

Chapter 12

Med-on-@ix: Real-Time Tele-Consultation in Emergency Medical Services – Promising or Unnecessary?

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ABSTRACT

The aim of the project Med-on-@ix is to increase the quality of care for emergency patients by the operationalisation of rescue processes. The currently available technologies will be integrated into a new emergency telemedical service system. The aim is to capture all the necessary information comprising electrocardiogram, vital signs, clinical findings, images and necessary personal data of a patient at the emergency scene and transmit this data in real time to a centre of competence. This would enable a “virtual presence” on site of an Emergency Medical Services physician (EMS-physician, the German Notarzt). Thus, we can raise the quality of EMS in total and counter the growing problem of EMS-physician shortage by exploiting the existing medical resources. In addition, this system offers EMS-physicians and paramedics consultation from a centre of competence. Thereby referring to evidence-based medicine and ensuring the earliest possible information of the hospital.

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INTRODUCTION

At present, emergency calls are condensed to certain keywords, such as *respiratory distress*, and dispatched to both paramedics as well as the EMS-physician. Typically, the ambulance staffed with paramedics is the first on scene and the EMS-physician arrives a few minutes later. In rural areas the arrival period can exceed 30 minutes as there are more ambulance bases than EMS-physician bases. The distances from the bases to the scene are much shorter for ambulances than for the EMS-physician. As a consequence drug free interval vary significantly, depending on whether the emergency is taking place in an urban or rural area. Additionally, the lack of EMS-physicians in times of general shortage of physicians impedes the 24 hours occupation of EMS-physician bases in rural areas (Deutscher Bundestag, 2006) (Behrendt & Schmiedel, 2004).

The Med-on-@ix-project aims at the broad implementation of a telemedical system in EMS enabling support up to a real-time teleconsultation. The basis of the system is a centre of competence with an experienced emergency medical physician (further called *Telenotarzt* in accordance to the German equivalent for EMS-physician, the *Notarzt*). Advanced mobile data transmission enables the real time transmission of all vital parameters of a patient and a video live stream from the ambulance and the scene to the competence centre, where the information is visualized on large screens.

He uses specially designed software, including maps, and he has a documentation software as well as databases. The competence centre is responsible for the contact and data transfer to the hospital and the consultation with other institutions (for example family physician, cardiology, poisoning centre, and so forth). Thus, the rescuers on scene can focus on their main task, which is the manual patient care. German paramedics are restricted in their clinical actions due to legal limitations, for example drug therapy at the emergency scene.

Therefore, the advantage of this system is, that measures reserved normally only for physicians could be begun on the order of the Telenotarzt until the EMS physician arrives on site. Thus, the treatment free interval may be shortened. In cases where the EMS-physician is not present in the foreseeable future, the Telenotarzt could even replace the EMS physician in part. In most cases it is mainly the expertise and decision-making of the physician that is needed, rather than the practical skills (Gries, Helm & Martin, 2003).

The main aim of this research is to improve the quality of medical care and patient safety while speeding up the whole process. Since 2004, this project has been created by the emergency medicine section at the Department of Anaesthesiology, University Hospital of Aachen. In 2006, the merger of the existing consortium of industry and research was completed. The project Med-on-@ix is funded by the Federal Ministry of Economics and Technology funding programme *SimoBIT* (secure use of mobile information technology to increase value creation in small business and government)

The main partners in this consortium listed below:

1. Department of Anaesthesiology at the University Hospital Aachen EMS-physicians are recruited from the Department of Anaesthesiology The department operates a simulation centre (AIXTRA) with a “Full-Scale Simulator” to practice various real emergency situations.
2. Department of Information Management in Mechanical Engineering of the RWTH Aachen University, Germany, (ZLW/IMA) This department focuses on system integration, customer-driven technology development and design of human-technology interfaces. Within the Med-on-@ix project, the ZLW / IMA is responsible for the implementation of scenarios, the design of human-technology interfaces, as well as

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