

**Case study: Helsinki University Hospital, Finland**

# **Unprecedented visibility into radiology operations**

Data-driven CT efficiency program

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Photo: Matti Snellman, HUS

# Executive summary

## Rethinking CT operations in a large healthcare system

Like many healthcare organizations, Helsinki University Hospital (HUS) was struggling with a shortage of qualified staff paired with increasing demand for imaging services. With a new facility currently under construction, HUS is interested in both enhancing its current operations and establishing optimized processes for the future site. HUS partnered with Siemens Healthineers to re-imagine their radiology operations in response to these new pressures.

Siemens Healthineers Value Partners for Healthcare Consulting and HUS collaborated in an innovative hybrid remote and on-site setting to optimize the CT process within the HUS radiology department. The partners identified six action fields where targeted improvements could enhance departmental efficiency and performance: operations, training & skills, layout, communication, patient experience, and control. The team proposed targeted changes in these action fields that can potentially increase annual CT throughput by 30% while reducing personnel costs by 40%.

# The customer

## Helsinki University Hospital: a major center delivering advanced care

Helsinki University Hospital (HUS) is a large-sized, 3,000 bed hospital network around the area of Helsinki. It encompasses 24 hospitals and treats more than 680,000 patients per year. It has all major medical specialties represented and is currently formed by around 27,000 employees.

Therefore, HUS belongs not only to the TOP 5 of the world's largest hospitals but is responsible for the most demanding special medical care throughout the country. Its diagnostic department comprises 60 imaging and 101 lab facilities. Moreover, HUS is well known for its pioneering spirit in healthcare, with is a perfect match for Siemens Healthineers.

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### About Helsinki University Hospital (HUS):

- Public healthcare provider
  - One of the world's 5 largest hospitals
  - Largest national university hospital with 680,000 patients per year
  - Employs almost 27,000 staff members
  - Represents all major medical specialties with a capacity of around 3,500 beds
  - Leads by the values of "caring, equity and pioneering" and aims to be a pioneer in healthcare
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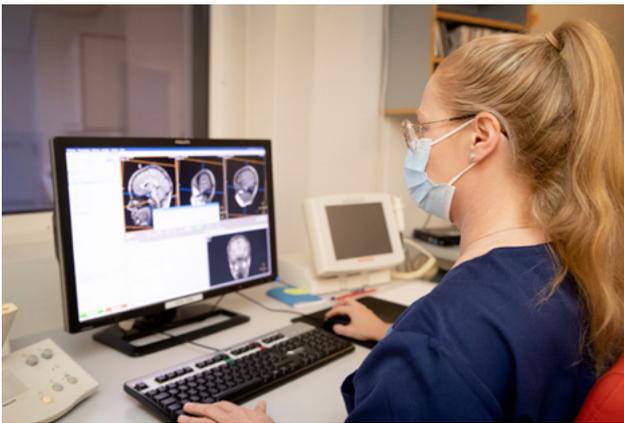


Photo: Matti Snellman, HUS



Photo: Ville Männikkö, HUS

### About Meilahti Tower Hospital:

- One of 24 hospitals in the HUS network
- Medical focus on cardiothoracic surgery, vascular surgery, gastrointestinal surgery, and neurology
- Organ transplants in Finland are performed here exclusively
- Responsible for stroke telemedicine thrombolysis across Finland
- Radiology department with 6 CT scanners



Photo: Matti Snellman, HUS

# The challenge

## Designing new and better processes for a current and a future hospital

HUS is building a new hospital – called the Bridge Hospital – next to the Meilahti Tower Hospital. This greenfield project is the largest in the history of HUS. Construction began in 2018 and is projected to finish in 2022, with operations starting in 2023.

This project means a huge organizational challenge for the diagnostic departments at HUS, as people from different workplace cultures and ways of working will be brought together. This compounds the already tense situation of rising demand for CT scans in Finland (>10 % annual increase) and a national shortage of radiographers. HUS management has decided to take advantage of the opportunity for change brought on by the Bridge Hospital project to increase efficiency and optimize processes related to CT scans. HUS sought to answer the following questions:

1. How can we redesign our CT processes to make utilization of resources (e.g. equipment) more efficient?
2. How can we shape personnel roles and responsibilities in an innovative deployment model?
3. How can we develop a new CT service delivery model before moving to the new facility?

HUS approached Siemens Healthineers to get answers to these questions and to create positive and lasting change in their CT workflows, using Meilahti Tower Hospital as a role model. The learnings from this project will inform future improvement projects in other departments within the HUS network. HUS and Siemens Healthineers jointly identified two focus areas: People and Process.

### People

Like many facilities today, the radiology department at Meilahti Tower Hospital faced a significant shortage of radiographers. Strong regional competition from the private sector in and around Helsinki exacerbated this shortfall. Thus, HUS needed new ways to attract and retain qualified staff. To that end, it was imperative that HUS staff were given a voice throughout the project. Their input is vital in shaping more efficient processes at the radiology department.

### Process

Improving the efficiency of the entire CT workflow was identified as a key goal. The scheduling procedure and the clear definition of roles and responsibilities required particular attention. Furthermore, the team also sought new ways to ease daily working procedures with innovative technologies and tools, like digital communication platforms to optimize cross-functional team work for instance.

To address these challenges, **four key principles** were defined:

- 1 Do more with less
- 2 Ensure that the right people are doing the right things – at the right time
- 3 Medical technology should support the staff and processes; not the other way around
- 4 Positive patient and staff experience is vital to success

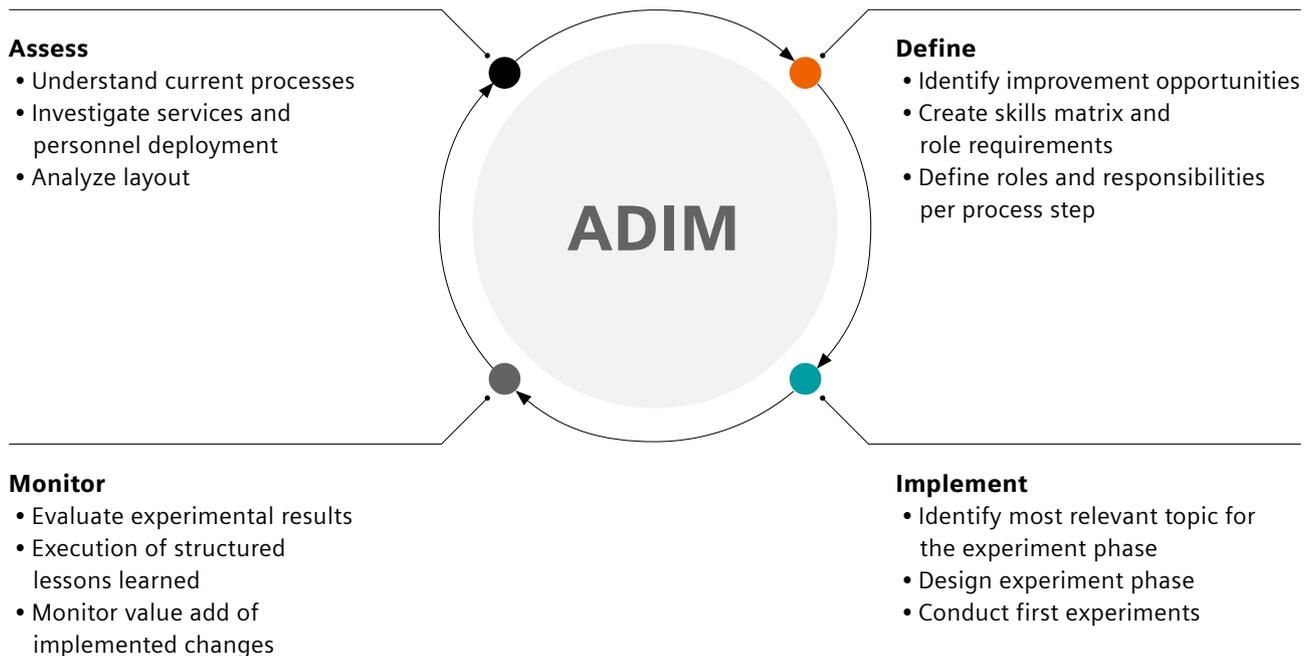
*“Our challenge is establishing people-centric processes for patients and staff and eventually applying that knowledge to the new hospital. With the right decision methods and data, HUS can evaluate and implement changes for improved efficiency and clinical performance to stay competitive.”*

Dr. Mika Koivikko, Chief Physician, Head of Division, Radiology, HUS

# The solution

## A structured, data-driven approach to improving efficiency

HUS and Siemens Healthineers used the proven ADIM-methodology to launch a 3-month efficiency program. ADIM structures the overall project in four phases:



### Assess

During the assess phase, the status quo was analyzed by conducting more than 20 interviews with experts at HUS. Due to COVID-19 regulations, all interviews were conducted remotely.

The current CT process at the Meilahti Tower Hospital was mapped using creative digital working methods like a virtual 360° tour provided by the HUS team. The consulting team also performed a sophisticated Business Intelligence (BI) analysis with data provided by HUS. Key inputs included:

- Radiology Information System (RIS) data
- Critical Incident Reporting System (CIRS) data
- Layout plans
- Shift plans
- Job descriptions

To form a full picture of the activities under assessment, the team visualized key metrics with the dashboard solution Qlik.

HUS goals in the assess phase included developing an understanding of the different service offerings and personnel deployment patterns. This laid a perfect foundation to proceed with the next phase of the plan, because subjective insights were matched with objective data, which made it easy to find improvement opportunities.

## Define

In the define phase, concrete improvement potentials were developed through close collaboration between HUS and Siemens Healthineers. A skill matrix and role requirements were also defined in this period. For every process step in the CT workflow the consulting team specified roles and responsibilities.

In cooperation with the Siemens Healthineers facility planning team, proposals for an optimized layout to suit the newly defined CT workflow and processes were made. After identifying the improvement fields, certain recommendations were prioritized for implementation in a series of experiments designed to determine the real-world effectiveness of the proposed solutions.

## Implement and monitor

After the initial two phases, the project was handed over to Innotiimi-ICG, the local consulting partner of Siemens Healthineers. Their team, together with HUS staff, was responsible for setting up experiments to test and monitor the proposed improvement actions. Using a local partner made it easier to work within COVID-19 restrictions that were in place at the time. In addition, Innotiimi-ICG was able to communicate with the customer in their native language and work on-site and in person.

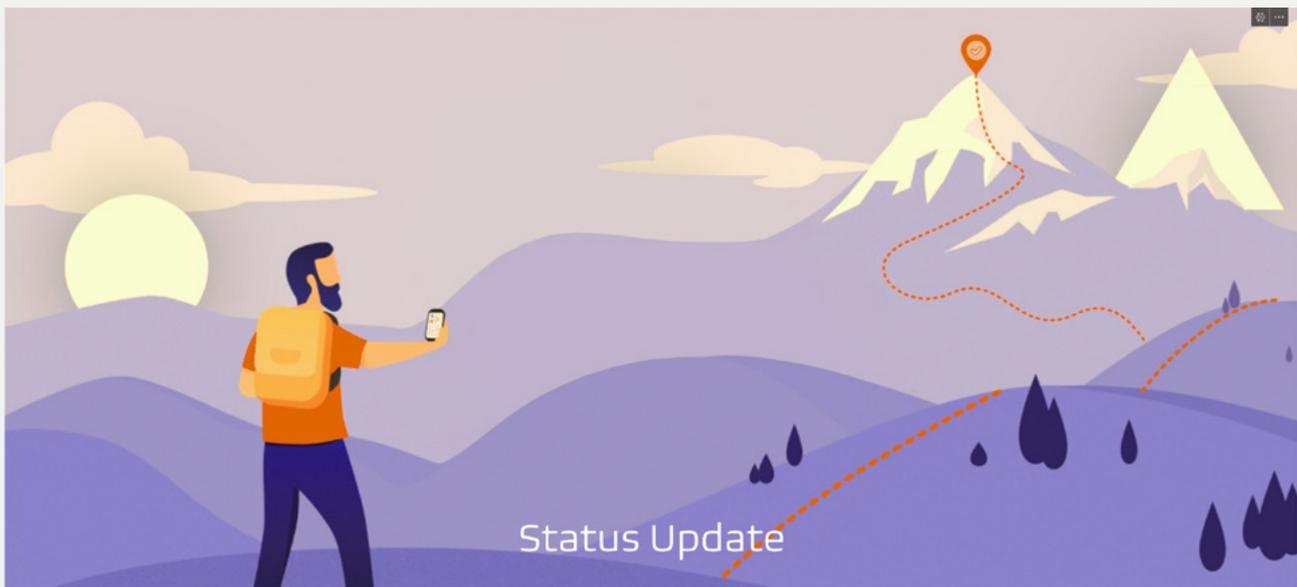
	 <b>Goal</b>	 <b>Procedure</b>	 <b>Outcome</b>
<b>Experiment 1</b>	Define what data is needed to determine variations in the patient appointment schedule and to optimize utilization of nursing assistants	Track whether patients get CT-scan on time and document sources of delays in the daily work of nurses	Insights on punctuality of CT-scans and initiation of discussion on roles and functions
<b>Experiment 2</b>	Enable faster patient release	Nursing assistants were given the responsibility of providing patients with additional information on upcoming exam	Radiographers had more time to interact with patients and patients had fewer questions for radiographers
<b>Experiment 3</b>	Use of a separate patient preparation room	A designated preparation room was assigned for CT exams.	Reduced stress and fear of errors among radiographers. Increased exam punctuality and time for patients.



## Staff engagement and change management

The project set-up was accompanied by efficient project management with regular steering board meetings. Since change requires the involvement of the people who will be affected, regular newsletters on the project progress were shared with the radiology department. This initiative strengthened the commitment of the staff and was especially necessary since mainly remote

interaction made it more challenging to involve staff members. In addition, the consulting team recorded an introductory video that was shared with all HUS employees at the very beginning of the project. Thus, everybody had the chance to get an overview of the project and get to know the project team and the project's objectives better.



Regular newsletters on the project status were sent to HUS staff to strengthen commitment in a remote-only project

# The results

## Identifying improvement areas and implementing change

Through the collaborative teamwork of the HUS staff team and the consultants, sustainable results were achieved.

The optimization areas and improvement potentials were summarized into six action fields, which are outlined below.

### Training and Skills

Focused and standardized training models for each staff role were recommended based on the employee skills matrix assessed in phase one. For example, extending the responsibilities of nursing assistants increased the overall attractiveness of this job profile. In the long run, these measures will help attract new employees and improve retention of existing staff. In addition, HUS will benefit from easy and fast onboarding of new employees by following the training recommendations.



#### Key results

- Updated nursing assistant job responsibilities improve recruitment and retention of talent
  - Faster onboarding
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### Operations

To improve CT operations at HUS, Siemens Healthineers developed a flexible calculation model to evaluate different operational and staffing scenarios. This sophisticated model is based on insights from the BI data analyses as well as expert interviews, and takes 6 parameters into consideration:

- Process times
- Operational model
- Structural setup
- Revenue structure
- Cost structure
- Staffing model

With this calculation model, HUS is now able to respond to individual situations and make changes equipped with knowledge of the financial impacts of different deployment scenarios.

Based on the insights generated, Siemens Healthineers proposed a completely new distribution of tasks between receptionists, nursing assistants, and radiographers, as well as an altered staff deployment model. This model demonstrated that, by implementing the recommended changes, staff costs could be cut by more than 40%. Furthermore, the model showed that by having the new working model and a separate preparation room, HUS could increase scheduled CT throughput by almost 30%.



#### Key results

- Potential to reduce staff costs by 40%
  - Ability to increase CT throughput for scheduled scans by almost 30%
  - Rapid evaluation and implementation of process and workflow changes enable ongoing improvement
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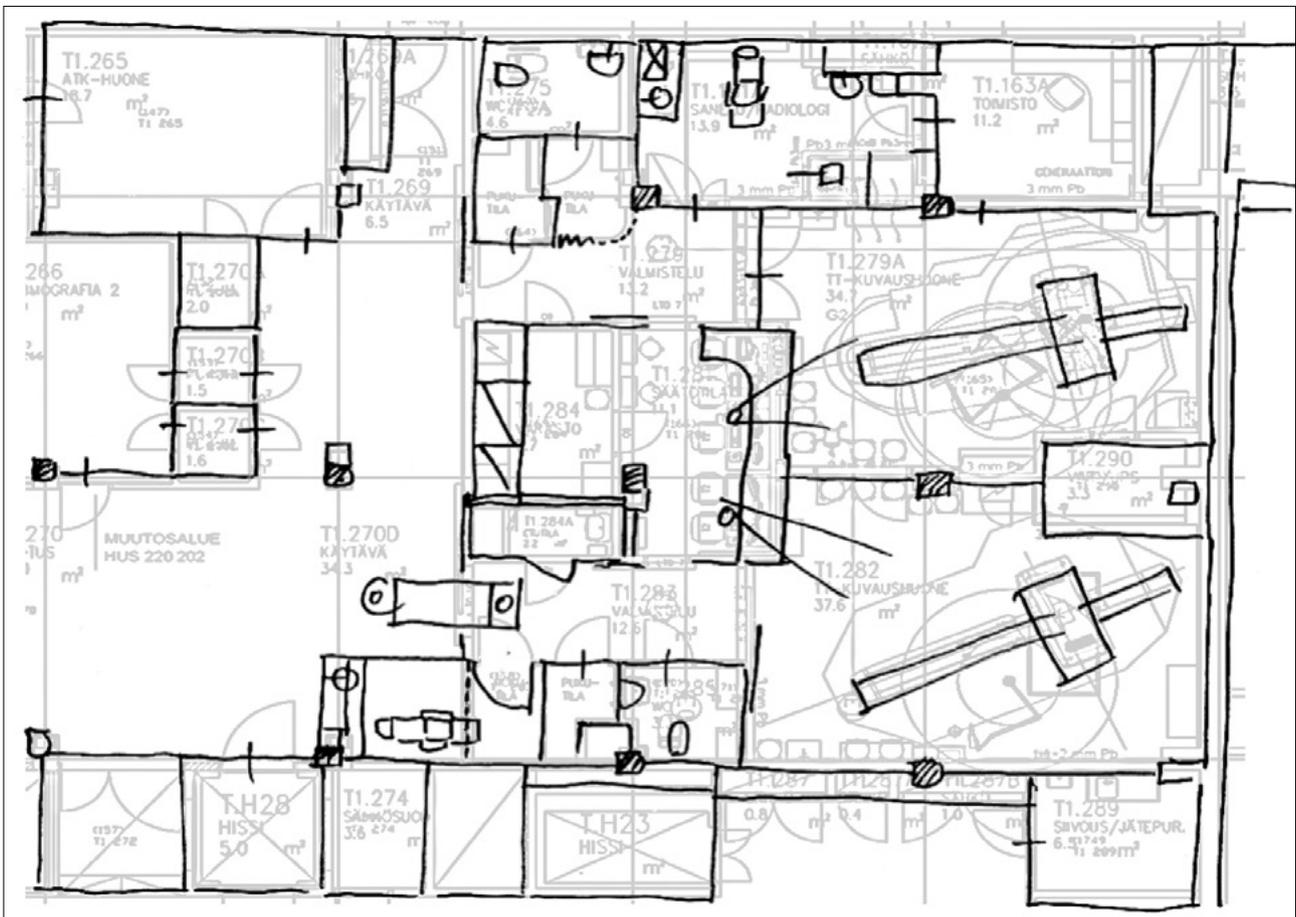
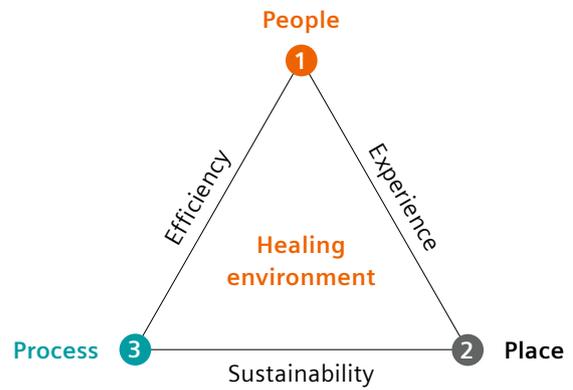
## Layout

The layout draft was adjusted to the needs of an efficient and modern workflow considering the three key factors of a healing environment: people, place and process.



### Key results

Human-centric layout enabled development of healing environment



Draft of the revised radiology department layout considering the elements of Healing Environment

## Patient Experience

Digital technologies will be used to enhance patient experience at HUS in the future. Monitors with individual waiting times, self-check-in counters and online booking systems will not only make the patient journey much more comfortable but also increase efficiency, resulting in reduced costs. Moreover, pre-defined standard communication sets for different types of scans will ensure that the patient will feel well informed through every step of the exam process. The new patient-centric care pathway will ensure a positive external and internal view of the radiology department.



### Key results

- Improved comfort and efficiency
  - Enhanced reputation of HUS radiology department
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## Communication

In order to increase communication among all disciplines and roles in the CT imaging process, regular joint meetings were proposed. This will improve interdisciplinary and interdepartmental information exchange.



### Key results

Improved communication across all CT stakeholders

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## KPI Controlling

By agreeing on a small number of measurable and impactful major KPIs (e.g. Procedures/Turnover per shift) that is valid and visible for the whole department, stakeholders are more likely to accept business decisions and workflow changes.

*“Siemens Healthineers work was extremely professional during each phase of the project. The project plan was clear, the focus of the work well managed and the team very skilled in their respective expertise areas. The most value adding part regarding the results of the project was the detailed and quantitative analysis of the CT imaging process. Siemens Healthineers deliverables exceeded the expectations in the actual process description and task mapping. Now we have a tool which helps us to plan and optimize our CT workflows. Thus we are able to respond to the constantly growing imaging demand.”*

Anna Skog, Operations Manager, Radiology, HUS

# Summary

## Data-informed consulting will add value for HUS

Several of the proposed recommendations have already been put into practice. For instance, the separate preparation room for CT exams was implemented permanently, as the corresponding experiment already resulted in 6% increased throughput per scanner.

By combining the traditional consulting approach with modern data analytics, a data-driven CT efficiency program creates significant added value for the customer. The insights gained from the data helped to find the existing pain points and to decide on the optimal recommendations across the six action fields (operations, training & skills, layout, communication, patient experience, and KPI controlling). Putting these theoretical suggestions into practice with local partner Innotiimi-ICG helped to verify and prioritize the potential value for the customer. This project approach showed that throughput could theoretically be increased by 30% and personnel costs cut by 40%.



Photo: Matti Snellman, HUS

*“With Siemens Healthineers, we have found a competent and innovative partner who has enabled us to achieve our goal of participatory process and utilization improvement despite cost savings and resource conservation in one.”*

**Dr. Mika Koivikko,**  
Chief Physician, Head of Division, Radiology, HUS

### Interested in improving your processes?

Collaborating with Siemens Healthineers Value Partners for Healthcare Consulting can help you optimize your operations.

**Get in contact:**

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# About Siemens Healthineers Value Partners for Healthcare Consulting

Healthcare is a complex business. Nearly every effort to grow, enhance or transform it is costly, too.

The financial strength of healthcare enterprises is inextricably linked to multiple performance metrics, including patient experience and clinical outcomes. The many diverse issues can be summarized with these few words: There is increasing and relentless pressure to do more with less. In demanding, volatile times, the importance of finding the right partner to collaborate with you and support you in preparing your organization for a healthy future cannot be overstated.

Siemens Healthineers has the resources, experience, and solutions to maximize value for stakeholders in the healthcare enterprise. And that value, as we see it, derives from excellence. As a result, every offering in the Siemens Healthineers Value Partners for Healthcare Consulting comprehensive portfolio is focused on the pursuit of excellence.

## 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.

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