



Case study: ZGT, Almelo, Netherlands

Delivering outcomes that matter to patients

Transforming care delivery in a challenging
emergency department setting

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The ED challenges and solution

Performance Excellence program for sustainable transformation of emergency care delivery

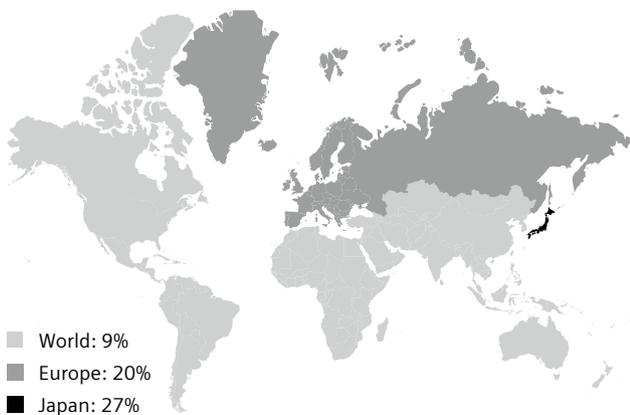
When patients arrive in an emergency department (ED) and their lives are at risk, fast care delivery is crucial. All relevant information must be available immediately, all technology must function dependably, and all responsibilities, processes, and communication channels must be clearly defined and followed. Acting as one team and applying optimized and standardized procedures is the key to success when every minute counts.

This is especially true when EDs face the pervasive and widely recognized challenge of overcrowding, which can strain resources, adversely affect the patient experience, and even result in more frequent medication errors and omissions, adverse outcomes, and increased mortality.

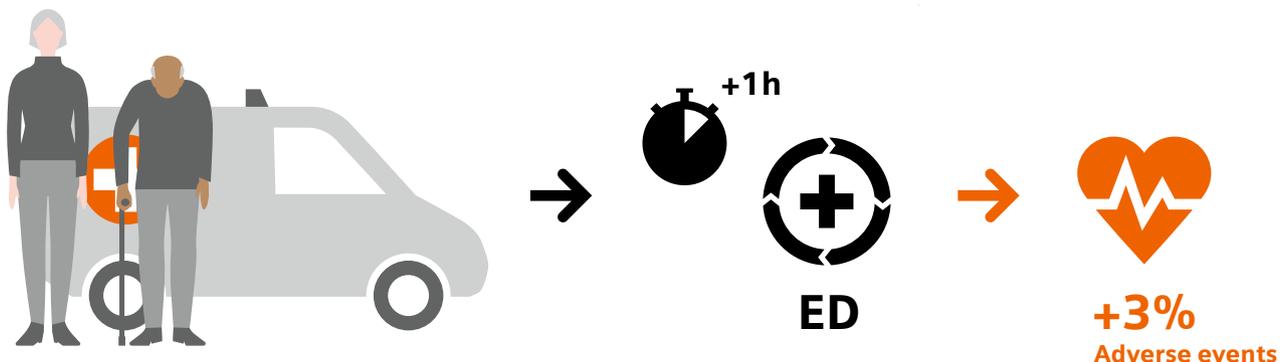
Insufficient ED capacity usually results in longer patient stays, and this is particularly dangerous for older individuals. The chance of experiencing an adverse event while in the hospital increases by 3% for every hour that a person over 65 years old spends in the ED before being admitted.¹ Given that the global population of individuals over 65 increased from 5.0% to 8.7% between 1960 and 2017,² this effect should not be underestimated. In the European Union, this age cohort already makes up 20% of the population, and in Japan it ranks even higher, at 27%.³

The complexity of today's medical conditions, heavy workload, limited availability of qualified staff, and economic efficiency pressures all represent additional challenges in the emergency setting. There is therefore a pressing need to optimize operations in order to increase efficiency and expedite throughput for greater patient outcomes.

Siemens Healthineers Value Partners for Healthcare Consulting offers a Performance Excellence program, developed using Lean methodology, that is ideally suited to help EDs overcome these challenges and leverage optimization potentials.



Age 65+



The challenge for ZGT

Improving access to care for emergency cases



About ZGT:

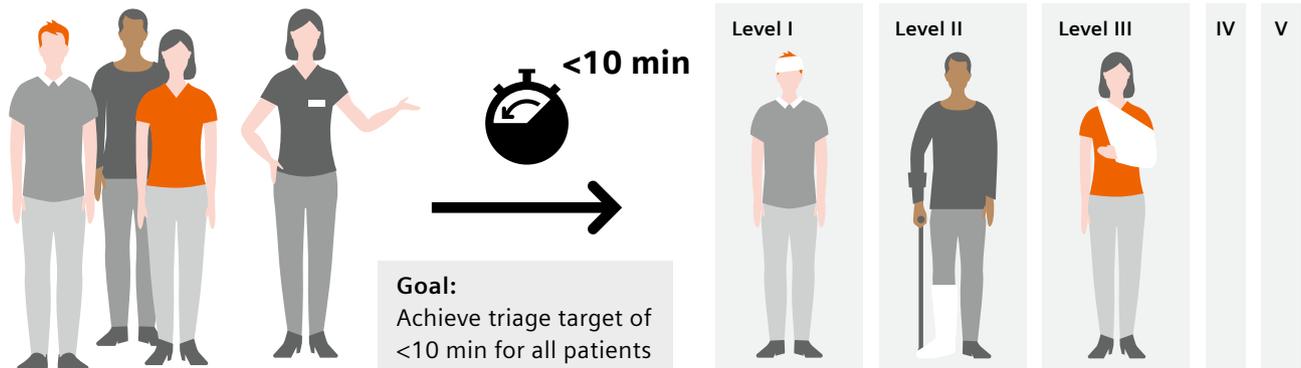
- General teaching hospital with about 750 beds
- 3,200 employees offer care to approximately 200,000 patients a year
- Two hospital sites in Almelo and Hengelo as well as three field clinics
- Besides general care, there is a special focus on geriatric care, metabolic syndromes, and oncology

The Dutch hospital ZGT (Ziekenhuisgroep Twente) in Almelo, Netherlands is a general hospital that receives approximately 25,000 ED visits per year. When the hospital's second ED at Hengelo closed in 2018, the number of patients entering the Almelo ED had increased by more than 48% over five years.

The Almelo ED struggled to accommodate this increased patient demand. The department's space was too limited, its aging technology was causing significant downtimes, and trauma patients had to be moved from room to room

due to a lack of mobile imaging devices. Furthermore, multi-functionality devices for faster patient diagnosis were not available, and diagnostic rooms had to be misused as treatment rooms.

As a consequence, the Almelo ED faced critical bottlenecks, resulting in treatment delays and bad patient experiences due to long waiting times. **More than 75% of patients were not triaged within the statutory targeted time of 10 minutes.** ZGT recognized the need for action and for transformational changes.



The method

Process analysis and definition of measures as a basis for optimizing clinical operations

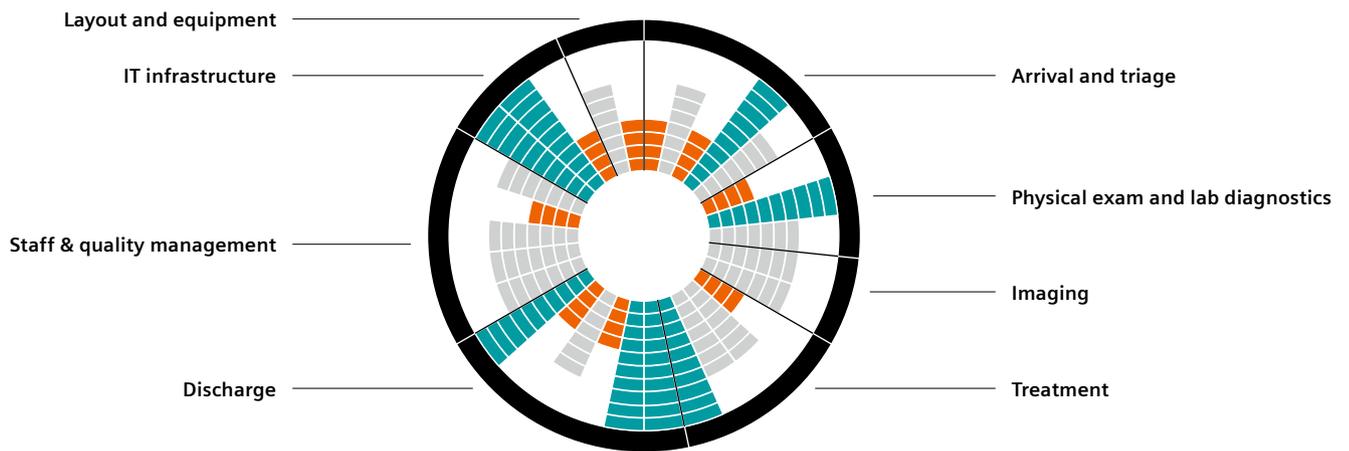


Image 1: A visualization of the facets of an ED's workflow that can be explored using Lean methodology.

The relocation of a previously adjacent nuclear imaging center created the possibility for expansion of the Almelo ED, as well as potential layout and workflow improvements. At this point, ZGT asked Siemens Healthineers Value Partners to conduct a detailed analysis of the ED's workflow and identify opportunities for transforming care delivery and optimizing patient outcomes.

The consulting team began by familiarizing themselves with the ED's current goals and challenges, using information provided by ZGT. Next, they performed a process analysis on-site – observing patient arrival and triage, physical examination and laboratory diagnostics, imaging, treatment, discharge, staff and quality management, IT infrastructure, layout, and equipment. The team also

conducted interviews with relevant stakeholders, including ED and ward nurses, doctors, physician assistants, radiographers, and radiologists.

The result was a comprehensive overview of the ED's patient flow, including identifying the root causes of urgent clinical and workflow bottlenecks. This endeavor culminated in a number of recommendations for improving ED workflows, layout, and imaging equipment usage. These recommendations were focused on optimizing clinical operations, improving the patient experience, elevating the quality and precision of care delivery, and increasing workforce productivity by creating a more manageable, less stressful working environment.

The outcomes

Improving health outcomes by reducing door-to-door time and fostering cross-departmental collaboration

The Siemens Healthineers team concluded that the overall average door-to-door-time for all patients showed huge room for improvement, especially for geriatric patients. The root causes identified for this prolonged length of stay were the unavailability of diagnostic equipment (since the diagnostic rooms were also being used for treatment), long intervals between scanning and diagnosis, and late discharge to ward.

For an immediate improvement of patient outcomes, the team redesigned the triage process – including earlier initiation of requests for imaging diagnoses and blood tests – and established a dedicated “fast-track” treatment room for patients with milder ailments.

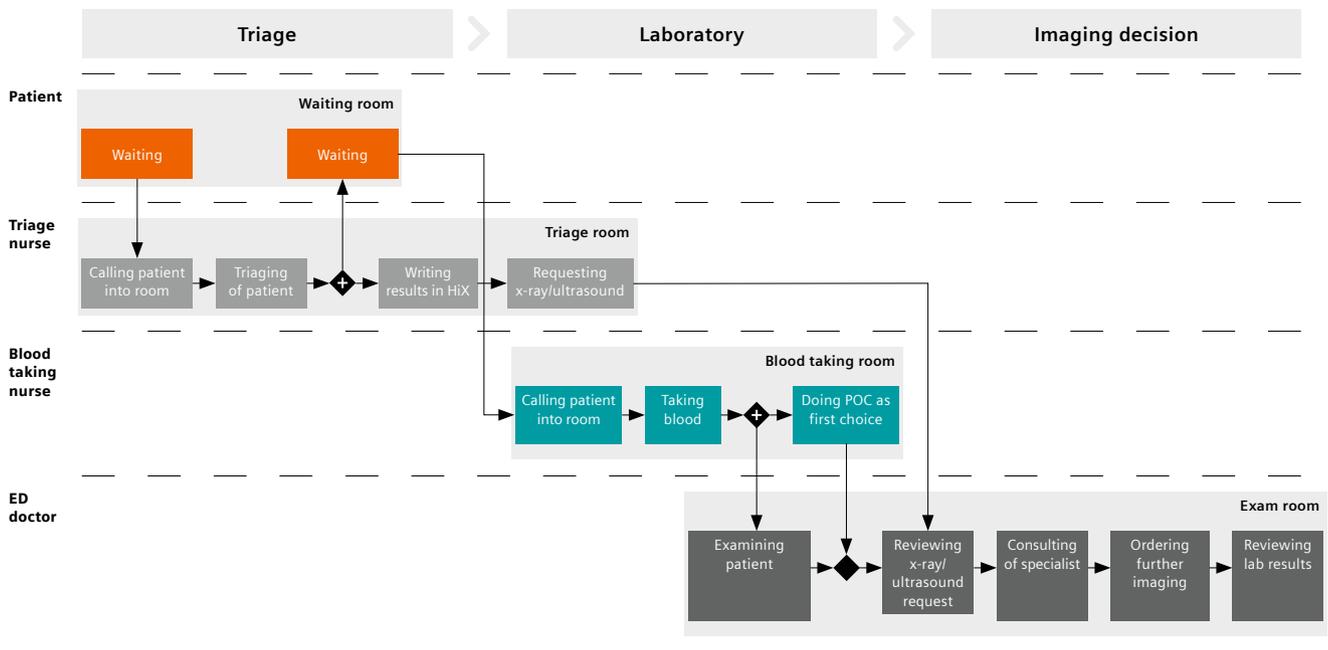


Image 2: Process map of ideal state for speeding up treatment and optimizing patient outcomes.

The Siemens Healthineers team also identified additional opportunities for overcoming bottlenecks and improving the patient experience, and recommended a number of corresponding solutions.

A sample of obstacles and solutions identified for ZGT ED

| Obstacles | Solutions |
|--|--|
| <p> Layout and equipment</p> <ul style="list-style-type: none"> • Due to their location within the trauma area, imaging rooms are often occupied by trauma patients. • The number of exam rooms is insufficient. | <p>The ED layout could be optimized by creating a separate imaging room, with on-site space for radiologists, as well as adding more exam rooms.</p> |
| <p> Arrival and triage</p> <ul style="list-style-type: none"> • Over 3/4 of the ED's patients are not triaged within the target time of 10 minutes. • Triage rules are sometimes ignored. | <p>Standardize the process prior to physician contact and retrain the team on the triage process.</p> |
| <p> Laboratory diagnostics and physical examination</p> <ul style="list-style-type: none"> • Though point-of-care (POC) blood testing units are available, they are perceived to be unreliable, and conventional lab tests with longer turnaround times are often used instead. • Not enough specialists are available to diagnose patients. | <ul style="list-style-type: none"> • The POC units need to be audited, and their reliability has to be demonstrated to staff. • Target times for diagnosis must be defined and measured. |
| <p> Imaging</p> <p>The two available (obsolete) x-ray systems cover either thorax/hip or extremity scans, but not both. Thus, polytrauma patients have to be moved from one unit to another during the imaging process.</p> | <ul style="list-style-type: none"> • Replace x-ray systems with modern, more effective devices. • Place one in the trauma room and one in the imaging room. |

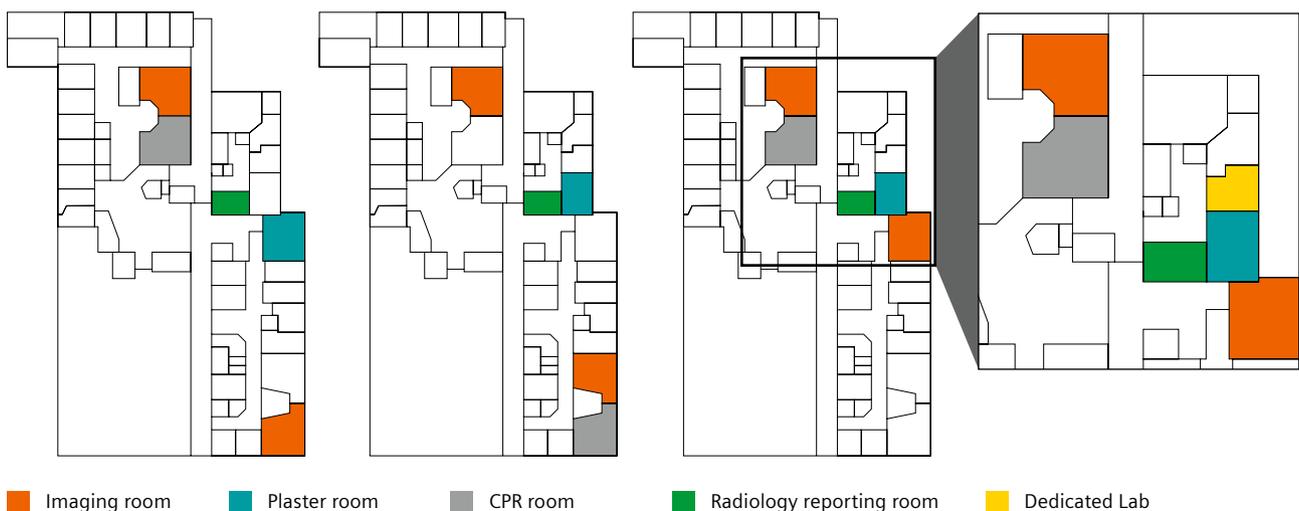


Image 3: Various layout scenarios were visualized, and benefits as well disadvantages were discussed.

Obstacles

Solutions



Treatment

Geriatric patients have a door-to-door time of over 3:45 hours – which exceeds the average time for patients overall by more than one hour.

Define standardized service-level and response times.



Discharge

The average pickup time for the ward is 34 minutes, which leads to unnecessary room occupations.

- The ward has to receive the information about a transfer 30 minutes earlier in order to make all necessary preparations.
- The staff must ensure that patients are ready to be picked up.



Staff and quality management

Newly hired staff are mostly untrained and inexperienced.

The current standardized training program should be updated to cover all the procedures and processes of the ED.



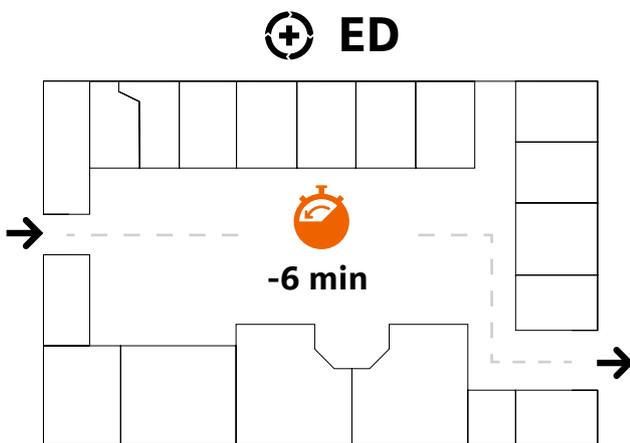
IT infrastructure

Though a single holistic data management system (HiX) exists, it is not being used to its full potential in monitoring status, capacity, or demand.

Implement a monitoring dashboard within the HiX. This creates transparency about the data that has to be presented to the staff regularly.



The emergency department implemented recommendations proposed by Siemens Healthineers Value Partners, and within a couple of months, the door-to-door time had already decreased by 6 minutes compared to the previous year, even though it was the busiest month of the year. Furthermore, communication between ED and radiology members improved, as did the working environment in general.



“There is so much in the delivered results we can use to improve. I like it very much! I am very pleased with the Siemens Healthineers team’s analysis. I was also surprised that they were able to analyze a whole emergency department in one week. And that it enables so many positive outcomes.”

Judith Mulder, Emergency Physician, ZGT, The Netherlands

The takeaway

Siemens Healthineers Value Partners can help you identify and seize opportunities to elevate your level of care.

As healthcare becomes more complex, and delivering healthcare services ever more challenging, the value of engaging savvy and experienced consultants is growing as well. Siemens Healthineers Value Partners brings together the required components of informed strategy, technological know-how, and expert implementation. Encompassed in these are clinical knowledge and experience with patient contact and services, elements that distinguish the business of healthcare from any other. The net result is a consulting partner who combines the advantages of a knowledgeable insider with those of an objective outsider, a partner who is uniquely positioned to provide a holistic view of the endeavor.

Siemens Healthineers can provide healthcare enterprises with an overview and analysis of their entire treatment pathway, from admission through discharge – including solutions powered by information technology, innovative engineered products, and artificial intelligence. Actively pursuing innovation, we also invest in research and development – to continuously pioneer new approaches that can help further transform our partners' care delivery.

Our goal is to support you with comprehensive solutions to the complex challenges of the ever-changing healthcare environment through a long-term Value Partnership focused on the delivery of high-value care.

Value Partnerships optimize care delivery to create more value for you.

Do you want to engage with Value Partners to optimize your operations?

Get in contact:

 [siemens-healthineers.com/value-partners](https://www.siemens-healthineers.com/value-partners)

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About Value Partnerships

Value Partnerships are enduring technology-enabled, performance-based relationships between Siemens Healthineers and healthcare providers. While every Value Partnership is unique, there are factors they have in common: established trust, aligned objectives, defined incentives, an assembled portfolio, and the co-creation of innovation. These Partnerships offer the framework for a range of services, strategies, and solutions designed

to help healthcare enterprises optimize operations, expand capabilities, advance their level of innovation, and prepare for a strong future. With sustainable healthcare consulting and transformation services as well as future-proof design planning, Siemens Healthineers is well positioned to co-create a solution with and for you that will generate significant clinical, operational, and financial benefits.

Disclaimer

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The results described herein by customers of Siemens Healthineers were achieved in the customers' unique setting. Since there is no "typical" hospital, and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.

The scientific overlay on the title is not that of the individual pictured and is not from a device of Siemens Healthineers. It was modified for better visualization.

¹ *EB Medicine. When overcrowded means unsafe: a research review of patient outcomes in over-capacity emergency departments. 2011.*
https://www.ebmedicine.net/media_library/marketingLandingPages/Overcrowding/When%20Overcrowded%20Means%20Unsafe.pdf

² https://www.ebmedicine.net/media_library/marketingLandingPages/Overcrowding/When%20Overcrowded%20Means%20Unsafe.pdf.
Accessed June 19, 2019.

³ *The World Bank Group. Population ages 65 and above (% of total). 2017 Revision.* <https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS>.
Accessed June 19, 2019.

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