

# **Year Report of the Institute of Medical Education Research Rotterdam (iMERR) 2014**

Prof. Dr. W.W. van den Broek, director of Medical Education Erasmus MC

# Introduction

The institute of Medical Education Research Rotterdam (iMERR) is a multidisciplinary, collaborative effort of the Faculty of Social Sciences, in particular the Department of Psychology, and Erasmus MC. The two faculties established iMERR one year ago. This effort was achieved by generous help of the Executive Board of the EUR as well as the dean of the Erasmus MC, prof. dr. J. Verweij and the dean of the Faculty of Social Sciences prof. dr. H.T. van der Molen.

The Andries Querido Visiting Chair established by the Board of the EUR and occupied by Prof. dr. Geoff Norman for the past two years inspired many researchers in the field of medical education to collaborate on this research. The iMERR group currently consists of 2.2 fte tenured staff for research and 6.0 fte temporary staff (2 post-docs, 3 internal PhD students, 10 external PhD students).

The Institute conducts research in medical education in the broadest sense, incorporating all aspects of medical education, ranging from selection of students up to the post initial education of medical specialists and stimulating the education and training of its investigators (PhD students and postdocs).

The institute has several research areas, selected due to their potential to meet current needs and to make the best use of the scientific background of the research groups in medical education within the Erasmus MC and the Institute of Psychology of the Erasmus University Rotterdam.

Overall research in medical education will focus on study success and quality of education based on evidence based medical education. To achieve this, collaboration not only with the faculty of social sciences is needed but also with other faculties and universities in The Netherlands, Europe and outside of Europe. We will invest in partnerships and networks between disciplines in The Netherlands and other countries. Already collaborations with other faculties of medicine have started as well as contacts were established with Centre for Education and Learning (CEL) and RISBO, the research institutes of the EUR.

The previous year a scientific integrity plan for iMERR was accepted. A website was published <http://www.imerr.nl>. We applied for several grants.

In order to become visible and seen as a nexus for research in medical education we organized institute wide activities where people can meet and work with members of the group. Bi-weekly “lab meetings” are organized for those involved in research. Monthly colloquia are organized to which members of other faculties and disciplines are also invited.

In November 2014 the Querido symposium was all about research in medical education and visited by national researchers in the field of medical education. These activities have contributed to open the door for collaboration with other departments, and joint studies are presently under development with researchers from the general practice, internal medicine, pediatrics and neurosciences departments.

iMERR is now located at a dedicated part of the Desiderius school. The aim for the coming years is to acquire grants, publish scientific articles, deliver PhDs and build interdisciplinary collaborations and networks with those institutions and researchers interested in medical education. A description and strategy will be published in a 5-year program for iMERR in the coming year.

*Key words:* medical education, continuing medical education, admission test college, clinical clerkship, internship and residency, problem-based learning, distance education, e-learning, clinical reasoning, minority recruitment.

## Scientific Publications in International Journals

- Bonke B, Zietse R, Norman G, Schmidt HG, Bindels R, Mamede S, Rikers R. Conscious Versus Unconscious Thinking in the Medical Domain: The Deliberation-without-Attention Effect Examined. *Perspect Med Educ.* 2014;3(3):179–89.
- Brinke BT, Klitsie PJ, Timman R, Busschbach JJV, Lange JF, Kleinrensink GJ. Anatomy Education and Classroom Versus Laparoscopic Dissection-Based Training: A Randomized Study at One Medical School. *Academic Medicine.* 2014;89(5):806–10.
- Dankbaar ME, de Jong PG. Technology for Learning: How It Has Changed Education. *Perspect Med Educ.* 2014;3(4):257–9.
- Dankbaar ME, Stegers-Jager KM, Baarveld F, Merrienboer JJ, Norman GR, Rutten FL, van Saase JL, Schuit SC. Assessing the Assessment in Emergency Care Training. *PLoS ONE.* 2014;9(12):e114663.
- Dankbaar ME, Storm DJ, Teeuwen IC, Schuit SC. A Blended Design in Acute Care Training: Similar Learning Results, Less Training Costs Compared with a Traditional Format. *Perspect Med Educ.* 2014;3(4):289–99.
- Ibiapina C, Mamede S, Moura A, Elói-Santos S, van Gog T. Effects of Free, Cued and Modelled Reflection on Medical Students' Diagnostic Competence. *Medical Education.* 2014;48(8):796–805.
- Kamp RJA, van Berkel HJM, Popeijus HE, Leppink J, Schmidt HG, Dolmans DHJM. Midterm Peer Feedback in Problem-Based Learning Groups: The Effect on Individual Contributions and Achievement. *Advances in Health Sciences Education.* 2014;19(1):53–69.
- Mamede S, Van Gog T, Van Den Berge K, Van Saase JLCM, Schmidt HG. Why Do Doctors Make Mistakes? A Study of the Role of Salient Distracting Clinical Features. *Academic Medicine.* 2014;89(1):114–20.
- Mamede S, Van Gog T, Sampaio AM, De Faria RMD, Maria JP, Schmidt HG. How Can Students' Diagnostic Competence Benefit Most from Practice with Clinical Cases? The Effects of Structured Reflection on Future Diagnosis of the Same and Novel Diseases. *Academic Medicine.* 2014;89(1):121–7.
- Mamede S, Schmidt HG. Reflection in Diagnostic Reasoning: What Really Matters? *Academic Medicine.* 2014;89(7):959–60.
- Mamede S, Schmidt HG. The Twin Traps of Overtreatment and Therapeutic Nihilism in Clinical Practice. *Medical Education.* 2014;48(1):34–43.
- Rotgans JI, Schmidt HG. Situational Interest and Learning: Thirst for Knowledge. *Learning and Instruction.* 2014;32:37–50.
- Schaap L, Verkoeijen P, Schmidt H. Effects of Different Types of True-False Questions on Memory Awareness and Long-Term Retention. *Assessment and Evaluation in Higher Education.* 2014;39(5):625–40.
- Scheele F, Van Luijk S, Mulder H, Baane C, Rooyen CD, De Hoog M, Fokkema J, Heineman E, Sluiter H. Is the Modernisation of Postgraduate Medical Training in the Netherlands Successful? Views of the Nvmo Special Interest Group on Postgraduate Medical Education. *Medical Teacher.* 2014;36(2):116–20.
- Schmidt HG, Mamede S, Van Den Berge K, Van Gog T, Van Saase JLCM, Rikers RMJP. Exposure to Media Information About a Disease Can Cause Doctors to Misdiagnose Similar-Looking Clinical Cases. *Academic Medicine.* 2014;89(2):285–91.
- Wijnia L, Loyens SMM, Derous E, Koendjie NS, Schmidt HG. Predicting Educational Success and Attrition in Problem-Based Learning: Do First Impressions Count? *Studies in Higher Education.* 2014;39(6):967–82.

# Promoties

**Mrs. M. Chamberland, MD. Title: Self-explanation fosters clinical reasoning among medical students.**

On November 13, Martine Chamberland, an internist of the Faculty of Medicine, Sherbrooke University, Canada, became the first student of iMERR to obtain a Ph.D degree. She successfully defended her thesis “Self-explanation fosters clinical reasoning among medical students”.

Self-explanation is a learning strategy that involves having students generating for themselves explanations about pieces of information in a to-be-learned text or a to-be-solved problem. Self-explanation has proved effective to foster learning in other domains, such as physics and chess, but had never been tested in medical education. Martine was able to show that self-explanation can also be a useful approach for clinical teaching. It fosters students’ learning of clinical diagnosis in complex topics and has its positive effect enhanced by the addition of appropriately designed modeling.

These findings bring a novel and relevant contribution to what is known about effective strategies for clinical teaching. Her thesis was supervised by Prof. dr. Henk Schmidt, with dr. Sílvia Mamede as co-supervisor, and evaluated by a committee composed by dr. Anique de Bruin (Maastricht University), Prof.dr. Axel Themmen, Prof.dr. Henk van der Molen, Prof.dr. Maarten Frens, Prof.dr. Matthijs de Hoog, and dr. Walter van den Broek.

## Ongoing PhD trajectories within the EUR

**Situational Judgment Test (SJT) for the Selection into Medical School (Wendy de Leng)**

Wendy started her PhD in April 2014 under the supervision of dr. Karen Stegers-Jager (co-promotor), prof. dr. Axel Themmen (1st promotor) and prof. dr. Marise Born (2nd promotor). Her PhD-project is focused on selection into medical school using a Situational Judgment Test (SJT).

During the selection procedure of last year a first SJT originating from the UK was administered among the applicants for the Erasmus Medical School. This SJT, created to measure integrity, aims at extending the range of constructs on which medical students are selected. In addition, an SJT displays lower ethnic subgroup differences that exist on traditional cognitive tests and can thereby increase the ethnic diversity among medical students.

The SJT was administered among a group of Subject Matter Experts (SMEs) in order to create a rational scoring key for converting the applicants’ judgments into scores. Several of these rational scoring methods exist. Wendy’s first study will be focused on the comparison of these different scoring methods on the reliability of and ethnic subgroup differences on the SJT. Because of the overall low reliability of the integrity SJT as well as concerns with the realism of some of the scenarios, Wendy started with the development of a new SJT using critical incident interviews. New scenarios will be written based on these critical incidents. This new SJT will be administered during the next selection procedure.

## **Recruitment and selection for a future diverse medical workforce (Lokke Gennissen, MD)**

Lokke Gennissen started her PhD in July 2014, under supervision by Karen Stegers-Jager, Matthijs de Hoog (Erasmus Medical Center), Lia Fluit and Jacqueline de Graaf (Radboud University Medical Center Nijmegen).

In order to make a more fluent transition from undergraduate to postgraduate medical training and in that way pursuing an educational continuum a fast track program is introduced in the Netherlands. The fast track program is a program for last year medical students, where they can already acquire competencies at the level of first year residents in training in their specialty of choice. These acquired competencies enable a reduction of the duration of postgraduate training.

In the context of these recent changes this PhD trajectory is focused on the specialism choice of medical students and the recruitment and selection of the future medical specialists. These recent changes confront students and (postgraduate) educators with an earlier decision moment. Students are confronted with an earlier specialism choice, while postgraduate educators are confronted with an earlier selection of students eligible for postgraduate training in their specialty.

To address the lack of diversity in the medical specialty population, the focus in the studies concerning the specialism choice will be on the role of ethnicity, socio-economic class and gender. In her first study she will interview both selection committee members and applicants regarding the selection of residents.

In a second study she will look into prestige perception differences of medical specialties between Dutch and ethnic minority medical students and between first generation and not first generation university students.

## **Ongoing PhD trajectories outside the EUR**

The following external PhD projects have been ongoing, since 2013, under the supervision of Prof.dr. Henk Schmidt, with dr. Sílvia Mamede as co-supervisor:

- Bernard Martineau, MD, general practitioner, Faculty of Medicine, Sherbrooke University, Canada. Thesis theme: The influence of peers on medical students' learning of physical examination.
- Dalal Al Qahtani, dentist, Medical College, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Contextual factors influencing physicians' diagnostic performance.
- Daniel de Castro, MD, internist-endocrinologist, Faculty of Medicine, University of the State of Ceará, Fortaleza, Brazil. Theme of the thesis: Instructional approaches to foster medical students' clinical reasoning.
- Elmi Badenhorst, psychologist, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa. Theme of the thesis: Students' misconceptions in medical education
- Fathia Al Shaikh, MD, Medical College, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Patient's characteristics and physicians' clinical reasoning.
- Manahil Mohamedani, MD, Medical College, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Physician-related factors influencing diagnostic reasoning and diagnostic accuracy.
- Telma Kremer, psychologist, University of São Paulo, São Paulo, Brazil. Thesis theme: Students' emotions and learning in medical education.

- Shaikha Hamed Al-Aujan, dentist, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Expertise in clinical reasoning in dentistry

# Projects

## International

A collaborative project with the Faculty of Medicine of the Federal University of Minas Gerais, Belo Horizonte, Brazil, is presently ongoing, funded by a research grant obtained from the CAPES-NUFFIC Program (Call for Proposals for cooperation with the Brazilian higher education on the level of Ph.D). The project has allowed for 3 joint studies to be conducted in Belo Horizonte in collaboration between the iMERR clinical reasoning research group (Henk Schmidt, Sílvia Mamede) and local researchers in Brazil. Two of the studies were presented at the AMEE 2014 conference and led to co-authored publications. The project has strengthened collaboration with a respected university in Brazil.

The iMERR clinical reasoning research group (Henk Schmidt, Sílvia Mamede) and researchers from the University of Pennsylvania Faculty of Medicine collaborated throughout 2014 in the design and implementation of a study on the effects of deliberate reflection upon to-be-diagnosed cases on internal medicine residents' diagnostic performance in a naturalistic environment (the internal medicine residency training in Pennsylvania). The study will be presented in the upcoming conference of the Society of Medical Decision Making in the US, lead to a joint publication and to follow-up studies.

The iMERR clinical reasoning research group (Laura Zwaan) collaborates with the university of McMaster University, Canada, and the University of Washington (USA) on a project on cognitive biases in clinical reasoning. The data-gathering is currently ongoing. The project will result in a joint publication.

The iMERR clinical reasoning research group (Laura Zwaan) collaborates with Dr. Hardeep Singh (Houston Veterans Affairs Center for Innovations in Quality, Effectiveness and Safety and Baylor College of Medicine, Houston, Texas) on several papers regarding measurement of diagnostic error. This resulted in one paper that is in press and one paper that is currently in preparation.

## National – Internal

Relation between biological and psychological stress and well-being, and academic performance (Karen Stegers-Jager & Andrea Woltman). This pilot study aims to investigate the relation between chronic psychological and biological stress levels and academic performance. Furthermore, both student-related factors as well as school-related factors will be studied that may influence stress levels, academic performance and students' well-being as defined by time use, including extracurricular activities, and (absence of) conflicts between life domains (study, family, work, leisure time). Chronic psychological and biological stress levels, as measured by psychological stress questionnaires and hair cortisol concentrations respectively, and academic performance of the last medical student cohort entering before and the first cohort entering after the implementation of a strict academic dismissal policy will be compared. In this project we collaborate with the Section Endocrinology of the Department of Internal Medicine, and with the Section Pedagogical Sciences of the Faculty of Social Sciences of the EUR.

Research project on the sources of cognitive diagnostic errors and strategies to minimize them ((Henk Schmidt, Sílvia Mamede). Three studies were conducted by the iMERR research group on clinical reasoning during 2014 in collaboration with others departments in Erasmus MC:

1. the influence of difficult patients behaviors on physicians' diagnostic accuracy, two joint studies with the

- general practice and the internal medicine departments (article submitted for publication);
2. the effect of salient distracting clinical features reasoning on physicians' diagnostic reasoning and diagnostic performance, an eye-tracking study was designed and conducted in collaboration with the neurosciences department (data is presently being analysed). In both studies, direct research costs (research assistant, participants' recruitment) were covered by a grant received from the Executive Board of the Erasmus University Rotterdam.

iMERR and the general practice department have worked together on a project to improve teaching of clinical reasoning in the bachelor phase. A new format for the course was designed by the GP department and is to be tested in April 2015. The iMERR clinical reasoning research group has provided technical support for the investigation of the effects of the new format on students' learning and satisfaction.

## **Collaboration (international/national)**

Research group 'Dedicated Schakeljaar' (NFU/ all Dutch medical schools)

InReSH (International Network for Researchers in Selection into Healthcare)

Dutch Flemish network of Researchers in Personnel Recruitment and Selection

## **Research reputation**

Ad hoc reviewing

In 2013–2014, the iMERR researchers worked as ad hoc reviewers:

1. For the top medical education journals (Medical Education, Academic Medicine, Advances in Health Sciences Education and others) and general higher education journals (Studies in Higher Education and others) as well for manuscripts on medical education submitted to top medical journals (JAMA).
2. For international medical education conferences (Association for Medical Education in Europe- AMEE conference), including grant reviewing.

## **Presentation in national and international conferences**

Research conducted by the iMERR members and by internal and external PhD students was presented at the 2014 NVMO, AMEE and Ottawa conferences. The latter are the largest international medical education conferences.



# Conference Organization

Mrs. Dr. Laura Zwaan is on the planning committee of the international Diagnostic Error in Medicine conference.

## Positions in professional society

Mrs. Dr. Laura Zwaan is the co-chair of the research committee of the Society to Improve Diagnosis in Medicine <http://www.improvediagnosis.org/?page=Committees>

## Editorial Board

Mrs. Dr. Laura Zwaan is on the editorial board of Diagnosis. Dr. Walter van den Broek is on the editorial board of the Dutch Flemish Journal of Psychiatry and Current Drug Therapy.

## Fellows

- Mrs. Dr. Silvia Mamede, MD, PhD, co-director of iMERR
- Prof. Dr. Ir. Axel Themmen, chair of the advisory board of iMERR
- Mrs. Dr. Karen Stegers-Jager, PhD, member advisory board iMERR
- Mrs. Dr. Andrea Woltman, PhD, member advisory board iMERR
- Prof. Dr. Henk Schmidt, PhD, member advisory board iMERR
- Mrs. L. Zwaan, PhD, member advisory board iMERR

## Associate members

- Jelmer Alsma, MD
- Prof. Dr. Patrick Bindels, MD, PhD
- Dr. Herman Bueving, MD, PhD
- Mrs. Mary Dankbaar
- Prof. Dr. Matthijs de Hoog, MD, PhD
- Mrs. Dr. Stephanie Klein Nagelvoort-Schuit, MD, PhD
- Prof. Dr. Els Berns, PhD

# Honorary members

- Prof. Dr. Geoff Norman, PhD

# Societal impact

- van den Broek WW. [Dedicated Bridge Year: A Blessing?] Dedicated Schakeljaar Een Zegen? Tijdschr Psychiatr. 2014;56(12):772–4.
- Heineman MJ, Borleffs J, van den Broek W, de Graaf J. Het Schakeljaar Uit De Mottenballen. Medisch Contact. 2014(9):442–4.
- Twitter and blog about a.o. medical education: <http://www.shockmd.com> , [twitter.com/drshock](https://twitter.com/drshock)
- Presentation Mw. Dr. Karen Stegers-Jager at Symposium “Anders in de Witte Jas’ VU Medical Center, June 17th 2014,
- Presentation Mw. Dr. L. Zwaan, PIAA congress on medical liability Invited speaker on cognitive debiasing in medical diagnosis October 7th, 2014 in Amsterdam the Netherlands.

# **Mrs. Dr. Laura Zwaan, psychologist, postdoctoral researcher and fellow at the institute for Medical Education Research Rotterdam.**

## **PhD guidance**

Shaikha Hamed Al-Aujan, dentist, King Saud bin Abdul-Aziz University for Health Sciences, Riyadh, Saudi Arabia. Thesis theme: Expertise in clinical reasoning in dentistry.

## **Collaborations**

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# **Mrs. Dr. Karen Stegers-Jager, assistant professor and fellow of iMERR, MSc in Educational Science and Technology, PhD in Medical Education from the Erasmus University Rotterdam.**

## **PhD guidance**

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## **Projects**

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## **Presentation**

Mw. Dr. Karen Stegers-Jager tijdens Witte Jassen ceremonie VUmc Amsterdam over Diversiteit in medisch onderwijs.

# Wendy de Leng Situational Judgment Test for the Selection into Medical School

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