alternative solutions or could new methods be developed? Can existing patient data be used for more in-depth assessment of the underlying pathophysiology? Changes in disease epidemiology may also necessitate new research. Healthcare professionals with ideas for scientific projects should contact researchers with the necessary relevant academic expertise at the appropriate unit or institution.

The flow chart on the following page is designed as a tool to aid research planning and to clarify the different phases of the research process. The chart can be applied both for qualitative and quantitative research projects.

#### **Idea →Hypothesis**

Write down the idea and develop the hypothesis. Putting things in writing clarifies one's ideas and makes it easier to state the objective of the project, as well as any supplementary aims. A clear definition of the question being raised increases the likelihood of valuable scientific results and is vital for further planning and efficient project work. This first creative phase of a research project may be the most challenging for many researchers. Although developing new ideas is critical to creating new and good research, there is little focus on how biomedical researchers can streamline and optimize this important phase of a research project. This book provides tips on how to become more adept at this

process: **Ness, R:** Innovation Generation: How to Produce Creative and Useful Scientific Ideas; Oxford University Press 2012.

## **Literature**

A thorough literature search pertaining to the relevant field and research question is essential. This process supplements and develops the original idea and helps determine whether the project may shed light on the research question. Literature searches may be performed using various bibliographical databases, potentially with librarian assistance (see Chapter 5). The Norwegian Knowledge Center for Health Services (Nasjonalt kunnskapssenter for helsetjenesten, “Kunnskapssenteret”) has designed checklists for evaluating research articles, systematic reviews and guidelines (<https://www.fhi.no/kk/oppsummert-forskning-for-helsetjenesten/sjekklistor-for-vurdering-av-forskningsartikler/>)

## **Choice of methods and design**

Determine which type of investigation should, and can realistically be conducted to answer the research question. A pilot study or use of retrospective data may be required in order to have sufficient basis for planning prospective studies. Randomized controlled trials are the "gold standard" for clinical studies. Studies may also employ a cohort or case control design, or be purely observational.

It is particularly important to calculate the number of patients/ subjects/ experimental animals/ cell experiments that must be included in order to provide a reliable answer, i.e.: perform a statistical power/sample size analysis. A study that does not have the statistical power to answer the question at hand should not be started, unless it is a pilot study. A new literature search may be useful at this stage. Contact experts within the fields of epidemiology or biostatistics at the planning stage of the study (see Chapter 8).

## User participation in research projects

User participation in research is becoming increasingly more important and is often required at an international, national

([www.regjeringen.no/HelseOmsorg21](http://www.regjeringen.no/HelseOmsorg21)), regional (<https://www.helse-sorost.no/helsefaglig/forskning>), and hospital level.

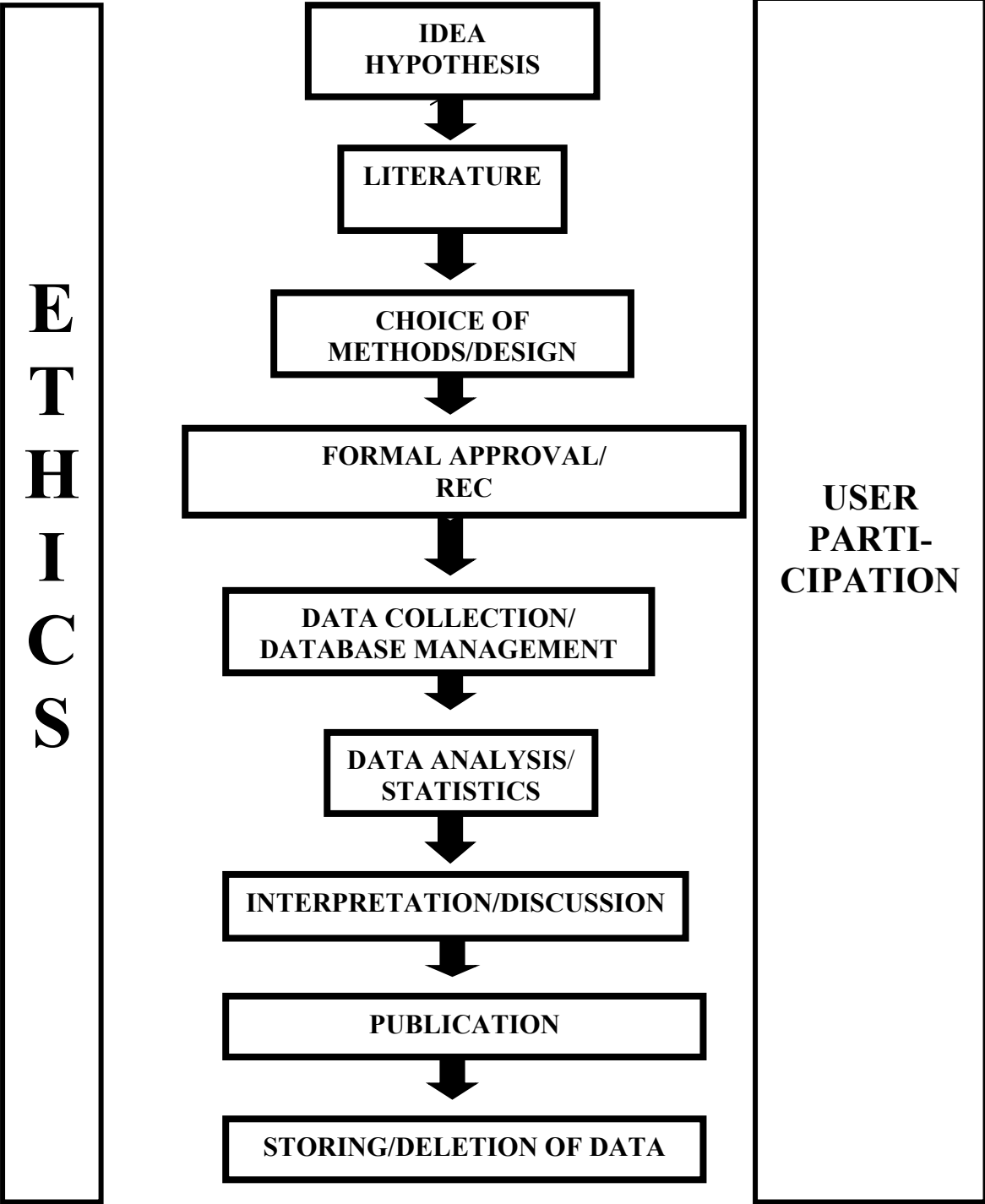
Oslo University Hospital (OUS) has adopted a general strategy and plan of action for user participation. The vision is that such user participation “*shall increase the quality of the treatment and give the patient increased safety and control over their own situation and own life*”. User participation ([Brukerutvalg](#)) is integrated in all the hospital’s tasks, also in research and development. It might be useful for many research projects to get advice from relevant user groups (when such individuals can be identified and wish to contribute) both in the planning and follow-up of research projects. OUS provides more information about user involvement in research projects:

<https://oslo-universitetssykehus.no/brukermedvirkning-i-forskning>

There is today an increasing involvement of patient groups and interest groups in a large spectrum of research projects, during planning, follow-up and evaluation of projects. For instance, it might be useful to have the relevant user groups review the information handed out to research participants/patients (and if relevant, to relatives of potential participants) before starting a research project.

For applications for research funding in Norway, the researchers must explain how user participation and organizations are involved in the research process and application. Several research institutions have started training activities aimed at researchers and user representatives to develop good and effective forms of cooperation.

The figure on the next page illustrates that user involvement is important in all phases of the research project, similarly to research ethics considerations not being limited to the "approval" phase (e.g. by (REK) of a research project.





## **Formal approval**

All research projects involving human beings, human biological material and health data are subject to review and approval. This includes approval by REK (the Regional Committee for Medical and Health Research Ethics, “Regional komité for medisinsk og helsefaglig forskningsetikk”), or the Norwegian Data Protection Agency (“Datatilsynet”) (alternatively the Data Protection Officer, “personvernombud”), the Norwegian Medicines Agency (SLV, “Statens legemiddelverk”) and the Norwegian Directorate of Health (“Helsedirektoratet”), as well as local approvals at the home institution, and in the case of multi-center studies, the partner institutions.

The following must be clarified well in advance of project commencement (for details, see Chapter 6):

- Local approval of the project, (usually at the Departmental/Clinical or Divisional level). We strongly recommend that institutional approvals be obtained prior to submitting an application to the relevant authority (REK / SLV etc.). Normally, the Head of the Department (or the equivalent) where the project is academically grounded will be the person who evaluates and approves the project professionally and resource-wise on behalf of the institution. As part of the local approval process it is also recommended that relevant research support staff at your institution is contacted for further clarification of regulatory issues. A Data Protection Officer (“personvernombud”) or other similar research support entities are currently established at most institutions where research on human beings is performed, which may include biological material or health information. For University employees, local guidelines for formal approval prior to project start may apply, such as described in the University of Oslo guidelines (The Quality System, <http://www.uio.no/english/for-employees/support/research/quality-system-for-health-research/>)

- External approval that must be obtained for your project (REK and other agencies): The need for external review and approval will largely depend on the purpose of the project, what (and whom) is being studied and if the study includes the use of drugs or medical devices, gene therapy and/or genetic testing. Chapter 6 presents the detailed requirements for such approval. Remember that if it is mandatory to submit your type of study to REK (see Chapter 6), the project should not start before REK has reviewed and finally approved it. For projects that do not require an approval from REK, but that include the use of personal or health data, it is normally required to notify the Data Protection Officer or to obtain a license ("konsesjon") from the Norwegian Data Protection Agency.
- Research Director ("Forskningsansvarlig"): Familiarize yourself with how this role is *defined in practice* at your institution.
- Research Protocols: Be thorough when you describe the project's purpose in your project protocols and consent forms. Any approval / license you obtain is limited to the research purpose/aim that you provide in the application / consent form.
- Participant consent is commonly to be obtained and the participant information and consent forms should be prepared and include all required information (including the purpose of the study) and the rights of the study participants (more on templates and consent requirements in Chapter 6).
- Registration of the project in a public database (such as <https://clinicaltrials.gov/>) may be required prior to the study, such as in clinical trials (see Chapter 9).
- Approval (in addition to obligatory REK approval) from the Norwegian Medicines Agency (SLV): Necessary for clinical drug trials (see Chapter 6), and medical devices: <https://legemiddelverket.no/english/medical-devices>

## **Collection of Data and Database Management**

Ensure that data collection is as thorough and rational as possible. A logical and tidy database is essential.

For research projects that involve the recruitment of test subjects and involve many collaborators / institutions, a regular update of the study's development could be especially important to motivate everyone to collect sufficient material or include sufficient numbers of study subjects. A positive project leader will automatically stimulate the research group and thus increase the likelihood of successful completion of the project.

*Data sources:* In medical research, patient information (health information), patient test results and health services data (for example data on patient progression through the healthcare system) are often essential data sources. Patient information can be obtained through the medical record systems, various quality control registries, including local, regional, and national health registries, or through the use of questionnaires. Patient biological samples can in some circumstances be retrieved from existing diagnostic biobanks or can be collected and stored in a research biobank for a specific project.

*Database construction* can be easy in smaller projects, but may include thousands of variables and a large number of databases in large, complex, long-term studies. This can present major challenges to the development and maintenance of databases, particularly as projects grow and an increasing number of researchers gain access to different parts of the data. Most hospitals and research institutions have their own research computer servers, and it should be decided early in the process which persons will be given access to the different levels of the research data. Generally a "*master file*", containing all the collected raw data, is established. Master files should not be changed after proofing and file cleansing is performed against the source data (the source data

may for example be made up of the files of individual research subjects, often called a Case Report Form, CRF). Any subsequent changes should be documented (in a separate file or other document), where corrected variables / data in the database are used for subsequent analyzes.

It is recommended to make a *variable list with correlating codes* at the start of the project. This simplifies the job later when you or others need to find which variables are related to each question in the research folder (Case Report Form: CRF). Since projects may contain many variables (both collected and constructed variables) and different (master) databases, it may be an advantage to have smaller and more focused datasets for each individual research question. The challenge is to always use the correct version of the variables, especially for the constructed variables. Database construction must provide a basis for subsequent quality control of data and final statistical analysis. It is strongly recommended to seek advice from experienced statisticians / researchers both before data collection is begun, and preferably during the construction of the complete dataset. In addition, transparency in the construction of datasets reduces the risk of fraud and misconduct in research, see Chapter 16. Be aware of the possibility of incompatibility between database and statistics programs. Programs that can handle the transition between databases and statistics programs are available, see Chapter 8.

At some health trusts, like OUS, registry support and help desk services for data handling in clinical studies are offered. At OUS, the Department for research administration and biobank offers registry support, including technical advice and guidance in planning, for the start and maintenance phase, and with extracting data from the registries. At the Department for clinical research support, similar services for clinical studies are offered including guidance in creation of databases and randomization strategies, control of research data and

processing of necessary documentation. Advising on the above topics is free, and there is a charge for this service if one or more operational tasks is to be performed by the research support unit.

Also, University employees may benefit from locally provided IT systems and support for clinical study handling, such as TSD (“Tjeneste for sikker datalagring”) at University of Oslo/USIT.

### **Data analysis and statistics**

A wide variety of statistics programs are available. Each hospital/research institution may have its own preferences. Contact a statistician in advance, for choice of method and design (see Chapter 8).

### **Interpretation and discussion**

Interpret the results carefully. Critically evaluate your own results, and compare with those reported by others. Discuss possible reasons for discrepancies with previously reported findings, including methodological issues (see Chapter 8).

### **Publication**

See Chapter 9.

### **Ethics**

See Chapter 16 for relevant links to the Research Ethics Library (<https://etikkom.no/FBIB/Detailjert-oversikt/>). Ethical questions and issues are important in all stages of a research project, from the planning stage to the end of the project (e.g. how to publish the research data).

- First and foremost, one must attend to the individual test subject’s interests and integrity. This applies to both the patient-related research, but also when the project exclusively involves the use of human biological material and/or

health data. Potential scientific results and possible public benefit that can be achieved must always be weighed against the interests of the research participants. For example, research participants should never be given poorer examination or treatment than the presumed best. All experimental diagnostics and treatment must therefore be assumed to be beneficial and have a solid rationale supporting the assumption.

- Research-related or commercial interests must not unduly influence data collection, database construction, or analysis. As a researcher, you have the responsibility to ensure that your research is based on objectivity and impartiality, regardless of who initiated the project.
- It may be unethical to start a (quantitative) research study that does not have adequate statistical power to answer the study questions.
- In many studies, the databases should undergo an independent audit prior to analysis. Research support Departments at large institutions can advise on how to carry this out. In addition, it is often necessary to have objective documentation of the study endpoints. Special guidelines apply to such independent evaluation of clinical drug trials.
- In the interpretation and discussion of data, all data must be made available for review, especially if there are adverse or unintended effects. Be open about and discuss the strengths and weaknesses of your study.
- The research must be of academically high quality. It is unethical to use resources and research participants for studies that do not reach a sufficient level of quality. It is also unethical to fail to communicate research results, including negative results, either as reports or scientific publications. Both the researcher and the research institution are responsible for making sure that research projects are carried out with good research ethics.

***Books:***

**Laake P, Benestad HB , and Reino Olsen B (editors.):** Research in Medical and Biological Sciences. From Planning and Preparation to Grant Application and Publication. Elsevier Academic Press 2015.

**Ness, R:** Innovation Generation: How to Produce Creative and Useful Scientific Ideas. Oxford University Press 2012.

**Laake P, Reino Olsen B og Benestad HB (red.):** Forskning i medisin og biofag. Gyldendal Akademisk 2008.

**Friis S og Vaglum P:** Fra idé til prosjekt. En innføring i klinisk forskning. Tano Aschehoug 1999.





## Chapter 4

### Project descriptions and protocols

According to the Health Research Act (<https://lovdata.no/helseforskningsloven>), research involving human beings, human biological material and health data must be described in a research protocol. It is the research protocol, along with the application to the Regional Committee for Medical Research Ethics (“Regional komité for medisinsk og helsefaglig forskningsetikk”, “REK”, see Chapter 6) that forms the basis for the committee's research ethics review and approval.

Clinical drug trials must be conducted according to Good Clinical Practice (GCP) and have special requirements for the protocol and project implementation, [https://lovdata.no/forskrift om klinisk utprøvning av legemidler](https://lovdata.no/forskrift_om_klinisk_utprøvning_av_legemidler)). It may be sensible to follow the GCP requirements also in other types of research studies. GCP requires that the protocol and other relevant study documents be dated, paginated, and signed by all involved in the study (or the leader/principal investigator in exempt cases). All study documents must have documentation of version control, in which updates should be made clear. Formal approvals of clinical research studies apply to the dated version submitted for review.

Previously, both project descriptions and research protocols were used. The distinctions between these two types of documents are about to be wiped out, and in most cases there is no need for a separate project description, given that the protocol is required. For your convenience, you may want to use the summary in the protocol as a short project description, for example:

- To inform and get approval for the project at your institution.
- To apply for funding (as an attachment to the protocol).
- As a working tool in relation to planning and implementation.

- When applying to other agencies, see Chapter 6

### **What a protocol should contain**

In the Regulation appended to the Act on the organization of medical and health research

([https://lovdata.no/forskriften om organisering og helsefagligforskning](https://lovdata.no/forskriften_om_organisering_og_helsefagligforskning)), it is specified what a research protocol (to be written in Norwegian or English) should contain. This includes among other things:

- The project leader's name
- A scientifically designed project plan (documenting the need for the research, project aims, materials and methods, likelihood of the study design to answer the research question, and the time frame)
- Sources of health data and a description of the processing of these data (including whether this is to occur in other countries/at other institutions)
- Sources of biological material (including whether these are to be sent abroad)
- Research-related ethical challenges
- Assessment of risks and benefits for the research participants
- Financing, conflicts of interest, dependency, and economy
- A plan for the publication of the results etc.

The protocol should be a detailed project work description that forms the basis for applications to all the relevant bodies for approval, a tool to be used whilst implementing the study, and the document against which results are evaluated (in a publication or report). The more thorough the protocol is, the easier it is to write scientific articles based on the study. The table below shows the contents of a typical research protocol, as well as additional factors, which may be relevant to many research projects. Supervisors should be able to give advice on any other specific items of relevance to the proposed study. Qualitative research

may emphasize other aspects than quantitative projects in their protocols.

Among other things, power calculations may not be applicable.

All studies	Useful in many studies	Relevant to some studies
<b>Date, version, pagination</b>		
<b>Title/working title</b>		
<b>Summary</b>	Information to participants	
<b>Project participants</b> Project manager, Project staff, (Supervisor), Collaborators	Delegating authority (especially in GCP–studies)	Steering committee/panel Reference committee
<b>Introduction</b> What is known today and what do we need more knowledge about?		Publication committee
<b>Hypothesis aim/objective</b> “Aim” or “objective”, preferably also hypotheses. Aim of Study Material and methods	Endpoints (primary/secondary)	Safety committee (some GCP-studies)
<b>Participants</b> Inclusion and exclusion criteria Recruitment, information, data protection	Procedures for handling of protocol deviations (should they be included in any analysis, which?) “Intention to treat”	Flow chart Randomization procedures
<b>Methods</b> Which methods <b>Administration of health data and biological samples</b>	Securing of methods Design: type and justification registration form ("CRF" *) Data Handling Procedures Procedure for collection / storage	Safety/ what if unexpected side effects? “Patient compliance”
<b>Statistics</b> Samples size and reason for this	Calculation of sample size / power analysis (relative to the main endpoint) Planned statistical methods	
<b>Implementation Plan</b> <b>Publication Schedule</b> Publishing of results, including the plan for publications / reports	Schedule ("milestones") Data management plan Tentative author order	Handling of resources Handling of deviations from the planned progress
<b>Research ethics considerations</b> Risk-benefit for participants Conflicts of interest/dependency	Plan for application to relevant bodies (see Chapter 6) Research participant information <b>Informed consent</b>	User participation (relevant and often mandatory to address in health-related studies)
<b>Storage, anonymization, data handling</b> , during and after study completion		
<b>Relevant literature</b>		
<b>Budget and Funding</b>	Insurance Financing/Sponsors	Priority of analyses
	Signature of project manager and collaborators	

\* CRF: Case Report Form

A template protocol in accordance with the requirements of the International Conference on Harmonization ICH-GCP is found for example in the research Department at OUS (see link: [Regional forskningsstøtte](#)) as well as on the NorCRIN websites (English Clinical Research Infrastructure Network; <http://www.norcrin.no/>). This template is recommended for use in clinical drug trials.

For projects that are neither subject to disclosure to REK nor a clinical drug trial, there exists no corresponding formal requirements for what a research protocol should contain. It is still recommended that you follow the same requirements that REK uses since these requirements are based on well-established standards for the preparation of scientific protocols.

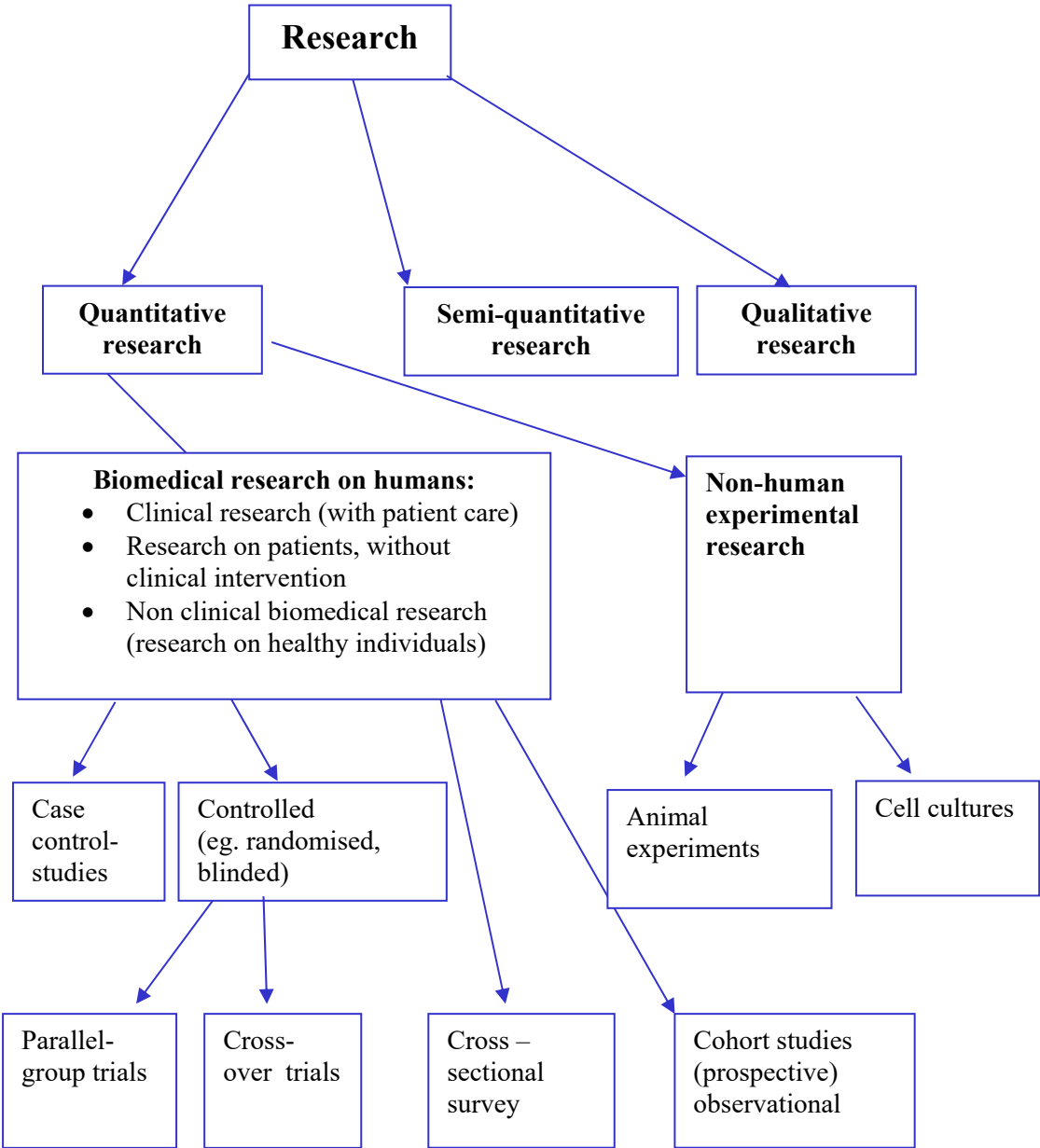
### **Changes to the research protocol**

If (substantial) changes are to be made to the study after formal approval is given, the changes must be approved by the REK, (<https://helseforskning.etikkom.no/endringer>) and any other relevant bodies before they can be implemented (for clinical drug trials: <https://legemiddelverket.no/Endringer>). Remember that the research institutions' own requirements and needs for updating research must be followed. It is important that the research protocol is updated in parallel with the research project changes. This is usually done in the form of an "amendment" ("addition") to the protocol in addition to the notifications to the relevant bodies of these changes.

**Useful link for University of Oslo employees:** <http://www.uio.no/english/for-employees/support/research/quality-system-for-health-research/>

**Chapter 5**  
**Research methodology and literature search**

It is important that research methods are reliable and valid. A reliable method is one, which can be standardized, and is specific, sensitive, reproducible and accurate. There are a number of approaches to the design of studies and research projects, all of which may be equally valid. Below is an overview of the most common research methods used in research projects within the fields of health science and medicine.



## **Quantitative versus qualitative research**

Medical research has traditionally been of a quantitative nature. This type of research measures amounts, degrees and frequencies and provides answers to questions such as: *How much? How often?* The emphasis is on "hard data", distance and objectivity. This approach is particularly suited to testing hypotheses. However, it is less appropriate for the study of "soft data" such as thoughts, experiences, attitudes and processes, for which qualitative methods are more appropriate. While quantitative methods analyze numbers and provide results in the form of tables and diagrams, qualitative methods deal with text (transcribed from interviews) and lead to results in the form of categorization of content and quotations. While quantitative research often tests hypotheses, qualitative research is often descriptive and tends to generate hypotheses. Although qualitative research is often descriptive and quantitative research analytical, this distinction is far from absolute. Qualitative research has gradually developed into a significant and distinct scientific area (Malterud 2003 and Kvale 2009). It is the nature of the research questions that should determine the appropriate scientific methods to be used (Lorensen 1998), and many research projects may benefit from both qualitative and quantitative methodologies.

Tools have been developed to measure patient-reported endpoints (PROM) for numerical assessment of "soft" data (see Chapter 8). Graduated scales based on interviews or self-reporting allow scoring of items such as symptom levels, satisfaction with treatment or quality of life. Parametric statistics may be used since, in practice, such scales function as interval scales (Campbell & Machin 2003). Validated scales such as these, allow researchers to use powerful statistical methods for the analysis of major clinical problems relating to patients'/informants' symptoms, experiences and considerations.

Patient-reported outcome measures (PROM) provides a patient's health information directly from the patient. PROM includes e.g. health-related quality of life (HRQL) and symptom measurements. Valid results in a study depend on choosing the right outcome, and thoroughly assessing whether the outcome measure is suitable to assess what is intended in the chosen population. The regional research support network PROMiNET ([www.prominet.no](http://www.prominet.no)) assists researchers by facilitating access to updated knowledge, valid research methods, and outcome measures.

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**Kvale S.** Det kvalitative forskningsintervju. Ad Notam Gyldendal 2009. 3<sup>rd</sup> Edition, Gyldendal 2015.

**Campbell MJ & Machin D.** Medical statistics: A commonsense approach. John Wiley and Sons 2003.

**Malterud K.** Kvalitative metoder i medisinsk forskning. En innføring. Tano Aschehoug 2003.

**Lorensen M.** Spørsmålet bestemmer metoden. Forskningsmetoder i sykepleie og andre helsefag. Universitetsforlaget AS 1998.

### ***Further literature***

#### **NEM's guidance on qualitative research**

<https://www.etikkom.no/forskningsetiske-retningslinjer/Medisin-og-helse/Kvalitativ-forskning/>. This publication is intended as an aid to the

members of the Regional Committee for Medical Research Ethics (REK) in the evaluation of research using qualitative research methodology. The publication contains many references to qualitative methodology.

## **BMJ's checklist for qualitative research**

<http://resources.bmj.com/bmj/authors/checklists-forms/qualitative-research>

## **Qualitative Research series from the BMJ**

[http://annietv600.wordpress.com/2008/09/04/qualitative-research\\_bmj](http://annietv600.wordpress.com/2008/09/04/qualitative-research_bmj)

**Friis S and Vaglum P.** Fra idé til prosjekt. En innføring i klinisk forskning. Tano Aschehoug 1999.

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**Malterud K.** Qualitative Research Standards, Challenges and Guidelines. Lancet 2001; 358: 483-488.

**Qualitative Health Research**, an international journal for qualitative research in nursing and health services. (<http://qhr.sagepub.com/>)

## **Literature search**

1. *Bibliographical databases* contain references to journal articles (often with abstracts), books and other publications. Some databases are available free of charge via the Internet, while others require a subscription.

Most journals are available in full text on the internet, but a subscription is required to access them. As a rule, institutional libraries subscribe to the most important databases, as well as to the key journals within most of the medical specialties. Please contact your library to get an overview of what you have access to, as well as what can be obtained beyond that which is included in print or electronic collections.

In Norway, many databases and journals are freely available through The Norwegian Electronic Health Library ([www.helsebiblioteket.no](http://www.helsebiblioteket.no)) - a national online resource in medicine and health sciences. The National Health Library



website also contains other useful information, including a separate page with links to helpful resources for researchers. Your local library will also have information about what is available at Helsebiblioteket.no.

The Norwegian Knowledge Center for Health Services (“Nasjonalt kunnskapssenter for helsetjenesten”, “Kunnskapssenteret”) has developed checklists for assessing research articles, systematic reviews and guidelines (<https://www.fhi.no/kk/oppsummert-forskning-for-helsetjenesten/sjekkliste-for-vurdering-av-forskningsartikler/>).

In order to perform a comprehensive literature search, multiple databases are usually needed, because they vary in scope and organization. Ample knowledge of the various databases is necessary in order to ensure the quality of the literature search. Most libraries offer guidance on literature searches, and many also organize courses on the use of the different databases. One of the most widely used bibliographic databases in medicine and the health sciences is Medline, which contains over 17 million references from around 5000 journals dating back to approximately 1948 and leading up to today. PubMed is the free version of Medline (<http://ncbi.nlm.nih.gov/pubmed/>). Medline is also accessible in a subscription version (e.g. provided from Ovid). There are several other relevant databases, such as EMBASE, which are important supplements to PubMed/Medline Ovid. A direct link to the full text articles may be available through local library websites, provided they have a subscription for the relevant Journal.

2. *Hospital Library.* Most hospitals have a medical library for staff, researchers and others affiliated with the institution. When performing a literature search, it may be useful to contact the library to get help with improving the search

quality. The library may also provide literature not included in the print or electronic collections.

3. *A personal library* of articles of particular interest for your personal use can be created in various ways. Some prefer partial or complete manual systems, such as continuous storage and numbering of relevant articles in combination with alphabetical ordering, either by topic and/or first author. Others prefer electronic tools, such as reference management programs. The most common reference management programs are Reference Manager and EndNote. These have mostly the same features and options and are easy to use. The programs are used to create a personal reference archive either by importing references from bibliographic databases such as PubMed or Medline Ovid, or by manual entry. The advantage of these programs is that they can be connected to Word and used to create citations and reference lists in articles. Hundreds of output styles are included, and by a few keystrokes the formatted reference list can be altered in compliance with the requirements of a specific journal. Please contact your medical library for information regarding which programs your research institution offers and opportunities for courses and guidance.

***Other useful literature search tips***

- Google Scholar (<http://scholar.google.no/>)
- GoPubMed.org (<http://gopubmed.org/web/gopubmed/>)

## **Chapter 6**

### **Research projects: The formalities**

This chapter will explain the formalities (approvals, etc.) that should be in place before a research project involving human beings, human biological material and health data can begin. Bear in mind that the Project Manager (“prosjektleder”) is responsible for obtaining the necessary approvals for the research project.

Internal approval processes for research processes at the individual research institutions are described in Chapters 3 and 7. This chapter (Chapter 6) focuses on requirements for external approvals from relevant government agencies (REK, the Data Inspectorate / Privacy Ombudsman, SLV and the Directorate of Health).

As with hospital staff, university employees have local guidelines for formal approval before project start, as described in UiO's guidelines (The Quality System, <http://www.uio.no/english/for-employees/support/research/quality-system-for-health-research/>).

#### **6.1 The Health Research Act and the Ethical Committee System for Medicine and Healthcare in Norway**

##### **The Health Research Act**

The introduction of the new Health Research Act and associated regulations in July 2009 (<https://lovdata.no/helseforskningsloven>), see Appendix) has led to considerable changes in formal procedures for prior approval and monitoring of research projects. Starting in 2009 the Regional Committee for Medical Research Ethics (REK) is the main authority that grants preapproval of medical and health research projects. The implication of this new Act is a more in depth

clarification of the responsibility of the research institution. The purpose of the new Health Research Act is to promote solid and ethically sound medical and health-related research. The Act is based on the Official Norwegian Report (NOU) 2005: *Good research - better health* (by the Nylenna Committee). Links to the relevant laws, regulations and guidelines that regulate management of research projects (and quality assurance projects) are listed in the appendix. The Health Research Act determines that REK is the only external body that preapproves medical and health research projects (with the exception of The Norwegian Medicines Agency and The Norwegian Directorate of Health, see below). The aim is to simplify the application process, so that the Project Manager ("prosjektleder") only has to deal with one external authority (REK), in addition to the research institution, for formalization and anchoring of a research project.

The role of *The Data Protection Officer* ("personvernombudet") in medical and health research is after 2009 largely maintained as part of the research institution's internal review and systems responsibilities. The Data Protection Officer for Research is a significant resource for obtaining advice and quality assurance in connection with processing and storage of health data in research. The Data Protection Officer is either internal to the institution or external. An updated list of institutions/ health trusts that have such an internal "personvernombud" is available on the Norwegian Data Protection Agency website under "personvernombud" (<http://www.datatilsynet.no/>).

Further information about privacy and information security within the healthcare sector can be found at the Norwegian Directorate of Health (<https://helsedirektoratet.no/English>). Obtaining assistance and advice from a Data Protection Officer for Research or equivalent support (e.g. from a competence center), is an important and central part of the research

administrator's responsibility to 1) perform review within the organization, and 2) ensure privacy and information security in all research involving the use of health data and other sensitive information. The Norwegian Data Protection Authority is still regulator for all processing of health data, also in research (§ 47 of the Health Research Act).

A useful guide to the Health Research Act is prepared by the Ministry of Health and Care Services (see Appendix). An online training course (with course test) for researchers on the Health Research Act is since 2012 freely available from The Norwegian Electronic Health Library, in cooperation with The Norwegian Medical Association (<http://nettkurs.legeforeningen.no>).

### **Organization of the ethics committee system of medicine and healthcare in Norway**

The Regional Committees for Medical and Health Research Ethics (REK, <https://rekportalen.no/>) were established in 1985 by the Ministry of Education and Research ("Kirke-, utdannings- og forskningsdepartementet") and currently consists of seven committees: REK South East (4 committees: A, B, C and D), REK West, REK Central, and REK North. The Project Manager's ("prosjektleders") place of work usually determines which REK will receive the application, but as a result of the new national distribution system introduced in July 2007, applications may also be processed by another committee.

The committees have since 2001 been subject to the Principle of Public Access, and as of 2007 they have been a part of the government's public administration. The members of the committee are appointed for a period of 4 years by the Ministry of Education and Research ("Kunnskapsdepartementet") on the basis of nominations submitted by the following specialties: medicine (Chair and Deputy Chair), psychology, nursing, law and ethics. A lay representative, a

representative for patient organizations, and a representative for the hospital owner or public health authority are also appointed. The activities undertaken by REK follow the provisions of the Research Ethics Act and Health Research Act. In addition, the work of the Ethics Committees is based on a number of conventions, as well as commonly accepted ethical principles. The REKs are to coordinate their procedural decisions in order to ensure that "equal cases are treated equally". As of today, the committees have no formal deadline for when a decision must be made by, relative to when they receive the application. The processing time depends in part on the need for the committee to obtain external expert opinion.

The National Committee for Medical and Health Research Ethics ("Den nasjonale forskningsetiske komité for medisin og helsefag", NEM, <https://www.etikkom.no/en/>) is an advisory body that coordinates the work of the regional committees (the REKs). NEM is also responsible for evaluating other independent ethical questions pertaining to research within the biomedical and health science fields, and has been the appeal body for cases evaluated by REK since 2007. NEM has the unique responsibility of promoting equality in the processing and evaluation of similar proposals by the various REKs.

*The Helsinki Declaration* is of fundamental importance to ethical research work within medical and health-related research. The Declaration was drawn up under the direction of and approval by the World Health Organization in 1964 ([Declaration of Helsinki](#)). The Declaration has been revised several times, most recently in 2013. In 2008 it was revised with special mention of new guidelines for research involving children and the use of placebo in research. Clarification of conditions for use of placebo was actually first made in the 2002 revision, and this was further emphasized in the 2008 version. The most recent editions of the declaration emphasize transparency of research funding. The need for

transparency surrounding funding is important, because studies have shown that the research results and publication willingness differs depending on who is paying for the research (Laine et al 2007). The Declaration also emphasizes the obligation researchers have to publish their own research results irrespective of positive or negative findings.

The NEM website includes a research ethics library (<http://www.etikkom.no/FBIB>), including information and articles on ethics, integrity and collegiality, co-authorship, privacy and responsibility of the individual, research on specific groups, research on human material, the relationship between society and research, science and the environment, as well as an overview of ethical research entities, laws and policies (<https://etikkom.no/Forskningsetikk/Etiske-retningslinjer/Generelle-forskningsetiske-retningslinjer/>).

Authors, who wish to describe REK, when writing articles in English, may use the term "Regional Committee for Medical and Health Research Ethics" (the corresponding American institution is the Institutional Review Board, IRB).

### **New European Data Protection Regulation (GDPR) of 2018 and the impact on research projects**

The Privacy Regulation (Regulation 2016/679) is a regulation that aims to strengthen and harmonize privacy in the processing of personal data in the European Union (EU). The regulation also deals to some extent with processing that takes place outside the EU or the transfer of personal data out of the EU. The regulation came into force on May 25, 2018. It then replaced the Privacy Directive, and has direct effect in the member states, and thus - unlike directives - does not require national law. The Privacy Regulation is EEA-relevant. In Norway, the regulation entered into force on 20 July 2018. The regulation

applies if the data controller or data processor (a business) or the registered (individual) is in the EU (or EEA).

If the controller is a public authority (with certain exceptions for the courts, etc.) or an undertaking with more than 250 employees, it is mandatory to appoint a privacy officer. The same applies to data processors where the core task is the processing of personal data. This means that having a Personal Data Officer (Personvernombud) at research institutions that process personal data is now again required by law. The new European Privacy Code (GDPR) requires that a Data Protection Impact Assessment (DPIA) be made. A self-declaration DPIA template has been made by the Personal Data office at OUS, and may be assessed at <https://nettskjema.no/answer/dpia.html>).

## **6.2 Projects that must be submitted to REK**

The Health Research Act applies to "medical and health research on humans, human biological material or health information". This also includes pilot studies and experimental treatment (<https://lovdata.no/helseforskningsloven>).

The requirement to apply to REK is limited to projects *with the objective of acquiring new knowledge on health and illness*; in other words, projects must have an explicit medical or health objective. The decisive factor is thus not whether or not the project deals with humans, human biological material, whether there is a considerable amount of information, or very sensitive information, or whether the project is to be carried out within the healthcare service already in place or by particular healthcare personnel.

For projects that fall outside of REK's mandate, standard institutional requirements on personal data protection and data security will still apply (e.g. Personal Data Officer involvement), see Chapter 6.3. The line between projects



that require an approval from REK and projects that require different approvals in order to be carried out, are discussed in more detail in Chapter 6.4. If the study involves clinical drug trials involving humans, an approval from the Norwegian Medicines Agency (SLV) must also be obtained, in addition to the REK approval, see Chapter 6.8.

### **Use of health data in research**

Prior approval from REK is both necessary and provides a sufficient basis for the use and processing of health data in research. But REK's approval is not synonymous with having the right to conduct the research project, as it is also necessary to obtain approval from (and in collaboration with) the relevant institution(s) from where the data are to be obtained, before the project can begin. This is discussed later in this chapter and in Chapter 7.

Requirements for REK approval also include research on de-identified data, i.e. where it is possible to link the information back to individuals by using a code key, even if the researcher does not have access to the code key. The authority that The Norwegian Data Protection Agency (Data Protection Officer) previously had to authorize the use of health data for medical and health-related research, has now been transferred to REK.

In The Health Research Act there is a special provision for research studies that only use data from one of the Norwegian national health registries (listed in the Updated Health Registry Act from January 2015, §11). Such registries include The Medical Birth Registry, Cancer Registry of Norway, Norwegian Prescription Database, the Cause of Death Registry, SYSVAK (national immunization registry) and NPR (Norwegian Patient Registry). Evaluation and approval from REK is not required if the data are equivalent to anonymous before being handed over to the researcher. This means that REK approval is not

required if personal identifiers have been removed such that the data are only indirectly linked to personal identifiers when handed over to the researcher (in other words the data has been anonymized). This exemption also pertains to research projects that link data between these central health registries. However, other medical and health-related research projects that involve linking to registries other than the central registry (e.g. health records, medical records and other public registries), must be evaluated and preapproved by REK. For example, the Project Manager ("prosjektleder") must apply to REK if data from the Cancer Registry is planned to be linked to information obtained from medical records of a health institution.

Research projects using genuinely anonymous information and anonymous human biological material are not required to notify REK either, assuming the data is anonymized before it is disclosed to the researcher. If the health data is first collected, and then anonymized, approval from REK is required.

Bear in mind that The Health Research Act and the requirements for preapproval from REK solely apply to the use of health data according *to a specific research protocol*. If planning the establishment of health records for future research (i.e. a quality registry / research registry), one usually has to apply for authorization from The Norwegian Data Protection Agency. Applications for authorization are normally handled by the institution's Data Protection Officer. In certain cases where the registry is less extensive and is to be used for a lesser duration of time, the registry can establish after solely notifying the local Data Protection Officer. The Data Protection Officer can help with guidance on what approvals are required.

## **Research Biobank and use of human biological material for research**

The definition of a research biobank is "a collection of human biological material used in a research project or which is to be used for research"

(<https://lovdata.no/helseforskningsloven>). Test results and information that can be derived from biological material, however, are not part of the biobank. These should be treated as health data (Chapter 7 of the Health Research Act). All projects involving the use of biological material must be approved by the REK. Unlike anonymous information, the disclosure obligation also applies to the use of anonymous biological material from a biobank.

REK has the task of approving the use of human biological material for research and for establishment of a research biobank (<https://rekportalen.no/>). The Health Research Act allows, however, for the establishment of a general research biobank that is not linked to a specific research project (§ 25). This is classified as a prospective research biobank where the recruitment happens prior to commencement of the research project. Such samples may be used in multiple future research projects. In such cases, the application to REK for establishing a general research biobank is to be submitted through REK's web portal. The application for the establishment of a general research biobank will often be based on a "broad consent" from the study participant (see the Health Research Act, § 14). Every research project that uses material from such a biobank must apply for REK approval and provide the informed consent form that is to be used.

The Health Research Act (§ 28) allows that biological material that has been obtained and used in a healthcare setting, be used for research. This includes biological material from diagnostic or treatment biobanks. REK may approve research projects for which *the patient's consent is not mandatory* in this setting, provided that "such research is of substantial interest to society and the

participants' welfare and integrity are assured". One of the conditions for such REK approval is that "patients have to be informed in advance that human biological material gathered for clinical purposes can in certain cases also be used for research, and they must be given the opportunity to reserve the use of their own human biological material in research studies" (§ 28). A registry has been established for persons who wish to withhold their biological material from being used for research ("Reservasjonsregisteret", i.e The Reservation Registry). The Project Manager ("prosjektleder") must ensure that potential project participants are not on this list. The Reservation Registry is administered by the Norwegian Institute of Public Health ('Folkehelseinstituttet'). Relevant information for researchers on how to ensure that biological material from persons denying such research is not used is presented on their website (<http://www.fhi.no/> - please see the Appendix for the complete link). These websites also include information for patients on how to register to withhold their own biological material from future use in research. However, this reservation is not absolute. The Project Manager can ask for and obtain consent from a potential participant for a specific project even if the person is listed in the reservation registry. The Health Research Act (§ 8) states, "commercial exploitation of research participants, human biological material, or health information as such is prohibited".

#### *Dispatch of human research material to foreign countries*

As a rule, a research biobank or parts of a research biobank can only be shared with other researchers and projects and sent abroad if approved by REK, and if the donor of the material (the study participant) consents to it (the Health Research Act, § 29). If human biological material from a research biobank or treatment biobank is to be used for research by other external researchers (§ 31 of the Health Research Act and § 15 of the Treatment Biobank Act, [Behandlingsbiobankloven](#)), those responsible for the Biobank (the Research

Director/“forskningsansvarlig”/ the person in charge) are required to ensure that the necessary approvals have been attained before sending the material. This is normally based on REK approval granted to the external Project Manager. Such sharing of biobank material is followed by a mutually signed material transfer agreement and is anchored internally at the research institution.

#### *New and altered use of existing research biobanks*

In order to make new and altered use of an existing research biobank, a new REK evaluation and approval is needed. This can be achieved either as part of a new application to REK for a project (a specific research biobank), or as a separate application for the establishment of a general research biobank unrelated to a specific project.

If significant changes are to be made to the use of human biological material in a specific research project or significant changes to an already established general research biobank, the amendment should be approved by the REK in a change notification form (<https://rekportalen.no/>).

#### **How to apply to REK**

Applications to the REK should be submitted electronically. Deadlines and meeting dates are listed on the web portal (<https://rekportalen.no/>). Regulations on the organization of medical and health research (see Appendix) contain comprehensive information about the roles and responsibilities when applying to REK.

The application form to REK must include information about the Research Director (“forskningsansvarlig”), “Project Manager (“prosjektleder”) (including her/his qualifications), the aim and rationale of the project, materials, methods, assessment of the probability that the study design will yield answers to the

research questions, timeframe, selection criteria for research participants, recruitment of participants, information/personal data security for participants, obtaining consent, ethical research challenges, research subject safety, interests, sources of finance, conflicts of interest, and publication of results. As a rule, the application for approval should be written in Norwegian. A research protocol should be attached in either English or Norwegian (see requirements for this in Chapter 4).

### **REK decisions**

REK *approves* or *does not approve* research projects and can stipulate conditions for approval. REK must provide grounds for their decisions. REK may use external experts in difficult cases and is free to determine the emphasis they place on any such expert advice. A list over approved REK projects is presented on the website (<http://helseforskning.etikkom.no>).

Most projects are approved after some or several changes. Often the written information for study participants is incomplete and requires improvement. A lot of time is saved by thorough preparation of the application. The Research Handbook's authors therefore strongly recommend all researchers who are not familiar with the REK applications to obtain advice and guidance from research staff and experienced researchers/advisors before applying.

In their evaluation, REK carefully considers any potential benefits and risks/inconvenience/discomfort to the project participants or the community at large. REK also considers whether the Project Manager and collaborators have the expertise needed and whether the proposed selection of participants is appropriate with respect to the research question. Other central components of REK's evaluation are the manner in which consent is obtained, and the question

of whether exemption from obtaining consent may be acceptable for a specific project.

### **Grounds for appeal to NEM**

Final decisions made by REK may be appealed to NEM by the Project Manager. This applies both to a rejection of the application (“non-approval”) and to any specific conditions put forth by REK in order to grant approval. If REK rejects the application on the grounds that they do not consider the project to be medical or healthcare-related, the Project Manager may also appeal this to NEM. Any complaints about REKs verdict should be sent to REK by the Project Manager. REK will then assess the basis for the appeal and may either change its original decision or forward the appeal and the case to NEM.

When publishing the results of a quality control study, which does not require REK approval, a researcher (author) can ask REK for a general statement for manuscript submission ("exempt from IRB (Institutional Review Board) evaluation"). This can be a convenient solution when you want to publish in a journal that requires all results to be based on a prior ethical review by the IRB. This is a requirement that all the reputable scientific journals have adopted and is based on Article 35 of the Helsinki Declaration.

### **6.3 Quality control studies and other types of research projects**

Quality control studies and other research projects that involve the use of personal and health data, but do not require REK approval, must notify the Data Protection Officer and, in some cases obtain a license from The Norwegian Data Protection Authority. Whether or not the study is intended for publication does not impact whether preapproval by REK is required. The deciding factor with regards to whether the project should be submitted to REK is based on whether privacy and health data will be used to obtain new general knowledge about

disease and health. Chapter 6.4 discusses the grey zone between quality control studies / other research projects (that are exempt from disclosure to REK) and research for which disclosure is mandatory.

Either way, researchers and healthcare professionals are always personally responsible for protecting the study participants' interests, including medical, health, and privacy issues, regardless of whether the project is subject to REK application or if the project requires notification to the Data Protection Officer or a license from The Norwegian Data Protection Agency. Anyone involved in research must have sufficient expertise to comply with the procedures and institutional requirements that apply regarding personal and health data.

Requirements for a high level of security when handling data, applies regardless of whether the project is a quality control study, other type of research, or requires approval from REK. The local Data Protection Officer or Information Security Officer at your research institution will have established routines and will also assist in ensuring proper handling of the data in the research project.

#### **6.4 The demarcation between research projects that need approval from REK, quality studies and other research projects**

*Research projects that must be approved by REK versus quality control studies.*

The Norwegian term “kvalitetssikring” (quality control studies) is an ambiguous term, and it may be difficult to determine whether a project should be defined as a research- or a quality control study. It is not the scientific methodology, whether the results are to be published, or whether the project is a type of research that is exempt from REKs mandate that determines whether a project should be defined as "research" or "quality control. REK’s practice shows that a number of projects are considered to be quality control studies based on the project aims. Studies with a primary aim of evaluating a treatment program or healthcare services are considered an integral part of the healthcare service. As a



result, these studies are subject to the overall health legislation, and the framework of the Health Research Act does not apply.

The REKs have identified some characteristics that define whether the projects are deemed as research or quality control projects. These characteristics are summarized and recommended by the Joint Committee for REK (“Fellesorganet for REK”, see link in Appendix).

Among the key factors indicating that a study should be defined as *"research"*, thereby requiring evaluation and approval from REK are:

- Does the project involve risks to the participants? In clinical follow-up studies, diagnostic procedures may for example involve risks that are acceptable for the purpose of obtaining a correct diagnosis, but that are not acceptable for use in a research follow-up study.
- Does the project involve extra procedures for the participants, which would not otherwise get done as part of regular clinical follow-up?
- Will the project generate new general knowledge that may be of general interest? (A quality control project may also generate "new" knowledge, but may still be exempt from mandatory REK evaluation, if the project has other obvious quality control study characteristics).
- Methodology development. If a study involves new diagnostic or therapeutic approaches tested in humans, this is deemed as “research”, and will require a REK evaluation and approval.
- Randomization of research participants argues for application to REK.
- If the study involves recruitment of a control group of healthy subjects, REK approval is required; as such participants are not covered by the regulations that apply to patients in the healthcare system.

Characteristics of a "*quality assurance project*" according to REK:

- Is the project retrospective? This does not mean that a quality assurance project cannot be prospective; study design may involve the collection of new data based on information from retrospective data, typically as part of a follow-up of a treatment program without specific research questions. This applies regardless of whether the data are collected from several institutions.
- Are different methods being compared? If the project aims to compare two established methods that are commonly used, and both are acceptable alternatives, this may indicate that the project should be defined as a quality assurance study. This does not apply to the testing of drugs.
- Projects evaluating patient experience and satisfaction combined with a retrospective evaluation of clinical practice may also be considered to be an integral part of the institution's quality assurance.
- Implementation and use of questionnaires, with the aim of structuring a regular clinical interview and using the data gathered to evaluate the service offered, will generally also be considered as quality assurance projects.

The decision of where to draw the line distinguishing projects that need REK evaluation and research that is exempt from this evaluation, is primarily related to the purpose of the project. This evaluation is not dependent on whether the project involves patients, health information or human biological material. If the purpose is not to generate new knowledge about health and disease, the project is not covered by the Health Research Act and does not require evaluation and approval from REK.

Examples of research projects that are not encompassed by the Health Research Act, but where health data are used, are projects aiming to study the organization and efficient use of resources in healthcare services (Health Services Research, "*helsetjenesteforskning*"). It is somewhat more challenging

to evaluate where to draw the line as to which studies require REK approval, when looking at studies that involve elements of socio-economic issues related to a defined patient group. One way to determine this is to question whether the patient group's health and diseases are the basis for the study or if the purpose is to evaluate socio-economic conditions, such as examining how some patient groups function at work, socially, etc. As a general rule, if the project involves patients and the purpose is in some way related to their health condition, an application should be submitted to the REK for review (on a special form in the REK web portal).

Even if REK characterizes a project as a quality assurance study, and it is thus exempt from the REK mandate, this does not imply that the requirement for informed consent can be waived. There is a distinction between quality studies and internal quality assurance according to the Health Personnel Act ("helsepersonelloven", § 26). The latter does not require informed consent, but is not defined as "research" since the purpose is related to the internal institutional activity and needs, such as improving quality of care. These distinctions can be clarified with the local Data Protection Officer ("personvernombudet") or the Data Protection Agency.

## **6.5 Patient consent**

### **General rule of consent**

*The main rule in research is that informed consent from each study participant is required.* For the consent to be valid, it must be explicit, voluntary, and documented. However, the Health Research Act allows collection of information and biological material that has already been obtained in a healthcare setting, without patient consent specific to using the information for research. However, this must be evaluated by REK. If REK determines that the project does not need to obtain consent from all or part of the recruited

population, the Committee will consider whether to set different privacy terms as a result of this exemption. For example, it may be considered appropriate to inform potential study participants about the research project and then give them the option of opting out of participating, as opposed to obtaining active informed consent. In postal questionnaires of a minimally invasive character, for example, REK may rule that returning a completed questionnaire (without the person's signature) is a sufficient documentation of “consent”.

### **Broad consent (“Bredt samtykke”)**

The Health Research Act (§ 14) allows for the option to obtain *broad consent* in research, defined as consent to a "broadly defined research objective that is to be specified in greater detail at a later time". This entails research participants giving broad consent to research, on human biological material and health information that includes one or more overall research objectives and fields of research. Please note that other countries do not necessarily accept broad consent, including projects funded by the EU.

The Health Research Act provides “cancer research” as an example of how one might state the purpose of a study for which broad consent is to be used. In most cases, the purpose might be narrowed down more than this, e.g. "Lung Cancer Research". Under the Health Research Act, participants giving broad consent have a right to receive information about project progression on a regular basis, but REK can also require that other terms must be met by the Project Manager. The use of broad consent is often convenient when establishing a general research biobank or a research registry (see Chapter 6.2). REK may be reluctant to approve the use of broad consent for research that includes children or persons that are legally incompetent with respect to consent.

## **New and altered use of human biological material that has already been collected**

In the case of new or altered use of human biological material that has already been gathered for research, REK will usually require that new consent is obtained. REK may, however, consider that such consent is unnecessary, so long as "the research is of significant interest for the community at large and the participants' welfare and integrity is maintained."

The principles of the Act on Health Research are also relevant for quality assurance studies and other types of research that do not require REK approval.

### **Who can consent to research participation?**

#### *Obtaining consent from children and adolescents*

Under the Health Research Act all persons over the age of 16 years have the right to give consent to medical and health research. For clinical drug trials or surgery parental consent is always required (this includes adolescents aged 16-18 years). For children and adolescents under the age of 16, parents must give their consent to participation in research. However, REK does have the ability to determine that only consent from the child is required without involving the parents, if there are particular reasons for this and the child is between the ages of 12 and 16 years. One example is a questionnaire looking at alcohol consumption amongst 15- year-olds, where it is up to the adolescents to decide whether to inform their parents if they answered the questionnaire.

Broad research consent from children is unlikely to be approved by REK.

Increasing emphasis is placed on the child's own thoughts about taking part in research projects, based on increasing age and maturity level. Children have a right to receive project information that is tailored to their maturity level.

Information procedures and written information should be adapted to different

age groups and degrees of maturity, using for example cartoons for very young children. Children's right to be heard does not imply that they are to sign a consent form (children give passive consent unless they themselves wish to give active consent), while parents (or others with parental responsibility such as the Child Welfare Services, 'Barnevernet') give explicit surrogate consent (“stedfortredende samtykke”).

#### *Obtaining consent from incompetent adults*

In general, the Health Research Act states that where persons without powers of consent (as defined by <https://lovdata.no/dokument/pasient-og-brukerrettighetsloven>, § 4) participate in a research project, their next of kin are to be asked and, where necessary, give consent on behalf of the incompetent person.

#### *Research on minors or adults without powers of consent*

Conducting research involving children and people without competency to consent is not just a wish to fulfill curiosity on the subject, it is a necessary right that these groups have. The safety and efficacy of drugs used for children must be documented. It is not sufficient to extrapolate conclusions about treatment of children based on knowledge gained from studies on adults. Children are different from adults with regards to pharmacokinetics, immunology and organ plasticity. Furthermore, these and other factors change through various stages of childhood.

In agreement with international principles, the Health Research Act stipulates many requirements, which must be fulfilled before research projects can be carried out on persons without powers of consent (§ 18). This includes the requirement that the research must imply no more than negligible risk or disadvantage to the individual participant and that the person herself/himself is

not opposed to participating. Another requirement is for it to be reasonable to assume that the research results will be of use to the individual person or patient group. In general, REK will consider whether a 'significant' expected benefit of a project is in reasonable proportion to any potential risks or disadvantages. In addition, scientific arguments must be presented for why the research project needs to be carried out on this specific group of patients lacking legal competence to consent. The general rule is that children from the age of 16 can give independent consent. There are, however, exceptions. For example, children 16-18 years must have parental consent to participate in clinical drug trials, or where bodily interventions are to be performed. Children over 12 years have the right to give their opinion as to whether they want to participate or not. There are also cases where children for reasons that should be respected do not want their parents/guardians to be informed about their participation in a study. Such cases are exceptions and it is advisable to contact REK early in the research planning for advice and guidance on how this should be handled.

### *Research in clinical emergencies*

The Health Research Act (§ 19) also stipulates multiple requirements particular to research projects that involve persons in clinical emergencies in which the patients themselves or their next of kin cannot give consent. The potential risk or disadvantage to each individual participant must be no greater than negligible; the participants themselves must not be opposed to the research project (or would assumedly not oppose the project had they been competent to give consent); the research can only be carried out in clinical emergency situations; and the result must be expected to be of great preventive, therapeutic or diagnostic value. The research participant or next of kin are to be given information about the project as soon as possible and, where applicable, must provide consent in order for further research to continue.

### *Template for study information and obtaining informed consent*

In 2008, REK, the Data Inspectorate, the Norwegian Medicines Agency and NEM jointly recommended the use of a *template for information and consent forms*. Two templates have been developed: one for clinical drug trials and one for participation in other research projects

([https://helseforskning.etikkom.no/Templates\\_for\\_Participation\\_Information\\_and\\_Consent](https://helseforskning.etikkom.no/Templates_for_Participation_Information_and_Consent)). The templates have been created to meet the demands posed by the increasing extent of formal information requirements related to research studies in recent years, and to ensure that the information presented meets the requirements specified in the biomedical research legislation. The information in the consent forms aims to help ensure that potential research participants understand what they are being asked to consent to. The information is differentiated and divided into a main section and additional chapters. The main section should be a maximum of two pages, while chapters A and B should not exceed four pages in total. The most important information should be presented in the main section. The following information chapters are meant to elaborate. The information must be adapted to the type of project and the target population, especially if this population consists of subjects who have reduced or lacking legal competence to consent, whether they are adults

([https://etikkom.no/redusert\\_samtykkekompetanse](https://etikkom.no/redusert_samtykkekompetanse)) or children

(<https://etikkom.no/barn>). In studies involving children, especially from the age of 12, information must not only be given to the parents, but also to the child, and in a format that matches the child's level of maturity and understanding.

Requirements for independent, documentable consent from the child will depend on the type of study and the child's age/maturity level. REK will evaluate this based on an overall understanding of the project. REK provides further guidance on children as study participants and children's consent

(<https://etikkom.no/barn>).



All the bodies named above recommend following the consent information template. Doing so, increases the likelihood that the application will be processed rapidly by all bodies. If the template is not followed and the participant information letter deviates substantially from the requirements in terms of content or length, REK may return the project application to the Project Manager for rewriting. Information letters and consent forms should be formulated in such a manner that they satisfy both legal and ethical requirements regarding content, as exemplified in the templates. It is important to note that many information letters to study participants become so long and complex, that recipients may well have difficulty comprehending the content, and REK will in such cases recommend changes to the information letter prior to approving the study.

At OUS (<https://oslo-universitetssykehus.no/personvern>) there are also custom-made examples of information templates for relatives and guardians, as well as short versions of participant consent forms.

Information letters are frequently insufficiently prepared. In general, they should be written in a neutral tone. Careful consideration should be given to the title of the study and the heading of the information letter. Examples of information requiring specification (the templates at <https://helseforskning.etikkom.no/> also cover these points) are:

- The aim of the project (the objectives of the project and reason why this particular person has been asked to participate)
- Which health trust/institution is responsible for the project (including names and addresses)
- The voluntary nature of participation in the project must be explicitly stated and, where appropriate, whether participation will affect any treatment the patient may be undergoing at the study hospital

- The sources of data being gathered; e.g. medical records, the Cancer Registry of Norway etc. and whether the patient is expected to make an active contribution in any way, for example by undergoing additional tests or filling in a questionnaire
- Whether the information used is connected to or derived from biological material and, if so, which analyses will be conducted on the material
- When information is to be deleted/anonymized (date)
- In cases where information is to be released to external parties (for example in collaborations between universities/colleges or other regional authorities), the names of these parties must be provided. If any collaborators are located abroad, permission must be sought to transfer biological material or health information. Where relevant, state which form the material will be sent in, anonymously or de-identified etc.
- Information allowing patients to make use of their rights. This includes rights of access so that they may find out what information has been registered and the option of recalling consent given previously (deleting information and destruction of biological material). Please note the limitations on withdrawal of test results in pharmaceutical trials, see information on the Norwegian Medicines Agency in this chapter.
- Any financial ties to sponsors, such as pharmaceutical companies, should be declared
- Final date for deletion of any audio or video recordings used in the project.
- It is advisable to set the date for when consent for inclusion in the health records are adopted. Such consent forms are often updated, and it may be important to keep track of which patients have agreed to what.

Some study information letters describe the role of the Project Manager and her/his research expertise in too much detail. This should be downplayed and the

information letter should instead focus on the role of the study participant, what consent is being requested for and the scientific aim (objective) of the study. It is recommended that information letters are written in the first person plural rather than first person singular ('we' rather than 'I'), cf. the fact that research is being carried out under the direction of the relevant employer (Do *not* start the letter in the following manner: "My name is XX and I am a PhD candidate at the University of Oslo. I am writing to ask if you would consider participating in this study...").

The language used in the information letter should be simple and easy to understand. Technical details, which have not been modified to suit the recipient, should be avoided. In complex studies, a one-page flow chart illustrating the course of the study, in addition to the information letter, may be useful for a potential study participant.

The consent form itself should not contain any new or detailed information, but simply state that the informant (study participant) consents to taking part in the study, as described in the information. In accordance with international regulations, clinical drug trial consents must also include the name and signature of the person who has provided information to the study participant. Such a signature may also be relevant for other types of research projects.

The information letter and consent form in clinical drug trials must be dated and have a version number. Bear in mind that without documented obtained informed, dated, and signed consent (where this is a requirement), a person cannot be included in the study and the person's data cannot be used. Data from non-participating individuals can in general not be used for dropout analysis.

## **Dispensation from access to confidential information in research projects**

Applications for dispensation are necessary for research based on confidential health and personal data information obtained by the healthcare service without consent from each individual patient. According to The Health Research Act, REK is responsible for deciding if confidential health information may be provided by health personnel for use in research. REK has the option of giving dispensation, allowing access to such information, only if the research project is deemed to be of substantial interest to society and only if the welfare and integrity of the participants are maintained.

When applying for dispensation to allow access to confidential information in quality research studies and other research studies that use health data, the legislation is complicated. According to the Health Personnel Act § 29, REK is the delegated authority for determining whether dispensation from confidentiality may be given, also in types of research studies that are not included under the Health Research Act. However, when it comes to quality research studies (see Chapter 6.4), the Directorate of Health determines whether exemption from confidentiality may be given (The Health Personnel Act § 29b: <https://lovdata.no/helsepersonelloven>). It is recommended to clarify such questions with the Data Protection Officer at your institution before a dispensation application is submitted.

If the researcher is to have access only to anonymous data, it is not necessary to apply for a dispensation. This presupposes, however, that those who disclose the health data have legal access to the relevant information. An example of this is where healthcare officers and others with legitimate access to the data retrieve information from a medical chart or other health registries and then anonymize and disclose the data to the researcher. Such retrieval of clinical data may imply

added costs for the institution, and researchers, even with REK approval, cannot expect the health institution to take on this extra cost without compensation.

For internal quality assurance studies of health services within a health trust/hospital, there is no requirement for approval from any external authority (The Health Personnel Act § 26). Internal quality *registries* are subject to notification to the local Data Protection Officer or The Norwegian Data Protection Agency.

## **6.6 The roles of the supervisory authorities**

*The supervisory roles of the Norwegian Board of Health Supervision (“Statens helsetilsyn”) and the Data Protection Agency (“Datatilsynet”) in ongoing research projects*

Under the Health Research Act, the Norwegian Board of Health Supervision is responsible for supervising medical and health research and the management of biobanks, while the Data Inspectorate is responsible for supervising the use of health information. The Research Director (“forskningsansvarlig”), the Data Processing Director (“databehandlingsansvarlig”), the Project Manager (“prosjektleder”), and other personnel involved in a research project have a duty to provide information to the supervisory authorities.

*The Norwegian Board of Health Supervision can rule that a project must be stopped or change the conditions for research projects and research biobanks if these have detrimental consequences for research participants or others, or are considered inappropriate or unjustifiable. The Norwegian Board of Health Supervision should be notified in writing in cases of “serious, unwanted and unexpected medical events that are believed to be related to the research.” This is in addition to the standard obligation to report clinical incidents and injuries both internally to the institution as well as externally (cf the Health Research Act, Chapter 5, and the Research Handbook, Chapter 14.6). In clinical*

pharmaceutical drug trials, the Norwegian Medicines Agency is the body that oversees the implementation of the study, and that ensures the establishment of internal control procedures (Standard Operating Procedures, SOP), which include rules for "Good Clinical Practice" (GCP).

*The Data Protection Agency* can rule that any processing of health information opposing the provisions of the Health Research Act must cease. Alternatively, the Data Inspectorate can stipulate conditions to be fulfilled before the processing of health information may be initiated/continued in a research project. Willful or grossly negligent violations can lead to a fine or prison sentence.

### **6.7 Report and final study report to REK**

Project Managers are legally obliged to submit a final report to REK at the end of a research project (§ 12, the Health Research Act). In the final report, results are to be presented in "an objective and reliable manner". REK can make specific demands with respect to the content in the final report. REK can instruct the Project Manager to provide annual or extraordinary reports where deemed necessary by the committee. The final report form is available on the SPREK web portal (<https://rekportalen.no/>): click on "Skjema for forskningsrapport", then "rapport"). Final reports should have a limited, abstract-like format; in line with final reports for interventional trials in the "clinical trials system" (see Chapter 9). It is important to note that a too detailed presentation of results before a study has been submitted for publication may be considered an attempt at duplicate publication by certain journals, and they may therefore not wish to publish the article.

## 6.8 Clinical trials and the Norwegian Medicines Agency (“Statens legemiddelverk”, SLV)

Clinical drug trials are regulated by special regulations on clinical trials of drugs in humans (see Appendix; “Klinisk utprøving av legemidler). There are strict requirements for the implementation of drug trials regardless of whether it is an early testing phase or the drugs have previously been approved and used for many years in clinical therapy. The studies must be conducted in accordance with Good Clinical Practice (GCP), implying that all those involved in the study must possess an updated GCP certification. These regulations are based on the EU Directive 2001/20/EC and 2005/28/EC (<http://ec.europa.eu/directive/2001/20/EC> and <http://ec.europa.eu/directive/2005/28/EC>). A number of national procedures (SOPs) are prepared with templates and checklists, reflecting the regulations for pharmaceutical drug testing (see <http://www.norcrin.no/>). New [Regulation No 536/2014](#) is expected to be implemented early 2021. The procedures and templates will be updated to reflect this (information about the implementation process: [www.norcrin.no](http://www.norcrin.no)).

All clinical drug trials in humans, both patients and healthy subjects, are to be pre-approved by the Norwegian Medicines Agency in addition to pre-approval from REK. The definition of a clinical drug trial is “*any systematic study of a drug made for humans with the aim of gaining or verifying knowledge about effects on physiological function, interactions, side effects, uptake, distribution, metabolism, or excretion of the medicine concerned, or the study of its therapeutic value*”. Medical drugs are substances, drugs or preparations etc. as defined by the Act of 4 December no. 132 on Medicines (“legemidler”). The regulations also apply to marketed preparations (regardless of how long they have been in use) and include health economics studies. The regulations do not cover experimental treatment of individual patients or non-interventional studies.

Applications must be made to SLV (in addition to REK) for approval of studies of drugs defined as advanced drug therapy (somatic cell therapy, gene therapy and tissue therapy). Advanced drug studies have their own GCP guideline ("<http://ec.europa.eu/health/documents/eudralex/>") that sets requirements for protocol content, patient information and additional requirements such as traceability and documentation (30 years instead of the usual 15 years, which applies to the regular drug studies). Gene therapy studies must also be reported to the Health Directorate (see Chapter 6.9).

At commencement of **international multicenter trials to be conducted in Norway**, applications must be made to the various regulatory authorities in each country (such as the SLV in Norway), or one may use the "[Voluntary Harmonization Procedure](#)," which is an effective tool for achieving harmonization and rapid approval of clinical trials that are to be run in many EU / EEA countries. Similarly, a joint application must be submitted to REK for the part of the study that is to be conducted in Norway. In international multicenter studies, a Norwegian national coordinator must be designated to act as the Project Manager according to Norwegian demands and to be responsible for the REK application. The various individual Norwegian research centers will be responsible for the part of the project implemented in their own institutions and for making sure that their own research data is collected and delivered according to the REK approval and approved protocol. Normally, each center will have a responsible project collaborator who will be under the command of the national coordinator (Project Manager) (§ 6 of the Regulation on the organization of medical and health research, see Appendix).

If it is assumed in a REK-approved multicenter study that the collected research data will be stored and analyzed with an external sponsor (e.g. commissioned research), the sponsor will, according to the REK approval, be responsible for



this part of the project. In such cases, however, it is important that the disclosure of health information from each center is carried out in accordance with the provisions of the Personal Data Act on information security and that such disclosure is based on an agreement between the collaborating institutions. Also, in these cases it is important to obtain the necessary advice and assistance from the Data Protection Officer or equivalent support functions. Some institutions have implemented their own internal forms for such data exchange. These forms are normally managed by the Data Protection Officer.

The Clinical Trial Unit at OUS offers monitoring of self-initiated clinical pharmaceutical drug studies (<https://oslo-universitetssykehus.no/monitorering>), with the intent to assure that the research at OUS follows national and international guidelines. The guidelines for Good Clinical Practice (GCP) state that the requirements for monitoring should take place before, under, and after a study/project. Quality assurance must commence before the first research participant enters the study and involves documenting the training of study personnel, GCP certification, and practical aspects surrounding performance of the study.

A study participant in a clinical drug trial may at any time withdraw from the study. Patient data and biological material collected up to this point may, however, be used in the study. For safety reasons, all documentation for a clinical trial, including research data, must be stored for 15 years after project completion (see § 8 [https://lovdata.no/Forskrift\\_om\\_klinisk\\_utprøvning\\_av\\_legemidler\\_til\\_mennesker](https://lovdata.no/Forskrift_om_klinisk_utprøvning_av_legemidler_til_mennesker)). This applies to each of the participating centers (Research Director/“forskningsansvarlig“).

Adverse events in clinical drugs trials must be reported to the Norwegian Medicines Agency. REK is no longer to receive such reports. See also Chapter. 14.6 on the obligation to report to the Board of Health in cases of severe, adverse, and unexpected events in research projects.

### **6.9 Clinical medical device trials and the Norwegian Medicines Agency (“Statens legemiddelverk”, SLV)**

From 2018 clinical trials testing medical equipment are to be reported to the Norwegian Medicines Agency if the trial includes equipment that is not CE marked and where the aim of the trial is to get CE approval of the equipment. The Norwegian Medicines Agency has prepared a separate guide for the notification of testing of medical devices (see Appendix). These studies must follow ISO 14155, which requires study monitoring (<https://legemiddelverket.no/english/medical-devices/about-medical-devices>). Medical Devices Regulation (MDR) 2017/745 is expected to replace the current Medical Device Directive (MDD) and the Active Implantable Medical Device Directive (AIMD) in May 2020, whereas the In-Vitro Diagnostic Regulation (IVDR) is expected to replace the In vitro Diagnostic Directive (IVDD) in 2022.

### **6.10 The role of The Norwegian Directorate of Health (“Helsedirektoratet”) Genetic research studies**

Genetic research studies (<https://lovdata.no/dokument/bioteknologiloven>) are currently to be approved by The Norwegian Directorate of Health in addition to requiring REK approval, if:

1. The research has or may have diagnostic or therapeutic consequences for the participants, or
2. The plan is to inform the participants about the result of the genetic study.

Any application for approval of such projects should be submitted to The Norwegian Directorate of Health. The Directorate and REK can provide guidance on how projects should be designed to be consistent with the Biotechnology Act. There is no separate application form for studies that fall under the provisions of the Biotechnology Act. Applications should be sent to: [postmottak@helsedir.no](mailto:postmottak@helsedir.no) with relevant attachments (such as protocol and consent form). More information at <https://helsedirektoratet.no/bioteknologi/genetiske-undersokelser>.

For gene therapy studies, approval must be sought from the Norwegian Medicines Agency (see Chapter 6.8), in addition to approval from REK and the Directorate of Health.

### **6.11 'Forsøksdyrutvalget' (The Institute for Nature Research)**

All scientists intending to conduct experiments on animals covered by the regulations (mammals, birds, fish, reptiles, amphibians, crustaceans etc.), must obtain permission from The Institute for Nature Research (“forsøksdyrutvalget”) or from the person given due authority by the committee. The person responsible for the project is required to have attended an approved laboratory animal course. Information about animal courses may be found on the website of the Norwegian School of Veterinary Science (“Norges veterinærhøgskole”): <http://nmbu.no/>. The regulations on animal trials can be found on: [https://lovdata.no/forskrift\\_om\\_forsok\\_med\\_dyr](https://lovdata.no/forskrift_om_forsok_med_dyr).

Further information on the Institute for Nature Research may be found on <http://www.fdu.no/fdu/> and the supervisory and application system of the Institute for Nature Research on <https://asp.gitek.no/fdu/pmws.dll/Login>.

The National Research Ethics Committee for Science and Technology (NENT) has issued new guidelines from 2018 (link: <https://www.etikkom.no/en/ethical->

[guidelines-for-research/ethical-guidelines-for-the-use-of-animals-in-research/](#))

with guidance to researchers and others who evaluate animal experiments, from a research ethical perspective. The guidelines can be useful in planning projects, in evaluating them and in reporting research. They also aim to contribute to reflection on research ethics and the use of animals in research, both in the research environment and in the public debate.

## **6.12 Registration of projects - Clinical Trials Protocol Registration System**

See Chapter 9.

## **Chapter 7**

### **Project organization and management**

This chapter covers terminology and roles that describe leadership of research projects. The chapter also includes practical advice on how to organize and lead a project in order to best facilitate project progression and to increase the likelihood of completing the project. However, the scientific success of the project will also depend on many other factors discussed in later chapters.

#### **7.1 The term "project" when used in a research setting**

A research project differs from the standard diagnostic and therapeutic tasks of clinical medical practice. Research projects are limited in terms of time and resources, and have very specific goals, that are often separate from the goals of patient care. The unique features of research become more apparent if the research work is defined as a project (see Chapter 4 about research protocols). Literature on efficient management of a project may prove useful in this setting. If the most common "project management tools" are employed, a number of pitfalls can hopefully be avoided. This chapter is specifically directed at those who have not worked much with projects earlier.

According to the Norwegian Health Research Act § 4, medical and health research is defined as "*activities carried out with scientific methodology to acquire new knowledge about health and disease*". By defining such activities as "a project" (as described in the research protocol and in accordance with the REK approval), the work is can be viewed as "a unique task which leads to a definite result, requires a variety of resources, and is limited to a finite amount of time" (**Andersen ES, Grude VK and Haug T.** Målrettet prosjektstyring. NKI-forlaget 2004). As such, a research project entails other performance requirements than those usually associated with hospital work.

## 7.2 Project organization - roles and responsibilities

A number of terms are used in the field of project work, although their use vary substantially according to context. The Appendix includes a summary of some Norwegian terms and their English translation. Important terms with respect to leadership roles and responsibility are "Research Director" ("forskningsansvarlig"), "Project Director" ("prosjektansvarlig"), "Project Manager" ("prosjektleder"), and "Data Processing Director" ("databehandlingsansvarlig"). These distinctions must be clarified before the project commences so that all participants agree on their rights and responsibilities.

University employees and hospital staff may find relevant information on roles and responsibilities relevant for their institution, such as at the University of Oslo website (The Quality System: <http://www.uio.no/english/for-employees/support/research/quality-system-for-health-research/>).

Frequently, the formal responsibilities of research project supervisors are poorly defined, even in cases where binding agreements exist between supervisors ("veiledere"), PhD candidates ("stipendiater") and research institutions (see Chapter 10). Based on the Health Research Act, it is the supervisor's potential role as the Project Manager (see Chapter 6) that defines the supervisor's legal study research responsibilities. Universities place additional demands on the supervisor's responsibilities regarding supervision of PhD candidates ("stipendiater", see Chapter 10), e.g. Regulations of the University of Oslo: <http://med.uio.no/forskning/doktorgrad-karriere/regelverk/>

The supervisor's (principal supervisor / co-supervisor) role in a doctoral project is not regulated by the Health Research Act, but follows regulations specific to the PhD program with supplementary provisions. Most often, however, the

supervisor is also the Project Manager of a research project that is part of the doctoral work. In this case, the supervisor's role also includes the responsibilities that a Project Manager ("prosjektleder") has under the Health Research Act. The division of responsibility in research projects is regulated by formal Norwegian legislation and by the institutions' own routines and guidelines. The following sections include more details about the various roles and responsibilities required for research projects involving patients, human biological material and personal health information.

### **Research Director ("forskningsansvarlig"), Project Director ("prosjektansvarlig"), and Sponsor**

*A Research Director ("forskningsansvarlig") is defined by the Health Research Act as «The institution, or another legal entity or individual, who has overall responsibility for the research project, and who has the necessary qualifications to fulfill the research administrator's duties under this Act".* In Norwegian health trusts ("helseforetak"), it is the hospital, by way of the CEO (Chief Executive Officer) that is formally responsible for research and acts as "Research Director".

The duties of the Research Director are defined in separate regulations specific to the organization of medical and healthcare research (see appendix for the link). The Research Director possesses the overall responsibility for the research project and must through the establishment of systems and routines (internal control) ensure that the institutions' own researchers are made capable of maintaining the ethical, medical, healthcare-related, scientific, confidentiality- and privacy-related aspects of a project. The Research Director should also facilitate proper organization, initiation, implementation, dissemination, closure and follow-up management of research projects. At larger institutions, i.e. health trusts, universities, and university colleges, the tasks (but not the

responsibilities) entrusted to the Research Director, are usually delegated to Department Chairs or Heads of Institutes.

In collaborative projects that take place at several institutions simultaneously and follow the same research protocol, each participating institution is responsible for the part of the research project carried out at their own institution (multi-center studies). When processing personal health information in a (multi-center) research project, the roles of Research Director (“forskningsansvarlig”) and Data Processing Director (“databehandlingsansvarlig”) will normally coincide.

Many researchers have double employment at a University and a Health Trust (e.g. hospital) (“helseforetak”). If a research project is mainly carried out at a Health Trust, or it involves the use of biological samples and health information obtained by the healthcare system, it is reasonable that the Health Trust, not the University, is defined as the responsible research entity (and carries the role as “Research Director” i.e. “forskningsansvarlig”).

*The role of the Project Director* (i.e. “prosjektansvarlig”) is not defined in the Health Research Act; clarification of this concept is still needed for some projects. In the corporate business world, a “Project Director” is often the client, whether the client is a representative from the business itself, or a single customer. In The Research Council of Norway’s (RCN) General Conditions of Contract, the term “Project Director” is defined as “*The institution, company or business that to the Research Council is responsible for ensuring that the project is carried out in accordance with the contract.*” This means that in a RCN funded project that is subject to disclosure to REK, one and the same institution may be defined as the Research Director according to Health Research Act and as the Project Director relative to the Research Council. In a multi-center project



there is often a "project responsible researcher" ("prosjektansvarlig forsker", in English often called the "Principal Investigator", PI) from each institution. In clinical drug trials, the PI position is held by the person known as the "Investigator" ("utprøver"), but for other types of studies one must clarify who is defined as the "local project responsible".

*The commissioning entity* ("oppdragsgiveren") may be the Project Director ("prosjektansvarlig") in the case of commissioned research (oppdragsforskning). However, this may vary according to the type of contract with the hospital and must therefore be clarified with one's immediate superior, as well as with the Research Director (i.e. "forskningsansvarlig").

In the clinical drug trial regulations ([https://lovdata.no/dokument/Forskrift\\_om\\_klinisk\\_utprøving\\_av\\_legemidler\\_til\\_mennesker](https://lovdata.no/dokument/Forskrift_om_klinisk_utprøving_av_legemidler_til_mennesker)), a *sponsor* is defined as "*a person, company, institution, or organization that is responsible for the initiation, management, and / or financing of a clinical trial.*" Similarly to the terms Research Director and Project Director, "sponsor" normally refers to an institution (legal entity). In a clinical drug trial organized as a multi-center study, there can be only one sponsor. This means that while each participating study center is individually responsible for conducting their portion of the research study at their own institution, only one institution carries the role as sponsor. As a rule, for clinical drug trials performed on behalf of the pharmaceutical industry, the pharmaceutical company in question acts as the sponsor, whereas for non-industry clinical drug trials (self-hosted clinical drug trials) the institution leading the study is defined as "the sponsor".

*The term "Investigator" ("utprøver")* is defined specifically for clinical drug trials and in separate regulations for testing drugs on humans. It is important to clarify the roles and tasks of the Project Manager (and/or supervisor), PhD

student, and other key study personnel, through delegated authority. The role descriptions must include information on which tasks the participant has both in the project management, and relative to the local investigators.

*The Data Processing Director* (“databehandlingsansvarlig”) must be identified for projects where personal and health information is used. According to The Personal Data Act, the Data Processing Director is “the person responsible for determining the purpose of processing personal information and the tools to be used”. In practice, this means that the institution, represented by the senior leader/CEO/manager, has the overall responsibility for processing project data. However, the tasks of the Data Processing Director can be delegated to others at the institution, and this is commonly done. Either way, the data processing responsibilities must be clarified when planning a project.

It is important that you as a researcher know who at your institution is assigned these roles on behalf of the institution (represented by the CEO: Chief Executive Officer). Who is assigned these roles may vary greatly between institutions. Commonly, the tasks entrusted to the ”Research Director” and ”Project Director” are delegated to a Department Chair (at a hospital) or a Head of Institute (at a University).

*The person responsible for a research biobank* (“ansvarshavende for forskningsbiobank”) must according to the Norwegian Health Research Act be "A person with a higher degree either in medicine or biology " and he or she is appointed by the Research Director at the institution. You should as a researcher familiarize yourself with how this is organized at your research institution. In collaborative or multi-center studies, it may be the case that the person responsible is from an institution other than your own.

In some cases biobanks have a board or a steering committee, in addition to the person responsible for the biobank (“biobankansvarlig”). For general research biobanks that are clinically oriented, the establishment of a supervisory board is recommended. The purpose is to advise the person in charge of the biobank as well as the clinics involved, on matters regarding the management and development of the biobank. Members of the board should consist of representatives from the relevant academic community as well as representatives from the institution in charge of research (i.e. the Research Director or other personnel at the institution that are delegated the tasks).

**In conclusion:** It is important in a research project that the responsibilities at the institutional level and at the individual level are established before the project commences. The researchers' responsibilities, roles, and rights in relation to co-authorship, tasks, and finances should also be clarified in advance. A common understanding of the role for each person involved in the study should be reached as early as possible in the project planning.

### **Project Manager ("prosjektleder")**

According to *the Health Research Act* a Project Manager is *"A physical person who is responsible for the day-to-day operation of the research project and who has the necessary research qualifications and experience to be able to fulfill the duties ascribed to the project manager pursuant to this Act"*. In a separate regulation on the organization of medical and health research (see the link in the appendix), criteria for the qualifications of the Project Manager are specified, including the requirement for having the "technical and scientific expertise that the research project requires for proper implementation." This means that students, PhD candidates, as well as others who wish to perform research, but do not have doctoral qualifications, most often cannot be defined as a project manager based on legal requirements. This is however dependent upon the

project's characteristics. For student projects or PhD work, usually the supervisor or co-supervisor acts as the Project Manager and carries out the formal and daily responsibilities of the project (see Chapter 10).

The Project Manager is responsible for all practical aspects of the project, including ensuring that the ethical, medical and privacy policy requirements are met and that the necessary (internal and external) approvals are obtained (see Chapter 6). The Health Research Regulations ([https://lovdata.no/forskrift\\_om\\_organisering\\_av\\_medisinsk\\_helsefaglig\\_forskning](https://lovdata.no/forskrift_om_organisering_av_medisinsk_helsefaglig_forskning)) describe the following responsibilities allotted to the Project Manager:

- Ethical, medical, healthcare, privacy and information security issues must be dealt with in the daily management of the project
- The project must be established with and approved by the Research Director before commencing
- For medical and health research projects necessary approvals by REK, SLV, and any other relevant bodies must be obtained prior to commencement, and the project must be carried out in accordance with the approved research protocol
- All project team members must have the skills to carry out their assigned tasks in the project

The project manager will also be responsible for the financial aspects of the project and to follow up on any project financier's reporting requirements.

For any research project, there can be only one Project Manager and this person is responsible for obtaining the necessary approvals (REK, SLV). If multiple institutions are involved, the Project Manager is obligated to inform all of them about the approvals before the project commences. In multicenter studies it is recommended that collaboration between several research institutions is

regulated in a separate agreement. For clinical drug trials, requirements for such agreements are currently incorporated in national SOPs (Standard Operating Procedures). Inven2 (<http://www.inven2.com/no>) and Regional Research Support (<https://oslo-universitetssykehus.no/fag-og-forskning/forskning/regional-forskningsstotte>), may assist researchers at Helse Sør-Øst and University of Oslo with formal collaboration agreements.

Clarification of common misconceptions regarding the Project Manager's role is often needed:

- Being a Project Manager is not synonymous with having ownership of the data. The regulations that govern the organization of medical and health research (see the link in the Appendix) specify that "*The project manager has the right to inspect all research data associated with the project as long as confidentiality is not an obstacle to this*". Intellectual rights with respect to ownership of data should be specified in the project description.
- Being a Project Manager is not synonymous with authorship. Authorship is regulated by the Vancouver Conventions ("rules") (see Chapter 9).

Though the concept of a Project Manager is not clearly defined for other types of research (i.e. research that is not governed by the Health Research Act and where disclosure to REK is not required), it is probably wise to use the general guidelines described above.

### **7.3 Project management ("prosjektstyring")**

Some tasks associated with research project management may not be directly related to research in particular. Therefore, it may be helpful to make use of the experience and academic insights of project management to ensure an efficiently run research project. Project management involves running a project in accordance with agreed standards of quality, within the agreed period of time

and using the resources available. Projects are divided into phases in order to clarify how and when to utilize specific resources. The phases in a project are typically: start-up, planning, implementation, winding down and termination. Although it may seem time-consuming to plan each of these phases, it cannot be overemphasized that thorough planning will save time and frustration. As Eisenhower famously said: "*A plan is nothing, planning is everything*".

According to project management theory, the Project Manager is responsible for:

- Planning and developing a progress schedule
- Determining what is to be done, how, and when
- Defining who is to do what (and does everyone agree?)
- Acquiring sufficient resources for the project
- Designing a follow-up- and information system for the project
- Organizing and following up the implementation of the project
- Ensuring that the tasks are carried out according to plan and in the correct manner
- Ensuring adequate follow-up and information to all parties involved (progress reports, superiors, steering groups etc.)
- Evaluating the project at its conclusion (publications or reports).

### **Primary or secondary objectives**

- One of the first, and most important tasks in a research project is to define specific project objectives. Without clear objectives, the protocol, grant application, methods, and publications are unlikely to be of good quality. When applying to REK (see Chapter 6) it is particularly important to outline and define the aims of the project well, as the aims provide the boundaries for the restriction REK sets on data usage.

- Aims must be verifiable. In research, this often means formulating hypotheses that can lead to yes/no answers. In scientific (quantitative methodology) terms, it is the null hypothesis that is to be disproved or confirmed.

### **Implementation, activity plan and milestones**

- An activity plan is a plan showing what is to be done when. This is of particular relevance in grant applications, since the likelihood of the project success is evaluated according to how realistic the implementation of the plan appears to be.
- Milestones are "checkpoints" en route with allotted dates (for example, when a questionnaire on lifestyle factors will be validated and approved for printing). A milestone plan provides a useful means of checking if the research project is on schedule. If this is not the case, the consequences must be assessed.

Project work as a topic, may be studied further at several institutions, including BI (<http://www.bi.no/>) and the Norwegian Center of Project Management (Norsk senter for prosjektledelse: <http://www.prosjektnorge.no/>).

Other useful information may be provided by local institution, such as at OUS, with advice on aims and implementation: <http://ous-research.no/faq/>.

### **7.4 The formalization of a research project**

According to the Health Research Act, the responsible research institution (i.e. the Research Director) is required to maintain an updated overview of ongoing medical and health research projects implemented in their own institution. This is in line with the requirement that the "project Manager" ("prosjektleder") involves the "Research Director" ("forskningsansvarlig") in the project prior to its commencement. Most research institutions have therefore as part of general

management of the institution, established systems for how research projects should be formally organized within the institution. In general, the internal institutional formalization process of a research project will be based on the following steps:

### **Step 1: Planning and internal approval**

1. Local discussions and internal approval of the project within the Department(s). This will normally be based on the discussion of:
  - Draft of research protocol (or REK application)
  - Draft of participant information sheet and consent form
  - Project budget
2. For institutions with their own research administration or Data Protection Officer (“personvernombud”): it may be required for the researcher to seek advice and guidance in the planning phase



### **Step 2: Approvals (REK, SLV, Data Protection Officer)**

The Project Manager (“prosjektleder”) is responsible for obtaining the necessary approvals before the project can start. Normally the research institution requires that the application (including relevant appendices) is registered and filed in the institution's administrative systems

From 2019, for OUS researchers, studies with all attachments are to be reported to the OUS Personal Data Officer (Personvernombudet) after project submission to REK) via the link: <https://nettschema.uio.no/answer/meldeskjema.html>



### **Step 3: Study start and implementation**

Once necessary approvals are obtained, the Project Manager's responsibility is to:

- Follow up the terms that underlie the approval
- Follow up the institution's procedures for access, storage and dispensing research data. If the project is a collaboration between several institutions (multicenter study), a data transfer agreement between the involved institutions is commonly made. The Project Manager has a particular responsibility to ensure that such agreements are in place



**The study is formalized and can start!**



## **Chapter 8**

### **Statistics and data analysis**

Data must be analyzed in order for research results to be evaluated. A sound understanding of data processing is required in the planning, execution, and completion phases of all studies. This is essential as statistical evaluation can demonstrate whether or not the study has been conducted with a sufficient number of subjects e.g. patients, or experimental animals.

The number of subjects or cell cultures required in a study depends upon a number of factors, the key term in this context being "minimum clinically relevant difference". In order to determine the "minimum clinically relevant difference" one needs to know the internal variation of the variable measured, i.e. the intrinsic variation present prior to comparing two groups. During the planning phase, the effect of the relevant variable as demonstrated in previously published papers may be used as a proxy for the "minimum clinically relevant difference". The number of participants required can be calculated using power analysis. This reduces the risk of conducting a study leading to results from which no conclusions may be drawn (i.e. an inconclusive study).

#### **Planning and hypothesis testing**

Many studies propose two competing hypotheses (for example: "The treatment provides an improvement" vs. "the treatment provides no improvement"). The hypothesis called *the null hypothesis (H<sub>0</sub>)* is the hypothesis to be disproven. The other hypothesis is called *the alternative hypothesis (H<sub>A</sub> or H<sub>1</sub>)*. The hypotheses must be well defined in order to conduct *a statistical hypothesis test*. A hypothesis test determines whether the null hypothesis should be accepted or rejected. When performing the test, two types of errors may occur: a rejection error (i.e. *a type I error*), or an acceptance error (i.e. *a type II error*):

		Test result	
		H0 accepted	H0 rejected
Reality	H0 true	Correct	<b>type I mistake</b>
	H0 false	<b>type II mistake</b>	Correct

The goal is to reduce the risk of both types of errors. These risks can be calculated for a given data set and a given test. Studies are often planned such that *the risk of a rejection error (significance level,  $\alpha$ )* is set for example at 5%, and *the risk of an acceptance error ( $\beta$ )* is set for example at 10%. Increasing the number of observations (patients, cell cultures etc.) will often reduce the risk of erroneous conclusions. The necessary number of observations may be calculated by power analysis. This calculation requires an estimate of the least amount of change observed that would still equal a relevant difference between the groups being compared, the known or anticipated variation in outcome, and the predetermined significance level,  $\alpha$ , and acceptance level,  $\beta$ .

Once the necessary data has been collected, a statistical hypothesis test may be carried out. This is usually performed using a statistical program, and the result is provided in the form of a *p-value (the probability that the result could have occurred randomly,  $p$ =probability)*. The rule is that the null hypothesis is *not rejected* if the p-value equals or is larger than the significance level ( $p \geq \alpha$ ), but is rejected if  $p < \alpha$ , for example if  $p < 0.05$ . The statistical test examines the probability of the obtained results (or more extreme results) if the null hypothesis were true. This probability is expressed by the p-value; the lower value- the less likely that the null hypothesis is true (**Laake P et al.**

Epidemiologiske og kliniske forskningsmetoder. Gyldendal Akademisk 2007).

If the null hypothesis is rejected, we express that there is a statistically significant difference between the tested groups. It is recommended that statistical significance is assessed by confidence intervals and to avoid relying

solely on p-values (**Veierød MB et al.** Medical statistics in clinical and Epidemiological research. Gyldendal Akademisk 2012).

### **Statistical Analysis Plan (SAP)**

A description of statistical analyzes, including interim analyses are often gathered in a protocol or statistical analysis plan (SAP). Many attractive journals will favor articles submitted with a SAP (**Gamble C et al.** Guidelines for the Content of Statistical Analysis Plans in Clinical Trials. JAMA 2017;318(23):2337-43).

### **Selection of statistical tests**

The type of statistical hypothesis test that is appropriate to use depends on the type of data as well as the scientific question. One must know whether to use parametric tests (in the case of a Gaussian distribution of a variable i.e. one with a normal distribution), or non-parametric tests (for variables that do not have a normal distribution in the observed population).

It is necessary to be critical when determining what constitutes a clinically or biologically significant difference between groups. Frequently a statistically significant difference is found between groups without the finding being of biological significance. If a large number of individuals or experimental subjects are included, a small and unimportant biological difference may result in a statistically significant difference. Likewise, statistically significant associations or differences may arise if many variables are tested after completing a study, simply because of the large number of parameters being analyzed. The requirements for statistical significance increase if multiple variables are tested (cf. the Bonferroni correction). If multiple hypotheses are to be tested, this needs to be considered at the planning stage as well as when determining the significance level and the size of the study.

Most biomedical publications contain a section describing the use of statistical analyses, detailing the factors mentioned above. The choice of experimental study design (e.g. randomized, controlled, blinded, open - see Chapter 8), data analysis methods (e.g. t-test, non-parametric tests, ANOVA), data tools (e.g. SPSS, Excel, SAS, EpiData, NCSS), choice of significance level ( $\alpha$ ), and how the size of the sample has been calculated (based on power analysis) should be discussed in this section. Such statistical considerations must be completed before the study commences. The researcher him/herself should have a good grasp of this information. However, in planning large studies, it is important to seek advice early from statisticians or epidemiologists. The information in the sections listed below should help to make this work more manageable.

### **Courses**

Universities arrange research courses for their PhD students. Many of the newly established "research schools" (forsknings-skoler) will offer research courses of a more specific nature. Some of these courses focus solely on statistics and include training in data processing. Other courses provide more general insights into research, including information on how to plan a research study.

### ***Literature***

There are a number of books available, spanning a wide range in terms of difficulty and detail. Books may be used as reference works and as a means of learning and understanding statistical terms and methods. The following books are frequently used by medical and health science researchers:

**Svend Juul et al.** Epidemiologi Og Evidens – 3<sup>rd</sup> Edition 2017, Munksgaard Denmark.

**Altman DG.** Practical statistics for medical research. Chapman & Hall 1991.

**Aalen O et al.** Statistiske metoder i medisin og helsefag. Gyldendal Akademiske Forlag. New Edition 2018.

**Ejlertsson G.** Grundläggande statistik med tillämpingar inom sjukvården. Studentlitteratur; last Edition 1999.

**Kirkwood BR and Sterne JAC.** Essential Medical Statistics. Second edition. Blackwell Science. New edition 2016.

**Laake P et al.** Epidemiologiske og kliniske forskningsmetoder. Gyldendal Akademisk 2007.

**Rothman K.** Epidemiology; An introductory. Oxford University Press 2002.

**Veierød MB et al.** Medical statistics in clinical and epidemiological research. Gyldendal Akademisk 2012.

### **Data programs for setting up databases and analyzing results**

A number of software programs are available for storing and processing data. The programs used depend on factors such as availability at the institution the researchers are affiliated with, personal preferences, and the nature of the study.

**Microsoft Excel** is available at most institutions. The program is easy to learn and use, and courses on Microsoft Excel are frequently arranged. The program is, however, not suitable for advanced statistical analyses, and the graphics program is not ideal.

**PASW (Predictive Analytics Software) or SPSS (Statistical Package for the Social Sciences)** are different versions of the same software package. The package is a single unit developed by integrating several computer programs that were originally developed for social science research. The software is user friendly, high in quality, and comes with the appropriate manuals. Universities host courses on SPSS on a regular basis. There are websites where one can get assistance, including <http://ats.ucla.edu/stat>.

**EpiData** is the database recommended by WHO. It is available free of charge and is well suited for most clinical studies (<http://www.epidata.dk/>).

**EPI Info 2002** is another useful program well suited for questionnaires, database building and some types of statistical analyses in epidemiological studies. The program can be downloaded free of charge from the Internet (<http://www.cdc.gov/epiinfo>).

**Medcalc** (<https://www.medcalc.org/>), **NCSS** (<http://ncss.com/>), **SAS (Statistical Analysis Software)** (<http://www.sas.com/>), **Stata** (<http://stata.com/>), **Tibco Spotfire** (<http://spotfire.tibco.com/>) and **The Comprehensive R Archive Network** (<http://cran.r-project.org/>) are additional statistical packages that are useful with respect to their purpose.

Some statistics programs also contain excellent graphic tools. However, specific scientific graphic tools can be purchased separately, such as:

**Sigmaplot** (<http://sigmaplot.com/>)

and **Graphpad Prism** (<https://www.graphpad.com/scientific-software/prism/>)

**NVivo** is a program for analysis and presentation of data obtained using qualitative methods. The program has to be purchased, but a 30-day free trial version can be downloaded from

[http://www.qsrinternational.com/products\\_nvivo.aspx](http://www.qsrinternational.com/products_nvivo.aspx)

### **Assistance from statisticians or epidemiologists**

The university hospitals and other research institutions have qualified statisticians and epidemiologists with medical expertise. It is recommended that researchers contact such specialists as early as possible in the planning stage of a study and continue to seek advice from a statistician as the study progresses. It should be discussed and agreed upon in advance whether the statistician is to be a co-author (the Vancouver “rules” on co-authorship must be followed, see Chapter 9), receive payment or be acknowledged in the planned publication(s).

The Department of Epidemiology, Statistics and Health Economics, within the Department of Research Support (“Forskningsstøtte”) at Oslo University Hospital, offers assistance to researchers throughout the health region ([Oslo Senter for biostatistikk og epidemiologi \(OCBE\)](#)).

### **Bioinformatics**

In today’s world, many Research projects within biomedicine utilize biotechnological methods that generate large amounts of research data, requiring sophisticated biostatistical work. This field is rapidly evolving, and specific expertise is offered at the major research institutions.

### **Websites**

Several websites feature accessible literature and background information regarding statistical methods, as well as various program packages, which include simple rules for calculating the number of patients (experimental animals/ subjects) needed for a study (power calculation):

<http://randomization.com/>

<http://statpages.org/>

<http://biostat.mc.vanderbilt.edu/twiki/bin/view/Main/PowerSampleSize>

<http://stat.ubc.ca/~rollin/stats/ssize/n2.html>





## **Chapter 9 Publication**

### **9.1 Publication forms**

Scientists have a moral obligation to share their results with others, also when study results differ from those expected. This is clear from the Helsinki Declaration: "Negative as well as positive results should be published or otherwise made publicly available" ([Declaration of Helsinki](#); §36). The Norwegian "Act on medical and health research" (the "Health research act", "helseforskningsloven") also requires that the Research Director ("forskningsansvarlig") and Project Manager ("prosjektleder") ensure transparency in research by making research results publicly available (§ 39).

Publishing scientific results is a significant part of the research process, and in doing so researchers contribute to the common fund of knowledge. The publication of results and methodology is a prerequisite for scientific debate. Publishing enables replication of a study and comparison of results with those of other studies.

During the process of writing and summarizing results it is important to bear in mind the context in which the results are to be presented. Publishing a scientific paper is not the aim of every research project. Some may wish to report the results in a local setting or at an internal meeting only, whereas many researchers will present a poster or oral presentation at international conferences and submit a scientific paper to a medical or health sciences journal. The content of a lecture and the type of presentation will also differ according to whether it is to be a relatively comprehensive lecture in a hospital department setting or a ten-minute presentation at a scientific conference.

It is important to consider to which journal the paper will be submitted. Follow the guidelines of the journal or the conference organizer at all times, as this will make the paper formatting easier. Also bear in mind the reader of the paper; i.e. whether it will be the world's leading researchers in the scientific field or colleagues in a hospital department who have never heard of the subject before. Adapt the form and content of the message accordingly.

## **9.2 Writing a scientific paper**

Scientific papers follow a standard format (e.g. requirements regarding characters and number of words etc.), which is described in the "Instructions to Authors", usually on the website of the relevant journal. These must be adhered to. Reading other papers in the journal is of benefit with respect to becoming familiar with the required format. The Vancouver Convention ("rules") describes authorship with respect to publication of articles (see section 9.4 below).

### **Title**

The title should indicate the content of the manuscript, attract the attention of the reader and must be in the format of the journal in question.

### **Abstract (summary)**

Follow the format in the journal's "Instructions to Authors". See <http://mulford.utoledo.edu/instr/>, a website with links to the Guidelines for Authors of a number of journals.

### **Introduction**

Describe the background for the study and the scientific question being investigated. What information is currently known and where are the knowledge gaps? The introduction should culminate in the main question being posed by the study. "The aim of the study" should be concise and describe in concrete terms how the question is to be answered (see Chapters 4 and 6 on primary and

secondary goals). This is perhaps the most important part of the paper and will govern how information is presented throughout the remaining part of the article. The aim of the study may be divided into a primary objective (aim) and secondary aims. A description of the study's hypothesis is often desirable.

### **Materials and methods**

These need to be described in sufficient detail for other researchers to be able to replicate the reported findings. Laboratory methods should indicate the coefficient of variation of the applied method. Describe which patients/informants/experimental animals/cells etc. were included in the study, the number of included subjects, the inclusion and exclusion criteria, and the outcomes being measured. Choice of statistical analysis method should also be indicated; this is often done in a separate paragraph. Many journals restrict the length of the methods section, making it difficult to describe the methods in sufficient detail. In such cases, including supplemental materials might be a way to cover details that do not fit in the manuscript itself; check the “Instructions to authors” to see if this is possible.

### **Results**

First, present the main findings of the study, potentially with important background data for the study population. Next, present the results corresponding to the secondary (or following) aims. The main findings can often be presented in a figure (demonstrating the most interesting points), but bear in mind that figures, tables and text are meant to complement each other, not overlap. Do not include too many figures and tables. Consult the “Instructions to Authors.” Findings should be presented objectively and not be discussed; the latter is reserved for the "discussion" section.

### **Figures**

The «Instructions to authors” will define how the figures should be presented, but tips are also available in several books and articles on how to best illustrate one’s major research findings

<http://blogs.nature.com/methagora/2013/07/data-visualization-points-of-view.html>

## **Discussion**

Give a brief description of the major findings of the study. Thereafter, compare them with prior relevant studies. Alternative explanations should be discussed if the results are inconsistent with previous findings. Discuss possible sources of error and potential biological mechanisms that may underlie associations demonstrated by the study. It is advisable to include a discussion of the strengths and limitations of the present study. Conclude by restating the main findings and discuss the impact these may have within the related scientific field.

## **Acknowledgements**

In this section gratitude is expressed to colleagues who do not fulfill the criteria for co-authorship. Note that many journals require a "substantial contribution" for a person to be acknowledged. Some also require that all those acknowledged have agreed in writing to appear in the acknowledgements section. Consult the "Instructions to authors". Financial and other contributions (e.g. technical support) are also mentioned in this section. For cases where the researcher has financial ties to a company that is involved in the study, there are rules on how this should be disclosed.

## **References**

Regulations governing the references one should choose in one's publications are generally lacking, except the restrictions applicable to plagiarism (see Chapter 16). The Norwegian Committees of Research Ethics ("forskningsetiske komiteer") has published a paper on sound reference use in publications (<https://www.etikkom.no/FBIB/Temaer/Redelighet-og-kollegialitet/>)

It is important to refer to high quality studies that provide a balanced account of the background for your research question, preferably reporting the original studies that first described the findings. Studies that confirm such findings may also be mentioned, but not without including the original paper. Reporting

thoughts, ideas and statements from others, as if they were your own, is considered plagiarism. Plagiarism is intellectual theft, and is regulated in Norway by "Lov om opphavsrett til åndsverk", <https://lovdata.no/dokument/åndsverkloven> as well as by "Lov om Universiteter og Høyskoler", [https://lovdata.no/dokument/lov om Universiteter og Høyskoler](https://lovdata.no/dokument/lov_om_Universiteter_og_Høyskoler).

A trap some researchers fall into is to cite someone else's citation without reading the original paper or checking whether corrections to the article have been published. As a result, incorrect citations may be "inherited" from one paper to the next, and in the worst case, erroneous information is presented as fact. To complement the general unwritten consensus on use of references in science, some institutions have developed specific guidelines for their employees and students.

The way in which references are presented, (i.e. "the style"), both within the body of the article and in the list of references, varies by journal. Adhere to the format of the relevant journal. Software programs such as "Reference Manager"/"Endnote" are useful as they generate an electronic database which can be used as a source of citations during paper preparation. By choosing the appropriate "output style" for the relevant journal, the list of references will be adjusted accordingly and "in-text" citations will be entered in the correct format. A new "output style" can be generated and saved for later use, by editing an existing similar format (see Chapter 5).

If multiple authors wish to contribute to the editing of the text where references are concerned, it may be advantageous to make a specific reference database for the article that everyone uses during revision. Otherwise, problems may occur with the order of and the generation of the final reference list.

### 9.3 Choice of journal

A supervisor will often have valuable insight into the scientific profiles of relevant journals and what target audiences a paper should aim towards. Many consider the "impact factor" of a journal to be important, since this indicates citation frequency and the number of people who read the journal. However, high impact factor is not synonymous with high scientific quality. A greater number of readers will undoubtedly be reached through Nature/ Science/ Cell/ NEJM/ Lancet than through a Scandinavian journal. Although many journals catering to narrow clinical subspecialties may be of very high quality, they will have a lower impact factor than journals with a wider audience (such as journals on cardiovascular disease, cancer etc.). The ranking of the journals one publishes in plays a role in the evaluation of future applications for grants and academic posts; and research institutions receive research funding on the basis of number of publications and the caliber of the journals they publish in (see below). Information on the impact factor of various journals is found in the citation database (<http://ipscience-help.thomsonreuters.com/>).

JCR (Journal Citation Reports), published by the Institute for Scientific Information (ISI), presents quantitative data beyond the impact factor of a journal, aiming for a systematic and objective review of all the journals that are part of the comprehensive article- and citations database, Web of Science.

**The DORA Declaration:** In 2018, many research institutions in Norway, including OUS, have signed the DORA Declaration on Research Assessment: (<https://sfdora.org/read/>) which aims to improve the evaluation of research results by avoiding the use of the journal's Impact Factor or other magazine-based indicators as a measure of the quality of individual articles. So far, the statement has been signed by over 500 institutions and over 12,000 single researchers worldwide.

Publication in "**Open Access**" journals has been rapidly increasing since the 2000s, and means that articles are freely available via online access, without subscription. These journals also use peer review, and the quality of journals and articles vary, in the same way as subscription-based (and printed) journals. It is becoming a requirement in many parts of the world that research conducted using public funds should be freely available on the web. However, someone has to pay the costs of publishing these Open Access journals, and often it is the authors themselves (or their employers) who have to pay. UiO requires Open Access available papers from scientists employed after July 4th 2013. One way to achieve this is for UiO to publish the "postprint" version (the latest version from the author to the journal before the final version) after the agreed embargo time (administered by the University Libraries via the [CRISTIN](#) system). The Research Council of Norway supports [PlanS](#), and requires from their grant supported researchers full "Open Access" publications without embargo time from 2024. In the mandate for the Regional Health Authorities in 2019, the Ministry of Health and Care Services has stated the following, as a follow-up of Plan S: "The Regional Health Authorities shall ensure that all scientific articles based on research funding from the Regional Health Authorities shall be openly available from 1<sup>st</sup> of January 2021".

From 2019, the University Libraries in Norway have negotiated agreements with several publishers, meaning that several researchers in Norway can publish "Open Access" at no extra (personal) cost. The number of agreements is constantly expanding and the University Libraries can be contacted for updated information (<https://www.ub.uio.no/english/writing-publishing/open-access/index.html>). In 2019, 5 agreements are negotiated with the major publishers (Elsevier, Wiley, IOP, Taylor & Francis and Springer Compact). Details of the individual agreement and its duration can be found at <https://www.ub.uio.no/writing-publisere/open-access/avtaler-og-rabatter/>.

## **Further tips on scientific writing**

**Booth WC, Colomb GG og Williams JM.** The Craft of Research. Third Edition. University of Chicago Press 2008.

**Friis S og Vaglum P.** Fra idé til prosjekt. En innføring i klinisk forskning. Tano. Aschehoug 1999.

**Hofmann A.** Scientific Writing and Communication: Papers, Proposals and Presentations. Oxford University Press 3<sup>rd</sup> Edition 2016.

**Laake P, Reino Olsen B og Benestad HB (red.).** Forskning i medisin og biofag. Gyldendal Akademisk 2008.

**Turabian KL.** A Manual for Writers of Research Papers, Theses, and Dissertations. University of Chicago Press, 9<sup>th</sup> Edition 2018.

**Zeiger M.** Towards clearer writing. Eur Respir J 1993; 6: 457-60.

**Zeiger M.** Essentials of Writing Biomedical Research Papers. Second Edition. McGraw-Hill Education 1999.

**Moher D, Schultz KF, Altman DG.** The CONSORT statement: revised recommendations for improving the quality of reports of parallel-group randomised trials. The Lancet 2001; 357: 1191-4.

- More information on **CONSORT**: <http://consort-statement.org/>

**von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP.** The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for improving observational studies. The Lancet 2007; 370: 1453-7.

- More information on **STROBE**: <http://strobe-statement.org/>

## **9.4 Authorship of scientific publications**

The Vancouver criteria for authorship, "Uniform requirements for manuscripts submitted to biomedical journals" were first published in 1979 and have been updated several times (<http://www.icmje.org/>). A group of editors of medical



journals met in Vancouver in 1978 and established guidelines regarding authorship rights in biomedical journals. This group is officially named the "International Committee of Medical Journal Editors" (ICMJE) and meets annually. The Editor of the Journal of the Norwegian Medical Association was a member of ICMJE (until spring 2015). Over 500 medical journals follow these rules on authorship.

ICMJE defines an "author" in a biomedical journal as "*someone who has made substantive intellectual contributions to a published study...*"

(<http://www.icmje.org/recommendations/defining-the-role-of-authors-and-contributors.html> and <http://icmje.org/icmje-recommendations.pdf>). To be

defined as an author, the following 4 criteria must be satisfied:

1. "*Substantial contributions to conception and (or) design of the work, or the acquisition or interpretation of data for the work, or analysis and interpretation of data*".
2. "*Drafting the work article or revising it critically for important intellectual content*".
3. "*Final approval of the version to be published*".
4. "*Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved*".

This 4<sup>th</sup> criterion was added in the 2013 revision of the authorship requirements.

Each author must fulfill all the criteria (1, 2, 3 and 4). Please note the requirement for «substantial contributions» in criterion 1.

According to the Vancouver Convention authors are recommended to submit a description of each author's contribution to the editor (in the submission of a PhD thesis a detailed description of authorships such as this will be required by

the University). For details, consult the Guidelines for Authors for the relevant journal.

Any person contributing significantly to the work without fulfilling authorship requirements may be acknowledged, and their contribution briefly described. Multi-center authors must individually satisfy requirements for authorship.

According to the Vancouver “rules”, the order of the authors should be decided jointly by the co-authors. Authors must also be prepared to explain the order of authors and the contribution of each co-author. Further information regarding co-authorship and guidelines for publication in medical journals is found on <http://www.icmje.org/>.

A spirit of positive collaboration is essential should any problems arise in discussions on authorship. PhD candidates should have a contract defining their relationship with their supervisor. In addition a supervisory institution that can assist if any problems arise, should be named (for example the Director of a research department). Other than this, there are few rules and little formalized support structure governing cases of conflict. However, discussions of authorship early in the research process may prevent conflicts by avoiding misunderstandings, shattering of expectations, and damage to the scientific collaboration (see Chapter 14). In general, it may be wise to be generous in offering co-authorship, and similarly wise to decline such offers if the requirements for co-authorship are not fulfilled. Co-authorship entails not merely prestige, but also responsibility for the scientific content of a scientific paper.

## **9.5 Crediting/addresses for scientific papers and PhD theses**

In 2011, the three publicly funded research sectors introduced a joint research

documentation system, known as CRISTIN (Current Research Information System in Norway, <http://www.cristin.no/>). Scientific publications and doctoral degrees are reported through this system. Data from this common system is the basis for performance-based research funding in all sectors.

Researchers credit institutions for their work by publishing an address of the institution on the scientific publication. It is important to note that such credit can be given regardless of employment.

The National Strategy Group for Health Research (“Nasjonal strategigruppe for helseforskning”, NSG, <http://www.helseforsk.no/>) has discussed guidelines for publication crediting, and has concluded that it is the author who decides crediting, on the basis of the following general rules: An institution shall be credited and its address included in the publication if it has provided a necessary and essential contribution to the performed work. The same author should also provide addresses of other institutions if they also meet these requirements. Other contributors may be named in the "Acknowledgements" section.

It is appropriate to provide the address to a hospital if the research is conducted at and/or funded by the regional health authority and/or health trust (e.g. hospital). In assessing whether the research is "conducted at" a specific hospital, the use of biological materials and/or health data from hospital patients (e.g. medical records), use of medical equipment at the hospital and other infrastructure such as IT equipment, facilities, etc. should be heavily weighed. If the research is fully or partially funded by a regional health trust, the corresponding hospital's address should be included, thereby crediting it.

Some research institutions have signed local collaboration agreements for scientists who work both at the university and at the health trust, such as Oslo University Hospital and University of Oslo. Researchers should check what is

considered the correct address to use before submitting a paper for publication. When crediting several institutions, the crediting must for practical reasons either stand as separate addresses, or have a *semicolon* or *and* between the two addresses (e.g. Oslo University Hospital and University of Oslo). The general rule is that all PhD candidates who are accepted at the UiO PhD programme must credit UiO as at least one of their affiliation in all publications. The candidate may have several affiliations, but UiO must be one of them.

### **9.6 Duplicate publication**

Duplicate publication refers to publication of original results twice. Usually this would entail publication in two journals. However, some journals do not even accept published abstract reports prior to publication in the journal. This must therefore be verified in advance so as to avoid spoiling one's chances of publication in the more prestigious journals. Most journals will however accept a poster or oral presentation at international conferences prior to publication of a paper. Bear in mind that if journals suspect or discover attempts of duplicate publication, this will lead to sanctions such as barring further submissions in the relevant journal for a specified period of time. Some journals accept duplicate publication (often known as secondary publication), as long as this is stated upfront. One example is the Journal of the Norwegian Medical Association, which may be interested in a Norwegian language version of interesting data previously published in an international journal.

Guidelines regarding duplicate publication/overlapping publication are found in the Vancouver agreements (<http://www.icmje.org/>). In addition, most journals have clarified their views on duplicate publication, e.g. what is acceptable in terms of abstracts at international meetings etc. prior to publication. Read the Instructions to Authors carefully before submitting a paper to a journal.

## **9.7 Relationships with commercial industry ("sponsors"), conflict of interest, and publication**

Most research institutions have standard contracts for collaboration with sponsors in research projects. The guidelines at your institutions should be followed. Seek advice for assessment of contracts with sponsors, particularly with respect to the rights of access to and publication of results (e.g. from Inven2, for researchers at UiO and "Helse Sør-Øst", <http://www.inven2.com/no>). The researcher may otherwise find that their attempt to publish can be hampered by the sponsor if the latter does not wish to have the results published. Each project must be negotiated between the hospital and the sponsor. The principal investigators are crucial in this process. See also the paragraph on "Acknowledgements" in this chapter.

According to the Helsinki Declaration, both authors and publishers have ethical obligations with respect to publishing research results. Both negative and positive results must be published or otherwise made available to the public. Disclosure of funding, institutional links and any possible conflict of interest must be stated in the publication. Disclosing "Conflicts of Interest" includes more than possible financial ties, see recommendations made by the Vancouver group: <http://icmje.org/conflicts-of-interest/> and the recommendations by NEM (<http://etikkom.no/>) In general, it is preferable to openly present any possible factors that may impact one's ability to be objective and neutral in one's research and publications, and rather enable the journal (and its readers) to decide whether these factors could have influenced the research). The ethical reflection on any potential "conflicts of interest" should be undertaken by the researchers already during the planning phase of the research project, and not solely as presented as a "disclosure" when submitting the paper to a scientific journal. More details on the Vancouver group's evaluation of the relationship to the "sponsor" in biomedical research publication may be found here:

<http://icmje.org/recommendations/browse/roles-and-responsibilities/author-responsibilities--conflicts-of-interest.html>

Bear in mind that REK does not approve studies with publication restrictions, such as restrictions imposed by a "sponsor", where the committee evaluates such restrictions to be in conflict with the Helsinki Declaration (§36). Article 36 states that all authors are responsible for ensuring that both negative, inconclusive, and positive results of the project be published.

### **9.8 Peer review of articles in scientific journals**

Peer review of submitted papers is standard for all renowned journals within medical research. Peer reviewing implies that the editors ask independent peers within the field of research to critically evaluate the submitted manuscripts. Peer reviewers are not employed by the editorial board of the academic journal. Many consider this form of evaluation to be an extension of their academic work and a means by which to receive considerable useful feedback to improve the paper. The aim of peer review is to assist the editor in deciding if the manuscript is suitable for publication, and also whether further information is required or other analyses are necessary prior to publication. The number of peer reviewers used for each manuscript and the emphasis placed on their judgment varies between journals and also depends upon the submitted paper. The Vancouver group has a description of the peer review system (<http://www.icmje.org/>).

There are no uniform conventions on how authors should respond to feedback from editors and to the judgments of peer reviewers. Naturally, many researchers are disappointed if their paper is rejected. In the cases where the authors are given the opportunity to reply to questions and amend the paper accordingly, many find that their manuscripts eventually are approved for publication. All questions from the editor and peer reviewers should be

answered in detail, and the Instructions to Authors will often outline how to do this. Keep in mind that most papers improve after revisions based on peer reviews.

A very frustrating situation is when a paper is rejected after unjust or incorrect criticism by the reviewer, without the author receiving the opportunity for dialogue with the editor. If the criticism appears to be unreasonable, several options may be considered. One is to approach the editor with a polite letter pointing out any disparities in the rejection and asking whether a corrected version of the manuscript could be considered for evaluation (resubmitted as a "new manuscript"). Generally, the recommendation is not to base oneself on the aforementioned option too often, but rather to amend the paper based on whatever useful suggestions were provided and submit to another journal.

## **9.9 Registering clinical trials**

The journals affiliated with The International Committee of Medical Journal Editors (the Vancouver-group) require all clinical trials that prospectively randomize research participants in treatment or control groups, to be registered prior to study start. Drug trials approved by REK and SLV will automatically be registered in the Clinical Trial Registry (<http://clinicaltrialsregister.eu/>), which is one of several internationally recognized databases.

Trials may be registered on the following websites:

<http://anzctr.org.au/>

<http://clinicaltrials.gov/>

<http://clinicaltrialsregister.eu/>

<http://www.isrctn.com/>

<http://trialregister.nl/trialreg>

<http://www.umin.ac.jp/ctr/>

<http://who.int/ictrp/network/primary/en/>

Researchers who have registered their intervention trials are asked to also register their results in the same database within a year of study completion. This requirement follows from an American act (Section 801 of the Food and Drug Administration Amendments Act of 2007, FDAAA; Pub. L. 110-85, <http://prsinfo.clinicaltrials.gov/fdaaa.html>), where American researchers may be fined if the main results are not published on the same website (<http://clinicaltrials.gov/>). This requirement may also have consequences for researchers in Norway, if they are engaged in collaborative studies with American researchers and if applying for research grants from the USA. This web-publishing requirement may be adapted by many other countries. At present, the public trial database will show the study as not completed, unless the researcher has submitted the main results from the study. An advantage with such web publication is that missing study effects will be difficult to hide. In addition persons other than the principle researchers of the study are given insight into the study. The disadvantage of such publication is that the study results may not have been evaluated by external peer reviewers, i.e. an external quality control is missing. In addition, it is currently unclear what sort of distinctions will be made in the future between traditional publications and such short web version of trial publications. At present, ICMJE accepts this presentation of the main findings ("similar to an abstract"), without it being considered a "double publication" of the regular journal manuscript. In the latter, the interpretation of the results in a greater context will be the main focus of the publication (<http://icmje.org/>).

The Journal of The Norwegian Medical Association has published an article with guidelines for registration of clinical trials ("Praktiske råd ved registrering av kliniske studier", Tidsskr Nor Legeforen 2007; 127: 1654-6) as well as a podcast on the same subject.



*Other relevant literature*

**De Angelis C, Drazen JM, Frizelle FA et al.** Registrering av kliniske forsøk. Tidsskr Nor Lægeforen 2004; 124: 2339.

**De Angelis C, Drazen JM, Frizelle FA et al.** Er det kliniske forsøket fullstendig registrert? Tidsskr Nor Legeforen 2005; 125: 1877-8.

**Haug C.** Kliniske forsøk må registreres! Tidsskr Nor Legeforen 2005; 125: 2449.

**Haug C.** Medisinske sannheter. Tidsskr Nor Legeforen 2005; 125: 1469.

**Laine C, Horton R, DeAngelis C, et al.** Clinical trial registration: looking back and moving ahead. Published in <http://www.tidsskriftet.no/> (14.6. 2007).

**Nylenna M.** Publisere & presentere - Medisinsk fagformidling i teori og praksis. Gyldendal forlag 2<sup>nd</sup> Edition 2015. ISBN: 978-82-05-49012-3.



## **Chapter 10**

### **Research supervision**

#### **Aim**

The purpose of research project supervision is to ensure that the person being supervised, regardless of the candidate's background or level of ambition, will be able to carry out the project in the best possible manner. A supervisor should give expert advice, already during the early stages of the project. Although not all research projects are designed to lead to a doctoral degree, agreements on PhD supervision can serve as a good example of other types of supervision.

Most universities and university colleges have specific supervision agreements and programs. Supervision is meant to lay the foundation for the development of a PhD thesis that will prepare the candidate for future independent research activities and work in the scientific community at large, both of which require academic expertise. Doctoral studies require independent research within a specialty field, and the goal is to produce a thesis of high academic quality. In addition, doctoral candidates are to receive advanced training in methodology and theory to ensure academic depth and width and to provide a framework for the field at hand. The doctoral candidate should also receive training in how to communicate academic work and scientific results. The training program should be planned and carried out in consultation with the supervisor.

Research candidates are expected to fulfill certain requirements with respect to work effort, PhD course attendance etc., as well as complying with deadlines the supervisor finds appropriate for efficient progression of the project. Both parties, the candidate and the supervisor, can terminate an agreement if the terms are not being met, but flexibility and skillful consideration from both sides, is an advantage.

## **Contracts**

Acceptance to a doctoral program is formalized in a written agreement. The agreement between the doctoral candidate, the supervisor(s) and the school/faculty/institute states the rights and duties of the respective parties. The agreement states the subject of the thesis, the time period of the agreement, a plan for financing, the nature of the supervision, the place of work, and possibly also a PhD course plan.

PhD work is to be supervised by a faculty member, or by another person with the necessary expertise, or possibly by multiple such people working in collaboration. In general, one of the supervisors should be affiliated with the school/faculty (“fakultetet”) to which the candidate has been admitted. At the University of Oslo (UiO), the main supervisor is normally a UiO employee. If relevant arguments are presented for why this is not the best alternative for a specific research project, an external main supervisor may be appointed. In such cases, an internal co-supervisor must also be appointed. At present, UiO requires a minimum of 2 supervisors. The updated rules are found on the UiO MED PhD programme website (<http://www.med.uio.no/english/research/phd/>). In cases where there are several supervisors, one of them is to be appointed as the main supervisor, the other(s) is (are) co-supervisor(s). Supervisor (s) must have a PhD or the equivalent expertise. The candidate and supervisor(s) are expected to maintain regular contact, as laid down in the guidelines for candidate supervision. In general, doctoral candidates should also be given the opportunity to have their thesis work discussed at a seminar, within the research group or in other relevant forums.

During the process of selecting a project and supervisors, we recommend that you check bibliographical databases such as PubMed, EMBASE and BIBSYS to find the articles the supervisor(s) have produced as well as to identify number of

doctorates they have supervised during the last five years. If the main supervisor has not been particularly active in this respect or is new as a supervisor, the co-supervisor should have a reasonable level of research activity. In addition to the question of expertise, it is important to know something about the supervisor's character, as well as her/his abilities to create a good working environment. Ample supervisor expertise and research activities are of little benefit to the PhD student if the supervisor has no time to supervise the candidate. Paired with the candidate's own abilities and motivation, a motivated supervisor is the best basis for carrying out a successful doctorate project. The same factors are important with respect to supervision at other levels and to other extents.

### **Supervision**

Regular contact is important in order to meet the planned deadlines. Most PhD students have regular appointments to meet with their supervisor, often approximately one hour a week. The candidates usually present a rough agenda before the meeting; they might prepare a draft of a manuscript, a table or a topic for follow-up discussion. This provides the basis for the supervisory discussion and further work. It is the supervisor's duty to give feedback and general comments about the work and progress of the project. The co-supervisor often plays a specific role, often of a methodological nature. He/she may for instance act as a biostatistical supervisor. In case of difficulties or conflicts, it is recommended that all the supervisors and the candidate meet jointly to clarify the situation and find a way forward. In some cases supervision can also be given in groups. Good supervision is one of the most important prerequisites for a successful research project. More information about the universities' requirements for supervision and follow-up of students are found on their websites.

## **Research Schools**

University research schools in Norway can supplement and reinforce the supervisor's work. Small- group based teaching and courses within specific research fields are likely to promote recruitment of high quality doctoral candidates (<http://uio.no/forskning/doktorgrad-karriere/forskerskoler/> and <http://www.uio.no/english/research/quality-system-for-health-research/>)

## **Conflicts**

If conflicts of a personal and/or academic nature arise between the supervisor and the candidate in a PhD program, a person who has been designated to take on responsibility for resolving such matters is available at each institution. Any conflicts are generally handled with the nearest superior. The Institute leader is responsible for follow-up of such cases, and the medical school (“fakultetet”) has the final responsibility. This only applies to formal agreements for PhD studies. Sometimes problems arise regarding supervision or questions about authorship, credits, and other difficulties that need an unbiased assessment.

## **University of Oslo: information on PhD supervisor roles:**

<https://www.med.uio.no/english/research/phd/supervision/supervisor/>

**Courses on University-level pedagogy** are offered at all Universities

**Courses on research leadership** are held at several Universities in Norway (also in English at UiO since 2019: <http://www.uio.no/english/for-employees/competence/leadership-development/research-leaders/rlp/index.html>) as well as at Copenhagen Business School (<http://cbs.dk/>)

**Courses on ethics:** See Chapter 16 of this Research Handbook, and the electronic library of The National Committee for Medical and Health Research Ethics (NEM): <http://etikkom.no/FBIB>.

**Research regulations and responsibilities:** See Chapters 6 and 10 of this Research Handbook and the Norwegian Health Research Act guidelines <http://regjeringen.no/>

”**Successful Supervision, A Dialogue Facilitator**” from the Karolinska Institutet, Sweden. This is a practical guide, made to help the supervisor and PhD candidate define expectations and roles and to help develop realistic research project plans (<https://staff.ki.se/literature-for-supervisors>).

#### **Research supervision books in Norwegian**

- **Lauvås P and Handal G.** Forskningsveilederen. Cappelen Akademisk forlag 2006.
- **Dysthe O and Samara A.** Forskningsveiledning på master- og doktorgradsnivå. Abstrakt forlag 2006.

”**Downhill tracks**” for PhD students and for supervisors, see Appendix: based on slalom ski-tracks; includes tips for all stages of a PhD research project.





## **Chapter 11**

### **Financial support and resources**

A number of institutions, grants and endowments can wholly or partly finance research projects. There are four levels in Norway for these sources of funding: an international (e.g. EU), a national, a regional (health regions, universities) and a local level (hospitals, institutions, departments). International, national and regional sources of funding have in general greater financial resources than local funding sources. However, local sources of funding for research projects should also be investigated.

Tips on how to write grant applications:

**Chasan-Taber L.** Writing dissertation and grant proposals. CRC Press, Taylor and Francis 2014.

**Regional Research Support (OUS):** tips for writing applications (English text):  
[www.ous-research.no/faq](http://www.ous-research.no/faq)

In 2019, the numbers of grants for research funding are declining, as several funding sources increase the grant money per project. The regional health trusts and the Dam Foundation (previously named Extrastiftelsen) still provide individual grant opportunities. In general, there are several types of calls, and the availability of these grants vary between institutions and regions:

- Personal grants (for example PhD grants or recruitment grants)
- Grants to a research group (may also be PhD grants - the research supervisor or the research group is awarded a grant before a PhD candidate is identified)
- Short-term special grants (e.g. to buy time off from clinical work to enable completion of a project)
- Postdoctoral grants (grants awarded after a PhD has been completed)
- Career grants (grants for research above the level of postdoctoral work to support talented researchers; top-level research)

- International mobility grants (grants to promote international collaboration through training and methodological development)
- Grants specifically for expenditures (often called operations costs and equipment costs) and/or to cover technical/nursing staff (often a supplementary or secondary section in most applications, but may also be the main section of applications for endowments and funds)
- Grants for attending conferences: often towards travel expenses, living costs and conference registration fees; may be a supplementary or secondary section in many types of grant applications, but may be the main section of applications for small endowments and funds. A researcher's own institution/department/hospital may often finance this.

### **International sources of funding**

The EU has grants available for international (European) collaborative research projects and for research leadership (ERC: European Research Council <http://erc.europa.eu/>). The EU also has grants for mobility and career development (Marie Skłodowska Curie Actions), as well as for individual and collaborative research projects (European Research Council, ERC, and Societal Challenges: <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen>).

Horizon 2020 <http://ec.europa.eu/programmes/horizon2020/>, EU's framework program for research and innovation, is aimed at ensuring that European research, technological advances, and innovation lead to good solutions to shared challenges in the future. Demographics, health, climate- and environmental issues, transportation, and safety are social challenges that are emphasized. Horizon 2020 is the world's largest research program, with a budget of almost 80 billion euro for the 2014-2020 period. Norwegian researchers can apply for these grants on equal footing as researchers elsewhere

in Europe. The Norwegian authorities and the Research Council of Norway strongly encourage Norwegian researchers to apply for such funding. It is possible to apply for both individual project grants/stipends as well as for grants for collaborative projects between various research groups in various countries. Large research institutions receive help with the application process. At OUS, the department of research administration and biobank has established its own regional support system for EU-funding applications. On their website you will find additional information on what the department can assist with in conjunction with EU-applications ([EU - Internasjonalt](#)).

The universities also provide support systems for EU-related applications. In Oslo, there the University and OUS-EU research application services provide joint support on research grant application preparations.

Another available option is to apply for grants through the NIH (National Institute of Health) in the United States ([www.forskningsradet.no](http://www.forskningsradet.no) and <https://www.nih.gov/grants-funding>). These applications also require great investment and effort on the applicant's part.

### **Some international grant web sites**

- EU:  
<http://ec.europa.eu/programmes/horizon2020/>  
<http://cordis.europa.eu/>
- NIH:  
<https://www.nih.gov/grants-funding>).
- <https://www.nordforsk.org/no>
- <http://www.novonordisk.com/>
- <https://era.gv.at/directory/143>
- <https://ec.europa.eu/research/bioeconomy/index.cfm?pg=policy&lib=jpi>
- <http://eeagrants.org/>

- <http://www.cost.eu/>
- <http://www.gatesfoundation.org/>

## **National sources of funding**

1. **The Research Council of Norway ("Norges forskningsråd", NFR,** <http://www.forskningsradet.no/>) finances research at all levels. The primary emphasis is on large-scale, self-initiated projects (with total budgets of approx. NOK 10-12 million) including top-level research programs and postdoctoral grants ([http://forskningsradet.no/no/Sok\\_om\\_midler/](http://forskningsradet.no/no/Sok_om_midler/)). Larger projects may include PhD grants, although these are now mainly channeled through universities and regional health authorities. See the NFR website for further details.

2. **National Program for Clinical Treatment Research in the Specialist Health Service (KLINBEFORSK)**

The program is a national initiative for clinical multicenter studies in the Health Trusts. The main objectives are to offer more Norwegian patients participation in treatment testing research project, to contribute to increased coordination of competence, resources and infrastructure and to strengthen the basis for providing effective, safe and good quality health services. The program announces funding annually for multi-center studies where all health regions are represented, and with a budgetary framework of approx. 5 - 20 million NOK.

3. **The Dam Foundation (former Extrastiftelsen)** consists of 38 health and rehabilitation organizations. Some of the profits from Norsk Tipping goes to voluntary organizations' projects in prevention, rehabilitation and research. It is not necessary to be a member of the foundation in order to apply for funding, but the applications must be submitted through one of the approved applicant organizations. More information about application types and

requirements can be found on the website (<https://www.dam.no/>). The Dam Foundation requires that the applicant organization cover any "overhead" of its own funds.

4. Although many of the **voluntary charitable organizations** participate in the The Dam Foundation, most of them also have their own grants and call deadlines. Applications may be made for both small and large research grant amounts. Contact the charitable organizations directly; updated links to patient foundations may be found on:  
<http://www.felleskatalogen.no/medisin/pasientorganisasjoner/alle>.

## 5. International grants

There are multiple grants administered by the universities and the Research Council of Norway (RCN, "Forskningsrådet") with the purpose of stimulating collaboration and exchange of ideas and research competencies with researchers in other countries. Often, applications for foreign grants and for postdoctoral grants will support each other, increasing the odds of acceptance ([www.forskningsradet.no](http://www.forskningsradet.no)).

Various academic organizations (internationally), have their own grants for shorter or longer research stays abroad. Search for these within the individual "societies."

6. **Center grants.** In addition to the international grants mentioned above, various national and international prizes/grants are awarded for excellence in research at an internationally recognized high academic level. At regular intervals, grants are awarded to "sentre for fremragende forskning" (SFF), and Centers for Research-Driven Innovation (SFI), and those who achieve such support are allocated multi-year financial resources, and are offered significant assistance

for application writing, project descriptions and budgeting. More information on <http://www.forskningsradet.no> Other research center grants include KGB Jebsen (<http://www.stiftkgj.no/k-g-jebsen-sentre-for-medisinsk-forskning/>).

7. **Other stipends.** There are various endowments and stipends that support research endeavors. Stipends are often limited in terms of extent and specify certain requirements for the application. See “legathåndboken”, <https://www.legathandboken.no/>.

#### 8. **Regional research grants.**

The Norwegian Health Authorities have varying practices for how they advertise available grants. Most Regional Health Authorities advertise both earmarked national research grants, as well as specific regional financing, on a yearly basis. More information for OUS is found at: <https://www.helse-sorost.no/helsefaglig/forskning>. The Health Authorities have in the last years contributed major financial support towards research at a regional level and collaborate with the universities through cooperative bodies in each region (“Det regionale samarbeidsorganet”). In addition, other regional funding sources exist, such as RBUP (“regionsentrene for barn og unges psykiske helse,” i.e. the regional centers for child and adolescent mental health” <http://rbup.no/>).

9. **The Universities** support research in many ways, including through funding of PhD and postdoctorate positions. The universities also give out several grants.

#### **Research grant application support**

All large research institutions in Norway provide local assistance in external fund applications. At OUS and UiO, the external funding teams at OUS ([grants@ous-hf.no](mailto:grants@ous-hf.no)) and UiO-MED ([med-funding@medisin.uio.no](mailto:med-funding@medisin.uio.no))

assist researchers with identifying relevant calls, improving the presentation of grant application, obtaining support letters, and guidance through the OUS and UiO-MED institutional rules for submitting applications.

#### **Useful links to UiO and OUS websites for grant announcements:**

- <http://www.tiki-toki.com/timeline/entry/736150/External-grant-deadlines/>
- <http://www.med.uio.no/english/research/news-and-events/funding/>
- <http://ous-research.no/calls/>

#### **Stepwise guidance for grant application from UiO and OUS:**

- <https://www.uio.no/english/for-employees/support/research/research-project/>
- Information in Norwegian at:  
<https://www.uio.no/for-ansatte/arbeidsstotte/fa/forskningsprosjekt/>

#### **Local financial support in own research institution**

Local regulations for anchoring of applications for research funding vary between research institutions. It is therefore recommended that all applicants contact local research support and financial manager for clarification, including assistance with budget proposals that take into account any rental of equipment, consumables, and salary levels (the latter including social costs and potential overhead costs). Different sources of research grants also have different rules regarding the inclusion of overhead costs, sometimes these must be guaranteed by own institution in the application.





## **Chapter 12**

### **Organization of research**

Research is one of the four main responsibilities of health trusts in Norway, cf. the Act on Specialist Health Services ("Lov om spesialisthelsetjenesten", <https://www.lovdata.no/spesialisthelseloven>). Research activities should therefore be apparent in the business plans, budgets, and activity reports of health trusts and regional health authorities, as well as individual hospitals. The Ministry of Health and Care Services in Norway ("Helse- og omsorgsdepartementet") provides research funding for health trusts and university hospitals amounting to several hundred million kroner per annum. These funds are administered by the regional health authorities and cooperative bodies ("Det regionale samarbeidsorganet") in each region. Since 2003, the size of the results-based portion of the funding granted to each health region (currently 70% of total funding), has been based on "publication points" awarded for the number of completed PhD theses and publications in scientific journals. Starting in 2011, a new, shared national database on academic publishing has been established (CRISTin with Norwegian Science Index (NVI), see Chapter 9 for details of this research meriting system).

Parliamentary Bill No. 30 (2008-2009) "Klima for forskning"

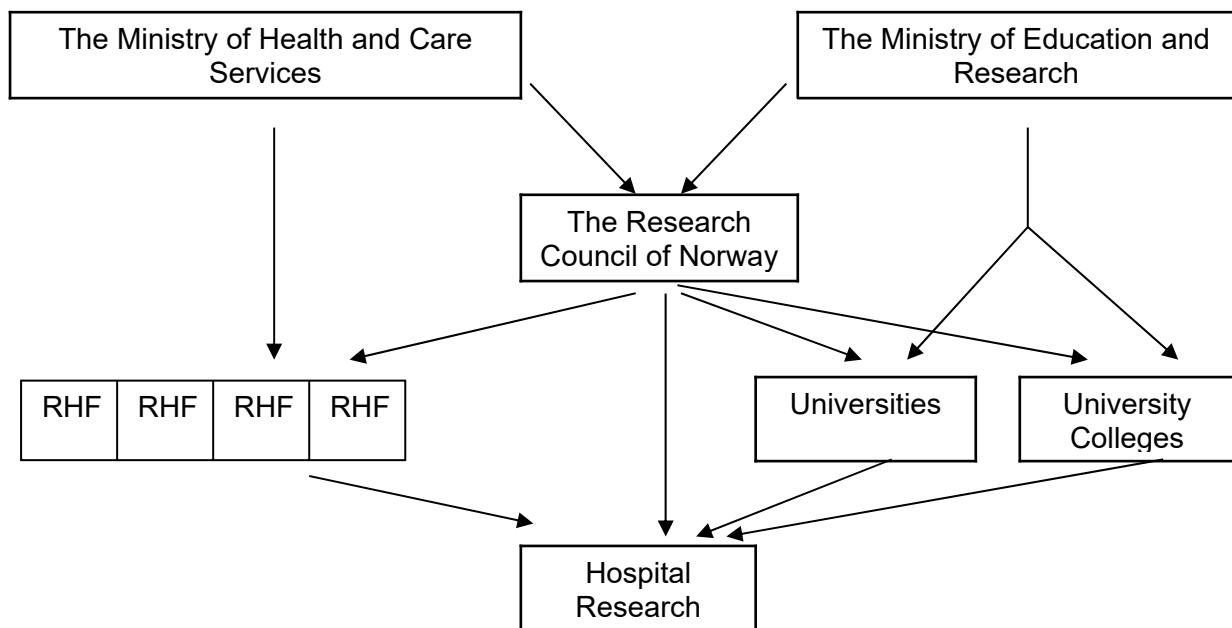
(<http://regjeringen.no/St.meld.nr.30>) and NOU 2011: 6

"Et åpnere forskningssystem" (<http://regjeringen.no/NOU 2011:6>) direct the major strategies for research to be used in Norway over the next several years.

Strategies for research linked to health trusts and universities are developed both at a local and a regional level. The regional research strategies can be found on the websites of the regional health authorities. Additional national research strategies may also affect the field of medical research.

## Nationally

In line with the Norwegian legislation on health trusts (“Lov om helseforetak”) the health trusts in Norway are obliged to ensure management of patients, research, and education (<http://odin.dep.no/hod/Ot.prp.nr.66>). The Ministry of Health and Care Services (“Helse- og omsorgsdepartementet”) is responsible for research at the health trusts, whereas the Ministry of Education and Research (“Kunnskapsdepartementet”) is responsible for research at the universities. This division of responsibility for medical research in Norway has led to considerable challenges at all levels.



At the organizational level below The Ministry of Health and Care Services, are the four regional health authorities in Norway (RHF, "regionale helseforetak"), which have the overall responsibility for individual health trusts ("helseforetak"-HF). The Ministry of Education and Research has overall responsibility for university schools/ faculties (e.g. “medisinske fakultet”) and university colleges (“høyskoler”). Reporting procedures for the utilization of research funds allocated to the regional health authorities have been established. The Ministry

of Education and Research is responsible for the funding allocated to universities and university colleges (“høyskoler”). The Research Council of Norway (RCN, ”Forskningsrådet”) is in an intermediate position: RCN receives funding from several ministries, as well as from other sources and makes research contributions through various framework- and strategic programs. Funding is directed at individual researchers, research groups or universities.

Research at health trusts is by nature often based within research groups at university hospitals where expertise and equipment required for translational and basic science research is available. However, small hospital trusts are also required to conduct research. In addition, national or regional research competency centers are located at the university hospitals.

### **Regionally**

The regional health authorities receive instructions from the Ministry of Health and Care Services that outline the framework and principles for research activities and regulate collaboration between regional health authorities and universities in key areas. In 2002, after the healthcare reform on ownership, collaborative bodies ("Samarbeidsorganer") between the regional health authorities and the universities/university colleges have been established in each region.



## **Chapter 13**

### **PhD studies and research options for hospital employees with a PhD**

#### **13.1 PhD studies**

##### **Why "do" a PhD**

Over the last 10-15 years in Norway, there have been few career inducements for physicians to pursue a PhD in medicine. Within most specialties, senior hospital positions have been relatively easy to obtain without a PhD, even at university hospitals. Furthermore, it has been more financially rewarding to be a clinician rather than a researcher. Three years as a PhD student can result in an income drop of 1 million NOK as compared to the salary of an attending physician/consultant with on call duties. In prior years, a PhD was often a prerequisite for permanent senior employment at a university hospital.

As a result of the projected increase in newly qualified doctors over the next few years, the competition for physician positions at Norwegian hospitals is likely to increase significantly. This is likely to increase interest in research as a means by which doctors may qualify for hospital positions. In addition, a number of measures have been taken to increase interest in medical research. Since 2003 many hospitals have introduced an annual salary bonus for completion of a PhD, provided continued active research. Also, combined clinical/research posts at university hospitals allow physicians to spend a minimum of 50% of paid working hours on research (previously known as "D-stillinger", "fordypningsstillinger"). This type of position secures clinical salary levels, while allowing the individual designated time for research.

The most substantial reason for embarking on a PhD program however, should be the personal motivation and the wish to enjoy the challenges involved. A PhD provides candidates the opportunity for in depth study of an exciting subject of their choice. Such study gives rise to a deeper understanding of a field and

enables a person to more effectively take in, comprehend and disseminate novel scientific ideas and knowledge in general. In addition to yielding many pleasures, research is a source of numerous challenges, not only scientific, but also personal, that one must be prepared to face. Although colleagues, supervisors and family can be a great source of support during PhD studies, a strong inner drive is essential to tackling the challenges that are likely to arise.

### **How to "do a PhD"**

Common practice is to find a PhD supervisor, and then to apply for a PhD program at the university where he or she is employed. In Norway, physicians receive the degree "cand. med." upon completion of undergraduate medical education, and were previously awarded the title "dr. med." upon completion of a postgraduate doctoral degree at a Norwegian school of medicine ("medisinsk fakultet"). Individuals with a different degree background used to be awarded a "dr. philos.", "dr. polit." or "dr. scient." degree upon successful completion of a doctoral dissertation and defense at Norwegian medical schools. Since the fall of 2003, the term PhD (philosophiae doctor) has been used for all doctoral degrees completed at a Norwegian university, irrespective of the candidate's academic background. In order to be admitted to a PhD program, an applicant is required to hold a relevant Master's Degree or the equivalent (5 years). For admission to a PhD program at a medical school, the applicant must have either a "cand. med.", "cand. san.", "cand. scient.", or relevant master's degree. Applicants that possess equivalent qualifications may also be accepted; this is evaluated on an individual basis. Approved completion of a PhD program, which includes the trial lecture and thesis defense, gives the individual the right to use the title PhD.

For admission to a PhD program, universities often require documentation of research financing for at least 50% of ordinary work-hours.

## **PhD and supervisor roles**

A "PhD track" for PhD students at the Faculty of Medicine (i.e. the medical school) at the University of Oslo is presented in the Appendix. The track outlines the major steps on the road to the PhD disputation and can easily be adapted to other Norwegian universities as well as to other schools within the various universities. In addition, the Appendix presents a "Supervisor track" in the Appendix, with tips for supervision and distribution of tasks between the supervisor and the PhD student.

The requirements for a doctoral degree have changed in recent years. Completion of research-related courses within the PhD program (equivalent to 30 credits) is mandatory. The number of publications required is reduced compared with previous years (usually 3-4 articles, see information from the relevant university for details). The standard timeline of Norwegian PhD programs encompasses three years of full-time research training. The timeline may be extended to allow for prescribed training, including teaching medical students. Funding institutions usually provide funds for three years only. This is a limited period of time to complete a PhD, particularly for patient-based studies. Formally, supervisors are appointed by the medical school on the basis of suggestions made by the candidate and research groups at the institution (or the supervisor herself/himself).

The most tangible result from completion of a PhD is the papers published in international, peer-reviewed journals. These are then collated with an overall introduction and summary of findings in the final thesis ("synopsis", "avhandling").

More information on research training programs at medical schools in Norway (including requirements for PhD degrees and applications for admission) are found on the following university websites:

**University of Oslo (UiO):**

- <http://www.uio.no/english/research/doctoral-degree-and-career/>
- PhD education at UiO, The Faculty of Medicine (i.e. the medical school):  
<http://www.uio.no/english/research/phd/>
- Handbook for PhD students in Oslo, in English:  
<http://www.med.uio.no/english/research/doctoraldegree/phd/forms/candidate/handbook.pdf>
- UiODoc: Interest group for PhD students at UiO:  
<http://www.facebook.com/uiodoc>
- MedDoc: Forum for PhD candidates at the medical school:  
<http://www.med.uio.no/english/research/phd/phd-forum/meddocs/>
- MD/PhD track at the medical school:  
<http://www.med.uio.no/english/research/phd/>

**University of Bergen (UiB):**

- <http://uib.no/fof/24847/forskerutdanning>
- Information for PhD students: Handbook for doctoral education (PhD)
- University of Bergen: [PhD-Handbook](#)

**Norwegian University of Science and Technology (NTNU):**

- <https://www.ntnu.edu/studies/phmed>
- PhD education: <https://www.ntnu.no/mh/phd>
- MD/PhD program: <https://innsida.ntnu.no/wiki/-/wiki/Norsk/Forskerlinjen>
- Information for PhD students: PhD handbook, Norwegian edition ([Phd-haandbok-norsk](#))



## University of Tromsø (UiT):

- <https://en.uit.no/forskning>
- MD/PhD Program:  
([https://en.uit.no/forskning/art?p\\_document\\_id=490406](https://en.uit.no/forskning/art?p_document_id=490406))
- PhD studies: <https://TODOS-PhD-Candidate-Guide.pdf>)
- TODOS (Tromsø Doctoral Students): Interest group for PhD students at UiT: <http://todos.uit.no/>

## Additional information on PhD studies

**PhD on track:** a resource for new PhD students. This website is a collaboration between several contributors, including the University Library of Oslo, The National Library ("Nasjonalbiblioteket"), the University of Bergen, Bergen University College ("Høgskolen i Bergen") and the Norwegian School of Economics ("Norges Handelshøyskole"): <http://www.phdontrack.net/>

## PhD degrees and supervisor contracts

NIFU Step awards PhD points to an institution or health trust based on the following criteria: "The criterion for reporting a PhD degree, is that 50 percent or more of the PhD work is performed at or financed by the institution. This criterion implies that one and the same PhD cannot be reported by two or more institutions partaking in the pole. Normally, employment and funding is stated in the supervision contract. It is the candidate's, not the supervisor's, work and effort that must meet the PhD criterion for affiliation to the institution. The PhD work may be both internally and externally financed. The criterion means that one PhD thesis normally only can be credited to one institution. The exception is when the PhD studies have involved equal cooperation between two institutions, in which case, the PhD degree points may be shared. "

Awareness of the rules for awarding credit for a PhD is important when starting a collaborative PhD project. The intent of two collaborating institutions to share the credit for a PhD thesis should be included in the contract between the institutions.

### **13.2 Research possibilities after completing a PhD**

There are several alternatives for healthcare professionals seeking positions in which they can perform research:

- A full clinical position with research "on the side": Is attempted by many, but is difficult and often results in spare time being "eaten up" by research.
- Funded time off from clinical work: specific local options, combined clinical/research positions, grants that may be either locally awarded (by the health trust the clinician is employed at) or by the regional health authorities.
- Full research grants (see Chapter 11): For physicians this often involves reduced income when compared to fulltime clinical work. To compensate, some doctors work extra shifts.

#### **Possible research positions after a PhD:**

- *Postdoctoral grants* (from 1-3 years) from the universities, the Research Council of Norway (see Chapter 11), from the regional health authorities or possibly from individual health trusts/hospitals.
- *Associate Professorships* ("Amanuensis-stillinger"): involves a great deal of teaching.
- *Qualifying Grants* ("Kvalifiseringsstipendier")/Career Grants ("karrierestipendier") at the universities: (usually 3 years): for work used to qualify for professorship.

- **Professor II:** Usually a 20-50% position divided between research and teaching. The balance between clinical work and the professorship may be tailored.
- **Professor I:** Full-time professorship, where the main emphasis is on research and facilitating research. A 10-30% part-time clinical post at a health trust is not unusual, but this varies.

Few positions are available at universities and university hospitals for researchers at the level between a postdoctoral level (fixed term of years) and a professor. Very few Professor I and limited numbers of Professor II positions exist. One may possess the experience and skills required to be an excellent professor, but face the situation where there are no professorships to apply for. There are certainly challenges ahead for hospitals and universities in terms of securing a sufficient number of postdoctoral research positions for skilled researchers, not to mention the challenge of ensuring productive research amongst those currently employed as professors.



## Chapter 14

### What problems may arise during the research process?

Hopefully researchers at hospitals and biomedical- or healthcare research institutions in Norway experience research as a source of intellectual and personal fulfillment. Although this chapter focuses on some of the problems that can and do arise, the pursuit of ideas is undoubtedly exciting, challenging and rewarding. In short - research is fun. The research process often entails emotional ups and downs. At times research will be challenging, fun and sometimes even euphoric, whilst at other times it can be tiring, frustrating and difficult. Attitude plays a significant role in determining «quality of life” as a researcher.

Pessimists will maintain that there are endless possibilities for things to go wrong in any research project. In addition to all problems one can foresee, things go wrong even after safeguarding. For example, the freezer (containing irreplaceable patient biological samples) and two separate alarms malfunction simultaneously, resulting in destroyed samples and three years of research wasted (A piece of advice: put the samples in two separate freezers. That way only half the batch will be lost next time).

Optimists, on the other hand, will say that one can learn from one's mistakes and that skills improve with every project (not to mention with respect to backing up data compilations electronically; not doing so has led to many research crises). Personal drive and enthusiasm, background knowledge and a willingness to implement new information and skills are important factors in promoting research. Usually more than one person is required to carry out a research project (resources, supervisors, other research collaborators etc.). The data collection stage in a collaborative project is often (relatively) unproblematic, provided that everyone involved displays basic politeness and has reasonable

social IQ. Then the time comes for analysis and publication. Experience dictates that this is the time when conflict between collaborators tends to arise.

### **14.1 Possible conflicts regarding authorship**

Disagreement about authorship rights and the order of authorship for scientific publications is probably the most common cause of interpersonal conflict in research. The reasons for, and consequences of this, may vary. The authors of this Handbook refer to the definition and guidelines for authorship provided in the Vancouver Conventions (“rules”) and our own interpretation of these guidelines (see Chapter 7). The Norwegian Health Research Act (<https://lovdata.no/helseforskningsloven>) does not regulate the question of scientific authorship. The Act’s definition of rights and duties of the ”Project Manager” (“prosjektleder”) has no implications regarding options for and rights to co-authorship (see Chapter 7).

**The Vancouver Convention** (Vancouver “rules”, see Chapter 9) states that no one is to be listed as a co-author without having made a *significant contribution* to the research. Although the Vancouver “rules” specify *who* satisfies authorship requirements for a scientific paper, they do not say anything about the *order of authors*. Usually the order reflects the contributions made by each individual to the research and the publication. However, different traditions and unwritten rules apply in different countries and research settings.

*The first author* is usually the person who formulated the hypotheses, performed/was responsible for the analysis/ data processing and who has contributed most to writing the manuscript.

*The second author* is usually the person who made the second largest contribution, and any remaining authors are listed after this. Note that some research groups write authors subsequent to the first author in alphabetic order.

*The last author* is usually the person who carried the overall scientific responsibility for the project. In some research institutions, leaders of research groups or heads of institutes are listed as last authors of publications, regardless of the nature of their contribution to the project. There is no support for this practice under the Vancouver Convention, unless there has been real scientific contribution to the project concerned. A statement regarding the contribution of each author to the paper will hopefully reduce any conflict surrounding authorship. Previously, only a few journals demanded that each author's contribution should be described at time of submission of an article, and some journals also published this information with the manuscript. The latest revision of the Vancouver Convention from 2013 includes new authorship requirements, including documentation of who is responsible for the total work (see Chapter 9). This will likely contribute to more appropriate authorship declarations.

The pursuit of research engenders few financial benefits in Norway and *academic recognition* and publication of results are therefore of great significance. This partially explains why conflicts that are damaging to both the research projects and the research community, may occur. Many researchers are concerned about their potential to obtain research grants in the future, and the chances of doing so are reduced if their names do not appear in a key position in the order of authors on the journal publication (either number one, two or last).

### **How to reduce the potential for conflict regarding authorship**

- Come to an agreement about the order of authors before the study commences or as soon as the aim for a study has been formulated (contingent on their contributions actually qualifying for authorship). It may seem awkward to raise the matter at such an early stage, but experience has shown it to be even more awkward later. Doing so will also clarify each study

participant's role in the project so that all parties have realistic expectations with respect to their own contribution and their "rewards" as an author.

- Be generous in offering co-authorship and equally generous in refusing any co-authorship offered. Remember that, as co-author, one must be able to justify the content of the article and also declare responsibility for specific parts of the paper.
- If the premise for the research or the research activities themselves is altered in the course of the project, the question of authorship should be discussed again. It is quite common for new methods and aims to be introduced and it is thus quite reasonable to review authorship.
- Authorship is an area in which etiquette plays an important role and much is to be gained from playing with an open hand. The question of the order of authorship is, in essence, about "giving credit where credit is due". As long as collaborators are in agreement about each individual researcher's contribution to a project, they should be able to reach agreement about the order of authors in any publication.

## **14.2 Potential conflicts with a supervisor**

See Chapter 10 on supervision (including contracts, university involvement in supervising conflict resolution, and supervisor courses). No foolproof recipe exists for how to avoid conflicts between supervisor and candidates, nor for what type of relationship is the most productive, promotes the most independence, or is the "best". Personal characteristics clearly affect any collaboration. Candidate and supervisor do not necessarily need to possess identical personal characteristics; in fact it may be more fruitful for them if they have complementary strengths. The potential for conflict can be reduced by making clear agreements and giving reciprocal feedback. An agreed level of ambition is also important; what is the time frame of the project and do both the candidate and supervisor(s) agree on plans for project progress? Clarify in



advance how much time the supervisor has available for the candidate and whether the candidate is to have free access or access at fixed times. Schedule a set time for feedback on drafts of papers; stick to appointments to avoid wasting time and causing unnecessary irritation.

### **14.3 Access to research data and research biobanks after the PhD period**

A number of factors determine continued access to research data and biological material in a research biobank after the PhD period is over:

- The nature of the employment contract and whether the employer remains the same during and after the PhD period
- The nature of the information to and consent given by respondents who have provided data and/or biological samples for the project
- Conditions for obtaining information from existing databases (such as a medical charts and external registries), as well as conditions for use and collection of sample from existing biobanks
- Conditions determined by public authorities such as the Data Inspectorate, the Regional Committee for Medical and Health Research Ethics (REK) and the Directorate for Health Affairs.

It is difficult to provide a general answer to whether research data and biological samples will be accessible for candidates after completion of a PhD unless this has been agreed upon in advance with both the employer and respondents. Many research institutions have their own guidelines on access to data in health registries and biological samples. In principle, the ideal condition is that research data and biological samples should be accessible for future research by other parties. However, "protection from competitors" must also be considered. In practice the "Data Processing Director" ("databehandlingsansvarlig") and the person in charge of the research biobanks (in the case of large research institutions this responsibility often lies at an administrative level above that of

the project manager) will determine whether continued access will be granted. Proposals for new use of existing research data and/or material from research biobanks must always be submitted to REK etc., as specified by the laws and regulations described in greater detail in Chapter 6. The Vancouver Convention also places restrictions on publications based on existing biobank material. Collection of biological samples alone is not considered to be a "substantial contribution", and is therefore not sufficient to satisfy criteria for authorship under these regulations.

#### **14.4 What if one's papers are rejected for publication?**

Why are the articles being rejected? Identify the key problem. Peer reviewers usually provide useful comments on why they have criticized a paper and sometimes the editor will add her/his own comments. Go through the stages outlined in Chapter 3 to identify where the research project went wrong. If the study has not been sufficiently well designed there is little chance of having papers published after the study is completed. If it is only a matter of additional analysis being required, it is common to follow the advice of the reviewers or alternatively attempt submitting the article to another journal. Whatever journal is chosen, including those with the highest impact factor (The Lancet, Cell, Nature etc.), the authors should always check the profile of the journal before submitting a manuscript, in order to avoid wasting time on submitting a paper to a journal with a different scope than that of the paper.

#### **14.5 Insurance and research projects**

In biomedical and healthcare research projects that involve human participants, insurance may be required.

## **The Norwegian System of Compensation to Patients (Norsk Pasientskadeerstatning, NPE)**

The Norwegian System of Compensation to Patients (<http://www.npe.no/>) is an independent government agency under the Ministry of Health and Care Services. NPE processes compensation claims made by patients /research project participants who believe they have suffered an injury resulting from treatment within the private and public healthcare system. The NPE system also covers research projects in these settings. NPE now covers both private and public health services provided by authorized healthcare personnel (and by those acting on their behalf).

## **Product Liability Act ("Lov om produktansvar") and clinical trials**

The Product Liability Act (<https://lovdata.no/dokument/produktansvarsloven>) safeguards the interests of patients/research subjects participating in pharmaceutical trials. *The Project Manager ("prosjektleder") of a clinical drug trial is legally obliged to purchase insurance through membership in the Drug Liability Association ("Legemiddelansvarsforeningen")*, unless the project is not covered by the insurance policies of a potentially involved pharmaceutical company. Insurance is obtained by contacting [unedv@bahr.no](mailto:unedv@bahr.no) (more information on: <http://www.laf.no/>). The fee is calculated based on the number of patients included per year and may add up to a substantial amount. Confirmation of existing insurance must be sent to The Norwegian Medicines Agency, ("Statens legemiddelverk") when applying for a clinical (drug) trial.

## **Separate insurance**

It the research project is not covered by the Product Liability Act or the Norwegian System of Compensation to Patients (NPE), alternative insurance

must be purchased. The relevant insurance policy should cover liability and damages regardless of culpability.

#### **14.6 Duty to report to “Statens helsetilsyn” (Norwegian Board of Health Supervision) in cases of serious, undesirable and unexpected events in research projects**

The Norwegian Health Research Act has a provision for mandatory reporting to “Statens helsetilsyn” in cases of accidents in clinical research. The act (see Chapter 5) declares that *"The project manager shall promptly give written notice to the Supervisory authorities in cases of severe and unwanted or unexpected medical events that are believed to be related to the research. The project manager, other researchers, and other personnel should on their own initiative provide the Supervisory authorities information about conditions that may endanger the safety of the research participants. In cases of unnatural deaths the Police is to be notified immediately."* The obligation to notify the Norwegian Board of Health Supervision ([www.helsetilsynet.no/](http://www.helsetilsynet.no/)) is mandated in addition to the regular compulsory reporting of adverse medical events internally and externally. The Norwegian Board of Health Supervision may, following inspection, give orders for the suspension of or change to the terms of a research project and research biobanks, provided they are thought to have harmful consequences for the research participants or others, or are otherwise unsuitable or unsatisfactory.

## **Chapter 15**

### **Commercialization and obtaining patents**

At research institutions such as health institutions, universities and university colleges (“høyskoler”), ideas are constantly being developed, which in addition to being of great scientific interest also have commercial potential. Society has a need for research results and projects that benefit society as a whole, and in recent years assessment of potential for innovation has become a higher priority. As a result, universities and university colleges (“høyskoler”) have in recent years been working more actively to develop organizations, systems and routines that enable research results to be commercialized. There are now a number of “Technology Transfer Offices” (TTO) and research parks in Norway whose mission is to package and promote research ideas to the business sector in order to realize their market potential.

#### **Commercialization regulations**

As of January 2003, the Act on Universities and University Colleges (“Universitets- og høyskoleloven”) and the Act on Employee Inventions (“Loven om arbeidstakeroppfinnelser”) were altered to reflect a greater emphasis on commercialization of university research. Institutions may now claim ownership-rights to research results that are patentable.

The authors of this Research Handbook believe there is a need to raise awareness and increase training of researchers if the aim of research institutions to commercialize and patent results is to be realized in practice. If an idea results in commercialization, it can provide money for further research funding. In this way, innovation and commercialization may in fact increase research funding, in addition to other positive effects of innovation.

## **15.1 National programs that support commercialization of research**

### **The Research Council of Norway's program FORNY2020**

FORNY2020 is a program developed by The Research Council of Norway's program in order to bring the results from projects conducted at publicly funded research institutions to the market. The program supports new companies and commercializing actors (TTO). Researchers must apply through a TTO. The main aim of the program is to release the potential value in the results obtained by publicly financed research institutions. FORNY2020 seeks to:

- Generate growth in new and existing companies by directly funding projects
- Enhance professionalism, efficacy, and specialization of the TTOs affiliated with universities, university colleges ("høyskoler"), hospitals and independent research institutes in their respective fields.

The FORNY2020 program does not provide research funding, but instead supports activities that lead to the utilization of research results. Activities eligible for funding include:

- Verification and documentation of research results that can be used in practice.
- Preparation of research results from publicly funded institutions for commercialization.
- Development of research results with commercial potential into attractive investment objects.

The FORNY2020 program partially funds and interacts closely with eight commercialization actors, often called TTOs (Technology Transfer Offices). The TTOs are affiliated with research institutions and cooperate closely with trade and industry.

Alterations since 2012: FORNY2020 continues the work of the previous FORNY program, dedicated to creating commercialization agents. The new program focuses on highlighting the best commercialization projects.

From 2012, the target group that can apply for funding is expanded to include:

- New small companies that are based on results and ideas from publicly funded research institutions
- Other organizations that facilitate commercialization of publicly funded research results.

Alterations since 2013: Together with Connect Norway, mentors are now offered to companies established under FORNY2020.

Alterations since 2014: Local project funding is offered to commercialization actors established and owned by Norwegian universities, university colleges (“høyskoler”), institutes and health trusts.

See FORNY2020’s Program Plan for more information about the program and commercialization agents: [FORNY2020](#).

### **InnoMed - Innovation and business development in the health sector**

“InnoMed, The National Network for need based Innovation in Healthcare (“Nasjonalt nettverk for behovsdrevet innovasjon i helsesektoren”, <http://innomed.no/> was established by The Ministry of Health and Care Services (“Helse- og omsorgsdepartementet”) and the Ministry of Trade and Industry (“Nærings- og handelsdepartementet”). InnoMed is run as a Norwegian national collaborative network between the regional health authorities, Innovation Norway, The Research Council of Norway, HINAS (“Helseforetakenes innkjøpsservice”), KS (“Kommunesektorens interesse- og

arbeidsgiverorganisasjon”) and Nav (“Arbeids- og velferdsetaten”). The group is lead by The Norwegian Directorate of Health (“Helsedirektoratet”).

InnoMed’s vision is health-based value creation that is to benefit patients and the whole of society. InnoMed’s aim is to increase efficacy and quality in the healthcare sector through the development of new solutions. These should be based on national needs and have international market opportunities. The solutions are developed in close collaboration between healthcare recipients, Norwegian companies, renowned professionals and funding agencies.

InnoMed’s activities are funded by The Directorate of Health (“Helsedirektoratet”) and Innovation Norway.

## **15.2 Patenting inventions**

A patent awards the owner exclusive rights to commercial exploitation of a patented invention for a period of 20 years. For pharmaceuticals, the patent period is 25 years due to the length of time involved in the process of approving pharmaceuticals. In order to be patented, inventions must be recent and differ significantly from previous inventions. The principle purpose of a patent is to ensure competitive advantage and thereby safeguard any future revenue for the owner. Inventors have the right to a reasonable share of the revenue generated by commercialization of a patent. A patent is thus a means of rewarding researchers for their efforts and encouraging new and current inventors. Patent law protects a patented product, method or an application, but does not regulate the use of inventions in research or development settings. Norwegian patents are not automatically valid abroad and vice versa.

For further information on applying for patents on research results, contact your local TTO (see Appendix for TTO addresses, page 175).



Inventions within all technical areas may be patented if the general patent requirements are fulfilled (being new, significantly different from previous inventions and having industrial applicability). However, patent law prohibits patenting of methods used in surgical treatment, therapy, or diagnostics carried out on humans or animals. Pharmaceutical products and methods of analysis may however, be patented.

The primary function of the Patent Board (“Patentstyret”), a government authority organized under the Ministry of Trade and Industry, is to process applications for patent protection. On their home page you will find a guide for beginners, information on patents, forms, and patenting laws (<http://www.patentstyret.no/>). The Patent Board offers introductory courses on patent protection at regular intervals.

***Additional Literature:***

Patent Law: Patentloven: (<https://lovdata.no/patentloven>)

Patent Directive (legal protection of biotechnological inventions), described in Prop.No. 86 to the Odelsting (Ot.prp. nr 86, 2002-2003):

<https://www.regjeringen.no/otprp-nr-86-2002-2003-/>

***Useful links relevant for UiO and OUS employees, including the role of Inven2 (TTO):***

<http://www.med.uio.no/english/about/innovation/>

[http://www.uio.no/english/for-](http://www.uio.no/english/for-employees/support/research/innovation/index.html)

[employees/support/research/innovation/index.html](http://www.uio.no/english/for-employees/support/research/innovation/index.html)



## **Chapter 16**

### **Research ethics, misconduct and fraud**

#### **16.1 Research ethics**

Research ethics is focused on raising awareness among researchers in particular, and society at large with respect to issues that arise in modern research. There are three important research ethics categories applicable to the field of medical and healthcare research:

- Ethical standards for good scientific practice (concerning the research process).
- Ethical norms for proper research (often called protection ethics).
- Ethical standards for publication of research results (publication ethics).

Sound research ethics will increase the population's confidence in research results, individual researchers, and the research community in general. The confidence that society has in researchers and their results is a prerequisite for research funding and, in addition, it is likely to affect the recruitment of new researchers. In other words, ethical reflection and sound research ethics are a prerequisite for allowing researchers opportunities to freely realize their aims. Breaches of sound ethical practice are likely to damage the status that research has been given, to decrease support for research in society, and to reduce potential participants' willingness to contribute to research projects.

The Norwegian Health Research Act shows how central research ethics is, as the law states that the purpose of the Act is to "promote" sound and ethical medical and healthcare research".

In May 2017, a new Research ethics act was passed in Norway ([Lov om organisering av forskningsetisk arbeid \(forskningsetikkloven\)](#)). The act implies

that the research institution is responsible for teaching employees and research candidates established research ethics and norms.

## **16.2 Requirements for responsible research (protection ethics)**

The main purpose of regulating research that involves human beings, human biological material and health information, is to protect the individual's basic rights (i.e. the rights of the research participants). It is worth noting that the laws and regulations that have been established in this research area are largely based on the ethical principles that the researchers themselves have been promoting in their respective fields (professional norms). The Helsinki Declaration, developed by the World Medical Association (first edition in 1964, most recently revised in 2013), is particularly important for the field of medical and healthcare research. Several international agreements that build on the principles embodied in the Declaration of Helsinki have later emerged. Central to this context are:

- The European Convention on Human Rights and Biomedicine ("Europarådets konvensjon om menneskerettigheter og biomedisin"); Additional Protocol on the Convention on Human Rights and Biomedicine (<http://conventions.coe.int/treaty/en/reports/html/195.htm>)
- European agreements and legislation (EUs legemiddeldirektiv/ EU Directive on Pharmaceuticals); GCP (Good Clinical Practice): <http://europolov.no/rettsakt/legemiddeldirektivet>).
- The Council for International Organizations of Medical Sciences (CIOMS, <http://www.cioms.ch/>).

The Health Research Act is based largely on the ethical principles that we are governed by under international agreements. Fundamental in this context are these principles:

- Research is to be based on respect for the participants' human rights and dignity.

- The participants' welfare and integrity should be placed before the interests of science and society.
- Medical and healthcare research shall respect ethical, medical, healthcare, scientific, and personal data issues.

Similarly, through international and national privacy laws, there have been established some basic principles for the use of personal health information. These principles are also relevant for research. Particularly important are the principles that:

- Utilization of personal health information in medical and healthcare research should have an explicitly stated purpose.
- Use of personal health information must be *relevant and necessary* to achieving the research objectives of the project.
- The degree of personal identification of the relevant health information shall not be greater than what is necessary to achieve the research objectives.
- Information shall not be kept longer than is necessary in order to complete the research project.

The Norwegian Health Research Act requires that medical and healthcare research is to be organized and practiced properly, thereby applying the central principles of protection ethics.

### **16.3 Risk-benefit assessment of research that can potentially cause harm**

In medical and healthcare research involving patients the legal requirement of “soundness” (“forsvarlighet”) is based on a thorough and balanced assessment of anticipated additional risk of harm to participants due to participation in the research project, percentage of injuries estimated to be potentially serious, in addition to information on the expected benefits to participation and the possible extent of such potential benefit. Potential for severe damage that may affect

even a minority of the participants must be given substantial weight and such risks must be communicated openly - both in the REK application and in the written information to potential study participants.

A sound research projects implies that no one should be asked to consent to participating in a project before a proportionality assessment has been carried out by the researchers (and REK) looking at the potential risks and benefits, including an evaluation of the balance between these factors. It is also an important step in the planning of a research project to identify possible measures to reduce any potential risks to the participants. Such measures could include establishing study monitoring, performing interim analysis, making a contingency plan and select criteria for when a research study should be stopped.

### **How to define risk?**

Risk in a project is defined as a product of probability and grade of severity. In this context it is important to remember that consequences are weighted more heavily than probabilities. This implies that the more severe the potential consequences, the more stringent the requirements for potential benefit must be. Severe harm that is foreseeable, even if it likely to affect only very few of the participants, is therefore given much weight in the evaluation of such projects. This assessment should be communicated clearly and evident in the REK application, in the research protocol, and in the information letter to potential research participants.

### **What is considered as acceptable risk in research?**

Research that does not imply any individual benefit, should not pose any more than a "minimal" risk to participants. Minimal risk is equivalent to what each of us encounter in everyday life. If the risks of participation in a

project are deemed to be greater than minimal risk, prospects for direct benefit to the participants should be present. If the risk is "considerably" greater than "minimal", the prospect that the research will have "potential benefit for future patients and society" does not constitute justification for carrying out the project.

### **Acceptable risk to whom?**

Even in projects with minimal or no risk to most participants, study participation may still have severe consequences for a few participants. It is therefore important to describe the project risks in a similar way as the likelihood of benefit in a project, both in the REK application and in the participant information. This information is important to ensure adequate (legal) informed consent from the participants.

### **Value of consent**

Participants in a research project shall receive relevant and truthful information about who will benefit from the project as well as the risks and burdens that participation entails. No one should be asked to consent to a project before a proportionality assessment has been performed and the balance between the risks and benefits has been deemed reasonable. A research participant consent does not however, protect participants against risk of damage. The assessment of a project's soundness will thus not be affected by whether it will be possible to get the participants' consent. An irresponsible research project is, in other words, not justifiable even if potential participants consent to participating. The Project Manager ("prosjektleder") and the Research Director ("forskningsansvarlig") are responsible for ensuring that research participants are only exposed to "justifiable" risks in line with potential REK approval.

## **16.4 Misconduct and fraud in biomedical and healthcare research**

In recent years several cases of fraud in biomedical research have been revealed.

The debate on co-authorship in scientific journals has thus become even more relevant, focusing on what qualifies a researcher for authorship and the responsibilities that co-authorship entails.

The Act on Research Ethics was ratified in 2006 (<https://lovdata.no/forskningsetikkloven>). The Act on Medical and Health Research was ratified in July 2009 (<https://lovdata.no/dokument/helseforskningsloven>). In May 2017, a new Research Ethics Act was formalized in Norway ([Lov om organisering av forskningsetisk arbeid; forskningsetikkloven](#)). The Act shall contribute to the research in public and private being conducted in accordance with recognized ethical norms, and it requires that every Research Institution has an Ethical Research Committee (“Redelighetsutvalg”).

Fraud in biomedical and healthcare research can have far-reaching consequences. In addition to affecting the reputation of medical research, cheating can lead to risk of great harm to patient groups exposed to new treatments implemented based on false information.

In practice, qualitatively poorly executed research and outright research fraud may be on the same sliding scale. This includes everything from unintentional mistakes and actions, such as incorrect observations, analytical errors, and missing credits, to plagiarism, false correction, or exclusion of "inappropriate" data, as well as fabrication of data. Some define the difference between fraud and error by stating that fraud entails a deliberate intention to cheat and deceive. In the Act on Research Ethics ("Lov om behandling av etikk og redelighet i forskningen"), academic fraud is defined as *"falsification, fabrication, plagiarism and other serious breaches of academic practice carried out with intent or with gross negligence in the planning, carrying out, or reporting of*



*research*". The authors of the Research Handbook are of the opinion that "gross negligence" ("grovt uaksomt") in this context includes breaches of standard internal or external scientific norms or regulations that researchers, by way of their skills and position, ought to be acquainted with and comply with.

It is impossible to determine the exact extent of fraud within biomedical and healthcare research. This is partly because the definition of fraud is somewhat unclear and partly because the legal definitions do not necessarily correspond exactly to research ethics definitions. By its very nature, research fraud is based on factors that are concealed and denied, as in other forms of fraud and breaches of trust. It is uncertain whether scientific fraud is more prevalent than before and whether variation exists between disciplines. There have been attempts to establish the extent of scientific fraud via questionnaires to researchers. Such questionnaires in Norway in the 1990s indicated that many researchers were aware of concrete cases of scientific fraud, but very few declared that they were involved in fraudulent research themselves.

### **Personal motives as the reason for misconduct and fraud**

There is an increasing pressure to publish ("publish or perish"), particularly within biomedical disciplines in which it is crucial for researchers to be the first to publish important findings. Publications have also become the basis of a merit system, both in terms of personal career and with respect to allocation of research grants. However, the pressure to publish cannot fully explain why a few researchers deliberately choose to commit fraud in research, for example fabricating research data. It is likely that personal characteristics of the individual researcher also play a role. For example some researchers exposed of committing fraud have been found to repeat their fraudulent behavior (in research). The desire for "honor and glory" may also represent a motivational factor that can lead to research fraud.

A recently published report on research ethics in Norway from 2018 (RINO: <https://www.uib.no/rino>) has mapped researchers' attitudes and, among other things, revealed poor formal education in research ethics and lack of knowledge about how to report nonconformities.

## **16.5 What can be done to prevent research fraud?**

### **Existing measures**

A number of quality assurance systems are already in place to minimize research errors and improve the quality of research within research institutions. In reality, the most important elements of the quality assurance system are the research groups and the researchers themselves. Systematic errors can be prevented through sound research design and random errors can be corrected for by statistical analyses. All research institutions are required to have internal control routines so that they can carry out their activities in a responsible manner (cf. Health Personnel Act, "Helsepersonelloven", § 16 and the Health Research Act, §6). In addition, a number of public agencies have auditing and supervisory functions with respect to research, see Chapter 6. Advance audits are the most comprehensive, e.g. REK and the Data Inspectorate (applications for licenses). Audits of ongoing research and of completed research projects are likely to be more fragmentary, both at the level of individual research institutions and at higher levels. Many research institutions also have their own bodies and routines for monitoring ethical and quality aspects of ongoing research projects.

Once a research project has been completed, publishing mechanisms become an important factor in revealing errors or deficiencies. Often preliminary findings are presented as lectures or posters and manuscripts are revised according to the feedback received on these before submission to an academic journal.

Methodological, ethical and presentational aspects of the study are evaluated through the peer review system of academic journals and, as a rule, articles have

to be revised a number of times before they are published. The underlying assumption is that peer review improves the academic quality of published work, but there is general agreement that this system cannot guarantee exposure of fraudulent research. Peer reviewers are not close enough to the data sources to be able to check the validity of results, although they do sometimes discover irregularities, which may lead to suspicions of fraud. Editors may then request further information from the authors. It is a matter of some debate among editors of leading medical journals, how the peer review process may be improved and also the degree of responsibility editors have for articles they publish. It has become increasingly common for journals to require authors to declare the exact nature of the contribution they have made to the study and the publication. If a journal suspects there is something dubious about the research, they have the option of rejecting the article or sending out a "warning". By requiring the publication of the main results in publicly available databases (such as <http://prsinfo.clinicaltrials.gov/fdaaa.html>, see Chapter 9), as is now required of researchers in the USA within one year after termination of a study, the opportunity to withhold "unfavorable" results will also be reduced.

### **Citation and ethics**

Correct use of references shows academic integrity and avoids plagiarism.

Presentation of results, thoughts, ideas or formulations made by others, as your own, is plagiarism. Plagiarism is intellectual theft, and is regulated by several Norwegian acts, including "åndsverkloven"

(<https://lovdata.no/dokument/åndsverksloven> and "universitet- og høyskoleloven" ([https://lovdata.no/dokument/universitets-og høyskoleloven](https://lovdata.no/dokument/universitets-og_høyskoleloven))). See Chapter 9 (on publishing), as well as an article on the use of references in the "Research Ethics Library" (<http://etikkom.no/FBIB>).

## **Current sanction imposed on fraudulent researchers**

The regulation of scientific fraud and misconduct in the research process is inadequate in Norway. Sanctioning may have a general preventive effect and thereby reduce risk of fraud and misconduct in the research field. The sanction options include actions include censure by colleagues and exclusion from academic circles, as well as withdrawal of research funding. In addition, fraudulent researchers may face administrative, disciplinary, civil or criminal action, risking imprisonment and fines. They may be given notice by their employer and sentenced to pay compensation to parties who have been duped or injured. Fraudulent researchers who are also healthcare workers risk receiving a warning from the Norwegian Board of Health Supervision ("Helsetilsynet"), and in extreme cases the authorization to practice clinically (e.g. as a medical doctor) may be withdrawn. In 2006 one researcher lost the PhD title ("dr. med.") and the approval of this researcher's doctoral thesis at the University of Oslo was withdrawn.

## **16.6 How to prevent fraud in research communities**

### **Institutional responsibility and requirements dictated by The Norwegian Act on Medical and Health Research as pertains to Research Directors and Project Managers**

Can fraud be prevented by more research bureaucracy? The opinion of the authors of this Handbook is that more bureaucracy and control could easily lead to research being paralyzed by over-regulation and may result in many researchers giving up their careers. On the other hand, research culture must be based on a fundamental ethos of integrity, openness and honest work of high quality in all parts of the research process, as well as awareness on the part of research institutions of their responsibility for the system.

In practice, the integrity of the researchers themselves and internal social research control are probably more important than external control, which is chiefly designed to expose the most serious cases of fraud. The opinion of the authors of this Handbook is that research institutions must continue to be the cornerstone of initiatives promoting sound research ethics and prevention of misconduct. This implies the need for clarification, simplification and streamlining of existing rules and development of internal and external control systems. Continued promotion of sound principles in research and ethical awareness in the research community and PhD education is essential, and includes emphasis on the moral, professional and legal responsibilities of the individual researchers. Open debate and communication in research groups regarding ongoing research projects as well as discussions of what is sound research practice and research ethics, should contribute to the promotion of sound research and help prevent misconduct and fraud.

Presentation of research data and methodology not only provides opportunities for improving the scientific quality of projects, but also ensures openness in the research environment, which, in turn, makes fraud more difficult. Any fraud would soon be discovered if large amounts of data appeared after only a brief period of time since other researchers in the group are fully aware that data collection can take several years. Sound research behavior and sound research culture require openness, honesty, trust and fruitful collaboration and are thus likely to contribute to reducing conflicts, misconduct and fraud. It is also important that a greater number of researchers in research groups have access to original data so that the data material, calculations and presentation of results may undergo a greater degree of quality control.

Some of the possible avenues for research institutions to explore in this context include further development of research training with greater emphasis on

research ethics and improved supervision procedures, as well as closer follow-up of PhD-candidates and researchers.

In practice, the supervisors' role in research projects varies considerably. The opinion of the authors of this Handbook is that supervisors should, as a rule, be well acquainted with all aspects of a research project, including quality control of data collection, electronic data processing, and statistical analyses, in addition to contributing to the publication process itself.

The New Norwegian Health Research Act involves greater emphasis on research institutions' formal responsibility for all aspects of the research project (see Chapter 6). The duties of the "Research Director" ("forskningsansvarlig") are defined in the Act's regulations, including facilitation of ethical, privacy-related and information security issues and internal controls etc. The "Project Manager's" ("prosjektleder") responsibility for the daily operations of a research project is also well defined and should ensure that ethical, medical, and privacy considerations are taken into account in daily research operations. The "Project Manager" ("prosjektleder") is also responsible for notifying and involving the "Research Director" ("forskningsansvarlig") before the research project commences, for obtaining the necessary approval from REK and any other relevant bodies (see Chapter 6), and for ensuring that the project is carried out according to the approved protocol.

The responsibility of the Research Director (at the research institution) is made clear in the Research Ethics Act of 2017, and entails a system responsibility for overall good research ethics, which includes, among other things, establishment of the Fairness Committee (see below) and training opportunities and guidance, both by supervisors, fellows and other researchers.

(see also “uredelighetsloven” below). The overall responsibility that the research institution carries with respect to the system as a whole, does not reduce the individual responsibility that researchers, collaborators or supervisors have with respect to promoting and conducting ethical research and sound research practice throughout all stages of all research projects.

### **Protection of "whistleblowers" in the workplace**

It is often difficult for a person who discovers or suspects fraud to know how best to deal with the situation. The closer the "fraudster" is to one's own research group, the more difficult it can be. In practice, inexperienced researchers should be able to discuss the matter with their supervisor, who can then take the matter further. If this is not possible, advice should be sought from another senior researcher in whom one has confidence. An institutional research system founded on sound ethical and research principles should reduce the need for "whistleblowers". A Norwegian Working Environment Act from 2007 (<http://regjeringen.no/abeidsmiljolooven/varsling/varsling>) offers protection of whistleblowers against retaliation ("*Retaliation against an employee who reports irregularities in accordance with regulations is prohibited*", "*Det er forbudt med gjengjeldelse mot arbeidstaker som varsler i henhold til reglene*"). Employers are to develop routines for internal reporting of irregularities or put into place other measures to enable internal reporting of blameworthy conditions in the workplace. This law also applies to research.

### **New merit systems?**

Some feel that reducing the pressure to publish would affect the motivation underlying research fraud. However, it is inconceivable that biomedical and healthcare research communities in Norway would choose other academic systems of merit and funding arrangements than the rest of the world, basing these merits largely on scientific publications.

## **Norwegian national panel for misconduct in research**

The National Panel for Inquiry into Fraudulent Research ("Nasjonalt utvalg for gransking av uredelig forskning", <http://etikkom.no/Granskingsutvalget/>) is a national resource for universities, research institutions, businesses, and employers that deals with cases of misconduct in research and is a supplement to local institutional systems. The Panel was established in 2007, in line with the intentions of the Act on research ethics ("forskningsetikkloven"). The Inquiry Panel deals with cases of suspected fraud either reported by institutions or individuals. The panel may open a case at their own initiative, but at baseline the responsibility lies with the individual institution. There is no statutory requirement for research institutions to submit serious cases to the committee, but it is expected that the panel should be informed if an institution is dealing with a case of misconduct/fraud on its own.

The Inquiry Panel is not to impose penalties or sanctions. This is to be left to the employer or, indirectly, to the funding agents. Under the Act on Research Ethics ("Forskningsetikkloven"), research institutions are given primary responsibility for prevention of and dealing with fraudulent research, including appropriate research ethics training for its candidates, as well as investigations into specific cases of fraud.

The decisions of the Panel can be appealed.

The Inquiry Panel cooperates amongst others with the Norwegian national research ethics committees with the aim of spreading information about and preventing scientific misconduct. The Commission cooperates with corresponding bodies in other countries, presents an anonymous annual report, and provides information about the decisions reached by the Panel and their



experiences. The Panel prepares material and guidelines that institutions can use when handling specific cases of alleged misconduct in research.

### **The Research Ethics Committee (“Redelighetsutvalg”)**

In accordance with the requirements of the Research Ethics Act, a joint Research Ethics Committee (“Redelighetsutvalg”) for the Department of Clinical Medicine at the Faculty of Medicine, the University of Oslo, Oslo University Hospital HF and Akershus University Hospital HF has been established from 2019. The committee's first chair is Professor Emeritus Ole Sejersted. The committee shall deal with cases of possible violation of recognized research ethics norms in accordance with Sections 6 and 8 of the Research Ethics Act, including cases where the parties or institutions require the case to be presented to the Committee.

The Research Ethics Committee will review individual cases and contribute to the institutions' responsibility to ensure that research at the institution is conducted in accordance with recognized research ethics standards. On request, the Committee will also handle cases from other health institutions in the Region (<https://www.med.uio.no/forskning/om/etikk/redelighetsutvalget/>).

### **Research ethics committee at UiO**

The Research Ethics Committee at UiO is the university's advisory body for research ethics. The Research Ethics Committee may, on its own initiative, comment on research ethics. The committee also addresses individual cases where there is suspicion of scientific fraud or breach of good scientific practice at UiO (<https://www.uio.no/om/organisasjon/utvalg/forskningsetisk-utvalg/>).

## **Science Ombudsman at OUS and UiO**

As of 2019, a replacement is sought for the previous Research Ombudsman system at Oslo and Akershus University Hospitals and University of Oslo (Faculty of Medicine, Institute of Clinical Medicine).

Professor Knut Willem Ruyter is from 2019 employed as a Science Ombudsman (“Vitenskapsombud”) at the Institute of Basic Medical Sciences and Institute of Health and Society at the Faculty of Medicine, University of Oslo. The Ombudsman is independent of the organization (UiO) and will, among other things, provide guidance and advice to scientific staff that are in difficult research ethics situations ([www.uio/vitenskapsombud](http://www.uio/vitenskapsombud)).

### ***Background literature***

#### **International links:**

The Helsinki Declaration

<https://www.etikkom.no/no/FBIB/Praktisk/Lover-og-retningslinjer/Helsinkideklarasjonen/>

The Oviedo Convention

<http://www.etikkom.no/en/FBIB/Praktisk/Lover-og-retningslinjer/Oviedokonvensjonen/>

COPE: The Committee on Publication Ethics

<http://publicationethics.org/>

Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine

<http://www.conventions.coe.int/>

The Vancouver Conventions (“rules”) (see also Chapter 9)

<http://www.icmje.org/>

The EU Directive on Pharmaceuticals, “EUs legemiddeldirektiv” (GCP: Good Clinical Practice)

<http://www.ema.europa.eu/ema/>

The European Convention on Human Rights and Biomedicine (“Europarådets konvensjon om menneskerettigheter og biomedisin”); Additional Protocol on the Convention on Human Rights and Biomedicine

(<http://conventions.coe.int/treaty/en/reports/html/195.htm>)

CIOMS (The Council for International Organizations of Medical Sciences)

<http://www.cioms.ch/>

### **National links:**

The National Committee for Medical and Health Research Ethics («Den nasjonale forskningsetiske komité for medisin og helsefag», “NEM”)

<https://www.etikkom.no/Aktuelt/Nyheter/2019/europeiske-retningslinjer-for-forskningsintegritet/>

The National Committee for Medical and Health Research Ethics («Den nasjonale forskningsetiske komité for medisin og helsefag», “NEM”)

<http://www.etikkom.no/>

Research Ethics Library by NEM («Forskningsetisk bibliotek”)

[www.etikkom.no/FBIB](http://www.etikkom.no/FBIB) and <https://www.etikkom.no/en/news/publications/>

Good research practice (NEM)

<http://www.etikkom.no/Forskningsetikk/God-forskningspraksis/>

The Act on Health and Research («Helseforskningsloven”)

<https://lovdata.no/helseforskningsloven>

Courses in Health Research Act (and research ethical issues)

The Norwegian Electronic Health Library (“Helsebiblioteket”) / The Norwegian Medical Association

<http://nettkurs.legeforeningen.no/>

The Ethics and Integrity in Research Act (Om lov om behandling av etikk og redelighet i forskningen, Ot.prp. nr. 58 2005-2006)

<http://www.odin.no/Ot.prp.nr.58>

Nylenna Committee Report (NOU 2005: 01 God forskning - bedre helse)  
[http://www.regjeringen.no/NOU\\_2005:01](http://www.regjeringen.no/NOU_2005:01)

Universitets- og høskolerådet  
[www.uhr.no/](http://www.uhr.no/)

Medical Ethics Unit at the University of Oslo («Senter for medisinsk etikk»)  
[www.med.uio.no/helsam/om/organisasjon/avdelinger/sme/](http://www.med.uio.no/helsam/om/organisasjon/avdelinger/sme/)

University of Oslo: Research ethics  
<http://www.uio.no/for-ansatte/arbeidsstotte/fa/regelverk-og-forskningsetikk/etikk/index.html>

University of Oslo: Quality System for Research:  
<http://www.uio.no/english/for-employees/support/research/quality-system-for-health-research/index.html>

Bioethical research group at NTNU («Bioetisk forskergruppe»)  
[www.ntnu.no/etikkportalen](http://www.ntnu.no/etikkportalen)

### *Norwegian books and literature on research ethics*

**Nydal R og Solberg B (red).** Juks, uredelighet og god forskning. Tapir akademisk forlag 2006.

**Simonsen S og Nylenna M.** Helseforskningsrett: den rettslige regulering av medisinsk og helsefaglig forskning. Gyldendal akademisk 2005.

**Ruyter KW (red.).** Forskningsetikk: beskyttelse av enkeltpersoner og samfunn. Gyldendal akademisk 2003.

**Ruyter KW, Førde R og Solbakk JH.** Medisinsk etikk: en problembasert tilnærming. Gyldendal akademisk 2000.

**Hofmann B, Myhr AI og Holm S.** Scientific dishonesty- a nationwide survey of doctoral students in Norway. BMC Medical Ethics 2013, 14:3.

## **APPENDIX: Links**

(Translations to English from several Norwegian terms are presented on pages 175-6)

### **A**

ADHD-foreningen

<http://www.adhdnorge.no/>

Adobe

<http://www.adobe.no/>

Arbeidsmiljøloven (om varsling)

[www.regjeringen.no/Arbeidsmiljøloven varsling](http://www.regjeringen.no/Arbeidsmiljøloven_varsling)

### **B**

Bergen teknologioverføring AS (BTO)

<http://www.bergento.no/>

Bergen universitetsfond

<https://www.uib.no/foransatte/100537/bergen-universitetsfond>

BI

<http://www.bi.no/>

BMJ

<http://www.bmj.com/>

### **C**

Committee on Publication Ethics (COPE)

<http://publicationethics.org/>

CORDIS: Community Research & Development Information Service

<http://cordis.europa.eu/>

### **D**

Datatilsynet

<http://www.datatilsynet.no/>

Datatilsynet, veiledning for forskere

<https://www.datatilsynet.no/verktøy-skjema/>

Den norske legeforening

<http://www.legeforeningen.no/>

## E

EpiData

<http://www.epidata.dk/>

EpiInfo, nedlasting

<http://www.cdc.gov/epiinfo>

EUs legemiddeldirektiv (EU Directive on Pharmaceuticals)  
(GCP: Good Clinical Practice) [www.ema.europa.eu/GCP](http://www.ema.europa.eu/GCP)

Europarådets konvensjon om menneskerettigheter og biomedisin  
Additional Protocol to the Convention on Human Rights and Biomedicine, concerning  
Biomedical Research)

<http://conventions.coe.int/Treaty/EN/Treaties/>

## F

Fellesorganet for REK (FREK); kjennetegn ved kvalitetssikring vs fremleggelsespliktige  
forskningsprosjekter

[http://helseforskning.etikkom.no/Kvalitetssikring vs framleggelsespliktig prosjekt FREK des 2011.pdf](http://helseforskning.etikkom.no/Kvalitetssikring%20vs%20framleggingspliktig%20prosjekt%20FREK%20des%202011.pdf)

Forbundet mot rusgift

<http://www.fmr.no/>

Foreningen for hjertesyke barn

<http://www.ffhb.no/>

FORNY2020

<http://www.forskningsradet.no/prognett-FORNY2020/Forside/1253963921794>

Forskningshåndboken

<https://oslo-universitetssykehus.no/forskningshandboken>

Forskningsparken AS

<http://www.forskningsparken.no/>

Forskrift om forsøk med dyr

[https://lovdata.no/forskrift om forsøk med dyr](https://lovdata.no/forskrift%20om%20forsok%20med%20dyr)

Forskrift om organisering av medisinsk og helsefaglig forskning

[http://lovdata.no/forskrift om organisering av medisinsk og helsefaglig forskning](http://lovdata.no/forskrift%20om%20organisering%20av%20medisinsk%20og%20helsefaglig%20forskning)

Forskningsreguleringsutvalget (Nylennautvalget), Ot.prp. nr. 58 (2005-2006) Om lov om  
behandling av etikk og redelighet i forskning

[www.regjeringen.no/Ot.prp.nr.58](http://www.regjeringen.no/Ot.prp.nr.58)

Funksjonshemmedes fellesorganisasjon

<http://www.ffe.no/>

## G

Avdeling Forskningsstøtte for kliniske studier/Clinical Trial Unit (CTU), Forskningsstøtte  
<https://oslo-universitetssykehus.no/regional-forskingsstotte>

## H

Helsebiblioteket  
<http://www.helsebiblioteket.no/>

Helsedirektoratet  
<http://www.helsedirektoratet.no/>

Helse- og omsorgsdepartementet  
[www.regjeringen.no/nb/dep/hod](http://www.regjeringen.no/nb/dep/hod)

Helse- og omsorgsdepartementet: Crediting/addresses for scientific publications:  
[http://www.regjeringen.no/upload/kilde/hd/red/2004/0032/ddd/exel/207826-kontaktpersoner\\_og\\_enheter\\_14.4.2004.xls](http://www.regjeringen.no/upload/kilde/hd/red/2004/0032/ddd/exel/207826-kontaktpersoner_og_enheter_14.4.2004.xls)

Helse- og omsorgsdepartementets nettsider: how to of measure research activity:  
<http://www.regjeringen.no/nb/dep/hod/tema/sykehus/nasjonalt-system-for-maling-av-forskning>

Helse Bergen, forskning og utvikling  
<http://helse-bergen.no/fag-og-forskning>

Helse Bergen, internkontrollrutiner for medisinsk og helsefaglig forskning: <http://www.helse-bergen.no/no/FagOgSamarbeid/forskning/Documents/Forms/AllItems.aspx>

Helse Bergen, det regionale samarbeidsorganet  
<https://helse-bergen.no/forskning-og-innovasjon>

Helse Bergen, Regionalt kompetansesenter for klinisk forskning  
<https://helse-bergen.no/avdelinger/forskings-og-utviklingsavdelinga/forskning-og-innovasjon>

ExtraStiftelsen, Helse og Rehabilitering  
<https://www.extrastiftelsen.no/>

Helse Sør-Øst  
<https://www.helse-sorost.no/>

Helseforskningsloven  
<http://www.lovdatab.no/helseforskningsloven>

Helsinkideklarasjonen  
<https://www.etikkom.no/Helsinkideklarasjonen>

Hørselshemmedes landsforbund  
[www.hlf.no/](http://www.hlf.no/)

## I

ICMJE, Uniform Requirements for Manuscripts Submitted to Biomedical Journals  
(Vancouver-avtalen/ Vancouver Convention/ Vancouver "rules")

<http://www.icmje.org/>

ICMJE Editorials, Sponsorship, Authorship, and Accountability

<http://www.icmje.org/sponsorship, Authorship and Accountability>

InnoMed (Nasjonalt nettverk for behovsdrevet innovasjon i helsesektoren)

<http://innomed.no/>

Innoventus Sør

<http://innoventus.no/>

Innsiden (intranet only available for Heath Trusts in Helse Vest)

[innsiden.helse-bergen.no/forskning](http://innsiden.helse-bergen.no/forskning)

Instructions to authors in the health sciences

<http://mulford.utoledo.edu/instr/>

Interactive statistical calculation pages

<http://statpages.org/>

<http://biostat.mc.vanderbilt.edu/twiki/bin/view/Main/PowerSampleSize>

<http://stat.ubc.ca/~rollin/stats/ssize/>

Inven2

<http://www.inven2.com/no>

## K

Kreftforeningen

<http://www.kreftforeningen.no/>

Kunnskapsdepartementet

St.meld. nr. 20 (2004-2005) Vilje til forskning

<http://www.regjeringen.no/St.meld.nr.20>

Kunnskapssenteret – Nasjonalt kunnskapssenter for helsetjenesten

<http://www.kunnskapssenteret.no/>

Kurs om Helseforskningsloven (Helsebiblioteket/ Den norske Legeforening)

<http://nettkurs.legeforeningen.no/>

## L

Landsforeningen for hjerte- og lungesyke

<http://www.lhl.no/>



Landsforeningen for nyrepasienter og transplanterte  
<http://www.lnt.no/>

Landsforeningen uventet barnedød  
<http://www.lub.no/>

Legathåndboken  
<http://www.legathandboken.no/>

Leiv Eriksson Nyskaping AS  
<http://www.len.no/>

Lov om biobanker (biobankloven)  
<http://lovdata.no/behandlingsbiobankloven>

Lov om humanmedisinsk bruk av bioteknologi m.m. (Bioteknologiloven)  
<http://lovdata.no/bioteknologiloven>

Lov om spesialisthelsetjenesten  
<http://lovdata.no/spesialisthelsetjenesten>

Læresenteret Oslo University Hospital, Ullevål, pasientorganisasjoner  
<http://oslo-universitetssykehus.no/brukerutvalg>

## M

Maler, informasjonsskriv  
<https://helseforskning.etikkom.no/malforinformasjonsskriv>

Mattilsynet  
<http://www.mattilsynet.no/>

Meltzerfondet  
<http://meltzerfondet.no/>

Multipel sklerose-forbundet i Norge  
<http://www.ms.no/>

## N

Nasjonalforeningen for folkehelsen  
<http://www.nasjonalforeningen.no/>

Nasjonalt forskningsdokumentasjonssystem, FRIDA  
<http://www.uib.no/>

Nasjonalt kunnskapssenter for helsetjenesten (Kunnskapssenteret)  
<http://www.fhi.no/>

Nasjonalt nettverk for forskning og forskerutdanning i etikk  
<http://www.forskningsradet.no/no/Etikk/>

Nasjonalt system for måling av forskningsresultater  
[http://odin.dep.no/hod/nasjonalt system for måling av forskningsresultater](http://odin.dep.no/hod/nasjonalt_system_for_måling_av_forskningsresultater)

National Institutes of Health, ClinicalTrials  
<http://www.clinicaltrials.gov/>

National Institutes of Health, Grants and Funding Opportunities  
<http://grants1.nih.gov/grants/>

NEM (Den nasjonale forskningsetiske komité for medisin og helsefag)  
<http://www.etikkom.no/>

NOU 2005: 01 God forskning - bedre helse  
[www.regjeringen.no/nb/dep/hod/NOU 2005:1](http://www.regjeringen.no/nb/dep/hod/NOU_2005:1)

NorCRIN  
<http://norcrin.no/>

Norges astma- og allergiforbund  
<http://www.naaf.no/>

Norges blindeforbund  
[www.blindeforbundet.no/internett/](http://www.blindeforbundet.no/internett/)

Norges diabetesforbund  
<http://www.diabetes.no/>

Norges døveforbund  
<http://www.deafnet.no/>

Norges forskningsråd  
<http://www.forskningsradet.no/>

Norges forskningsråd, call for grants  
<http://www.forskningsradet.no/utlysninger>

Norges handikapforbund  
<http://www.nhf.no/>

Norges mosjons- og bedriftidrettsforbund  
<http://www.bedriftsidrett.no/>

Norges teknisk-naturvitenskapelige universitet (NTNU)  
<http://www.ntnu.no/>

Norges teknisk-naturvitenskapelige universitet (NTNU), Medisinsk etikk og bioetikk  
<http://www.ntnu.no/ism/etikk>

NTNU Technology Transfer AS  
<http://www.tto.ntnu.no/>

Norges miljø- og biovitenskapelige universitet (NMBU), veterinærhøgskolen  
<http://www.nmbu.no/>

Norinova Technology Transfer AS  
<http://www.norinova.no/>

Norsk revmatikerforbund  
<http://www.revmatiker.no/>

Norsk folkehjelp  
<http://www.folkehjelp.no/>

Norsk Pasientskadeerstatning  
<http://www.npe.no/>

Prosjekt Norge  
<http://www.prosjektnorge.no/>

Norske kvinners sanitetsforening  
<http://www.sanitetskvinnene.no/>

Norsk Vitenskapsindeks (NVI)  
[www.regjeringen.no/norsk vitenskapsindeks](http://www.regjeringen.no/norsk_vitenskapsindeks)

NVivo  
<http://www.qsrinternational.com/products.aspx>

## **O**

Odelstingsproposisjon nr. 66 (2000-2001) Om lov om helseforetak m.m.  
<http://odin.dep.no/hod/OT.prp.nr.66>

Oslo universitetssykehus, Forskning  
<https://oslo-universitetssykehus.no/fag-og-forskning>

Oslo universitetssykehus, Medisinsk bibliotek  
[http://www.oslo-universitetssykehus.no/medisinsk bibliotek](http://www.oslo-universitetssykehus.no/medisinsk_bibliotek)

Oslo universitetssykehus, Forskning og personvern  
<https://oslo-universitetssykehus.no/personvern>

Oslo universitetssykehus, Biobank og register  
[https://oslo-universitetssykehus.no/biobank og register](https://oslo-universitetssykehus.no/biobank_og_register)

Oslo universitetssykehus, Regional Forskningsstøtte  
[http://www.oslo-universitetssykehus.no/fagfolk\\_/forskning\\_/forskningsstotte\\_/Sider/side.aspx](http://www.oslo-universitetssykehus.no/fagfolk_/forskning_/forskningsstotte_/Sider/side.aspx)

<https://oslo-universitetssykehus.no/regional-forskningsstotte>

Oslo universitetssykehus, Ekstern finansierte prosjekter

<https://oslo-universitetssykehus.no/ekstern-finansiering>

Oslo universitetssykehus, Monitorering (legemiddelstudier)

<https://oslo-universitetssykehus.no/monitorering>

Oslo universitetssykehus, Datahåndtering

<https://oslo-universitetssykehus.no/datahandtering>

## **P**

Patentdirektivet (rettslig beskyttelse av bioteknologiske oppfinnelser), Ot.prp. nr 86 (2002-2003)

<http://www.regjeringen.no/patentdirektivet>

Patentloven

<https://lovdata.no/patentloven>

Patentstyret

<http://www.patentstyret.no/>

Personvernombudet for forskning

<http://www.nsd.uib.no/personvern>

Prekubator

<http://prekubator.to.no/>

Prominet

[www.prominet.no](http://www.prominet.no)

PubMed

<http://www.ncbi.nlm.nih.gov/pubmed>

## **R**

Redd Barna

<http://www.reddbarna.no/>

Regional komité for medisinsk og helsefaglig forskningsetikk (REK)

<https://rekportalen.no/>

Regionsenter for barn og unges psykiske helse

<http://www.rbup.no/>

REK, mal for hva som bør inngå i et informasjonsskriv

<https://helseforskning.etikkom.no/mal-for-informasjonskriv>

REK, klinisk utprøving av legemidler til mennesker  
[https://helseforskning.etikkom.no/klinisk utprøving til mennesker](https://helseforskning.etikkom.no/klinisk-utprøving-til-mennesker)

REK, skjemaer for vurdering i REK  
<https://helseforskning.etikkom.no/skjemaer>

Reservasjonsregisteret  
<http://www.fhi.no/reservasjonsregisteret>

Rådet for psykisk helse  
[www.psykiskhelse.no/](http://www.psykiskhelse.no/)

## S

SAS: Statistical Analysis Software  
<http://www.sas.com/>

Simula Innovation AS  
<http://www.simula.no/>

SINTEFT TTO AS, <http://www.sintef.no/tto/>)

SkatteFUNN  
<http://www.skattefunn.no/>

SPSS brukerstøtte  
<http://www.spss.com/no/support>

Statens legemiddelverk, kliniske utprøvinger  
[www.legemiddelverket.no/Godkjenning\\_og\\_regelverk/Klinisk-utprøving/](http://www.legemiddelverket.no/Godkjenning_og_regelverk/Klinisk-utprøving/)

Stiftelsen Dam (former Extrastiftelsen)  
<https://www.dam.no/>

Stortingsmelding nr. 20, Vilje til forskning  
<https://www.regjeringen.no/stmeld-nr-20-2004-2005/>

## T

Tidsskrift for Den norske Legeforening  
<http://www.tidsskriftet.no/>

## U

UCLA: Statistical Computing Resources  
<http://www.ats.ucla.edu/stat>

UNIFOR - Forvaltningsstiftelsen for fond og legater ved Universitetet i Oslo  
<http://www.unifor.no/>

Universitetet i Bergen, forskerutdanning ved det medisinske fakultet  
<http://www.uib.no/info/forskning/forskutd>.

Universitetet i Bergen, forskerskoler  
<http://www.uib.no/phd/phd-ved-uib/forskerskoler>

Universitetet i Bergen, Medisinsk fakultetsbibliotek  
<http://www.ub.uib.no/avdeling/med>

Universitetet i Oslo  
<http://www.uio.no/>

Universitetet i Oslo, doktorgradsprogrammet ved Det medisinske fakultet  
<http://www.med.uio.no/forskning/doktorgrad-karriere/forskerutdanning/>

Universitetet i Oslo, forskerutdanningsprogrammet ved Det medisinske fakultet  
<http://www.med.uio.no/forskning/doktorgrad-karriere/forskerutdanning/om/>

Universitetet i Oslo, Seksjon for medisinsk etikk  
<http://www.med.uio.no/for-ansatte/organisasjon/omorganisering/forskningssamarbeid/ihs/13.html>

Universitetet i Oslo, Etikkprogrammet  
<http://www.etikkprogrammet.uio.no/>

Universitetet i Oslo, forskning innen medisin og helse  
<http://www.uio.no/forskning/vi-forsker-pa/helse-medisin/>

Universitetet i Oslo, kvalitetssystem for medisinsk og helsefaglig forskning  
<http://www.uio.no/for-ansatte/arbeidsstotte/fa/regelverk-og-forskningsetikk/kvalitetssystem-helse/>

Universitetet i Oslo, vacant positions  
<http://www.uio.no/om/jobb/ledige-stillinger/>

Universitetet i Tromsø, medisinsk forskning  
<https://uit.no/startside>

Universitetet i Stavanger  
<http://www.uis.no/>

## V

Vancouver-konvensjonen(Vancouver-avtalen/ Vancouver Convention/ Vancouver "rules");  
ICMJE, Uniform Requirements for Manuscripts Submitted to Biomedical Journals:  
<http://www.icmje.org/>

Veilederen til helseforskningsloven  
[www.regjeringen.no/veileder-til-helseforskningsloven](http://www.regjeringen.no/veileder-til-helseforskningsloven)

VIS (former Innovest and BTO)  
<https://www.visinnovasjon.no/>

Vitenskapsombud UiO  
[www.uio.no/vitenskapsombud](http://www.uio.no/vitenskapsombud)





**APPENDIX:**  
**Overview over Norwegian TTOs (Technology Transfer Offices)**

Bergen Teknologioverføring AS  
Thormøhlensgate 51, 5008 Bergen  
Telephone: 55 58 30 50  
Email: [post@bergento.no](mailto:post@bergento.no)  
<http://www.bergento.no/>

Kjeller Innovasjon  
P.O. Box 102, N-2027 Kjeller  
Telephone: 64 84 43 00  
Email: [post@kjellerinnovasjon.no](mailto:post@kjellerinnovasjon.no)  
<http://www.kjellerinnovasjon.no/>

Innoventus Sør Gimlemoen 13, 4630 Stavanger  
Telephone: 37 29 51 80  
Email: [post@innoventus.no](mailto:post@innoventus.no)  
<http://innoventus.no/>

Forskningsparken AS  
Gaustadallèen 21, 0349 Oslo  
Telephone: 22 95 85 00?  
Email: [post@oslotech.no](mailto:post@oslotech.no)  
<http://www.forskningsparken.no/>

Inven2 AS  
Gaustadallèen 21, 0,349 Oslo  
Boks 1061 Blindern  
N-0316 Oslo  
Telephone: 22 84 00 80  
Email: [post@inven2.com](mailto:post@inven2.com)  
<http://www.inven2.com/no>

Leiv Eiriksson Nyskaping AS  
P.O. Box 1262 Pirsenteret, 7462 Trondheim  
Telephone: 73 54 51 00  
Email: [firmapost@len.no](mailto:firmapost@len.no)

<http://www.len.no/>

NTNU Technology Transfer AS  
Telephone: 90 05 11 11 / 73 55 11 81  
Email: [contact@tto.ntnu.no](mailto:contact@tto.ntnu.no)  
<http://www.tto.ntnu.no/>

Norinnova Technology Transfer AS  
Postboks 6413 Forskningsparken  
9291 Tromsø  
Telephone: 77 67 97 60  
Email: [post@norinnova.no](mailto:post@norinnova.no)  
<http://www.norinnova.no/>

Prekubator AS P.O. Box 8034, 4068 Stavanger  
Telephone: 51 87 40 00  
Email: [prekubator@kunnskapsparken.no](mailto:prekubator@kunnskapsparken.no)  
<http://prekubator.tto.no/>

Simula Innovasjon AS  
P.O. Box 134, 1325 Lysaker  
Telephone: 67 82 83 40  
Email: [post@simula.no](mailto:post@simula.no)  
<http://www.simula.no/>

SINTEFT TTO AS Stiftelsen SINTEF, Postboks 4760 Sluppen  
7465 Trondheim  
Telephone: 73 59 30 00  
Email: [info@sintef.no](mailto:info@sintef.no)  
<http://www.sintef.no/>

## **APPENDIX: Local Research Support Oslo University Hospital, South-Eastern Norway Regional Health Authority and Haukeland University Hospital:**

### **Oslo University Hospital (OUS):**

OUS offers research support to all researchers within the South-Eastern Norway Regional Health Authority, in addition to researchers at private hospitals ([Regional forskningsstøtte](#)) ”Kompetansesenteret for personvern og informasjonssikkerhet” (<https://oslo-universitetssykehus.no/personvern>) advises researchers on issues of privacy and information security. The Center offers Personal Data Officer services (“personvernombud”) for research and quality control systems for a number of health trusts in the region.

### **South-Eastern Norway Regional Health Authority:**

The Department of Research and Innovation coordinates and manages research in the health region and maintains research administrative tasks, including secretariat functions for regional and national committees. The department contributes to strategic support the innovation activity in the region, follows up on strategic research tasks, including allocation of research and reporting. The department also provides advice to the Regional Health Authority leadership on research issues and issues related to innovation. The department’s aim is to safeguard and strengthen the research and innovation within the region (<http://www.helse-sorost.no/fag/forskning-og-innovasjon>).

### **Haukeland University Hospital:**

”Regionalt kompetansesenter for klinisk forskning” offers support in the planning, implementation, statistical analysis and publication of clinical research. The center is also responsible for coordinating networks within the regional health authority, and acts as a link to the university-based research groups. (<http://haukeland.no/omoss/avdelinger/kkf/Sider/>).

## APPENDIX: Norwegian and corresponding English terms in this Handbook:

Norwegian Terms	English Terms or explanation
Arbeidsmiljøloven	<i>The Norwegian Working Environment Act</i>
arnevernet	<i>Child Welfare Services</i>
Behandlingsbiobankloven	<i>The Treatment Biobank Act</i>
Bioteknologiloven	<i>The Biotechnology Act</i>
Bredt samtykke	<i>Broad Consent</i>
Current Research Information System in Norway (CRISiN)	<i>The Norwegian Research registration system (CRISiN)</i>
Databehandlingsansvarlig	<i>Data Processing Director</i>
Datatilsynet	<i>The Data Protection Agency</i>
Den nasjonale forskningsetiske komité for medisin og helsefag	<i>The National Committee for Medical and Health Research Ethics</i>
Dødsårsakregisteret	<i>The Cause of Death Register</i>
Europarådets konvensjon om menneskerettigheter og biomedisin	<i>The European Convention on Human Rights and Biomedicine</i>
EUs legemiddeldirektiv	<i>EU Directive on Pharmaceuticals</i>
Folkehelseinstituttet	<i>The Norwegian Institute of Public Health</i>
Forskningsansvarlig	<i>Research Director</i>
Forskningsombudsman	<i>Research Ombudsman</i>
Forskningsrådet (Norges forskningsråd: NFR)	<i>The Research Council of Norway (NRC)</i>
Forsøksdyrutvalget	<i>The Institute for Nature Research</i>
Fødselsregisteret	<i>The Medical Birth Registry</i>
Førstemanuensis	<i>Associate Professor</i>
Helse- og omsorgsdepartementet (HOD)	<i>The Ministry of Health and Care Services</i>
Helsebiblioteket	<i>The Norwegian Electronic Health Library</i>
Helsedirektoratet	<i>The Norwegian Directorate of Health</i>
Helseforetak (f.eks. sykehus)	<i>Health Trust (e.g. a hospital)</i>
Helseforskningsloven	<i>The Norwegian Act on Medical and Health Research</i>
Helsepersonelloven	<i>The Health Personnel Act</i>
Helse-Sør-Øst (HSØ)	<i>The South-Eastern Norway Regional Health Authority</i>
Helsetjenesteforskning	<i>Health Services Research</i>
Helse Vest	<i>The Western Norway Regional Health Authority</i>
Helsinkideklarasjonen	<i>The Helsinki Declaration</i>
Kirke-, utdannings- og forskningsdepartementet	<i>The Ministry of Education and Research</i>
Klinisk forskningsstøtte (avdeling for), OUS	<i>The Department for Clinical Research Support, OUS</i>
Kreftregisteret	<i>The Cancer Registry of Norway</i>
Kunnskapssenteret	<i>The Norwegian Knowledge Center for Health Services</i>
Kvalifiseringsstipendier	<i>Qualifying Grants</i>
Kvalitetssikring	<i>Quality Control Studies</i>
Legemiddelansvarsforeninge	<i>The Drug Liability Association</i>
Lov om behandling av etikk og redelighet i forskningen	<i>The Act on Research Ethics</i>
Lov om produktansvar	<i>The Product Liability Act</i>
Loven om arbeidstakeroppfinnelser	<i>The Act on Employee Inventions</i>
Mattilsynet	<i>The Norwegian Safe Food Authority</i>
Nasjonbiblioteket	<i>The National Library</i>
Nasjonalt strategigruppe for helseforskning (NSG)	<i>The National Strategy Group for Health Research</i>
Nasjonalt nettverk for behovsdrivet innovasjon i helsesektoren	<i>The National Network for need-driven Innovation in Health care</i>

Nasjonalt utvalg for gransking av uredelig forskning	The National Panel for Inquiry into Fraudulent Research
Norges veterinærhøgskole	The Norwegian School of Veterinary Science
Norsk pasientregister (NPR)	The Norwegian Patient Register
Norsk Pasientskadeerstatning (NPE)	The Norwegian System of Compensation to Patients
Norsk senter for prosjektledelse	The Norwegian Center of Project Management
Nærings- og handelsdepartementet	The Ministry of Trade and Industry
Oppdragsforskning	Commissioned Research
Oppdragsgiveren	The Commissioning Entity
Oslo Universitetssykehus (OUS)	Oslo University Hospital (OUS)
Patentstyret	The Patent Board
Personvernombud	Personal Data Officer
Phd. stipendiater	PhD candidates
Prosjektansvarlig (ikke definert i Helseforskningsloven)	Project Director (not defined in the Norwegian Act on Medical and Health Research)
Prosjektleder	Project Manager
Prosjektstyring	Project Management
Redelighetsutvalget	The research Ethics Committee
Regional komité for medisinsk og helsefaglig forskningsetikk (REK)	Regional Committees for Medical and Health Research Ethics (REK)
Regionalt helseforetak (f. eks. Helse Vest)	Regional Health Trust (e.g. Western Norway Regional Health Authority)
Reseptregisteret	The Norwegian Prescription Database
Reservasjonsregisteret	The Reservation Register
Spesialisthelseloven	The Norwegian Act on Specialist Health Services
Statens helsetilsyn	The Norwegian Board of Health Supervision
Statens legemiddelverk (SLV)	The Norwegian Medicines Agency (SLV)
Stedfortredende samtykke	Surrogate Consent
SYSVAK	The National Immunization Registry
Tidsskrift for norsk legeförening	The Journal of The Norwegian Medical Association
Universitet i Oslo (UiO)	University of Oslo (UiO)
Universitets- og høyskoleloven	The Act on Universities and University Colleges
Veileder	Supervisor

## **APPENDIX: Acknowledgement**

The Research handbook has expanded since the first edition in 2003, with useful and important contributions from several authors. The authors welcome suggestions for improvement of the Research Handbook ([uxnraf@ous-hf.no](mailto:uxnraf@ous-hf.no) and [mihjoe@ous-hf.no](mailto:mihjoe@ous-hf.no)).

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Heidi Fjeldstad OUS contributed substantially to the English translation of the 2017 version. Any linguistic flaws in the 2019 version remain the responsibility of the Research handbook authors.

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# Downhill Skiing Track: Research Project Track in 1-2-3-4

Tips for researchers at the Division of Obstetrics and Gynaecology, Oslo University Hospital (OUS)



## Step 1: START HERE (after having a good idea..):

**Document preparation (Projectmanager):** NB: Get an internal preliminary approval FIRST, and seek help: colleagues, department / local research advisor, OUS support ([Klinisk forskningsstøtte](#)): biobank, sponsor and GCP assistance, [Inven2](#) (TTO: contracts, patent etc), "Personvernombud" (PVO, Personal Data Officer)

Fill in REK form electronically (<https://rekportalen.no/>)

and create documents A-C (dated). Templates B + C are available at: <https://www.oslo-universitetssykehus.no/personvern>

•A (Protocol)

•B (Informed Consent)

•C (2 page OUS document: Form for access to and storage of research data)

•Norwegian Medicines Agency (SLV) application documents: applies to clinical drug trials and gene therapy studies (<https://legemiddelverket.no>)

## Step 2: Local approval in the Department(s)

1. **Project Manager ("prosjektleder"):** send (e-mail) to relevant OUS department (s)

- PDF of REK application (online form)
- Documents A, B and C (and potential SLV application)

2. **Head of Department** (in consultation with the research advisor) approves the project by an e-mail to the Project Manager ("prosjektleder")

## Step 4: Clinical Trial and access to OUS research server:

1. Register clinical trials in [www.ClinicalTrials.gov](http://www.ClinicalTrials.gov) and Helse Norge [Helse Norge](#) if relevant
2. Fill out the form that you receive in an e-mail from OUS for access to OUS research server (K:) for your research data storage
3. Internal overview KVI: 2 sentences for spreadsheet research board for patient recruiting studies: Project Manager sends copy of REK application to R&D Division of Gynaecology and Obstetrics: [mihjoe@ous-hf.no](mailto:mihjoe@ous-hf.no)
4. Head of Department have access to an overview of new and ols research studies: Medinsight/PVO/Registeroversikt

## Step 3: Central OUS and REK approvals

1. The Project Manager ( must have a PhD and must be registered in "CRISTIN") sends the documents from step 1 (n this track) simultaneously to:

•**REK** (electronic application with attachments. The Department Head is registered as the one "responsible for research," a role delegated by the OUH director- who is legally responsible as Project Director) <https://rekportalen.no/> (+SLV if a clinical drug trial)

•**OUS centrally:** <https://skjema.uio.no/meldeskjema>

2. The Project Manager receives responses:

•REK approves study (by e-mail) or asks for changes that must be verified by REK

•PVO and biobank OUS: give notice of any needed changes or give the OK (by e-mail)

Head of Division receives a copy of REK's decisions and key information sent to the Project Manager (by e-mail)

START

FINISH

**The study is formalized and can start!**

(check the next page: "Follow-up of Research"- Track ...)

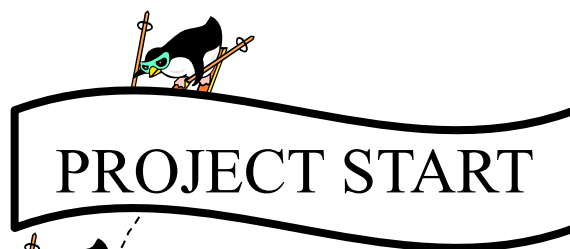
\*REK-application: If the department manager is the project manager, the clinic manager must be stated as the contact person under «Research responsible». If the clinic manger is the project manger, the clinic's head of research is normally the contact person

*Annetine Staff (Research leader), Kirsten Hald (Head of Dept. of R&D) and Michael Pilemand Hjørnholm 2019*



# Which formalities to follow-up AFTER approval and commencement of the research project?

AFTER approval (from the OUS department(s), REK (and SLV) and approval from OUS "Godkjenning")



**In case of significant study changes, the researcher should inform:**

- REK (electronic forms) (+SLV)
- Central approval "Godkjenning" by OUS (attach the alteration form submitted to REK, REK's decision will be copied here)
- Head of Division if applicable, this person will either way receive a copy of all REK decisions via OUS (send a copy to the Dept. of R&D: [mihjoe@ous-hf.no](mailto:mihjoe@ous-hf.no))

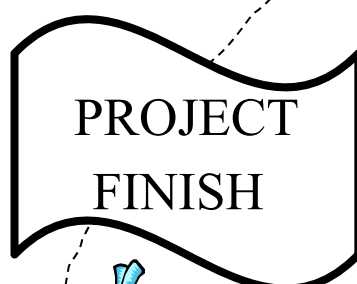


**At the conclusion of the study:  
The researcher must inform:**

- REK (finalization form) (+SLV)
- Central approval "Godkjenning" by OUS (attach the same form as the one to REK)
- Head of Division if applicable, this person will either way receive a copy of all REK decisions via OUS (send a copy to the Dept. of R&D: [mihjoe@ous-hf.no](mailto:mihjoe@ous-hf.no))

Register results from clinical trials:

[www.ClinicalTrials.gov](http://www.ClinicalTrials.gov)



**The researcher must also:**

- Consider further storage of research data and samples (anonymized, delete etc, see REK application)
- Consider Publication Ethics (Personal data protection of study participants, selection of data presented, qualification for authorship, etc.)

# Downhill Skiing Track: PhD Track

Tips for PhD students, exemplified for the Faculty of Medicine, University of Oslo (UiO)



- The supervisor and project should be decided upon before submission of PhD application
- Do we fit together? See "Supervisor track" and Chapter 13 of the Research Handbook (RH)



Read the [PhD Handbook](#), which includes information on the PhD program and application requirements at UiO

## START

### Application of admission to the PhD program:

- Application form (information about the applicant, supervisor, co-supervisors, financing, PhD courses)
- Project description (maximum 10 pages)
- Certified copies of diplomas from completed degrees (medical, masters, graduate or equivalent)
- Confirmation of PhD project funding ( $\geq 1$  year)
- Agreement with external parties (for external employees and / or candidates who make use of resources outside the University). A main supervisor from outside the University may be suggested, but should be justified

### Project period

See "The Downhill Skiing Track for Research Project" and Chapter 10 (RH) to ensure that the formalities are in order for the research project



### Recommendations of the Committee

Within three months after receiving the thesis, the adjudication committee must submit a report. The committee must give notice within two months of whether revisions are required or if the dissertation will be rejected. The committee evaluation should be available six weeks before any agreed upon time of disputation (minimum five weeks)



### Thesis submission

#### Submission of a thesis to the UiO includes:

- Application letter for evaluation of the thesis
- 4 copies of the thesis (memory sticks)
- Confirmation of approved PhD courses
- Co-authorship declarations
- Declaration of research permits (REK etc)
- A form containing suggestions for members for the adjudication committee (a task for the main supervisor)

### Printing of the thesis

After the thesis has been approved, it must be made publicly available at least two weeks before the disputation. Contact [Reprosentralen](#) (also assists in free electronic publishing in the UiO [DUO](#) electronic library). A popularized scientific summary (in Norwegian and English) must be sent to UiO at least 4 weeks before the disputation



### Preparations for disputation

UiO has made a list of tasks for the PhD candidate and The Faculty of Medicine

#### PhD Handbook

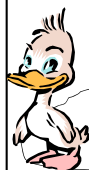
#### Booking of premises for disputation

The PhD student is responsible for booking the auditorium for the trial lecture and disputation. This may be scheduled after the committee evaluation is received

### The big day: Trial lecture and disputation

The adjudication committee decides the title for the trial lecture, which lasts 45 minutes. The candidate is given the topic 10 working days before the trial lecture will take place.

The disputation (2.5-3 hours) is chaired by the Dean or a deputy Dean. This "Acting Dean" first briefly describes the submission process and evaluation of the trial lecture. Thereafter, the PhD candidate gives a 20 minute popularized scientific account of the PhD research work performed. Subsequently, the first opponent has a maximum of 75 minutes for opposition, while the second opponent should limit the opposition to a maximum of 60 minutes



## FINISH

### PhD Party:

Guidelines for the PhD dinner on the day of the disputation. A nice speech is expected of the candidate

### Conferral of the PhD degree

After approved PhD disputation, the PhD degree is conferred upon the candidate by the University Dean on behalf of the University Board. This ceremony includes awarding of doctoral diplomas and usually occurs twice per semester. The PhD candidate may bring a limited number of guests

### Useful documents for the PhD track:

- [The PhD program](#)
- [Supervision](#)
- [Adjudication committee](#)
- [The chair of Defence](#)
- [Forms](#)
- ["Med en doktor i magen"](#)



Congratulations,  
you have passed your PhD exam!

Appendix in "The Research Handbook - from idea to publication", 8th. edition 2019, English version by Annetine Staff ([uxnaf@ous-hf.no](mailto:uxnaf@ous-hf.no)) and Karin C. Lødrup Carlsen ([uxklo@ous-hf.no](mailto:uxklo@ous-hf.no)) et al

Annetine Staff and Michael Pilemand Hjørnholm 2019



# Downhill Skiing Track: Supervisor Track

Exemplified for PhD supervisors at the Faculty of Medicine, University of Oslo (UiO)

## Basic information for supervisors:

- PhD education at the Faculty of Medicine: <http://www.med.uio.no/english/research/phd/>
- UiO supervision information: [Supervision - Faculty of Medicine](#) and [Information for the supervisor - Faculty of Medicine](#)
- Courses in university-level pedagogy (UiO: Pedagogisk forskningsinstitutt, including a 25 hours module in “Scientific mentoring/ guidance” : <http://www.uv.uio.no/iped/om/fup/oppby-gjennomf/>)
- Ethics training programs: see this Research Handbook (RH) Chapter 16 and “Forskningsetisk bibliotek” (NEM: <http://www.etikkom.no/FBIB>)
- Research Formalities and responsibilities: see Chapters 6 and 10 (RH)
- Research Leadership Program: See Chapter 9 (RH) and UiO (<http://www.uio.no/english/for-employees/competence/leadership-development/research-leaders/rfp/index.html>) and Copenhagen Business School, (<http://www.cbs.dk/>)
- Books on being a supervisor, in Norwegian: Lauvås P and Handal G (Forskningsveilederen. Cappelen Akademisk Forlag 2006) and Dysthe O and Samara A (Forskningsveiledning på master- og doktorgradsnivå. Abstrakt Forlag 2006)
- **Successful Supervision, A Dialogue Facilitator**” from Karolinska Institutet: practical help for the supervisor and student: clarifies expectations and roles, and provides guidelines for creating realistic plans for the research project: <https://staff.ki.se/literature-for-supervisors>

## Supervisor and candidate: a good match for this PhD project?

- Check CV and personal background information. For students: check with other PhD students/research group members
- Clarify expectations (it is the supervisor’s responsibility to initiate the conversation): ambitions, responsibilities, roles, mutual expectations, collaborative format, co-supervisors’ roles, PhD timeline, funding, publication rules (possible publications during and after PhD), potential access to data following PhD etc.

## The main supervisor's tasks (in most cases):

- Assistance with shaping the PhD project ideas and outline (may be provided by the potential PhD student) of the student’s PhD application
- Obtaining PhD grant
- Identify suitable co-supervisor(s)

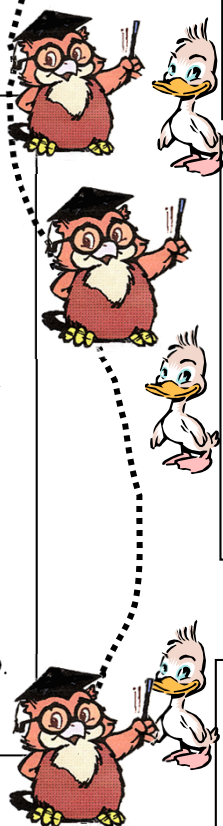
## Project period:

- **2019 UiO PhD Handbook**
- **The supervisor is responsible for ensuring that formal regulations are followed** (during the entire project period) and should help the PhD candidate in understanding the rules for formalizing research projects. The Research Director is responsible at the institutional level and the Project Manager has the practical responsibility, according to The Health Research Act, see Chapters 6 and 10 (RH)
- **Formal preapproval of research projects** (at the institution and within REK etc): see “Project Downhill Track” and Chapter 10 (RH) to ensure that the formalities are in order for all research projects
- **Regular sessions with the supervisor:** Frequency, type and duration depends on the project type, and the candidate’s/supervisor’s background, experience and personality.
- **In case of conflict** between PhD student/supervisor (if a conflict cannot be resolved internally or at local institution): contact the PhD coordinators at the Faculty of Medicine, UiO.
- **Career guidance on future research options** after PhD completion

## The End (of the PhD period):

- Guide the synopsis writing and submission of PhD thesis
- Provide suggestions to UiO on composition of the PhD evaluation (adjudication) committee (the head of the committee must be academically employed by UiO, both genders are to be represented)
- Deliver a nice supervisor speech at the PhD party

# START



**Submit application for admission to the PhD program:** see Chapter 13 (RH), and “PhD Downhill Skiing Track”. Read information in the UiO [PhD handbook](#)

## Project period:

- **Conduct the research projects** ☺
- Attend PhD program courses (30 credits, including mandatory and elective components) and follow up meetings with the supervisor/ research group
- The PhD student has a personal responsibility to ensure that regulations and recognized ethical principles are followed, although the institution (“forskningsansvarlig” i.e. the Research Director) has the overall formal responsibility and the Project Manager has the day-to-day practical responsibility

## The End (of the PhD period):

Submission of PhD thesis, dissertation, PhD party (see Chapter 13 and the “PhD Downhill Skiing Track”). A nice speech to supervisors and everyone else that has assisted in the PhD period is expected

# GOAL



**Congratulations, the student has been successfully supervised to a PhD degree!**

# Downhill Skiing Track: Quality Control Study Track in 3 steps

Tips for researchers at the Division of Gynaecology and Obstetrics, Oslo University Hospital (OUS)

**Approval of quality control studies, health research and other studies with publishing purpose, outside the mandate of REK at OUS:**



Quality Control Study Idea

START



## STEP 1: START HERE (after having a good idea..):

**START to discuss the project/get preliminary internal anchoring with ALL involved departments in the project \***. Seek help: colleagues, department manager (can the project be carried out as planned? Required more resources?), local research advisor, department for R&D in the Division of Gynaecology and Obstetrics, research manager, "Personvernombud" (PVO, Personal Data Officer)

Create document A & B OUS-template on: <http://www.oslo-universitetssykehus.no/personvern>

• **A (Protocol):** Simplified version is made for quality assurance project

• **B (Informed Consent):** Customize for future publishing: At group/individual level, sharing of data etc.

Publishing requires as default consent. If it is considered inappropriate (possibly research-unethical, based on selection bias) to obtain patient consent, the PVO may make exceptions/balances after assessment of the project integrity. Researcher must justify social benefit/patient benefit/privacy disadvantages for the individual patient and group, and indicate whether data that is intended to be published/presented is actually anonymous etc.

Gray zone research/quality assurance? PVO and department/research advisor can help with the assessments, but send REK in case of doubt/gray projects against research (see Downhill Skiing Track for research)

## Step 2: Department(s):

Electronic application to \*relevant OUS department (s)

- Document A (only needed if not enough space in document D)
- Document B (informed consent, if needed)
- Document D (always needed)
- Head of Department(s) (after consultation with research advisor) approves the application



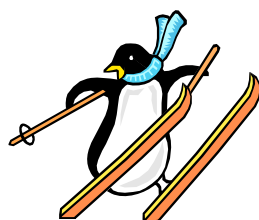
## Step 3: PVO (Personvernombud):

**New from 2019:**

- <https://skjema.uio.no/meldeskjema>

Upload attachments as requested. It is the PVO that provides the formal treatment basis for the use of personal data, including publishing opportunities. Patient consent is the main rule, but exceptions can be made correspondingly in REK. The project manager must emphasize that the project is NOT intended as pure internal quality assurance, but that this is a study, ie it is ALSO intended to published data from this quality project.

The PVO will, in recommendation, confirm the creation and where the registry can be stored on the correct OUS server. Department managers on the Division of Gynaecology and Obstetrics, have access to an overview of the clinic's quality projects: OUS Medinsight PVO registeroversikt



FINISH

**The study is formalized and can start!**

**PS: remember to let PVO and [mihjoe@ous-hf.no](mailto:mihjoe@ous-hf.no) know when the study is finished..**

Appendix in "The Research Handbook - from idea to publication", 8th. edition 2019, English version by Annetine Staff ([uxnnaf@ous-hf.no](mailto:uxnnaf@ous-hf.no)) and Karin C. Lødrup Carlsen ([uxklo@ous-hf.no](mailto:uxklo@ous-hf.no)) et al

Annetine Staff (Research leader), Kirsten Hald (Head of Dept. of R&D) and Michael Pilemand Hjørnholm 2019



# Downhill Skiing Track: Economy 1-2-3-4-5-6

Tips for researchers at the Division of Obstetrics and Gynaecology, Oslo University Hospital (OUS)

**Step 1: (Project Manager): NB: First of all, get an internal internship** at all departments involved. Read Procedure No. 64254 in the e-Manual (Guidelines for Specific Financing Operations)

## Step 2: Application

**Project Manager:** Preparing application. Before submitting an application, it must be approved by all department heads involved

**Authorized manager** (see e-manual document 26) must approve that the application is of good quality and that the financial prerequisites are met

**Financial Manager** (KVI: Toril Waage) is responsible for controlling the financial conditions. **Remember:** take into account current rates for coverage contributions. For salaries: add social costs (40%) and overhead (18%: 8% to central OUS and 10% to clinic) (some exceptions, see e-manual document 19106)

**Research Support** in Oslo Hospital Service (OSS) offers advice and assistance (EU, Research Council, Health South-East RHF and other research sources) [grants@ous-hf.no](mailto:grants@ous-hf.no)

**Some applications for example all international and NFR** must be approved by the Department of Administrative Research Support (same mail as above)

<https://oslo-universitetssykehus.no/fag-og-forskning/forskning/regional-forskningsstotte>



## Hurray! Allocation of funds!

### Step 3: Receive grant / sign agreement

Confirmation of acceptance and receipt of funding must be approved on the same level as application

Letter of appropriation and agreement must first quality assured by Research Support



### Step 4: Organization of the project

Project manager contacts financial staff in clinic which helps with the creation of project number, as well as notification to Accounting and Research Support

Ev. new positions must be applied for through the managerial committee

The line manager is responsible for archiving all project documentation in P360



### Step 5: Ongoing project

The project manager and line manager are responsible for continuously checking the accounts for the project in LIS. Contact the finance team for info and if necessary. training

Progress Reporting: Follow instructions from the giver. Research support shall ensure quality / financial reporting to the EU.

See e-manual document 64254 for details

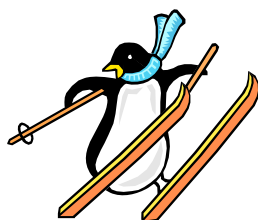


### Step 6: Finish project

The line manager has the main responsibility for the preparation of financial and professional reports

The project manager must contact the financial staff to review the accounts

Ev. Repayment of funds must be approved by the clinic's finance manager







**Oslo University Hospital:** Harald Arnesen, Annetine Staff, Karin C. Lødrup Carlsen, Anne Flem Jacobsen & Anne Grete Bechensteeen.



**Helse Bergen,**  
Haukeland  
University Hospital  
Ernst Omenaas

Web edition available at the web address of Oslo University Hospital:

<https://oslo-universitetssykehus.no/forskningshandboken>