Medical research into clinical practice

Code: M_BMRTCP19
Type: Optional
Period: Semester 1
Credits: 24.0
Language of instruction: English
Faculty: VUmc School of Medical Sciences
Coördinator: Mrs. dr. M.M. ter Wee-Zaal, mr. prof. dr. J.W.R. Twisk
Examinator: Mrs. dr. M.M. ter Wee-Zaal, mr. prof. dr. J.W.R. Twisk
Mode of delivery: Face-to-face
Learning activities and teaching methods: Lectures, practicals, working groups
Level: 300

Target audience
Bachelor’s students of VUmc School of Medical Sciences and external (and international) students with a (bio)medical background.

Course content
Nowadays, working as a physician means that you need to understand medical research, as this is the key to good clinical practice. But not only having the knowledge, but also being able to apply medical research is important. Therefore, the minor Medical Research into Clinical Practice has been developed. In this minor students learn how to set-up medical research, how to analyze the retrieved data as a tool to answer the research question of interest, and learn what the implications are for clinical practice. This minor is a combination of theory and practice as the student will be placed at a medical department to perform a medical research project on his/her own, in one of the research institutes of the VU medical center (or other locations if possible). For the students of the VUmc School of Medicine, the bachelor thesis consists of the paper that will be written based on their own research, which they have performed during the four months of this minor. The minor can be divided in three major divisions: the set-up, the analysis and the interpretation. Once every two weeks, the student will have a meeting with their supervisor from the department of Epidemiology and Biostatistics, in small groups during the Monday Morning Meetings, and once every two weeks, question hours are organized in which the students can ask help with their research project from prof. dr. Jos Twisk, dr. Marieke ter Wee and/or dr. Martijn Heymans.

General
Besides the teaching and practical hours, the student will be working on their own research for 2 days at the medical department during the whole period of 4 months.
The set-up: Setting up research
In the first weeks of the minor Medical Research into Clinical Practice, the student will learn more about how to set-up different types of studies and about the pitfalls accompanying the different type of studies. Besides that, the students will also learn how to perform systematic reviews, how to assess the quality of measurement instruments, and how to perform qualitative research and cost-effectiveness studies. Finally, the students will learn how to write a research proposal. This part is examined with a research proposal and a theoretical exam.

The analysis: Analyzing data to retrieve an answer to the research question
Statistical analyzes are a tool that is needed to retrieve an answer to the research question that is being studied. Therefore, we pay a lot of attention on how to analyze data. We start off with a recap of linear, logistic and Cox regression analyses. Furthermore, the students will learn how to deal with missing data, how to build and validate prediction models, and how to perform mediation analyses. This first part is examined with a combined theoretical and practical exam.
In the second part, the students will learn how to analyze correlated data, how to analyze longitudinal data and how to analyze data retrieved from RCTs. This part will be examined with a practical exam and a theoretical exam.

The interpretation: Interpretation of the findings and implications for clinical practice
In the last weeks of this minor, we will focus on how results of medical research are used in development of guidelines and prediction rules that are used in the clinical practice. We will focus on the impact of big data and why this is becoming more important in medical research. The students will learn how costs impact the health care system, how to deal with the press, how to assess the quality of published articles, and how to convert the results of medical research into a poster and presentation. This part is examined by a poster presentation.

Learning outcomes
1. Students know which steps to follow to set-up and perform a medical research;
2. Students can analyze and interpret their own research data;
3. Students can present the findings of their research in an appropriate manner;
4. Students know how research is being performed at a medical department of an (academic) hospital;
5. Students can perform their own medical research.

Assessment methods and criteria (min. 5 independent exams)
Four theoretical exams, Research proposal, 2 practical exams, poster presentation. All practical and theoretical exams are open book exams and with open ended questions.

Recommended or required reading and other learning resources/tools
Books:
- A Quick Guide on How to Conduct Medical Research. From Set-up to Publication. ISBN: 9789036822473
- Applied Mixed model Analyses. ISBN: VOLGT
- Applied Longitudinal Analyses for Epidemiology. ISBN: 9781107699922

Prerequisites
Knowledge on descriptive statistics and regression analyses (MWO1 and MWO2 - Bachelor courses B1 and B2) is recommended. Regression techniques (linear, logistic, Cox) and SPSS.
Target audience
Bachelor students in general who are interested in medical research and would like to combine theory and practice.