

AI Driven Emergency Care: Merian Iselin Clinic Case Study

2025 | Use Case | Fine-tuned LLMs for Emergency Wards

Merian Iselin Clinic is a leading private healthcare institution in Basel, Switzerland, with a history spanning over 100 years. It specializes in orthopedics, surgery, and urology, and is also renowned for its sports medicine services. The clinic tackled the challenge of administrative overload. By integrating specialized AI agents in its emergency department, the clinic streamlined workflows, reduced paperwork, and allowed doctors to focus more on patient care.



THE CHALLENGE

A concerning trend has emerged in modern healthcare: doctors are spending more time behind computers than with patients. Despite the widespread use of technology, many tasks - such as report writing - still require manual input. As a result, physicians spend only a small fraction of their time providing direct patient care, with the majority of their time spent on electronic health records and other computer-based tasks. This imbalance leads to inefficient use of their time and potentially reduced quality of care. For more than two thirds of primary care doctors in Switzerland, the time spent on administrative activities such as invoicing is a major problem.¹

In addition, the increased cognitive load on healthcare providers, who are often forced to multitask between digital and physical responsibilities, further strains the doctor-patient relationship. Technical inefficiencies and hardware limitations worsen the situation, underscoring the urgent need for streamlined, user-friendly systems that allow doctors to focus on what really matters- patient care.

38%
unnecessary
administrative work²

518k
is the corresponding
number of physicians
hours/year²

68%
physicians see admin
burden as a major problem¹

¹ Source: <https://www.bag.admin.ch/bag/en/home/das-bag/aktuell/medienmitteilungen.msg-id-93048.html>
² Source: <https://doctorsns.com/sites/default/files/2020-11/admin-burden-survey-results.pdf>



PROJECT GOAL

The goal of the project was to develop a system of innovative AI agents capable of maintaining a consistently high standard of diagnosis and treatment in the emergency - regardless of the experience level of the team - while at the same time reducing the administrative burden. Unlike traditional AI solutions that perform specific tasks, these AI agents function as units capable of handling complex tasks independently and responding dynamically to changing conditions. In doing so, they provide flexible, proactive, and scalable support to the medical team.

This setup allows emergency personnel to spend more time with patients, work more efficiently and adapt quickly to changing situations. In addition, the system runs on-premises, ensuring that no data leaves the hospital, protecting patient privacy and data security.



"The patient pathway on an emergency ward is accompanied by a great deal of time-consuming administration. Not always are the most experienced specialists permanently available. These two factors affect the efficiency of patient treatment and therefore also patient satisfaction. We believe that the use of AI can improve both the consistency of quality and the efficiency of treatment, thereby increasing the satisfaction of medical staff and patients. In QuantumBasel, we have found an attractive and competent partner in our region to implement such a complex project."

Prof. Dr. med. Reinhard Elke



SOLUTION APPROACH

First, the project team identified the specific work processes that needed to be supported by AI agents: patient data entry and management, trauma classification, imaging and laboratory registrations, diagnosis entry and coding, therapy suggestion and coding, and report writing and billing.

During an initial medical assessment and triage, the collected data is captured using AI-supported speech recognition and directly processed by specially trained AI agents. Designed specifically for medical use cases, these agents surpass the capabilities of general-purpose systems such as ChatGPT in terms of accuracy, efficiency and adaptability. In addition to providing an initial presumptive diagnosis with differential diagnoses, they offer precise, contextualized recommendations for further diagnostic steps.

After medical authorization, the AI agents automatically generate request forms for necessary examinations and send them directly to the appropriate departments.

The results of these examinations then refine the initial diagnoses and dynamically adjust the recommended diagnostic or therapeutic actions. Once a sufficiently reliable diagnosis is made, the AI agents suggest appropriate treatment paths. Upon the physician's confirmation, a comprehensive emergency department visit report is generated, including diagnoses, and treatment plans.

- 1. Aligned with Clinical Needs:** Supports both medical and nursing staff effectively.
- 2. Optimized Performance:** Uses self-monitoring and reinforcement learning to manage complex, time-sensitive processes.
- 3. Advanced Support:** Goes beyond basic automation to actively think, adapt, and assist the emergency team.
- 4. Up-to-Date Expertise:** Retrieves minimally invasive diagnostic options and specialized medical knowledge from current, validated databases.
- 5. Physician Control:** Ensures that physicians remain in full control with the ability to override AI-generated suggestions.



DETAIL INFORMATION

