



**Case study: Helse Stavanger University Hospital**

# Optimizing performance with a human-centric hospital layout

Helse Stavanger University Hospital is transforming care delivery through process mapping and layout optimization

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Illustration: Nordic Office of Architecture / Aart Architects.

## Executive summary

As populations grow older, and patients enjoy more choices in where and how they receive healthcare, hospitals have to adapt to provide more relevant services to an increasing population in a revised patient-centric healing environment.

Helse Stavanger University Hospital in Norway is currently constructing a new hospital building. When they initially reviewed their plans and drawings, some members of the Helse Stavanger staff grew concerned that the proposed layout would negatively impact workflow, efficiency, staff satisfaction and patient experience. For this reason,

Helse Stavanger decided to enter into a Value Partnership with Siemens Healthineers to assess the original proposal and make further recommendations to optimize it prior to the final expansion.

After intensive data collection, demand forecasting, and close stakeholder engagement, Siemens Healthineers promptly offered a new, future-proof layout proposal that centered on the needs of patients and the staff accountable for their treatment, yielding potential gains in efficiency and optimizing their overall performance.

# Introduction, market trends and offerings

Addressing both the needs of an ever-aging population and patient satisfaction with efficient and healing healthcare environments

Populations around the world are constantly aging. More elderly citizens mean a higher demand for healthcare services, including both diagnostic and treatment services. Providing quality care to this expanding population demands corresponding increases in efficiency throughout the care continuum.

Another key factor to consider is the rise of consumerism in healthcare. Patients expect a positive experience, both in terms of clinical outcomes and non-clinical factors. Because patients are more likely than ever to seek alternatives for their medical care, healthcare facilities should address non-clinical needs as well. Thus, a modern healthcare facility should have adequate lighting and ventilation, privacy for patients, and amenities for their accompanying families and friends.

Moreover, an inviting and pleasant surrounding creates a comfortable working environment for staff and thus makes the healthcare facility an attractive workplace. This tackles the challenge of general staff shortage as a pleasing and harmonious ambience can attract new workforce and encourages current personnel to stay. Therefore, an appealing healing environment leads to both higher patient and staff satisfaction.

A hospital built today has to meet the present challenges described above while also preparing for those of tomorrow. That is why hospital administrators seek specialized expertise in Facility Design and Workflow & Organization optimization. The goal is to plan, design, and build human-centric, process-oriented and “future-proof” facilities that have the flexibility to adapt to unforeseen changes over time.

Siemens Healthineers Value Partners for Healthcare Consulting has a robust portfolio of Clinical Operations key practices, which includes facility design and workflow optimization disciplines. Using a single partner for both of these important functions creates valuable synergies by maximizing cooperation and coordination throughout the project. Siemens Healthineers tackles complex planning and design projects with an interdisciplinary team of architects, consultants, and technology experts. Together with key stakeholders from the healthcare institution, this team can plan future-proof facilities that optimize workflows, improve efficiency, and create value for the hospital and its patients. This kind of teamwork is part of the DNA of Siemens Healthineers and its enduring, performance-oriented collaborative Value Partnerships.

# The customer

## Paving the way for excellence through expansion



Helse Stavanger University Hospital is located in Stavanger, a city of 130,000 people in southwestern Norway. The hospital is amid a significant expansion, with construction of a new building expected to be finalized in 2023. The staff of Helse Stavanger strives to provide the best possible care and treatment to their patients every day. The new construction is an important step toward their goal of becoming the best hospital in Norway, with expanded and modern facilities, and a clear benchmark with optimal performance for other hospitals in the region.

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### About Helse Stavanger University Hospital

- Located in the city of Stavanger, Norway
  - Mission: To provide the best possible care and treatment to their patients – every single day
  - University hospital with radiology and interventional & nuclear medicine department
  - Staff of 7,500 drawn from 30 nationalities
  - 600 beds
  - Serves a population of 369,000 in Stavanger and the surrounding area
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*“We had the feeling that the proposed reduction of the radiology floor space would cause major operational problems and affected staff and patient experience in the future. Siemens Healthineers provided us with the right arguments to address this with the project team and to enforce the required layout adjustments. Now, we are well positioned for the future.”*

**Hans Tore Frydnes**  
Head of Diagnostic, Helse Stavanger University Hospital



# The challenge

## Initial layout proposal compromised radiology workflows and patient experience

A new facility presents an opportunity to create an environment that maximizes efficiency, improves patient and staff satisfaction, and delivers positive clinical outcomes. After reviewing initial design drawings, key stakeholders at Helse Stavanger were concerned that the allocated area for the radiology and interventional & nuclear medicine department may not be enough to deliver the desired efficiency, satisfaction, and outcomes. Of particular concern was patient flow, as the initial plans dictated a relatively long transport route for acute patients, who would have to pass through the inpatient and outpatient areas to access services.

Helse Stavanger sought help from Siemens Healthineers to ensure that all departmental operations could be carried out, at the appropriate scale, under one roof. Consolidating in one location within the new facility would be beneficial for both workflow and patient experience. Another imperative was to honor the voices of the clinicians who would soon be working in the new facility, so that the new departmental layout would meet their requirements for workflow efficiency and clinical excellence through Operations Management measures. Drawing on the experience of more than 7,000 planning projects, Siemens Healthineers was a strong partner in helping Helse Stavanger reach its potential.

### The key concerns with the design proposal were:

- Initial plans intended to keep some services (PET and SPECT) at the old hospital and implement the new radiology service in the new hospital building in two phases over 5-10 years
- Insufficient area for important ancillary facilities like changing rooms, recovery rooms, etc., which are critical to maximizing utilization and satisfaction
- Lack of flexibility for anticipated future expansion of the department

### Key challenges at a glance:



Quickly incorporate input from clinical staff regarding workflows



Optimally locate all department facilities under a single roof



Enable a positive transformation of care delivery along clinical pathways



Further create forward-looking facility with room to grow

# The solution

Developing an optimal layout derived from a remarkable collaboration between an engaged trusted partner and empowered staff

Siemens Healthineers started by collecting data about operations and processes within the diagnostic radiology department in order to suggest optimal layout planning for CT, MR, and Nuclear Medicine. In very close conjunction with the Helse Stavanger staff, Siemens Healthineers Value Partners for Healthcare Consulting conducted a five-day assessment wherein they recorded all processes and process steps in diagnostic radiology as well as interventional radiology and cardiology. Together with all relevant stakeholders such as doctors, nurses, technicians, and supporting staff, Siemens Healthineers determined their daily needs, wants and no-go's for an individually tailored layout. Next, a market development study was conducted, enabling Helse Stavanger to forecast future capacity needs.

Equipped with this information, the mutual collaboration between the Helse Stavanger and the Siemens Healthineers team members quickly applied what they learned to propose a revised layout for the radiology department, aiming to improve performance and overall staff satisfaction and patient experience. Multiple interviews with internal stakeholders were held throughout the iterative layout review process, allowing for the development of an optimized layout that would meet the needs of patients and staff.



*“The interdisciplinary team from Siemens Healthineers contributed great ideas for an innovative imaging department layout to the hospital construction project and brilliantly implemented our thoughts and wishes.”*

**Terje Daniel Bakkelund**  
Head of Radiology, Helse Stavanger University Hospital

## Solutions and expertise deployed at a glance:



Process mapping



Layout review



Market study



Layout optimization



Stakeholder interviews

## Results of layout review and optimization at a glance:

- Recommendation to double area allocated for radiology department
- Concept to bring all radiology processes and equipment under one roof
- Proposed optimized layout for workflows, patient flows, and processes
- Revised design would accommodate projected future need for expansion
- An empowered staff whose ideas are helping to create an efficient and pleasant working environment

# The results

## Empowering efficient radiology operations and increased staff satisfaction and patient experience under one roof

*“Siemens Healthineers involved us as users closely in the development of an efficient employee- and patient-friendly layout design. We enjoyed working with this group of architecture, medical technology and process experts. We always felt we were heard and understood, and are really satisfied with the result of the project.”*

**Kathinka Daehli Kurz**, Head of MR & Jorunn Havnen,  
Head of CT, Helse Stavanger University Hospital



Expansion of the allocated radiology area to enable efficient processes

The data collection, layout review, and layout optimization processes culminated in a recommendation to double the floor space for the radiology department in the new facility in order to bundle all services at one location and provide room for workflow optimization and flexibility. The new layout, co-created and endorsed by the Helse Stavanger staff, was designed around patient pathways.

Input from the staff ensured that the new layout would optimize efficiency and enhance the experience of both patients and staff who would use the space. The new proposed layout provided for important spaces like prep areas, changing rooms, and recovery rooms. Lack of appropriate facilities can compromise patient experience and cause bottlenecks, decreasing utilization rates and patient throughput. The revised plan also provided for ample sunlight throughout the department, contributing to a positive healing environment for clinical staff and patients alike.

Finally, Siemens Healthineers helped the radiology department advocate for the proposed changes. Hospital administration has since adopted the recommendation to double the floor space and further layout recommendations from the combined team to achieve optimized workflows, patient flows, and processes may be incorporated into the finalized layout.



*“Working with Siemens Healthineers was a true, value-creating partnership in which the joint and sustainable success of all stakeholders and the overall SUS2023 project was in focus. We would definitely collaborate with them again on our next project.”*

**Ove Nordstokke**  
Project Lead SUS2023, Helse Stavanger University Hospital

## About Value Partnerships

Siemens Healthineers Value Partnerships are long-term, performance-oriented, collaborative engagements. We bring a combination of clinical insight, medical technology innovation, strategic vision, implementation expertise, and operational excellence to the table for you. As trusted partners, we help you formulate and achieve your strategic goals, increasing enterprise-wide value.

Value Partnerships drive value across your entire enterprise with focus on four domains: Technology, Operations, Workforce and Facility. Furthermore, together we enable breakthroughs through holistic and transformative initiatives such as Strategic Transformation and Digital Innovation.

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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.

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