Enhancing scanning capabilities through powerful MRI and AI solutions

Terveystalo

- Largest private healthcare service provider in Finland by revenue
- Leading occupational health provider in the Nordic region
- 377 clinics in Finland
- 152 clinics in Sweden
- 1.2 million private healthcare patients in Finland a year
- 1.8 million occupational health patients in Nordic region a year
- Employs 15,500 healthcare professionals
- 7.6 million individual appointments a year

"Our former MRI system had reached the end of its useful life. This presented the perfect opportunity to upgrade to a solution that would boost productivity, deliver sharper image quality and diagnostic accuracy, and improve the overall patient experience."

Sofia Karjalainen, Chief MRI Nurse

Innovative platforms for high quality imaging

The clinic reviewed several options and chose the SIGNA™ Victor 1.5T MRI from GE HealthCare for their forward needs. This powerful and sustainable MRI scanner rapidly performs reliable scans, providing high resolution and contrast imaging with minimal motion-induced distortion to support quick and informed clinical decision making. The radiofrequency technology inside SIGNA™ Victor uses a direct digital interface and offers up to 64 channels, the highest number in its class. This allows more coil combinations for faster and higher quality scanning, enabling staff members to perform a wider range of advanced studies than was previously possible.

Introduction

Terveystalo is the largest private healthcare service provider in Finland by revenue, and a leading occupational health provider in the Nordic region. The company is headquartered in Helsinki, and provides a range of general and specialist health and well-being services through a network of 377 clinics across the country, with a further 152 centres in Sweden. In 2023, Terveystalo provided private healthcare to approximately 1.2 million people in Finland alone, and occupational health services to 1.8 million people across the wider Nordic region. It employs approximately 15,500 health professionals across its extensive network, offering general appointments, laboratory tests, dental care, minor surgeries and imaging procedures. The radiology department at the Terveystalo clinic in Lappeenranta is staffed by four radiologists and five radiographers, who work in rotating shifts to perform X-rays, magnetic resonance imaging (MRI), mammography and ultrasound procedures. The team primarily carries out examinations on those who have been in accidents, or are referred through their occupational health schemes or the clinic's in-house orthopaedists. Scans are most commonly performed on the joints, spine and head to identify potential injuries

In addition, the lab could upgrade its previous 1.5T SIGNA™ HD system, installed in 2007, to the SIGNA™ Victor 1.5T MRI through the Victor Lift program. With the Lift program, the clinic was able to capitalise on the long life of the GE HealthCare MRI magnet while taking advantage of all the features and benefits of the new SIGNA™ Victor 1.5T system. The SIGNA™ Victor Lift 1.5T MRI program lowered total system acquisition costs while also providing savings in avoiding major construction costs, enabling the clinic to redirect funding to further enhance patient care in other areas.

The need to enhance diagnostic capabilities

The Terveystalo Lappeenranta clinic had been using its former MRI system for at least 15 years for routine MRI scans. The device had fulfilled its useful lifespan in light of the evolution in MRI technology over that time, signaling an opportunity for an upgrade or replacement. The team therefore initiated the search for an alternative solution that would enhance productivity, improve image quality and offer greater patient experience. The staff also wanted a system that would enable them to expand their imaging capabilities to additional areas of the body, such as the abdomen and prostate.

Adopting AI technology to enhance productivity

SIGNA™ Victor incorporates AIR™ Recon DL software, a breakthrough AI solution that sharpens image resolution, while reducing total scan time. The deep learning-based reconstruction algorithm removes noise, artifacts and ringing from raw images, improving the signal-to-noise ratio to generate crisper images. This enables additional features to be captured that could be challenging to see using the previous system. At the same time, the number of slices has grown significantly and slice thickness has been decreased, further supporting more informed and confident clinical decisions.

SIGNA™ Victor and AIR™ Recon DL solution has enabled the facility to cut the time spent on different types of MR examinations, for example, an ankle scan now takes:

36%
less time

16
minutes on average

50%
increase for in-plane resolution than when using the previous MR platform (Figure 1)

These time savings have freed staff to perform additional examinations and scanning sequences per individual when needed, enhancing diagnostic accuracy. They are also now able to spend more one-on-one time with each patient – enhancing the customer experience – and can provide scanning services to a greater number of individuals throughout the week.

SIGNA™ Victor and AIR™ Recon DL technology have made a huge difference to image quality and scan speed, especially for knee and shoulder scans, creating a smoother workflow. The platform and software are both easy to use, with automatic programs helping us to provide fast and reliable results every time.

Sofia Karjalainen

	Average exam duration (mins)				Scan resolution					
Scan type	Before the upgrade	After the upgrade	% difference	Example sequence	in plane spatial resolution		Increase in plane spatial resolution	Slice thickness		Slice thickness decrease
					Before the upgrade	After the upgrade		Before the upgrade	After the upgrade	
Ankle	25	16	-36 %	PD FS Cor	320 x 192	384 x 320	50 %	3.5 mm	3.0 mm	14 %
C-spine	15	12	-20 %	T2 sag	320 x 224	420 x 420	41 %	4.0 mm	3.0 mm	25 %
Wrist	22	17	-23 %	PD Cor	256 x 224	384 x 320	47 %	3.0 mm	2.0 mm	33 %

Figure 1: The time taken to perform various types of MR exams before and after the upgrade, and the percentage difference between these values. *= Jan-Feb 2024, before; **= June-July 2024, after.

Prioritising patient experience
The SIGNA™ Victor Lift upgrade features blanket-like AIR™ Coils, which improve patient comfort and enable a simplified, faster workflow while maintaining excellent image quality. A wider patient entry maximizes clearance and the ability to scan feet first further optimises the patient experience. The platform's shorter scan times also shortens overall examination length for each patient. This allows the staff to care for more patients each week, supporting earlier diagnoses and helping to reduce appointment delays.

"The AIR™ Coils noticeably enhance the experience for our patients, as they are softer and more comfortable than our previous solution. The imaging area is also more versatile, as it can be moved or expanded to the specific scanning needs and body size of each individual without inconveniencing them or adding to the examination time."

Sofia Karjalainen

Ensuring staff satisfaction
The recent adoption of the SIGNA™ Victor scanner has significantly enhanced staff satisfaction at the clinic. The new system is intuitive, requiring minimal training, which has been positively received by all users. Radiographers have also reported that the AIR™ Coils are lighter, easier to handle, making daily tasks much more manageable. The increased workflow efficiency brought by the new MRI scanner allows for a buffer between patient appointments, reducing stress for radiologists and clinicians and providing more time for decision-making and patient management.

"We have already received a lot of positive feedback from users, citing how upgrading to the SIGNA™ Victor scanner with deep learning technology has made the entire examination process faster and smoother for staff."

Sofia Karjalainen

Supporting sustainable healthcare
SIGNA™ Victor consumes

30% less power (1) per patient exam with AIR™ Recon DL

due to the shortened scan time, and features an eco-mode, which automatically reduces unnecessary electricity consumption. This green design helps the clinic to mitigate rising power costs. In addition, by upgrading the existing SIGNA™ HDxt system to SIGNA™ Victor through the Lift path, it eliminated the need to replace the existing scanner. This option was environmentally friendly, saving an estimated

37 tons of CO2 emissions (2)

in comparison to a full magnet replacement, mainly through reduced transport emissions.
Additionally, the upgrade avoided the need to remove walls for access, which would have created logistical challenges and incurred an estimated

A professional partnership that streamlined installation
GE HealthCare provided Terveystalo Lappeenranta with ongoing orientation, training and professional support from the start, ensuring that staff were well prepared before patient scans began.

The clinic also involved as many radiographers as possible in the in-person training, allowing for a seamless transition to the new system with little impact on customer appointments.
Reusing the existing magnet enabled the clinic to return to normal operations faster than would have otherwise been feasible.

"We were very happy with the quality of training and amount of technical support we received when we first started using the new scanner and software. The GE HealthCare staff have always been approachable and available if we ever have a query or problem, and we are confident that we will receive the help we need quickly in the future."

Sofia Karjalainen

Summary and future opportunities
The SIGNA™ Victor Lift upgrade and AIR™ Recon DL are expected to bring significant long-term benefits to Terveystalo Lappeenranta's imaging department. The durability of the upgraded magnet will extend its lifetime and simplify future maintenance, as it can remain in place .
The new platform will also enhance the quality of care provided by the clinic by allowing more personalised, one-on-one patient interactions and expanding the variety of scans that can be performed. Additionally, the increased imaging speeds will enable the staff to care for more patients as their customer base continues to grow, making high quality imaging and diagnostics available to a greater number of people in Finland and the wider Nordic region.

"The SIGNA™ Victor scanner, with integrated AIR™ Recon DL and AIR™ coils, has already exceeded all our expectations in the short time we have been using it. These latest MRI and AI technologies more than meet our requirements, and will enable us to support rapid and accurate examination of even more patients and injury types than was previously possible."

Sofia Karjalainen