PHILIPS

Customer partnership

Patient first: how Karolinska University Hospital is transforming to meet future demands of healthcare

About Karolinska University Hospital

With 15,800 employees and 1.6 million patient visits per year, Karolinska University Hospital is one of the top medical centers in Europe. It has two sites in the Swedish capital of Stockholm: Huddinge and Solna.

Karolinska University Hospital is responsible for highly specialized healthcare within the Stockholm County Council. It also carries responsibility for research and student education, in partnership with Karolinska Institute and other universities and colleges.

What if all clinical departments in your hospital were abolished and patient care as well as clinical research were organized around the patient's healthcare journey? That's the operating model that Karolinska University Hospital in Sweden is implementing to deliver highly specialized care to Stockholm's booming population. Their motto: patient first. In 2014, Karolinska and the Stockholm County Council established a 14-year strategic innovation partnership with Philips to help bring this vision to life with joint innovations that increase the value of care for patients.

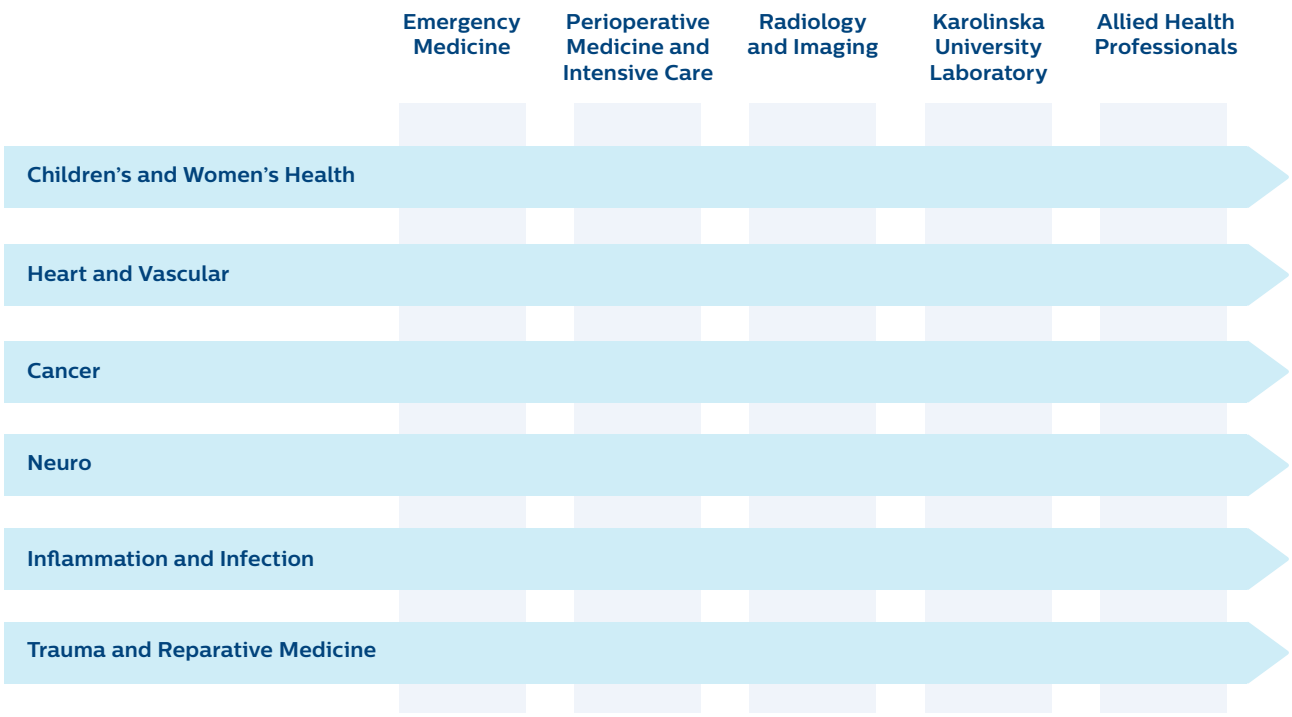
The need for change at Karolinska University Hospital has never been felt more strongly. Stockholm is the fastest growing capital in Europe, with an estimated population growth of 11% between 2015 and 2020[1]. Healthcare demands are expected to sky-rocket over the next two decades, with one out of four people in Sweden being 65 years or older by 2040[2].

In order to meet these demands, the Stockholm County Council in 2008 commissioned the construction of a new hospital building in Solna, Stockholm. The building, which is part of Karolinska University Hospital, was designed to promote collaboration between medical care, research and education. The first part of the hospital building in Solna was put to operation in November 2016. The other parts of the building will be commissioned during 2018. But there's more to Karolinska's transformation than a new building alone. The hospital is introducing a completely new operating model as well.

1. https://www.chamber.se/nyheter/stockholm-vaxer-snabbast-i-europa-2.htm
2. https://sweden.se/society/elderly-care-in-sweden/

A new operating model

Gone are the traditional clinical departments. Healthcare at Karolinska is now organized in patient care flows. For example, patients with heart and vascular conditions are treated in an integrated manner, with specialists from functions such as emergency medicine, imaging and cardiology working together – often in the same building or corridor. This new operating model intends to strengthen cooperation between different functions along the journey of a patient. All with the goal of giving the patient the best possible care, and delivering better outcomes.



The new operating model at Karolinska University Hospital. Patient care is organized horizontally along patient care flows (e.g., heart and vascular), with different functions — such as emergency medicine and imaging (shown vertically) — working together to deliver highly specialized and integrated care.

Source: https://www.youtube.com/watch?v=dR6sa2cmv9E

"We are transforming from a central radiology department into a function that is spread out across multiple buildings, closer to our patients and referring clinicians."

Patrik Puhony, operational director of the imaging function at Karolinska University Hospital

Reinventing the imaging function

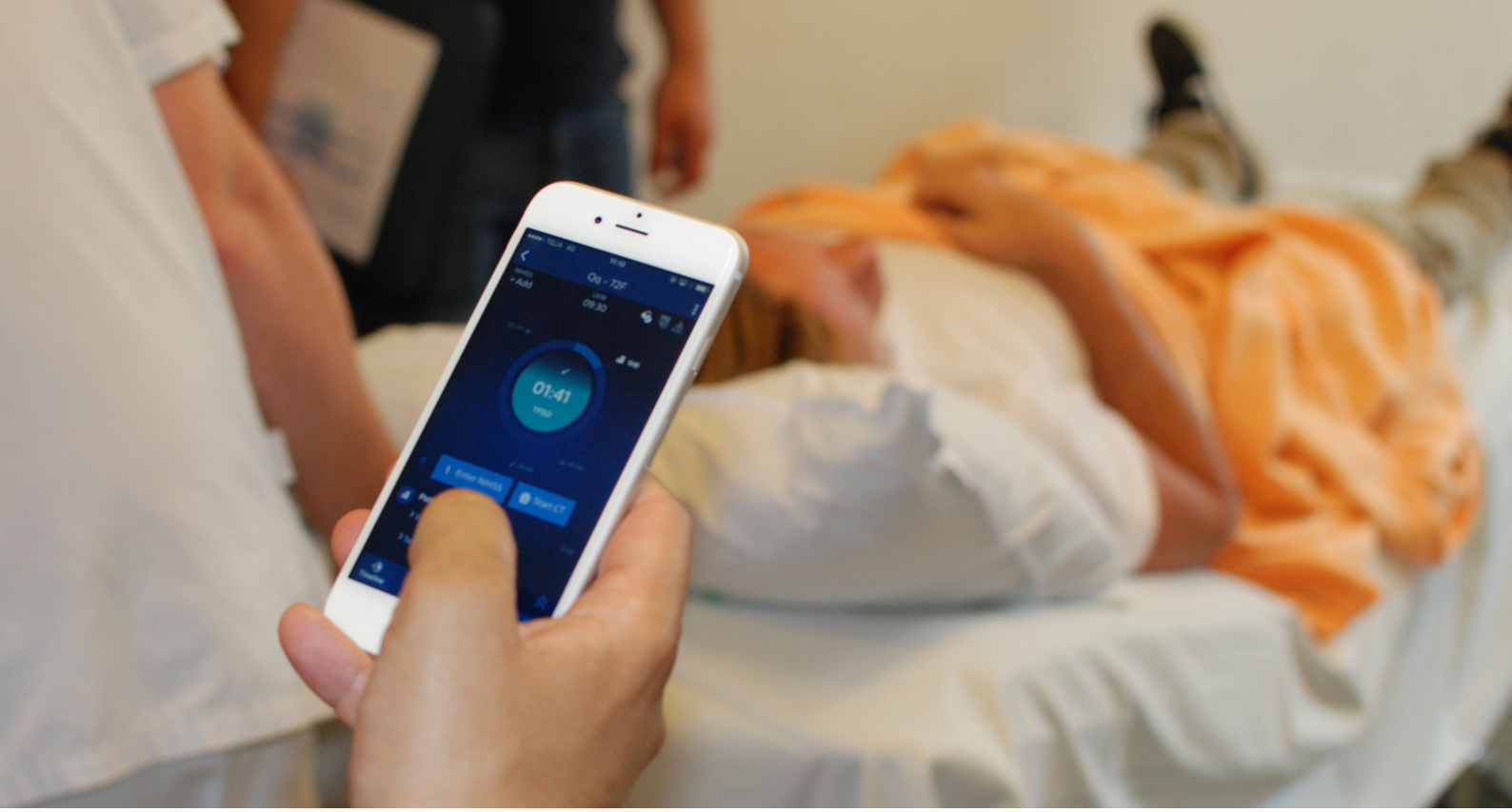
For Karolinska's imaging function, these organizational changes called for a complete reinvention. "We are transforming from a central radiology department into a function that is spread out across multiple buildings," says Patrik Puhony, operational director of the imaging function. "We want to be in close vicinity to our patients and to referring clinicians, so that we can deliver the best value to them. We do not simply want to provide a CT scan. We want to provide an answer to a medical question."

Moving closer to patients and referring clinicians is not just about delivering more value. It is also about improving efficiency, Puhony adds. Karolinska's imaging function faces a yearly growth of 5% in the demand for some diagnostic procedures. For nuclear medicine and PET imaging, the growth in demand is as high as 20 to 30%. "The only way to meet this demand is by working more efficiently," Puhony says.

The need for a strategic partner

From a practical point of view, Puhony and his colleagues also faced a huge challenge: to equip the new hospital building in Solna, they had to procure and install 172 pieces of brand new imaging equipment – including 48 pieces of heavy equipment such as CT and MRI scanners. In the meantime, the existing operations of the imaging function had to keep running smoothly with the current equipment.

"We realized that this was going to be a massive undertaking," says Karolinska's Henry Lindholm, who worked together with Patrik Puhony and others to select an external partner that could help. "We wanted to establish a strategic innovation partnership with a company that could help us in our transformation."



First results of a collaborative approach

In May 2014, Karolinska signed a 14-year innovation partnership with Philips, with an option to extend the partnership for 6 more years.

Managed equipment services: functionality for a fixed fee

One of the first priorities was to start equipping the new hospital building in Solna with imaging devices. Because Karolinska had limited resources to manage this themselves, Karolinska and Philips agreed on a managed equipment services model. This means that Philips coordinated the procurement and commissioning of all required imaging equipment. Philips also took on responsibility for the coordination of transport, installation, and commissioning of equipment, as well as for the training of staff. In addition, Philips ensures functionality over time, with ongoing maintenance, updates and upgrades.

"The main advantage of this agreement is that our equipment needs in Solna are met for the full 14-year period of the contract, for a fixed service fee," says Henry Lindholm. "So far, we have succeeded in getting 172 new pieces of imaging equipment in place, with very strict timelines, without any hiccups," Patrik Puhony adds.

Another benefit of the managed equipment services agreement is that it enables more strategic asset management, says Puhony. "How can we ensure zero down-time on all our equipment? How can we get the most out of our most critical equipment? It is much easier to address questions like these if you have one partner that monitors all equipment. This allows us to improve the accessibility of our services and make patient flows more efficient."

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> **Patrik Puhony**, operational director of the imaging function at Karolinska University Hospital

"We are developing innovations that have direct impact on the KPIs of a patient care flow."

Stefan Vlachos, head of the Center for Innovation at Karolinska University Hospital

Developing innovations within patient care flows

To drive innovations in care, Karolinska and Philips also set up an innovation partnership. "Together, we defined a bold aspiration," says Stefan Vlachos, head of the Center for Innovation at Karolinska. "By 2020, we want to have created healthcare innovations within three focus areas, with significant impact on value of care and patient experience."

"One of the goals of the innovation partnership is to bring our research and clinical practice closer together," Vlachos continues. In Karolinska's new operating model, both clinical practice and research are organized along patient care flows. "This means we focus on developing innovations that have direct impact on the KPIs of a patient care flow."

For example, in stroke care, a crucial KPI is the so-called door-to-needle time. This is the time it takes to get stroke patients from the door of the hospital to treatment. When someone is struck by a stroke, every second counts. That's why Philips and Karolinska are developing a mobile communications tool that allows different specialists to share information about stroke patients more quickly as patients are brought into the hospital. The aim is to reduce the door-to-needle-time.

"The first experiences with this tool have been very promising," says Vlachos. "We are now starting a clinical study to validate its impact." In the second focus area — prostate cancer — Karolinska and Philips are also developing a tool that makes it easier for different specialists to share information. In a third focus area — minimally invasive surgery — a milestone has been the introduction of augmented reality to enable more precise image-guided spine surgery. The first clinical cases using this new surgical navigation system have been successfully treated.

In 2017, the joint Karolinska-Philips innovation program won two Horizon 2020 grants from the EU Framework Programme for Research and Innovation, worth 22.7 million euros. "This offers exciting opportunities to intensify and extend our efforts," says Vlachos.

Continuous improvement as a next step

So far, the focus in the partnership has been on getting the new imaging equipment into place and developing first innovations. As a next step, the third and final pillar of the partnership is to drive continuous improvement in day-to-day processes within the imaging function.

For Juhana Hakumäki, head of the imaging function, this is all about rethinking ways of working within Karolinska's new operating model. "To meet the demand for imaging and physiology services, we need to work in clever ways, providing the best possible value with every examination. This comes down to everyday decisions: how we use our equipment, how we examine patients, how we organize the follow-up within a patient care flow."

Hakumäki believes that these decisions will become increasingly data-driven. "For example, we want to get the most out of our equipment park by analyzing utilization rates of different types of equipment. And if we follow patient outcomes over time, throughout a patient care flow, we can use that knowledge to determine the best possible examination for every patient."

"By connecting clinical research and practice, we can deliver better value to our patients."

Juhana Hakumäki, head of the imaging function at Karolinska University Hospital

Breaking down boundaries for better care

Looking at the results of the partnership with Philips so far, Juhana Hakumäki is happy with the progress that has been made. "Having a structured innovation partnership helps us to bridge the gap between clinical research and practice. What we do in clinical practice is often based on research we started ten years ago. That's why it's so important to connect the two: to speed up innovations that benefit our patients and staff."

Involving many different disciplines within Karolinska – from clinical specialists to IT and finance – has been key to the success of the partnership, Hakumäki believes. "Our new hospital building and operating model offer a unique chance to reinvent our organization. But this means we need to navigate through a lot of changes. This is something we can only do together. At the end of the day, we all have the same purpose: delivering the best possible value to patients."

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Results are specific to the institution where they were obtained and may not reflect the results achievable at other institutions.