

The Maastricht–Duke bridge: An era of mentoring in clinical research – A model for mentoring in clinical research - A tribute to Dr. Galen Wagner

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Abstract

Objective: With the passing of Dr. Galen Wagner, an exceptional collaboration between Maastricht University Medical Center, The Netherlands, and Duke Clinical Research Institute, USA, has come to an end. This article focuses on the background of what Galen coined the Maastricht–Duke bridge (MD-bridge), its merits, limitations and development throughout the years, and his special role.

Methods: Between 2004 and 2015, 23 Maastricht University medical students and post-graduate students were enrolled in the 4-month research elective, mentored by Galen and the Maastricht co-mentor. They were asked to complete a survey about their MD-bridge experience.

Results: Sixteen out of the 23 students responded. None but 1 participant had prior research experience. Following their MD bridge-program most participants published 1 or more manuscripts and/or presented their research in an international setting. They felt they had full responsibility as a leader of their project with all participants developing meaningful skills useful in their current job. Fourteen out of 16 would recommend the MD-bridge experience to others. Participants considered the program of great value for their personal growth and independence, giving a feeling of achievement. In addition, for some participants it led to careers in foreign countries including medical practice and research, or obtaining PhDs.

Conclusions: With Galen's impressive career of mentoring students, including the 23 MD-bridge participants, he has left behind an amazing concept of self-development in research and personal life. The successes of the MD-bridge prove that it is possible for students to be young investigators during or just after medical school with the potential to contribute to developing meaningful skills and noteworthy careers. Collaborations between international universities, such as the MD-bridge, are feasible and should be embraced by other institutions.

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Introduction

With the passing of Dr. Galen Wagner, an exceptional collaboration between Maastricht University Medical Center (MUMC) [1], The Netherlands, and Duke University Clinical Research Institute (DCRI) [2], Durham, North Carolina, USA has come to an end. This report focuses on the background of what Galen coined the Maastricht–Duke bridge (MD-bridge), its merits, limitations and development throughout the years. To achieve this, responses from the majority of participants in

this program over the last 10 years have been collected and structured as well as input from Maastricht University medical school. The MD-bridge would never have existed without the continuous input and efforts of the late Galen Wagner. Therefore, this article commences with an overview of the philosophy behind the program (the university without walls), as offered by Galen.

University without walls

Thinking and acting beyond borders, both literally and figuratively, has always been a major aspect of Galen's concept of clinical research. His primary interest was electrocardiology but with the advent of new imaging techniques, he recognized

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new opportunities to improve the ECG as a diagnostic tool by using information from multimodal imaging techniques such as the coronary angiogram, the echocardiogram and MRI. Galen has always collaborated with likeminded researchers who were open to work together. Much effort was spent not only to build solid collaborations, but also establishing a background to train students to do research in a transnational environment. Thus, for clinical, research and research-education purposes, walls between universities were broken down and bridges were built to establish bilateral collaborations and exchange programs. This is what Galen called the “*university without walls*”.

The story of the MD-bridge started in 2003 with the collaboration between one of the authors (Anton Gorgels), mentor at the MUMC and Dr. Mitch Krukoff, at DCRI, consisting of a study program on the analysis of post-reperfusion arrhythmias. Students were encouraged to go abroad (from their home institution in Maastricht to DCRI in Durham [NC]) and spend dedicated research time at Mitch’s laboratory. Subsequently, the program was continued by PhD fellows, but Galen wanted to continue research electives at the student level. A specific need for a training program to teach students how to do their own research using databases for which they had to build their own scientific collaborations emerged. Having been trained by Galen himself, Mitch found in Galen an excellent potential mentor for students to be coached in designing and performing their authentic scientific projects. Soon Galen was put in contact with Anton and the idea of an extended exchange program in the line of the aforementioned collaboration between Mitch and Anton took shape.

Methods

This article discusses the evaluation of the MD-bridge, a research elective program of Maastricht medical students supervised by a combined mentorship from Duke and Maastricht. Between 2004 and 2015, 23 Maastricht University medical students and post-graduate students were enrolled in the program and were asked to complete a survey with questions about their MD-bridge experience. The mission was to develop young investigators being capable of performing clinical research independently. Within the time frame of 4 months students were challenged to have a complete research experience from hypothesis to peer-reviewed journal manuscript submission and presentation of their work in an international context. The student was appointed as the principal investigator being responsible for all steps in the research project such as hypothesis generation, finding a suitable database, the description of the study project, bringing together the necessary co-investigators, the collection of data, data analysis using appropriate statistics, reaching the correct conclusions, and writing the manuscript ready for the reviewing process. Following the “*university without walls*” concept described earlier, co-investigators, databases and other aspects of the research process could be invited from other institutions. In practice, after a preparation phase in Maastricht with an initial description of the study hypothesis and required database, students went in pairs to Duke University for about 18 weeks, usually in their last year of

medical school. An Outcomes Research Practicum [3], developed at Duke, was utilized during the Maastricht-based preparation phase to provide a 4-point workshop outline format for research study design: Introduction, General Methods, Statistical Methods, and Logistics.

In detail, the initiation of the research mentorship was divided in 4 phases:

- Phase 1 consisted of the recruitment of an individual by the mentor at Maastricht University. The local mentor had to weigh and decide if a person was capable of completing a challenging research project.
- In phase 2, a study design was created according to the Outcomes Research Practicum template with input from Galen, the local mentor, the student and from other potential collaborators at Duke, Maastricht or elsewhere. A potential research database was selected that was either from Maastricht University, Duke University or from one of the collaborative authors’ institutions. This preparation at the local university was of key importance for the whole mentorship and had to be completed before a student went on-site to start the research project.
- Phase 3 was to actually leave the home institution and start the process of data acquisition, analysis, and writing the manuscript. Ideally, the student would finish the manuscript and submit it to a peer-reviewed journal before returning home. In this phase the student was mentored by Galen in person and the mentor at the home institution via phone or video conferencing but was personally responsible for study progression and communication with collaborators.
- Phase 4 consisted of completing the manuscript and submitting it for publication. The student would also go through the process of responding to reviewers’ comments and resubmission of the manuscript until it was published. If possible, the student would also present his/her work in an international context.

Results

In total 16 out of 23 students that attended the MD-bridge program responded to the survey about their experience. The output of the various scientific projects resulted in many publications in scientific journals as well as presentations (oral and in poster-format) at various small or larger international research conferences. This results section summarizes, as completely as possible, to what extent the program has led to output in terms of publications of the research projects, and also focuses on personal achievements of all attendees during their dedicated time at Duke University and the years thereafter.

Program output

Table 1 summarizes the MD-bridge output from the 16 individual participants that completed the survey. What should be emphasized in discussing the output of this program is that apart from one, none of the participants had prior research experience before starting the program, but most of them published 1 or more manuscripts and presented their research

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