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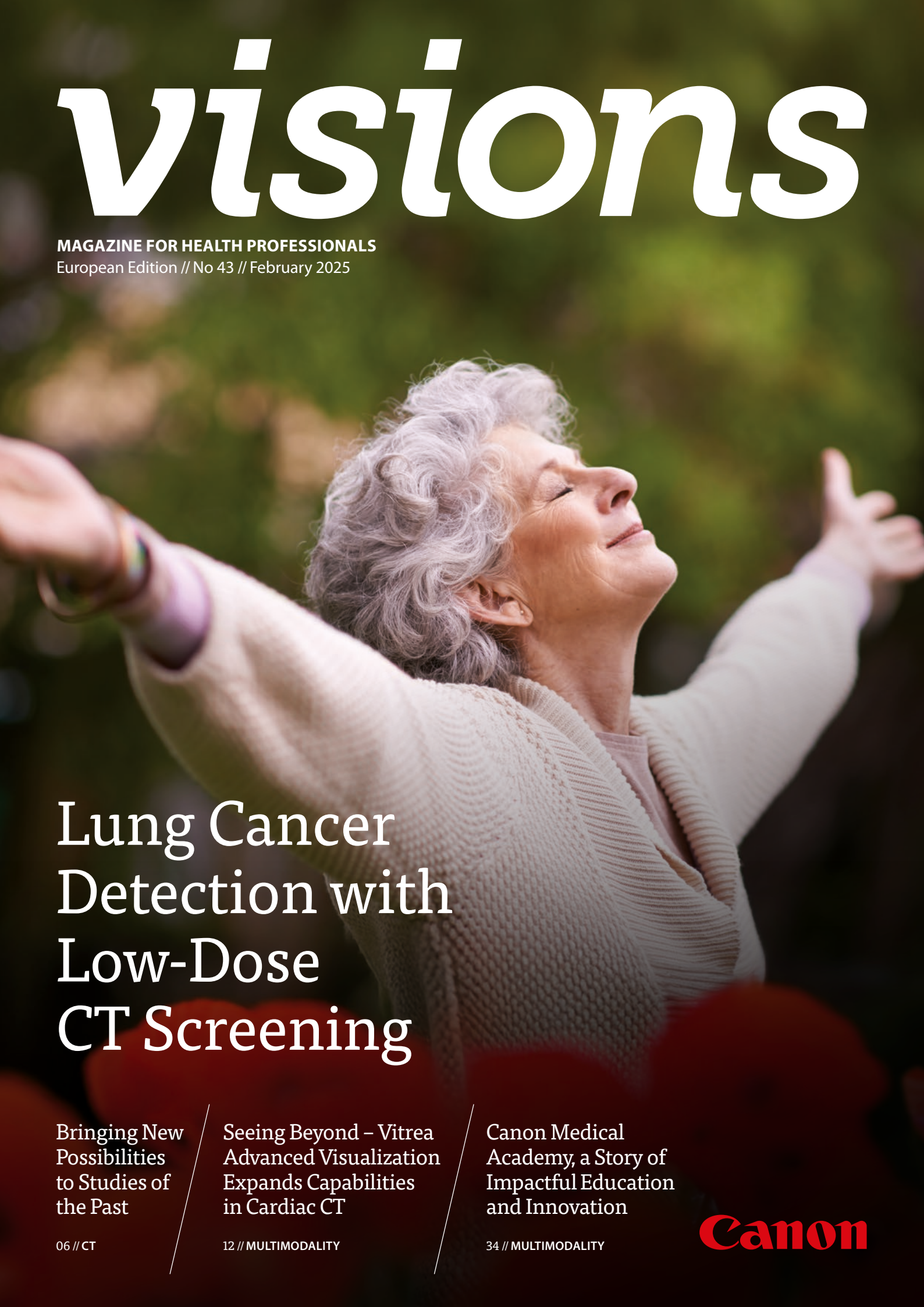
**MAGAZINE FOR HEALTH PROFESSIONALS**
European Edition // No 43 // February 2025



# Lung Cancer Detection with Low-Dose CT Screening



Canon

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 ISSN 1617-2876


# // EDITORIAL

Dear Readers,

It is with a mix of pride and nostalgia that we introduce this edition of VISIONS magazine: an important moment in our journey as we transition into an era of digital innovation. This exciting change reflects Canon Medical's commitment to sustainability and accessibility, setting the stage for a new chapter. At the European Congress of Radiology (ECR) 2025 congress in Vienna, in fact, we will present the last printed edition of VISIONS Europe – which will continues to thrive in a more sustainable and accessible digital format – representing a seamless evolution from decades of collaboration, innovation, and inspiration.

"We are all responsible for the health of our planet, so I am happy that we can contribute to this not only through our products but also by digitizing our European magazine VISIONS," said Jacqueline de Graaf, European Strategic Brand Manager at Canon Medical Systems Europe. This year's ECR theme, Planet Radiology, resonates with our commitment to sustainability, making our transition to a fully digital format even more meaningful. This pivotal change exemplifies Canon Medical's dedication to minimizing environmental impact while maintaining the highest standards in content delivery.

By transitioning paperless and enhancing our VISIONS Blog, we want to provide you with a more sustainable and dynamic platform. This change not only ensures broader accessibility for healthcare professionals worldwide but also introduces richer multimedia content and opportunities for interactivity, aligning with our "Made for Life" philosophy. Through this evolution, we aim to foster deeper engagement while reducing our ecological footprint.

Our focus on sustainability aligns seamlessly with the significant role Canon Medical plays in advancing healthcare. Among our many initiatives, our Lung Cancer Screening solutions stands out as an essential step forward in addressing one of healthcare's most pressing challenges. With lung cancer remaining a leading cause of cancer-related deaths, early detection is crucial. Canon Medical's pioneering technologies provide clinicians with the tools to identify abnormalities early, improving outcomes and saving lives. By empowering healthcare professionals with cutting-edge solutions, we fulfill our mission of making a meaningful difference in patient care.

Looking at this year and beyond, we reaffirm our promise to support the radiology community by driving innovations that elevate healthcare and streamline workflows, while respecting our planet.

Thank you for joining us on this journey and for being part of the VISIONS story. We invite you to read through this edition's insightful content and learn more about how Canon Medical's innovations continue to support healthcare professionals and patients worldwide.

**DAVIDE BILANCETTI**
*Editor-in-Chief of VISIONS Magazine,*
*European Content & Publishing Manager,*
*Canon Medical Systems Europe*

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# Bringing New Possibilities to Studies of the Past

Canon Medical's Aquilion Lightning SP solution is proving key in an international collaboration that combines advanced technology and archaeology to unearth new knowledge about human history. Researchers from the Anthropology Unit of the Gabriele D'Annunzio University of Chieti-Pescara (Italy), the Victorian Institute of Forensic Medicine, Monash University (Melbourne, Australia) and the Bioarchaeology Laboratory of the University of Indianapolis (USA) are using the Aquilion Lightning SP scanner and its advanced software to image skulls from victims of the eruption of Mount Vesuvius, in Italy, which buried the cities of Pompeii, Aplontis, and Herculaneum, in ash in 79 AD.

In the research project "Exploring the Secrets of Herculaneum: A Journey into Ancient Faces," 12 skulls of victims of the historical eruption from the town of Herculaneum, close to Pompeii, have been analyzed by experts in archaeology, anthropology and radiology. The main goal of the investigation is to reconstruct the ethnic composition of the population of Herculaneum more than two millennia ago.

Herculaneum, often overshadowed by its better-known neighbor, Pompeii, was a thriving Roman town that served as both a commercial and leisure hub. Herculaneum attracted wealthy citizens and international travelers due to its luxurious villas and proximity to the sea, while Pompeii was more industrial and populous. Historical records suggest that its inhabitants were a mix of Roman aristocrats, traders, and craftsmen, with strong connections to other Mediterranean regions, such as Egypt, Greece, and the Middle East. Historians have long been fascinated by the multicultural composition of Herculaneum's population.

*3D visualization of a skull using Vitrea Musculoskeletal software.*

The researchers have been able to obtain exceptionally detailed images of the skulls using the Aquilion Lightning SP.

"The 0.5 mm detector of the Aquilion Lightning SP provides high-resolution imaging, which is crucial for analyzing the fine structures of the skulls," said Arianna Di Felice, a PhD student in archaeo-anthropology at the University of Chieti-Pescara. "The system's advanced isotropic resolution allows us to perform precise 3D reconstructions of the 2,000-year-old remains."

## High-Speed Image Reconstruction

Additionally, its high-speed image reconstruction significantly reduces processing time. Fragile remains pose unique challenges for examination, such as degradation issues, making fast examinations crucial for archaeological and forensic research.

The Aquilion Lightning SP also incorporates advanced applications for post-processing, essential for anthropometric analysis and facial reconstruction.

"What makes the study of Herculaneum's population particularly fascinating is the opportunity to explore how the blend of cultures may have influenced not only the daily lives of its citizens but also their physical characteristics, lifestyles, and health," said Prof. Ruggero D'Anastasio, Professor of Anthropology at the University of Chieti-Pescara. "Through this study, we hope to gain a deeper understanding of the diversity present in the city at that time. These skulls represent individuals who likely experienced a rich cultural exchange, which is mirrored in their physical traits and the occupational markers we aim to uncover."

## New Insights

With the CT scans obtained from the research project, which started in 2022, the research team aims to uncover critical information regarding the ethnicity of the individuals who lived at Herculaneum, as well as explore any occupational indicators, and pathologies linked to their lifestyle and social status. This will not only shed light on the lives of the people from Herculaneum but also help expand understanding of the broader social dynamics of the ancient Mediterranean.

One of the main challenges of the work is the preservation of skeletal remains, which may be fragile and prone to damage during handling.


*From left: Federica Cordella (Radiographer, Spatocco Clinic), Raffaella Sirigu (Head of Radiographers, Spatocco Clinic), Arianna De Felice (PhD Student in Archaeological Anthropology, University Gabriele D'Annunzio Chieti-Pescara), Paola Amoroso (MD Radiologist, Spatocco Clinic), Francesca Di Sante (Nurse, Spatocco Clinic), Paola Gallucci (Radiographer, Spatocco Clinic).*

## Handled with Care

***What special conditions apply in imaging fragile archaeological remains?***

*Canon Medical System's Aquilion Lightning SP provides a number of benefits in this unusual work area:*

***Minimal handling time:*** *Fragile remains are highly susceptible to damage during prolonged handling. Fast image acquisition reduces the need for extended physical manipulation, preserving the integrity of specimens.*

***Reduced environmental impact:*** *Ancient bones are sensitive to environmental factors such as humidity, temperature fluctuations, and light exposure. Faster processing ensures the remains spend minimal time outside controlled storage conditions.*

***Avoid data loss:*** *Fast reconstruction reduces motion artifacts caused by natural shifts in the positioning of remains during scanning, ensuring precise and consistent imaging results.*

***Maximal workflow efficiency:*** *High-speed processing allows researchers to analyze more samples within the available time, improving overall productivity.*

***Improved collaborative research:*** *Real-time collaboration among multidisciplinary teams, such as radiologists and archaeologists, facilitating immediate data interpretation and decision-making.*

***Enhanced digital preservation:*** *Fast image reconstruction accelerates the process of creating digital archives of the remains, enabling immediate and secure long-term preservation in digital formats for future studies.*

*"The realistic image quality of Global Illumination helps us interpret subtle anatomical structures."*

*Carla Spatocco, Director of the Radiological Unit at Spatocco Clinic.*

In addition, the diverse ethnic backgrounds of the individuals present unique considerations for accurately reconstructing their facial features, requiring careful analysis and interpretation of the CT scan data.

"One of the major challenges in this project was obtaining accurate 3D renderings of bone remains that are over 2,000 years old," said Prof. Ruggero D'Anastasio.

"Canon's CT technology provided a solution through its combination of high isotropic resolution and advanced post-processing algorithms," said Carla Spatocco, Director of the Radiological Unit at Spatocco Clinic. "The isotropic resolution ensures that every voxel is captured

## A Blast from the Past!

***What can be discovered from the ancient remains using medical imaging?***

*Using Canon Medical Systems Aquilion Lightning SP, the researchers can find out more about the subjects regarding their:*

***Physical traits:*** *Cranial shapes, dental patterns, and bone structures may reflect the genetic diversity brought by trade and migration from regions like Greece, Egypt, and the Middle East.*

***Health and occupation:*** *Skeletal markers and pathologies offer insights into occupational roles, nutritional habits, and disease patterns influenced by the multicultural environment.*

***Cultural practices:*** *Burial customs, artistic styles, and dietary evidence provide a glimpse into how diverse traditions were integrated into daily life and social dynamics.*

with equal precision, enabling us to reconstruct highly detailed 3D models without distortion or data loss. Additionally, the software's ability to enhance contrast and eliminate noise was instrumental in distinguishing the fine anatomical details of the skulls, even in areas where the bone had degraded significantly."

"This breakthrough has made it possible to conduct detailed analyses, such as identifying microscopic pathologies and subtle structural variations, that would have been unthinkable using traditional methods," said Arianna Di Felice.

### Global Illumination

The project also utilizes Canon Medical's Global Illumination technology, which significantly enhances the reading of anatomical characteristics by providing photorealistic 3D renderings. The technology simulates complex lighting and shading, allowing for an unprecedented level of detail in visualizing spatial relationships and lesions within ancient skulls.

"The realistic image quality of Global Illumination helps us interpret subtle anatomical structures," said Carla Spatocco. "Photorealistic 3D

*"Il Flautista" (the "Flutist"), skull discovered during excavations in Herculaneum.*


*"Canon's CT technology is helping refine our research methods, not just for historical analysis but also in forensic cases of personal identification."*

*Arianna Di Felice, PhD student in archaeo-anthropology at the University of Chieti-Pescara*

reconstructions could serve as valuable educational tools, allowing students and the public to connect with the past in a tangible and meaningful way."

## Contributions to Anthropology

By applying forensic methodologies to the study of skeletonized and mummified remains, the project enables the team to delve deeper into the variability of anthropological characteristics.

"Canon's CT technology is helping refine our research methods, not just for historical analysis but also in forensic cases of personal identification," said Arianna Di Felice. "We foresee its continued use in future archaeological and anthropological projects, offering new possibilities for studying the past."

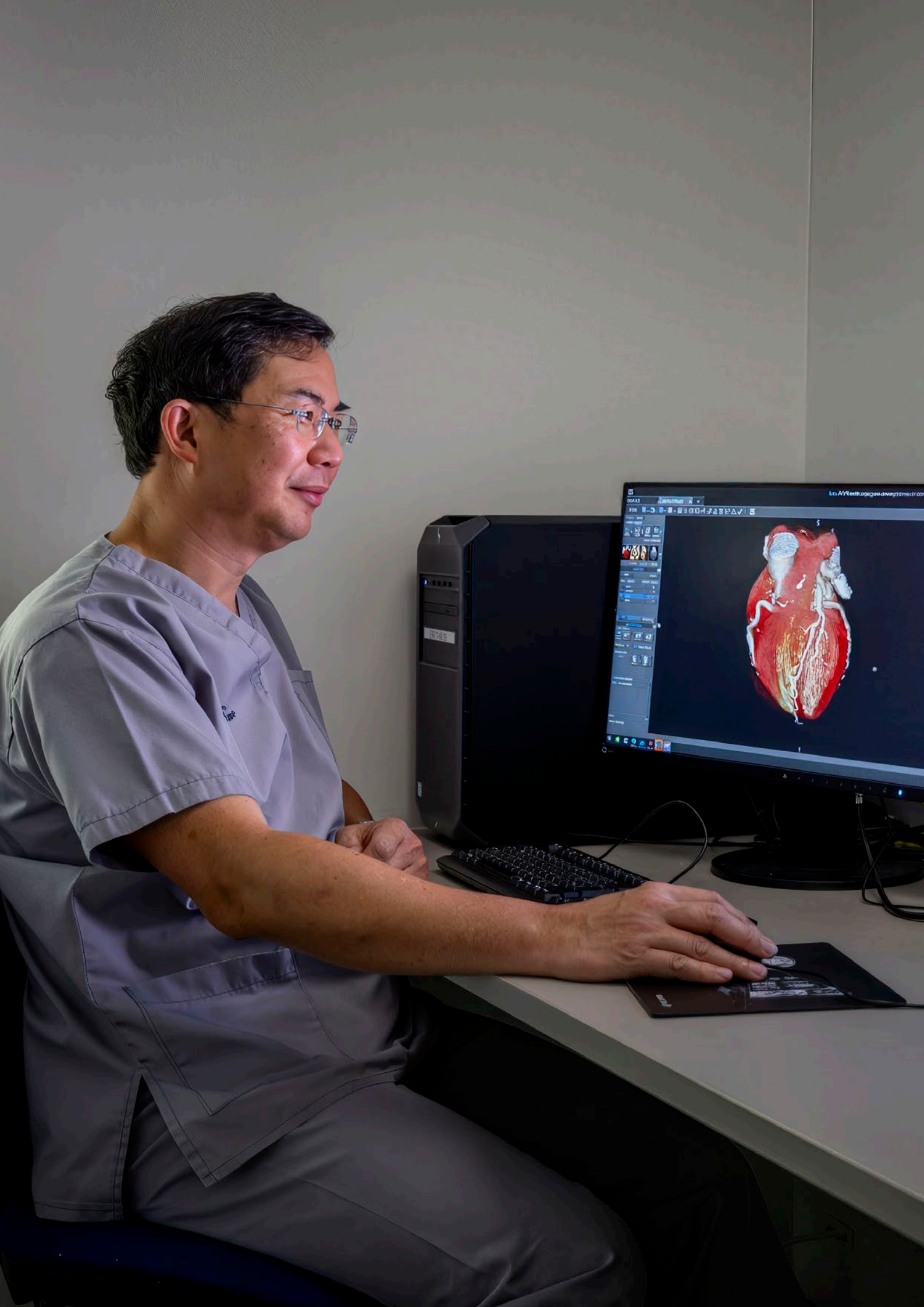
"By capturing the intricate details of the skulls, including bone structure and any potential pathologies digitally, the CT scans will enable researchers to reconstruct the faces of these individuals in 3D," she continued. "This process will provide insights into their physical appearance, health conditions, and possibly even their lifestyles, offering a glimpse into their daily lives."

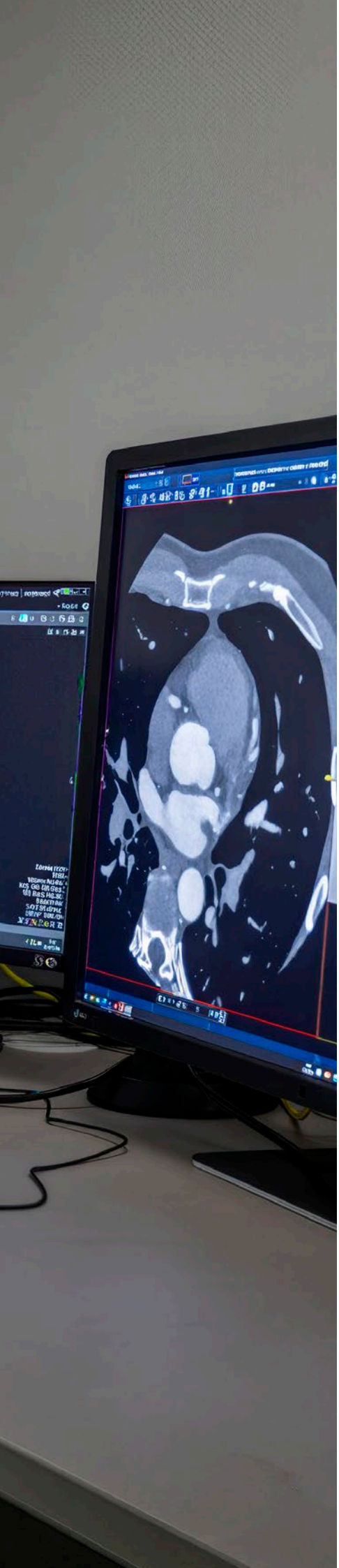
"CT scan technology is not yet widely adopted in the study of human remains, but we believe it should become a routine practice," said Prof. Ruggero D'Anastasio. "CT scans are invaluable both for investigative purposes and for ethical considerations, such as digital cataloging of remains, which may need to be restituted or reburied in the future." //

***What has already been discovered about the people of Herculaneum?***

*Numerous archaeological excavations are still underway in Herculaneum. Anthropological studies on human remains already found there continue. In particular, the dietary habits, different biological origins, and social differences of the population that lived there are being investigated.*

*Further studies are also underway on the taphonomic processes (biological decay/preservation) affecting the skeletons after death.*





# Seeing Beyond – Vitrea Advanced Visualization Expands Capabilities in Cardiac CT

Bradford Teaching Hospitals NHS Foundation Trust, West Yorkshire, United Kingdom, has developed its Cardiology Department over the years and now provides a comprehensive range of diagnostic and clinical cardiac services to the large population that it serves. Dr. Mark Kon, Thoracic Radiologist at Bradford Teaching Hospitals, explains how Canon Medical Systems has delivered imaging solutions that have enabled the Hospitals to meet the continually increasing demands, notably the Vitrea Advanced Visualization post-processing solution, which extends the possibilities with their Aquilion ONE CT scanners.

The Bradford Teaching Hospitals are operated by the Bradford Teaching Hospitals NHS Foundation Trust and are affiliated with the Leeds School of Medicine (Leeds University). The Bradford Teaching Hospitals serve a core population of 500,000 and provide specialist services to around 1.1 million people.

## Leading the Way

The Cardiology Department at Bradford Teaching Hospitals delivers a full range of adult cardiac services, including tilt tests, diagnostic and interventional coronary angiography, stress echo-cardiography, and trans-esophageal echocardiography. It provides first-line investigation for patients with stable chest pain. It is also used for acute aortic presentations, transcatheter aortic valve insertion (TAVI) assessments, and problem-solving for incidental cardiac and aortic findings.

Dr. Kon has been a consultant at the Hospitals for 20 years and has used Canon Medical equipment for a long time. His role includes lung cancer imaging, ultrasound CT-guided thoracic intervention, in collaboration with cardiology colleagues and cardiac CT.

*"The simplicity of Vitrea Advanced Visualization and Aquilion ONE allows me to offer a complete service for my Cardiology colleagues and our patients."*

*Dr. Mark Kon, Thoracic Radiologist. Bradford Teaching Hospitals, UK.*


Vitrea Advanced Visualization is an intuitive post-processing software that improves workflow and ensures accurate and efficient clinical diagnosis, supporting healthcare professionals in delivering high-quality patient care. It is especially useful for his work in cardiac CT.

With the Aquilion ONE and Vitrea Advanced Visualization, Bradford Teaching Hospitals were able to develop a regional service that led the way in coronary CT angiography, while adjacent hospitals were still developing their services.

"We started cardiac CT in Bradford over 15 years ago," he remarked. "Back then, we were using 64 MDCT and developed various beta-blocker regimes to gain heart rate control to minimize radiation dose. We were reliant on well-controlled heart rate with regular sinus rhythm to obtain diagnostic quality images."

"On-table intravenous beta blocker became routine, and low radiation doses allowed a wider range of patients to be safely scanned."

Over fifteen years' experience with intravenous metoprolol, a cardio-selective beta-blocker, allows them to gain rapid heart rate control on table. Patients are scanned at 20-minute intervals allowing for eight to 10 patients in a three-hour session.

## Robust Imaging

Bradford Teaching Hospitals opened a new CT suite equipped with an Aquilion ONE / PRISM Edition CT scanner in April 2024. With Canon Medical System's Aquilion ONE imaging, Dr. Kon can scan every patient prospectively with one heartbeat scanning.

"Irregular heart rhythms are irrelevant when we only need a single heartbeat," he said. "Acquiring images in systole and diastole means that even faster heart rates can be successfully imaged. And with such robust imaging, we never turn away any patients."

The acquisition time with the single heartbeat scanner is less than one second. This means that contrast only has to be present in the coronary arteries for a very short duration, so we only require a short, sharp bolus of contrast, typically 30-50ml at 5-6 ml/s.

*Bradford Teaching Hospitals' new CT Suite – The waiting and treatment environment of the suite was carefully designed after consultation with patients and staff and provides a calm space that reflects the outdoors to provide an extra relaxing distraction within the clinical setting.*

"By monitoring contrast arrival in the descending aorta, bolus tracking allows the use of trigger acquisition precisely, just when contrast has arrived at the coronary arteries. This avoids wasting time, contrast, and radiation compared to test bolus techniques," he added.

Aquilion ONE now utilizes Canon Medical System's Precise IQ Engine (PIQE). An AI-based Deep Learning Reconstruction algorithm trained on 0.25 mm dataset which generates sharp, noise-free images. "Reporting cardiac CT seems almost a pleasure with PIQE images!"

## Taking a Closer Look

Once the axial dataset has been acquired, Dr. Kon and thoracic radiology colleague Dr. Marjoram review the images on the Vitrea Advanced Visualization workstation, which automatically generates curved multiplanar reformatted images of the coronary arteries and side branches. It is available to them as an integrated client on any workstation at the different hospital sites of the Bradford Teaching Hospitals.

"I have used several coronary reconstruction software over the years, and I still believe Vitrea Advanced Visualization to be the most powerful," said Dr. Kon. "With a good study, any software can generate curved MPRs. However, when images are a little more challenging, for example, graft studies, tortuous vessels, or partially occluded vessels, Vitrea Advanced Visualization allows accurate correction using a suite of five tools."

The most automated tool strips away the lungs and thoracic cage leaving the heart and coronary vessels. It automatically detects and tracks the three main coronary territories and generates curved MPRs. Larger branches may also be tracked, awaiting user confirmation for labelling.

A secondary tool enables the user to select any other branch or vessels for automated tracking. This is especially useful for coronary bypass grafts, aberrant origins, or anomalous vessels.

The third 'pencil' tool allows the user to manually trace with the mouse missing segments of an incomplete tracked artery. This works best when the segments of interest can be seen on the surface of the 3D-volume rendered model or when the vessel disappears under other cardiac structures, such as the left atrial appendage.

Vitrea Advanced Visualization's fourth extend tool allows the user to extrapolate from the last tracked point to the final destination, often the aorta. Vitrea Advanced Visualization can successfully trace contrast in the vessel joining two endpoints.

## *Vitrea Advanced Visualization*

***Vitrea Advanced Visualization is an intuitive post-processing software that improves workflow and ensures accurate and efficient clinical diagnosis, supporting healthcare professionals in delivering high-quality patient care.***

***Simplicity:*** *User-friendly interface and easy deployment that enables smooth integration into your workflow. With an intuitive design, Vitrea Advanced Visualization simplifies advanced image processing and diagnostic support.*

***Efficiency:*** *Improved workflow through consistent user experience, maximizing productivity, and optimizing resource utilization for better clinical outcomes.*

***Confidence:*** *Robust clinical tools for accurate analysis provide the healthcare teams with confidence in both decision-making and patient management.*

Dr. Kon considers Vitrea Advanced Visualization's fifth tool, Centerline editing, to be the most powerful.

"Centerline editing in Vitrea Advanced Visualization requires a little manual dexterity, but it is this experienced application that makes it so robust," said Dr. Kon. "Literally, with pinpoint accuracy, the centerline of any vessel can be tracked with as few or as many points over as short or as long a segment as required. All without the interference of 'line dragging' automation especially seen with tortuous vessels."

"With Vitrea Advanced Visualization, I can follow any course of any vessel as long as I can see it. And I can always see it," he added.

## Educating Others

Alongside their consultancy work, Dr. Kon and his team run three Level Two Cardiac courses each year next to the CT scanning suite at Bradford Royal Infirmary. Vitrea Advanced Visualization has become a key part of the training. The candidates can work independently to learn how to read coronary CT using Vitrea Advanced Visualization software.

"Most of our candidates have very little experience of using software to manipulate coronary images," explained Dr. Kon. "In our courses, we teach them how to read coronary examinations on axial images and how to use the five tools to create curved MPRs. By the end of four days, they are all able to use Vitrea Advanced Visualization software to review cases."

"Those who have had previous experience of other solutions often say that Vitrea Advanced Visualization is the most intuitive and user friendly," he said. "I encourage them to explore it."

Not only do candidates learn how to review images in the courses, but they also get to experience the live acquisition of over 20 cases in the CT scanning suite on both Canon Medical System's Aquilion Prime 80 MDCT and Aquilion ONE 320 MDCT.

"This allows them to see the different techniques utilized with conventional 4cm scanning and 16cm wide detector single heartbeat scanning," added Dr. Kon.

In addition, Dr. Kon presents cardiac CT cases at several meetings, including those organized by the British Cardiac Society, the British Society of Cardiovascular Imaging, and the European Congress of Radiology. Canon supports these shorter demonstration courses by providing a full workstation with the latest edition of Vitrea Advanced Visualization and a database of Dr. Kon's cases.

"This is far better than using slides or a simple DICOM viewer, which can only demonstrate selected images or axial imaging. Having the full workstation allows me to demonstrate cases using all the tools that Vitrea Advanced Visualization has to offer," said Dr. Kon. "I start with simple axial viewing, moving to multiplanar reformats. Then, more complex coronary imaging, including grafts and stents. This gives me the chance to demonstrate all the tools Vitrea Advanced Visualization has to offer."

"The simplicity of Vitrea Advanced Visualization and Aquilion ONE allows me to offer a complete service for my Cardiology colleagues and our patients." //

Last year, there were major changes in the healthcare environment, including comprehensive revisions to fees for medical care, nursing care, and welfare for the disabled, work style reform for physicians due to the implementation of the revised Medical Care Act, and the promotion of healthcare digital transformation.

This year too, we will be required to respond to a variety of events. As the baby boomer generation joins the elderly aged 75 or over, priorities in medical demand will continue to change. In addition, there is no time to waste in addressing the issues facing the forefront of care, such as rising costs, a shortage and regional gaps of manpower resources, and the growing threat of cybersecurity risks.

At the same time, 2025 will mark the 130th anniversary of Wilhelm Conrad Roentgen's discovery of X-rays and the 50th anniversary of the introduction of X-ray CT scanners in Japan. This year, with the resolution embodied in our corporate philosophy Made for Life, Canon Medical Systems Corporation will continue to grow, aiming to contribute to those who face challenges in the field of medical care by providing better solutions while staying close to the medical front lines through a sales network of 15 major overseas local subsidiaries and 90 sales representatives in over 190 countries and regions around the world. Your continued support and guidance are deeply appreciated.

**TOSHIO TAKIGUCHI**
*President and Chief Executive Officer*
*Canon Medical Systems Corporation*

# Celebrating an Award-Winning Innovation

**Tetsuya Kawagishi.**

One of the highlights of 2024 for Canon Medical Systems was the recognition of the developer of cutting-edge ultrasound technology, who was awarded one of Japan's highest honors.

Mr. Tetsuya Kawagishi, President and CEO of Canon Medical Systems Europe, received the Medal with Purple Ribbon in April 2024. This national award is presented to individuals who have made outstanding achievements in academic research, art, culture, and other areas.

The medal was awarded in recognition of his involvement in developing novel diagnostic ultrasound technology to enable high-resolution imaging of tissues located deep within the body that cannot be visualized using conventional ultrasound technology. VISIONS spoke to Mr. Kawagishi to find out more about the outstanding achievement and his perspectives on 2025.

***Many congratulations, Mr. Kawagishi. The Japanese Purple Ribbon Award is a prestigious recognition. What does it mean to you?***

Canon Medical Systems excels at innovation. This was recognized by Japan's Purple Ribbon Award, which I was immensely proud to receive on behalf of Canon Medical Systems last year.

First of all, I must say that this is not only my own personal success. I was deeply involved in research and development at Canon Medical for many years. And over the years, I have seen how Canon Medical Systems strives daily to advance technology. In addition, receiving the award was a very important opportunity to recognize that our customers and field members contribute a great deal to our development.

*"Canon Medical's Research and Development are driven by our collective will to create solutions that meet important clinical and practical needs."*

*Tetsuya Kawagishi.*

I am filled with joy that Canon Medical Systems has been recognized for the award, because we are one team, including our joint research partners. I am proud to be working for a company with such a great culture. It is our duty to introduce our innovation, and nurture a culture that can create great innovation.

***Could you tell us a little about your journey in the medical imaging field?***

At Canon Medical Systems, I have been deeply involved in the research and development of new ultrasound technologies including tissue Doppler imaging, non-linear imaging, and 3D wall motion tracking.

I have led collaborations with global customers, managed marketing events, and contributed to upstream marketing and strategy-setting. As the organizer of global cardiac and radiology competence teams, I have played a key role in developing new technologies and managing projects, such as the i/a series and "iLead" liver package study.

With experience leading medical advisory boards, global launches, and advanced R&D initiatives, I have spearheaded next-generation architecture for ultrasound systems and supported business operations globally, collaborating closely with colleagues in various regions like Japan, the EU, Brazil, and the US.

I am delighted to have contributed to opening new doors for ultrasound systems. Customers told us they needed clearer images, and we delivered. I believe my contribution is that I am a member of the results of everyone's hard work.

***Canon Medical Systems has a strong reputation for innovation. Could you outline some of the key innovations or projects you've been involved with?***

Three ultrasound innovations stand out to me. The cardiac app, non-linear imaging, and tissue assessment. The aim of the cardiac application is to assess heart muscle function.

*"Achieving the highest standards in innovation is only possible through working together hand-in-hand with healthcare professionals, leading clinical experts, our customers, and others. I have seen this approach deliver exceptional results time and time again in my years of working at Canon Medical Systems."*

*Tetsuya Kawagishi.*

We provided the answer with tissue Doppler imaging and 3D wall motion tracking.

The market wants to see tumor vascularity with objective and quantitative non-linear imaging. Clearer, higher-resolution images. We provided contrast harmonic imaging and differential THI to meet these needs.

Shear wave elastography/dispersion and attenuation assess liver fibrosis and steatosis. Our unique active matrix technology and i-Beam forming also provide less artifact and better contrast.

***What roles do differential tissue harmonics (D-THI) and i-Beam play in ultrasound?***

Our customers explained how some ultrasound images could often be blurred by bones, air, and other artifacts. They wanted higher resolution, less blurred images to be able to see the vascularity on tumors, for example, with more clarity.

We set to work on finding ways to make ultrasound images better. One of our solutions was differential tissue harmonics (D-THI), which gives a clearer image even from far away.

The other one was the i-Beam, a technique capable of making the beam and image thinner. These solutions extend ultrasound's possibilities beyond its current capabilities. The techniques can be used in fields that were previously beyond the scope of ultrasound, such as MSK and deep abdominal examinations.

My mission is to ensure the development of 'game-changing' business solutions that will make a huge impact in the medical field.

***Why is a strong focus on innovation essential in achieving Canon Medical Systems' mission to drive the future of medical diagnostics forward?***

In the rapidly changing landscape of diagnostic imaging, healthcare professionals face many challenges. It is our priority to help them overcome these, and the only way forward is through innovation.

Our objective is to not only introduce new innovations but also to provide a culture that can create further great innovations.

We work on some amazing joint research projects and have come up with lots of innovative new ideas based on what our customers want. We apply our innovative approach to service, education, and professional organizations, all with the goal of providing exceptional customer care.

We are excited to grow with our customers, together, as part of the "Made for Life" experience.

***What advice would you give young people aspiring to work in medical imaging?***

Listen, observe, and understand. I ask precise questions until I understand and am convinced. I always try to go to the field as much as possible to have better communication, cooperation, and observation. Also, to believe that you can 'make waves.' You can make it possible.

Our market is very unique. It affects not only customers but also patients. We can only provide the solution with a deep understanding of the requirements. We must deliver our solutions to the real clinical scene.

## *A Track Record of Outstanding Innovations*

*The Purple Ribbon Award is a recognition of the ingenuity, quality and craftsmanship that is synonymous with Canon Medical Systems' research and development and its solutions.*

*It also reflects the true value of its "Made for Life" philosophy.*

*First and foremost, Canon Medical listens intently to its customers. It's market is unique. It comprises not only of customers, but also patients. And Canon Medical is deeply committed to its role to deliver solutions that benefit both in real clinical scenes. Those solutions demand a deep understanding of the requirements.*

*Secondly, Canon Medical is driven by its unwavering commitment to the "Made for Life" philosophy to continuously improve and excel in everything it does.*

*"We wholeheartedly believe that this can deliver a broader and deeper contribution to medicine and society."*

*Tetsuya Kawagishi.*

### *What about 2025 and beyond?*

As an engineer and member of the ultrasound business unit, I've had the incredible opportunity to lead customers in developing cutting-edge systems and pushing the boundaries of technology.

I am on a mission to develop a 'game-changing' business solution that will make a huge impact in the medical field. I am thrilled to be now developing the organization, including the global headquarters. I am excited to work with our customers to understand their market requirements and incorporate them into our product. I absolutely love this adventure of building the CMSE organization and process, which is always with customers. I am thrilled to contribute to society through my work!

We have been working on some amazing joint research projects and have come up with lots of innovative new ideas based on what our customers want.

This is "Made for Life" in 2025! And we couldn't be more excited about it!

### From conceptualization to clinical use

The novel technology developed by Mr. Kawagishi has now been incorporated into Canon Medical's lineup of diagnostic ultrasound systems as a new function called D-THI (Differential Tissue Harmonic Imaging) and is now available for clinical use worldwide. //

**Tetsuya Kawagishi**
*President and CEO of Canon Medical Systems Europe.*

## Differential Tissue Harmonic Imaging (D-THI)

*D-THI leverages the non-linear propagation of sound waves through body tissue. Non-linear behavior occurs when sound hits body tissue, and the speed at which it travels through the tissue varies according to the local pressure amplitude exerted by the sound wave. In zones of higher sound amplitude, it travels slightly faster than in zones of lower pressure. This leads to a distortion of the form of the sound wave during propagation and, as a consequence, the generation of harmonic frequencies that were originally not present in the sound wave before it entered the tissue (Fig. 1).*

*The generation of harmonics intensifies with the pressure of the sound wave and with the distance of the propagation. Therefore, harmonics are generated predominantly in the center of the transmitted ultrasound beam and in the area more distant from the transducer. Although the amplitude of harmonics is normally weaker than the fundamental frequency waves, they are concentrated in the center of the ultrasound beam and substantially reduced in the so-called 'side-' and 'grating lobes' which are off-center from wave transmission and reception in all transducers (Fig. 2).*

*Reducing side- and grating lobes is essential to improve image quality by removing image artifacts which originate from ultrasound echo signals from outside the ideal image plane and beam direction.*

*As already mentioned, harmonic frequencies are weaker than their corresponding fundamental frequencies. They depend upon the pressure amplitude and build up during propagation. In addition, as their frequencies are normally higher by multiples of the fundamental frequencies, another effect of sound waves in tissue becomes important. The higher the frequency, the stronger the*

*attenuation of the signal becomes. Consequently, echo signals from deeper areas become weaker when returning to the transducer, leading to a lower signal-to-noise ratio (SNR) of the image.*

*At this point, D-THI from Canon makes a dramatic difference: Non-linear propagation not only generates higher harmonics, producing multiple frequencies from a fundamental sine wave, but it also mixes different frequencies when propagated together within the tissue.*

*In a typical implementation of D-THI, a special transmit pulse is sent out that contains not just one central frequency (f) but two frequencies (f1 and f2). (Fig. 3). Due to the non-linear behavior of sound within the tissue, both f1 and f2 harmonics build up during the propagation, as described above. However, what is new and unique here, is that, due to the same non-linear behavior, a difference frequency f2 – f1 is generated. This "Differential Tissue Harmonic Frequency" features the same advantages as conventional harmonic waves, such as a sharper beam profile and less artifacts. However, in contrast to conventional harmonic waves, D-THI suffers much less from the attenuation effect due to their lower frequency. This means that D-THI signals from deeper regions are stronger, leading to a better signal-to-noise ratio in the deeper area of the image.*

*Canon Medical Systems' D-THI also carries the advantage that the bandwidth of the Canon transducers used is wide enough to ensure that the second harmonic frequency ( 2 x f1), which also builds up during the non-linear propagation, can be received as well (Fig. 3). In areas near the surface, the second harmonics add substantial signal strength to the echoes to improve the SNR of the image. And, as the harmonic frequency is at the higher end of the bandwidth, it also provides high spatial resolution to the image.*

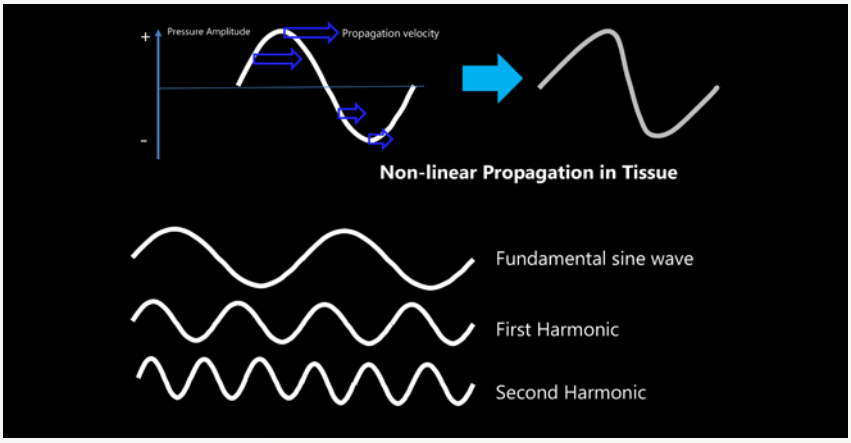



*Fig. 1, Non-linear propagation. Example of a sine wave undergoing distortion due to non-linear behavior of wave velocity with pressure. In addition to the fundamental sine wave, waves with multiples of the original frequency are generated.*

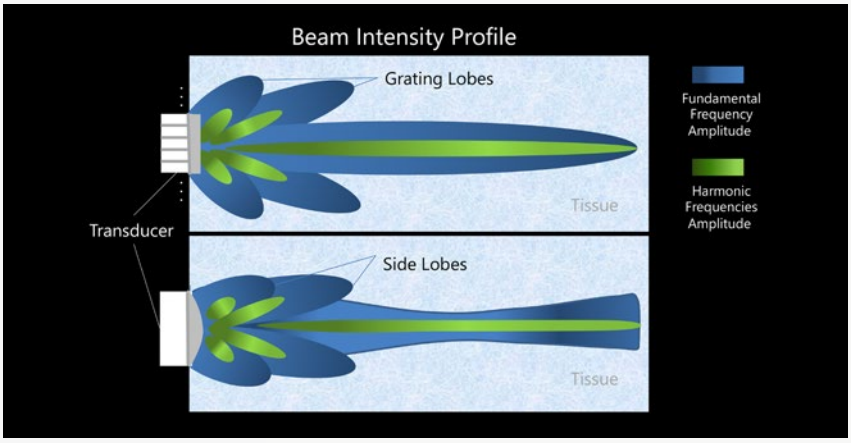



*Fig. 2, Beam profile under non-linear tissue propagation: Non-linear propagation effects depend upon the beam intensity, appear mainly in the center of the transmit beam and accumulate with the propagation distance. Side lobes pointing into the elevation direction and grating lobes pointing into the lateral direction of the transducer normally have lower intensity, and non-linear propagation effects are reduced.*

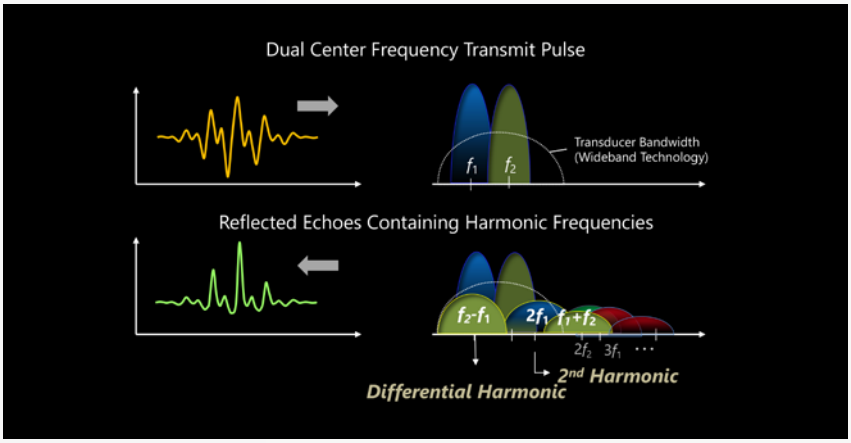
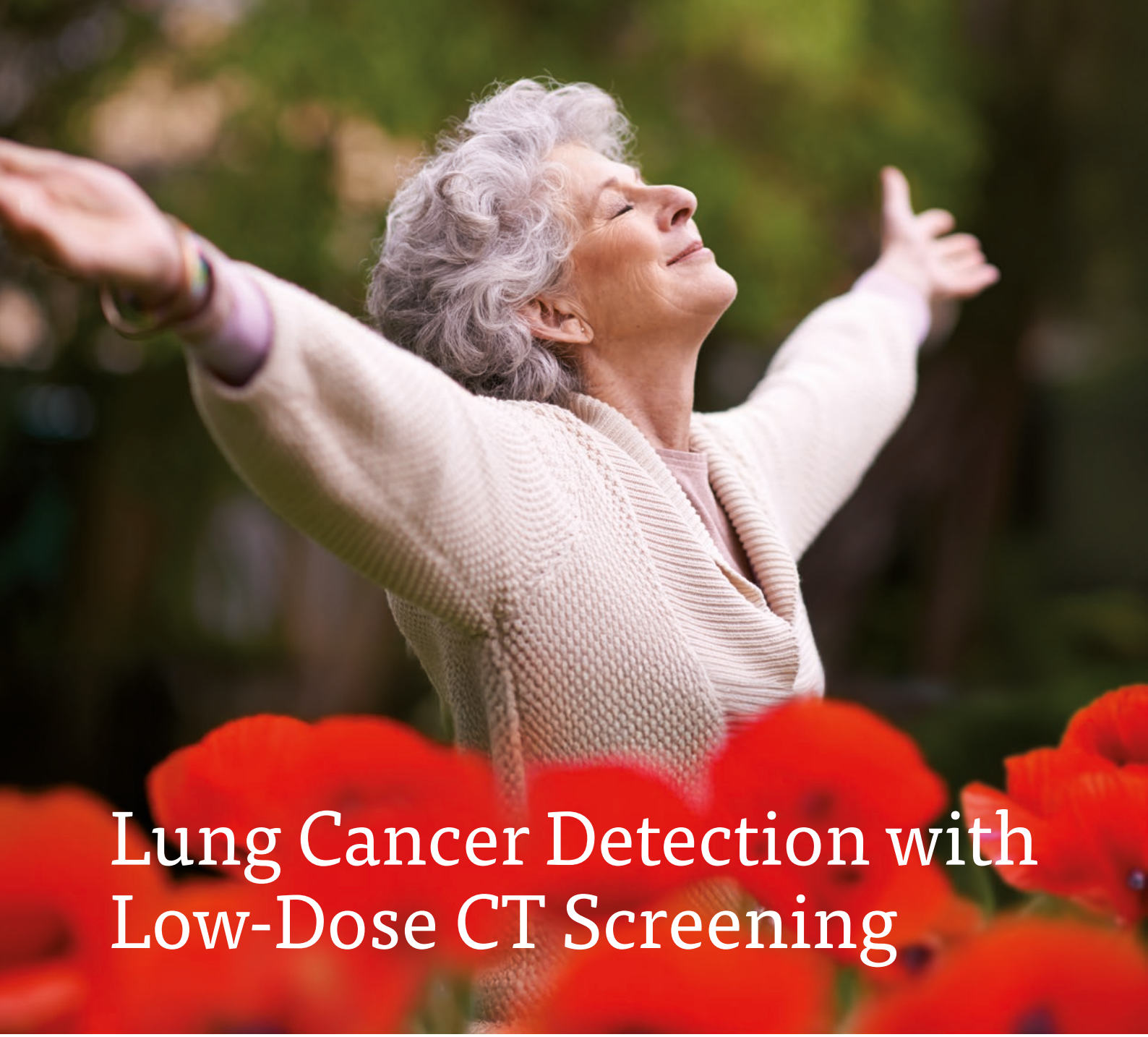



*Fig. 3, Principles of D-THI: The transmit beam frequency profile contains two central frequencies. The transducer bandwidth covers both frequency bands. Reflected echoes containing differential harmonic frequencies, as well as second harmonic frequencies, are received by wideband transducers to be further processed exploiting the advantages of good penetration and resolution of the incoming signal.*



# Lung Cancer Detection with Low-Dose CT Screening

**Prof. Cornelia M. Schaefer-Prokop**

Lung cancer causes millions of deaths worldwide every year[1]. The earlier it is detected, the better the patient's chance of survival. Lung cancer screening with low-dose CT can help diagnose cancer early, when treatment is more likely to succeed.

## Why is lung cancer screening important?

Screening for lung cancer is important because lung cancer is not only one of the most common cancers but also the deadliest cancer in men and women. Many cases of lung cancer are only detected when patients present with symptoms. At this stage, however, it is often too late for optimal treatment, and patients have a poor prognosis. The chance of a good outcome is increased when the cancer is detected at an early stage, as can be done through lung cancer screening.

## Why have screening programs not yet been implemented worldwide?

Scientific evidence shows that lung cancer screening statistically decreases lung cancer-related mortality. The first large trial on screening, The National Lung Screening Trial (NLST)[2],

## Biography of the author

*Prof. Cornelia Schaefer-Prokop works as a radiologist at Meander Medical Center in Amersfoort, in the Netherlands. Her research affiliations are with the Radboud University Medical Center in Nijmegen, the Netherlands, and Hannover Medical School in Hannover, Germany. Prof. Schaefer-Prokop is an expert in chest radiology with main research interests in computer-aided detection and classification, lung cancer screening, and interstitial lung diseases. She has served as President of the Fleischner Society and as the President of the European Society of Thoracic Imaging.*

was carried out in the USA, with results published in 2011 in the New England Journal. This randomized trial showed for the first time that screening reduced lung cancer-related mortality by 20%. The NLST compared low-dose CT with chest radiographs and included more than 50,000 subjects. More lung cancers were detected in the low-dose CT group as compared to the chest radiograph group. The NLST prompted many professional societies worldwide to endorse lung cancer screening and reimbursement of lung screening by insurance in the US.

The NELSON trial (Nederlands–Leuvens Longkanker Screenings Onderzoek)[3], performed in the Netherlands and Belgium and published in 2020, was the second major randomized screening trial that was large enough to confirm the results of NLST. NELSON had been performed on some 16,000 participants and was additionally able to show that the mortality reduction in women was substantially larger in women than in men. With the additional body of evidence available in favor of screening, many international professional societies started to recommend screening, and the European Union included lung cancer screening in their Europe's Beating Cancer Plan.

However, the implementation of lung screening has to be decided upon by each EU member state independently, which delays a Europe-wide roll-out. Many European countries have already started with pilot studies or even started implementation. Others hesitate because of logistic questions (are there enough radiologists and screening sites?), financial reasons (cost for implementation), the idea that screening would reward smokers (20% of lung cancer patients have never smoked, and 60% are former smokers, most of which would not qualify for current screening programs) and the difficulty to reach participants in the highest risk group (who are often unwilling to participate).

Such concerns are currently being tackled by EU programs such as SOLACE, which aims to provide tools to optimize screening and facilitate implementation in the EU.

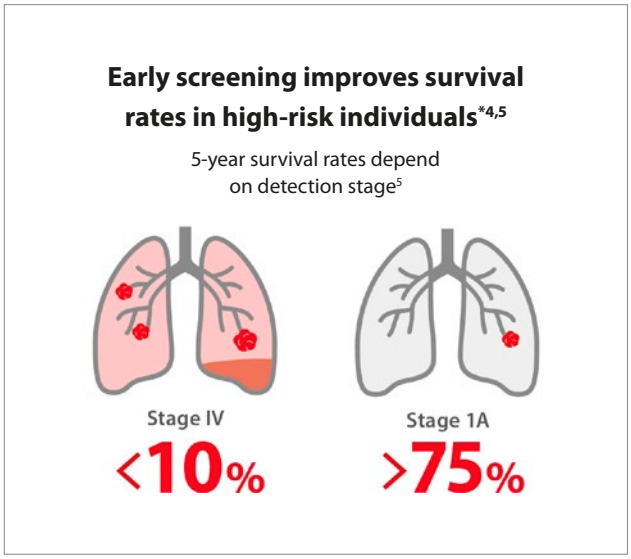
### What is the role of AI in lung cancer screening?

The role of AI in lung cancer screening is significant. Reading chest CT scans and just looking for nodules is a task that is so tedious that it can increase the risk of human error, which can result in missing potential cancers. AI support for lung screening can also help reduce radiologists' workloads, which are currently so challenging that the risk of burnout for radiologists has become substantial.

Besides the detection of suspicious lung nodules that could represent early cancers, AI can characterize nodule morphology, quantify nodule size, and asses growth rate, all with the goal of better establishing the risk for such a nodule to be an actual cancer that requires workup and treatment. In addition, AI can speed up reporting and help document findings in a reproducible and easily comprehensible fashion, including personalized recommendations for follow-up and workup. This not only improves screening outcomes but also makes it possible to cut screening costs.

### What is required from CT for effective lung cancer screening?

Since the cost of low-dose CT, for a large part, defines the overall cost of a lung cancer screening program, all technologies that can cut down costs are important to make screening the most cost-effective. Cost mainly depends on throughput and the hourly number of exams that can be performed per radiographer and interpreted per radiologist. Good logistics combined with simplified, partially automated scanning can increase the number of subjects to more than 10 per hour, while AI-supported image interpretation can make sure that reporting can be performed equally fast.




*Easy access to screening from anywhere with Canon Medical's CT City Hopper, an easy-to-transport temporary solution with a high-end CT.*

Sufficient image quality at low doses is a prerequisite for lung screening CT. This requires optimizing the scanner technology and the scan parameter settings: optimized X-ray beam filtering can reduce radiation burden, sensitive CT detectors can improve signal and reduce noise, and modern image reconstruction, such as deep learning reconstructions, can provide high spatial resolution and low noise.

In most settings, there will not be a large enough screening population in a region to fill up a dedicated screening CT unit. In such a situation, modern scanners with adequate scanning parameters, especially advanced image reconstruction techniques, will have to be used. In areas with a large screening population, the use of dedicated screening CT scanners will be an option. Such scanners should be equipped with far-reaching automation for cost-effective scanning, combined with technology to optimize image quality at low doses.

Combining modern CT technology with clever logistics and a well-trained AI-supported workforce will allow population-based lung cancer screening that provides maximum benefit at a low cost per quality-adjusted life year gained. //

**Prof. Cornelia M. Schaefer-Prokop**
*Radiologist, Meander Medical Center, Amersfoort, The Netherlands, and Researcher affiliated with the Radboud University Medical Center in Nijmegen, the Netherlands.*

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***Click HERE or scan this code to read more about Lung Cancer Screening.***

# Overcoming the Invisible Hurdles of Lung Cancer Screening (LCS)

## Deciphering Barriers to Lung Cancer Screening (LCS)

### Screening-related Concerns

**83%**

of survey participants perceived **potential harm from false-positive findings** as a significant barrier to LCS[3]

**65%**

of smokers who did not intend to screen were worried about **lung cancer risk from radiation exposure**[4]

### Practical Barriers

**18%**

of non-participants in the UK LCS Trial declined screening due to **travel challenges, including distance and trip costs**[4]

Differences in **CT scanner availability** across countries significantly impact the effective implementation of LCS[6]

| **43** | **8.9-44.3** |
|---|---|
| **US[5]** | **Europe[6]** |

Number of CT scanners per million population

### Other Barriers

- Fear of cancer diagnosis[7]
- Smoking-related stigma[4]
- Low perceived risk of lung cancer[7]
- Suboptimal integration of LCS into primary care[3]
- Lack or minimal reimbursement for LCS[4,8]
- Difficulties integrating a CT screening policy at the national level[9-11]
- Limited number of CT scanners in rural areas[9]
- Low health literacy[9] & LCS not being considered a medical priority in some regions[12]

## Ways to Overcome These Barriers

Increasing awareness about the benefits of **ultra-LDCT-based LCS**, such as **lower radiation exposure**[13] and **AI-enhanced image quality**[14]

Adopting **mobile screening units** to reach high-risk populations facing geographic barriers[4,7,9,15,16]

- Supporting multidisciplinary efforts to develop national programs for LCS and improve its integration into primary care[8,9,11]
- Integrating co-morbidities/combination screening into LCS[17-19]
- Supporting societal initiatives that promote and enhance LCS:
  - Patient advocacy groups (including smoking cessation groups)[4,20]
  - Promoting smoke-free generations[21]
  - Creating a health-conscious society[7]

## Improved implementation of LCS and uptake of eligible patients


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# The World Unseen: a Photography Exhibition Redefining Accessibility

Davide Bilancetti

Canon Europe has launched 'The World Unseen,' a groundbreaking photography exhibition that invites audiences to experience art without relying solely on sight.

What if photography exhibitions could challenge how we perceive the world, offering a multi-sensory experience that transforms the unseen into something deeply felt?

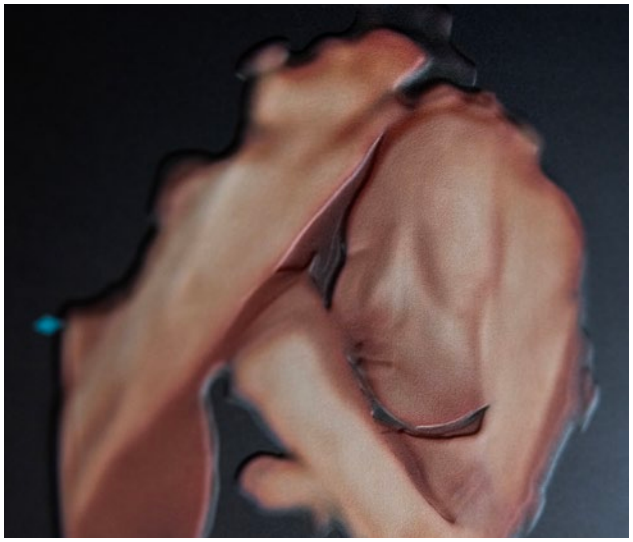
The answer to this question lies in 'World Unseen, the photography exhibitions you don't need to see' from Canon Europe[1], launched in 2024, it challenges traditional norms of visual art by integrating tactile images (created using Canon's elevated printing technology[2], combining Arizona flatbed printer series and innovative PRISMAelevate XL software), audio descriptions, soundscapes, and braille.

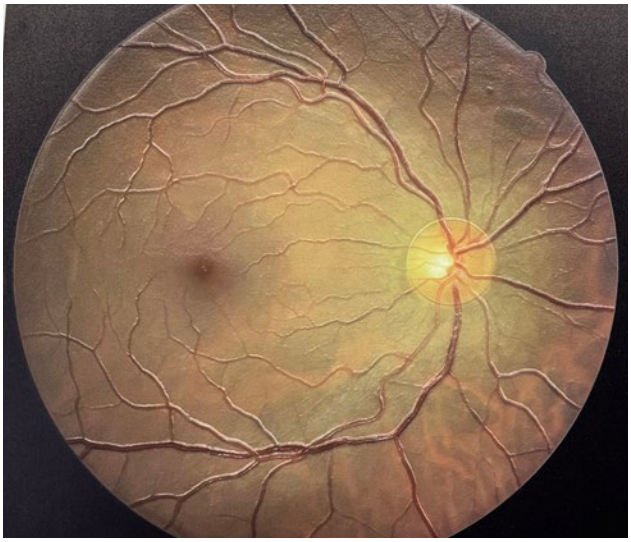
Developed in collaboration with the Royal National Institute of Blind People (RNIB), this unique initiative ensures that images can be experienced by everyone, including those who are blind or partially sighted.

## Raising Awareness of Visual Impairments Through Photography

Several images in 'World Unseen' have been intentionally obscured to simulate visual impairments such as diabetic retinopathy and glaucoma.

This creative choice helps sighted visitors understand the perspective of individuals living with these conditions, fostering empathy and awareness.





*Two of the exhibition's photos. On the left, a 3D scan of a baby at 29 weeks and three days, captured with the Canon Medical Aplio i700. On the right, a retinal image captured with the Canon Medical CR-2 AF clearly displays the macula and the optic nerve head.*

## A Life-Changing Experience Through Technology

One of the most moving stories from the 'World Unseen' campaign features Karen Trippass, a visually impaired expectant mother, who was able to experience her unborn child in a profoundly unique way. Through Canon's advanced ultrasound technology (Aplio i700), detailed imaging data was used to create a 3D-printed model of her baby's face. This tactile model allowed Karen to feel the contours of her child, forming a deeply emotional connection that sighted parents might typically experience visually.

This initiative was made possible by the expertise of ultrasound specialist Bill Smith, who worked closely with Karen to translate high-resolution ultrasound images into a physical, touchable format. For Karen, who had struggled to engage with traditional ultrasound scans, this experience brought the miracle of her pregnancy to life in an entirely new way.[3]

For healthcare professionals, this case underscores the transformative potential of advanced ultrasound systems. Canon's high-resolution imaging technology not only provides exceptional clinical insights but also makes these experiences more accessible to patients with unique needs, such as visual impairments. By bridging the gap between diagnostics and patient-centered care, this story demonstrates how innovative imaging solutions can enhance both outcomes and patient experiences.

## Inclusive Storytelling from World-Renowned Photographers

The exhibitions feature contributions from Canon Ambassadors, including renowned photographers Brent Stirton and Sebastião Salgado.

Their work embodies the essence of inclusive storytelling, transcending the boundaries of sight and allowing audiences to connect with the narratives in new ways.

## A Commitment to Accessibility and Collaboration

'World Unseen' serves as a reminder of the shared responsibility to create a more inclusive world.

By blending technology, art, and collaboration, Canon Europe highlights the importance of designing experiences that cater to diverse needs.

## Expanding Horizons Through Innovation

'World Unseen' is more than an exhibition; it is a vision of what accessibility and innovation can achieve together. For medical professionals, it offers a rare opportunity to see the transformative potential of imaging technology showcased in an entirely new context.

Through interactive displays and evocative photographs that simulate visual impairments, 'World Unseen' invites visitors to engage with the unseen from a deeply human perspective.

These exhibitions not only celebrate the possibilities of today's imaging technology but also opens the door to future collaborations between art and medical science.

Visit 'World Unseen' to experience this groundbreaking initiative firsthand, and imagine the ways in which medical images may continue to inspire and connect us all. //

***References***

[1] *Scan the code or click HERE to find out more about the World Unseen Exhibition*

[2] https://www.canon-europe.com/business/solutions/elevated-printing/

[3] https://www.canon-europe.com/view/into-the-light/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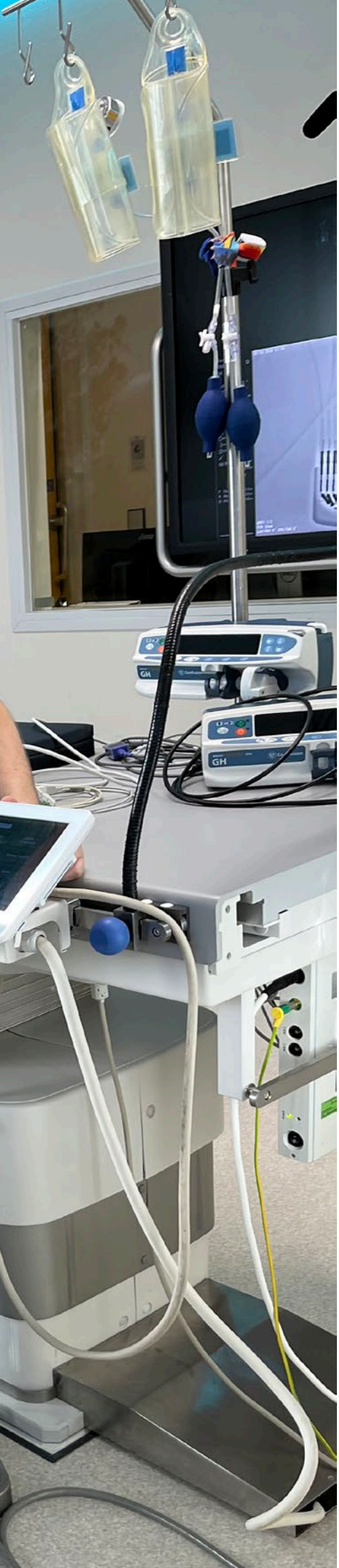

*Wim Nijwening, Nursing Leader Emergency Care and Senior Intervention Nurse HCK, Canisius Wilhemina Ziekenhuis, Netherlands.*

# Canon's Hemodynamic Solution - Broadening the Possibilities with "Just one Push on the Button"

**The Canisius Wilhemina Ziekenhuis (CWZ) is a top clinical teaching hospital that serves the Nijmegen area of The Netherlands. CWZ has 653 beds and covers 26 different medical specialties, including Cardiology, for which, it provides a 24/7 service including diagnostic and interventional procedures frwom two dedicated, cardiac cath labs. Approximately 1,500 coronary angiographies and 1,000 PCIs are performed there annually.**

CWZ has been using various products of Fysicon (a Canon Company since 2018) for more than 20 years. One of these is QMAPP®, a compact and advanced hemodynamic monitoring system that can now be integrated into Canon's Alphenix suite, enabling streamlining with cath lab workflows and delivering hemodynamic functionality to the fingertips, via a tableside tablet. Wim Nijwening, Nursing Leader Emergency Care and Senior Intervention Nurse HCK at CWZ, shares his experiences of working with the system and explains the possibilities that it offers through meeting many challenges in the cath labs at CWZ.

### Why did CWZ choose this system?

The tablet came with Canon's Alphenix system. We were interested in the integration with QMAPP on the tablet - We had been waiting for this integration possibility in a system for some time. It is used a lot, especially because we often need to work with just two staff. The distance between our registration room and our procedure room itself is considerable, and previously required us to divide our attention between circulation and registration work. All we have to do now is start up those patients in QMAPP, and beyond that, we don't have to get behind the controls. We can now carry out hemodynamics on the tablet, and the PC with the EPD is already in the back of the room. This makes it perfect for taking samples and FFR measurements. Room 1 has a tablet integration, Room 2 doesn't yet. Now that we use the tablet so much in Room 1, we do really miss this in Room 2.

### Could you describe the workflow at the cath lab before and after introducing Alphenix tablet with QMAPP functions integrated?

The measurements that we make in QMAPP are automatically registered in the right place in our EPD. Prior to this, we were required to enter them manually, which is an approach that is much more prone to error. With tablet integration, the manual transfer of measurements is a thing of the past. Just one push on the button and the sample is processed correctly.

### What was the biggest challenge without tablet integration?

Our biggest challenge in the cath lab was getting between patients and the registration room. It caused a lot of disruption when we wanted to take a sample but were out of the room. The advantage is that the nurse at the table now controls both the fluid management system (the system used to administer the contrast) and the tablet (used to process the samples). This eliminates the need to coordinate when the fluid management system should remain quiet and hold on giving contrast while making a sample. It is now is in the hands of the same nurse through use of the tablet. The nurse has the most time for this. Our other staff are often extremely busy during shifts.

## *"Now, we can stay with the patient, monitor and guide them better."*

*Wim Nijwening, Nursing Leader Emergency Care and Senior Intervention Nurse HCK, Canisius Wilhemina Ziekenhuis, Netherlands.*

### What were your expectations of tablet integration and have they been fulfilled?

That it offers a logistical advantage. It requires little- or no training. Everyone immediately understood how it worked. The tablet has large logical buttons containing all necessary functions. Although there are some points that can be improved, QMAPP integration to the Alphenix tablet has become an important part of the workflow.

### Which functionality in the tablet has the most added value for you?

Sampling.

### Did it take you a lot of time to get used to using the tablet?

No, because it is so familiar. No training was required to get started. We used the tablet for the first time during a weekend, when I was on-call and it was very busy. We were able to test it right away. One press on the button and it just works. You can rely on it.


*QMAPP integrated Alphenix tablet.*

### Would you recommend Alphenix tablet with QMAPP integration to other physicians and colleagues?

Yes. Definitely. We are very happy with it. It is especially valuable to us that the lines of communication with Fysicon are short. If you want something different there are possibilities for that. We also really feel that we can contribute to improvements because our suggested changes are actually implemented.

One example of the cooperation between Fysicon and our department is the introduction of the option "Get worklist".


*QMAPP, a compact and simple technology in the cath lab, makes your Alphenix suite more efficient*

Worklist update required up to one minute. This was often inconvenient, especially at the time when an emergency patient arrives. In consultation with Fysicon, an additional option has been added to actively refresh the worklist. This eliminates the need to wait and saves precious time. The system should be very convenient for all users. //

*"I would 100% recommend it to others to start using this Alphenix tablet with QMAPP integration."*

*Wim Nijwening,*
*Nursing Leader Emergency Care and Senior Intervention Nurse HCK,*
*Canisius Wilhemina Ziekenhuis, Netherlands*

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# Canon Medical Academy, a Story of Impactful Education and Innovation

**Davide Bilancetti**

Celebrating the first year of the Canon Medical Academy Europe training center with stories of success, innovation, and meaningful connections in healthcare education.

In September 2023, Canon Medical Systems Europe inaugurated its new European headquarters in Amstelveen, the Netherlands, marking a significant milestone in its commitment to advancing healthcare education and innovation.

Central to this structure is the first training center of the Canon Medical Academy Europe, featuring state-of-the-art medical equipment from all modalities, positioned adjacent to the 17 classrooms spanning over 8,600 m². The Canon Medical Academy offers a holistic range of educational and clinical resources tailored to the needs of healthcare professionals, with webinars, workshops, symposia, hands-on training, peer-to-peer education, a resource library, and an online database.

*"Being part of the Canon Medical community offers valuable access to education, information, and hands-on experience."*

*Mr. Tetsuya Kawagishi, President and CEO of Canon Medical Systems Europe.*

## The Journey So Far

Established in 2020 with the vision of bridging the gap between clinical excellence and education, since its very beginning, the Canon Medical Academy has become a leading center for peer-to-peer education, hands-on training sessions, online courses, and collaborative opportunities that have empowered healthcare professionals to enhance their skills and improve patient outcomes.

During this time, the Canon Medical Academy has hosted numerous workshops and training sessions, focusing on the latest imaging techniques and technological advancements, and collaborated with esteemed organizations, such as the European Society of Radiology (ESR). In fact, the Canon Medical Academy has a dedicated area at the European Congress of Radiology (ECR) in Vienna, where attendees can participate in several educational workshops with worldwide experts.

"We observed a gap between the clinical expertise and the innovations from our company. We want to bridge that gap by providing education to our customers to increase their clinical confidence and support them in their daily challenges," said René Degros, Vice President of Canon Medical Systems Europe.

"It is our commitment, based on our 'Made for Life' philosophy, to not only deliver clinical solutions to our customers but also to support them in their daily challenges," continued René Degros, who also added that "One of the biggest challenges today in healthcare is certainly the lack of staff. By offering training and education, we can support hospitals to become more attractive as employers and strengthen the position of Canon Medical."

*"It is our commitment, based on our 'Made for Life' philosophy, to not only deliver clinical solutions to our customers but also to support them in their daily challenges."*

*René Degros, Vice President of Canon Medical Systems Europe.*

## The Success in Numbers

The Canon Medical Academy has demonstrated its impact through measurable achievements and ongoing contributions to healthcare education.

Over the past few years, it has organized 84 webinars, drawn more than 58,000 registrations, and engaged over 20,000 live attendees, collaborating with 250 key opinion leaders (KOLs) from diverse disciplines.

Additionally, at ECR 2024, the Canon Medical Academy hosted 30 workshops with 2,400 registrations and welcomed over 1,000 participants, including 400 attendees at the symposium.

When asked about the most rewarding outcomes from the Academy's first year of operations, Jeroen Tijhaar, Sr. Clinical Manager in charge of the Canon Medical Academy project, pointed out "the overwhelmingly positive feedback from visitors," adding also that they "often express their admiration upon departure, highlighting the Academy's excellence."

"This is the best hub to meet the experts, to learn from those who are writing the papers, who are writing the guidelines, who are bringing the best practices, and to learn it on the equipment where you

*"By providing the latest educational knowledge, the goal is to enhance healthcare practices and improve patient outcomes."*

*Jeroen Tijhaar, Sr. Clinical Manager at Canon Medical Systems Europe.*

are used to working and you want to improve your performance back home," said Prof. Maija Radziņa, Associate Professor at Pauls Stradiņš Clinical University Hospital (Riga, Latvia).

"The Academy's facility is outstanding: modern, well-equipped with state-of-the-art technology, and conveniently located near Schiphol Airport. The instructors were highly knowledgeable, and the staff ensured everything ran smoothly. It was an enriching experience that exceeded my expectations," added one of the Canon Medical Academy Europe visitors in Amstelveen.

These two experiences offer a glimpse into the Academy's impact, illustrating its role in providing expert-led education and access to cutting-edge facilities and its impact on the professional growth of healthcare practitioners.

## Looking Ahead

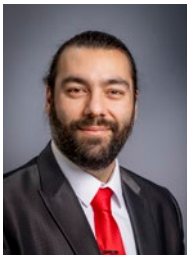
With its foundations well rooted, the Canon Medical Academy Europe plans to expand its educational programs, incorporating emerging technologies and addressing evolving healthcare challenges.

"The Academy aims to expand its educational programs, offering both online and onsite training to meet the evolving needs of healthcare professionals. By providing the latest educational knowledge, the goal is to enhance healthcare practices and improve patient outcomes. Additionally, the Academy seeks to strengthen KOL networking and foster customer collaborations while increasing access to training," said Jeroen Tijhaar.

It also aims to strengthen partnerships with academic institutions and professional bodies to foster a collaborative learning environment. Mr. Tetsuya Kawagishi, President and CEO of Canon Medical Systems Europe, highlights the Academy's role in addressing key challenges faced by clinicians: "Being part of the Canon Medical community offers valuable access to education, information, and hands-on experience, enabling clinicians to address shortages and enhance expertise while specializing in clinical areas and utilizing advanced equipment and solutions to benefit patient outcomes."

As Canon Medical Academy Europe reflects on the first year of its training center, the commitment to advancing healthcare education remains steadfast.

By equipping professionals with the knowledge and skills necessary to navigate the complexities of modern medicine, the Academy continues to embody Canon Medical's "Made for Life" philosophy, dedicated to improving lives through innovation and education. //



**Davide Bilancetti**
*Editor-in-Chief of VISIONS Magazine, European Content & Publishing Manager, Canon Medical Systems Europe.*

## Training facility

State-of-the-art Experience
**8,600 m²**

Adjacent classrooms
**17 rooms**

**~ 450**
Visitors

(since the inauguration of the Canon Medical Academy Europe in Amstelveen)

## Online Education

Over
**58.000**
registrations

More than
**20.000**
live Attendees

**84**
Webinars

**250**
Key Opinion Leaders (KOLs) involved

## In-Person Education at ECR 2024

Peer-to-Peer education
**30**
Workshops

Over
**1,000**
participants

**2400**
Registrations

**400**
Attendees at the symposium


Alphenix
Canon

*The team at Forth Valley Royal Hospital alongside Canon Medical Systems UK, Director of Sales CT/MR/XR/HIT, Alistair Howseman.*

# A First for Scotland at Forth Valley Hospital

**The Alphenix Sky + will enable the hospital to deliver complex precision procedures by offering greater levels of accessibility to patient anatomy, superior image quality, and workflow optimisation.**

To bring complex interventional procedures in-house and increase patient throughput, Forth Valley Royal Hospital has installed the Alphenix Sky +, making it the first hospital in Scotland to benefit from Canon Medical's most advanced ceiling-mounted imaging system, placing it at the cutting edge of diagnostic innovation.

## Superior Imaging Quality

The Alphenix Sky + offers clinicians superior imaging quality and the 220° rotation needed to carry out complex precision procedures such as prostate artery embolization (PAE) for prostate conditions. This will improve clinical workflow efficiencies by reducing the need for patient referral to alternative hospitals in Scotland, bringing healthcare closer to the community. In addition, patients with vascular and renal conditions, which previously required major surgery, can now undergo treatment through minimally invasive techniques.

The Alphenix Sky + also enables the hospital to carry out examinations of the uterus for women experiencing fertility issues and treat uterine fibroids, reducing the need for more invasive procedures or surgery.

*"Forth Valley Royal Hospital has installed the Alphenix Sky +, making it the first hospital in Scotland to benefit from Canon Medical's most advanced ceiling-mounted imaging system."*


*High-quality 3D images produced from the Alphenix Sky +.*

Jennifer Gilchrist, Radiology Services Manager at NHS Forth Valley, commented, "Whilst our previous radiology imaging system served us well, technology has significantly advanced since its purchase 12 years ago. We needed new state-of-the-art equipment that would provide crystal clear, high-quality images to enable us to carry out a broader range of precision procedures in-house. As a hospital, we are keen to serve our patients as close to home as possible and are thrilled that we can now make this possible."

## Integrated Unique Technology

Featuring a double C-arm feature with full rotation from either the right or left side of the table, the Alphenix Sky + can capture images of the patient's body from all angles and enable lateral 3D acquisitions, creating a high-resolution 3D image from a 2D set of data.

This is vital for complex procedures and images, including inserting small metal coils into veins or arteries to cut off the blood supply to cancerous tumors and placing stents, which can then be expanded to help clear blockages and maintain blood flow. Increased clinical confidence through 3D images leads to better patient outcomes.

Combined with an integrated workstation, the Alphenix Sky + system significantly reduces restrictions on examinations and procedures, aiding greater operator workflow and increasing overall productivity. It also offers a lower radiation dose than alternative scanners, a key consideration in diagnostic imaging, especially for patients requiring multiple scans during treatment.

The addition of a unique SPOT Fluoro, which helps improve workflow and visibility of guide wires and catheters, also works to reduce dose per procedure. The radiation field can be seamlessly adjusted independently, ensuring that the minimum area needed to perform the procedure is exposed, without needing to adjust the patient or system

*"Thanks to the new equipment, we now have the imaging precision needed for the services we want to provide."*

*Jennifer Gilchrist, Radiology Services Manager at NHS Forth Valley.*

position. Meanwhile, the use of the Dose Tracking System (DTS) within the Alphenix Sky + scanner allows the clinician to monitor the patient's skin dose in real-time, thus minimising the risk of radiation injury.

## Increased Diagnostic Capacity

In addition to the Alphenix Sky + system, Forth Valley Royal Hospital has also installed Canon Medical's Ultimax-i X-ray machine to further build diagnostic capacity and resilience within the hospital. The new machine, housed in the fluoroscopy room, enables high-quality images and videos to be captured using contrast dye. This can be used to examine patients experiencing difficulty chewing and swallowing food, which can often happen after a stroke. It can also be used to assess joints to determine if a patient would benefit from a hip or knee replacement and help with the precise positioning of stents to treat patients with a range of cancers, including bowel, stomach, gallbladder, and liver, as well as supporting a wide range of investigations carried out by the Endoscopy Department.

## Imaging Precision

Jennifer Gilchrist added, "Thanks to the new equipment, we now have the imaging precision needed for the services we want to provide. Resilience is another key consideration. Our old imaging fluoroscopy room wasn't set up for interventional procedures, so being able to carry these out with the Ultimax-i, as a support to the Alphenix Sky +, is extremely exciting. Together the two systems offer a perfect solution as we know we'll always have a backup machine in place and, better still, we can offer interventional procedures to more than one patient at a time.

Replacing and installing the new systems back-to-back enabled us to keep patient services running effectively during the transition, and Canon Medical ensured that the installation was completely seamless from start to finish. We could not have done this installation as successfully without the constant oversight from the experienced project manager and partners.

This is a long-term investment for the health board and hospital and, due to the relationship we have built, we know that if we require further assistance moving forward when it comes to upgrades, updates, and training, Canon Medical will be able to support us."

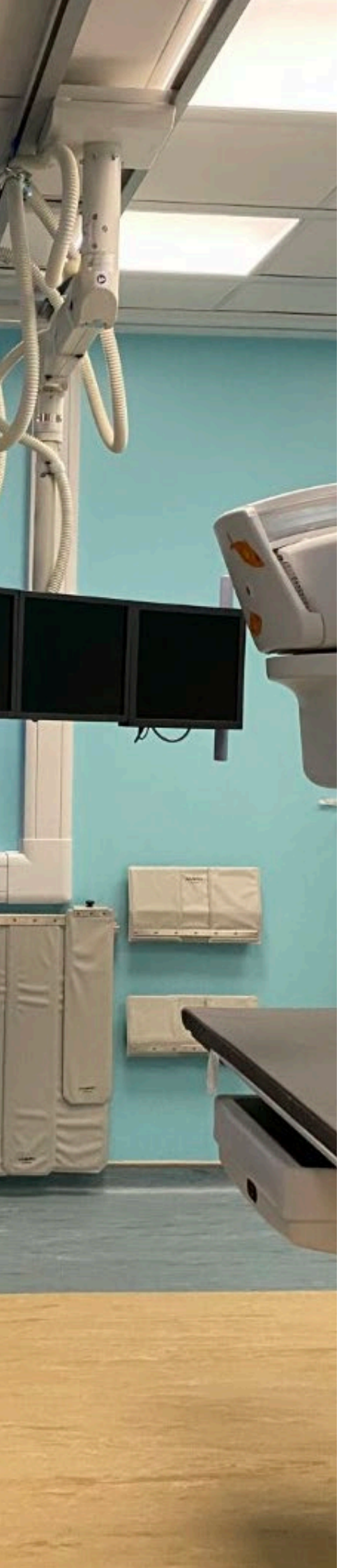
*"The Alphenix Sky + offers clinicians superior imaging quality and the 220° rotation needed to carry out complex precision procedures such as prostate artery embolization."*


*Alphenix Sky + installed at the Forth Valley Royal Hospital, Larbert, Scotland.*

## Better Patient Outcomes

Philip Willcock, XR/VL Modality Manager at Canon Medical Systems, concludes, "We are pleased to have completed the first installation of the Alphenix Sky + in Scotland, along with the Ultimax-i X-ray system at the Forth Valley Royal Hospital. The installation of both systems offers the hospital the ability to deliver more complex interventional procedures in-house, whilst increasing patient throughput and comfort by offering superior access to patient anatomy. Being able to capture high-quality scans of the patient's body from all angles is crucial to improving operator workflow and achieving increased productivity, clinical confidence, and better patient outcomes. We hope this is the first of many more installations in Scotland, and across the rest of the UK." //


LED-150



*Ultimax-i X-ray system at the Royal Alexandra Children's Hospital.*

# Helping Royal Alexandra Children's Hospital to Reduce Patient 'Scanxiety'

**Specialist fluoroscopy suite, incorporating new state-of-the-art Ultimax-i X-ray machine, reimagined to put paediatric patients at ease while delivering optimum diagnostic versatility and image quality at lower radiation dose.**

X-rays can be a daunting experience for patients, especially children. To help reduce 'scanxiety' – the increased level of anxiety patients may feel before, during, and after a scan – Royal Alexandra Children's Hospital, Brighton, partnered with Canon Medical Systems UK to reimagine the whole X-ray experience. This included transforming the hospital's fluoroscopy suite, via an extensive makeover, into a welcoming, comfortable, and even fun place for children while delivering the most advanced diagnostic imaging service via the new Ultimax-i X-ray system.

## Under the Sea Theme

Royal Alexandra Children's Hospital selected Canon Medical to create a visually alluring scanning environment to house the new Ultimax-i X-ray system. To appeal to children – many of whom have additional needs – the renovation included a floor-to-ceiling under-the-sea theme featuring sea creatures and a submarine, LED mood lighting to create a calming atmosphere, and a ceiling-mounted interactive projector featuring 50 different games and challenges for children to enjoy pre- and post-scan.

Offering diagnostic versatility, the Ultimax-i enables Royal Alexandra Children's Hospital to meet growing demand by enabling clinicians to see a broader age range of patients with a variety of conditions.

*"Royal Alexandra Hospital, Brighton, partnered with Canon Medical Systems UK to reimagine the whole X-ray experience."*

*The hospital's fluoroscopy suite has been transformed into a welcoming, comfortable and fun place for children.*

### Optimizing Workflow

Firstly, by optimizing workflow space, it allows for more complex scans and procedures to take place without additional reconfiguration of floor space. Secondly, an innovative multi-directional C-arm and an adjustable tilting table allow clinicians at the hospital superior ergonomic access to the patient's anatomy. Meanwhile, light-beam diaphragm functionality ensures greater precision for centring and collimation.

By offering clinicians a more complete and accurate patient view, the Ultimax-i reduces the need for patient movement and multiple images to be taken during scans, improving overall operator workflow and efficiency and, most importantly, ensuring patient comfort and safety. The smoother the scanning process, the better the child's experience, helping to reduce fear and anxiety during the scan.

*"The smoother the scanning process, the better the child's experience, helping to reduce fear and anxiety."*

### Reduced Dose Exposure

In addition to unsurpassed image quality, the Ultimax-i includes DoseRite, a comprehensive dose management suite of technology to minimise patient X-ray exposure. Clinicians are empowered with three variable dose modes to choose from, ensuring precise control over radiation exposure. Patients experience a notable reduction in dose exposure, thanks to fewer repeat views required, enhancing safety and comfort throughout the imaging process. This is particularly important when scanning children, many of whom are regular visitors requiring multiple scans.

The Fluoroscopy Suite refurbishment was made possible by funding from My University Hospitals Sussex, the dedicated charity for NHS hospitals in Sussex. They raise funds for treatment, care and research which go over and above core NHS funding, making a positive difference to patients and staff.

Steve Crump OBE, Director of Charities & Voluntary Services at My University Hospitals Sussex said: "We're incredibly proud to have funded this outstanding

*"We're incredibly proud to have funded this outstanding refurbishment at the Royal Alexandra Children's Hospital."*

*Steve Crump OBE, Director of Charities & Voluntary Services at My University Hospitals Sussex.*


*"The combination of the new X-ray system in its under-the-sea setting provides the very best experience we could hope for."*

*Kyriakos Iliadis, Lead Consultant Paediatric Radiologist MD MSc at University Hospitals Sussex Foundation Trust.*

refurbishment at the Royal Alexandra Children's Hospital. The state-of-the-art equipment, along with the vibrant ocean-themed design, will ensure children requiring fluoroscopy procedures receive the best service possible, as well as have a positive hospital experience. The charity is delighted to have enabled this improved pathway and quality of care for paediatric patients across the region."

The new Ultimax-i system offers simplicity and, due to its versatility and superior image quality, enables the hospital to provide a wider range of services and keep up with the growing demand for diagnostics. Ongoing support from Canon Medical's Application Specialists also means that the hospital can adapt the functionality of the equipment in the future to enhance useability and unlock further capability as required.

Kyriakos Iliadis, Lead Consultant Paediatric Radiologist MD MSc at University Hospitals Sussex Foundation Trust, concluded, "The feedback has been immensely positive from everyone who has encountered the new system and the new fluoroscopy suite – from radiographers to consultants but, most importantly, patients. The combination of the new X-ray system in its under-the-sea setting provides the very best experience we could hope for. Often, the children are having so much fun, they do not want to leave!" //

# Wide Field OCTA May Revolutionize Retinal Vascular Disease Care

The use of eye examinations as reliable predictive tools for a range of conditions in healthcare is expanding. Several different image modalities give information about structural and functional vascular information in the eye, and eye examinations are fast and convenient. Examination with Optical Coherence Tomography Angiography (OCTA) is non-invasive, does not require fluorescein injection or pupil dilation, and takes just seconds.

In the last couple of years, wide field OCTA technology has come to the forefront in its potential to transform the assessment of retinal vasculature. Manchester Royal Eye Hospital in the United Kingdom (UK) was the first in the country to utilize Canon Medical System's new, ultra-wide field OCTA system – the Xephilio OCT-S1 – in a patient-facing setting. Professor Tariq Aslam, Professor of Ophthalmology and Consultant Ophthalmologist at the hospital, explained to VISIONS how the system holds significant advantages for imaging and managing the impact of diabetes on the eye.

## A Growing Problem

More than 830 million people across the world have diabetes. This number has consistently grown for decades. Early screening for diabetes-related changes is essential for effectively managing the condition and reducing the risk of serious complications, including those that affect retinal health.

"With the rising prevalence of diabetes, effective and efficient management of diabetic retinopathy remains a logistical and clinical challenge," explained Prof. Aslam. "It requires multiple visits for monitoring and treatment with multiple potential modes of imaging that can include invasive and intravenous dyes. There are multiple potential avenues for treatment, such as laser treatments, anti-VEGF and steroids, as well as surgical interventions and systemic control."

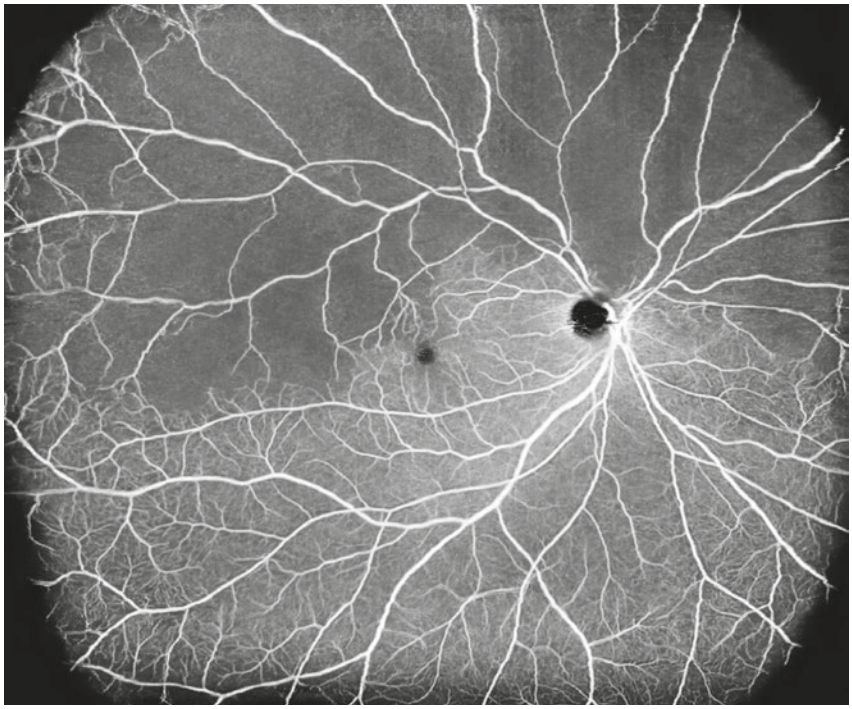
## A Solid Solution

Prof. Aslam has recognized that wide field OCTA provides a significant advancement in retinal imaging.

"My work with wide field OCTA began with research studies that explored the use of bespoke image analysis

*"Wide field OCTA and the Xephilio OCT-S1 have definite potential to revolutionize the care of patients with retinal vascular disease."*

*Prof. Tariq Aslam.*



*Wide Field is invaluable for all retinal vascular diseases not only in diabetes, also vascular occlusion. Courtesy of Luke Carine, Manchester Eye Hospital, UK*

algorithms to analyze and quantify angiographic image biomarkers in conditions, including long-COVID, pregnancy, and diabetes," he said.

During the study, Prof. Aslam received increasing requests from clinical colleagues to use the scanner on their patients who needed information that was not available through more invasive means such as fluorescein angiography, particularly for pregnant patients.

"The main advantages of wide field OCTA over traditional imaging methods are convenience and accessibility," he remarked. "The scans can easily be done at every visit, and available or comparative assessments before each consultation. This is not possible with fluorescein angiography."

"The information it provides does not completely replace the current gold standard of fluorescein angiography, but in many key areas required for decision-making for fundamental questions, such as the risk of neovascularization, there is a rising body of evidence that wide field OCTA provides a pragmatic alternative for a majority of cases," he explained. "It may, furthermore, provide information that other traditional systems cannot, such as information on different depths of networks and vessel intensity, as well as a great ease of application of image processing and analysis for machine learning and expert algorithms."

Working with the Xephilio OCT-S1 has enabled Prof. Aslam to detect neovascularization more clearly and supported monitoring of new vessels, which has allowed for more confident, sensitive and specific use of treatments.

"In the future, studies with the system may be able to allow for prediction of the likelihood of progression to later stages from early scans," he added. "We are currently exploring the potential of the Xephilio OCT-S1, as well as adaptive optics, in the early detection of Alzheimer's Disease. However, there are also a large number of systemic diseases that might have potential for input from the data these scans provide."

## Prof. Tariq Aslam

**MD, MA(Oxon), DM (Oxon), FRCSEd(Ophth), PhD**

*Prof. Tariq Aslam began his medical training at Oxford University, Oxford, UK, and completed his Medical Retina Fellowship at Moorfields Eye Hospital in London, UK.*

*His first research doctorate from Oxford University involved clinical trials in ophthalmic surgery, and a further PhD from Heriot-Watt University in Edinburgh, Scotland, investigated technology applications in ophthalmology.*

*Both doctorate theses utilized his computer programming skills, and his most recent led to a prize for the best PhD across all University disciplines. His current research explores many clinical interests in the retina, including psychological aspects and the potential for computerized and technological enhancement of patient care, along with novel device development.*

*Prof. Aslam has over 200 peer-reviewed publications (predominantly as lead author), has several patents, and serves as an investigator on multiple commercial studies, as well as investigator-led studies. His research has led to a spin-out medical technology company with awards for social impact, which is his ultimate research goal.*

*He is now Professor of Ophthalmology and Interface Technologies at the University of Manchester, a Consultant Ophthalmologist at Manchester Royal Eye Hospital, Manchester, UK, and the Director of the IOVS MSc Course, Manchester, UK.*


### Workflow Improvement and Less Need for fluorescein Injections

Prof. Aslam and his team have also benefited from the workflow improvements that the new system has brought.

"We have completed an audit since acquiring the Xephilio OCT-S1, which has demonstrated significant impact on patient management with reduction in needs for fluorescein angiography and increasing uptake of the facility allowing immediate support for patient management, especially in diabetic clinics,"

## Xephilio OCT-S1: AI-Powered Performance OCTA

*Xephilio OCT-S1, by Canon Medical, offers superior image quality and a host of automated features to optimize and simplify examinations. It now offers a series of systems with high scanning speed to ensure short examination times, enhance efficiency and improve patient comfort. Our OCTA systems have sophisticated, AI-supported, image post-processing with 3D projection artefact removal to ensure excellent image quality.*

### *Wide Field Swept Source OCT in One Single Capture*

*With the Xephilio OCT-S1, Canon Medical introduces revolutionary swept-source technology allowing capture of wide field images of up to 23 mm in a single scan. The Xephilio OCT-S1 enables superior penetration of ocular opacities and provides outstanding tomographic images. It provides a new quality of OCT images in a single scan with greatly reduced noise, increased detail and improved visibility within just seconds.*

*Swept-source technology allows for a high scanning speed of 100,000 A-scans per second, while maximizing the essential signal data quantity during the acquisition. The 1,060 nm wavelength results in invisible scan lines and therefore ensures better patient collaboration and reduces the impact of the total examination.*

### *Intelligent Denoise*

*Canon's RX Intelligent Denoise software was developed using machine learning and an existing clinical OCTA image database to create a neural network for deep learning.*

*Deep learning neural network (DLNN) artificial intelligence (AI) software integration in eye care has shown notable applications in both image quality improvement and reducing acquisition time.*

*The software decreases the graininess of OCTA images by increasing the signal to noise ratio without loss of anatomical data, therefore, improving diagnostic value within seconds.*

### *CSI Segmentation*

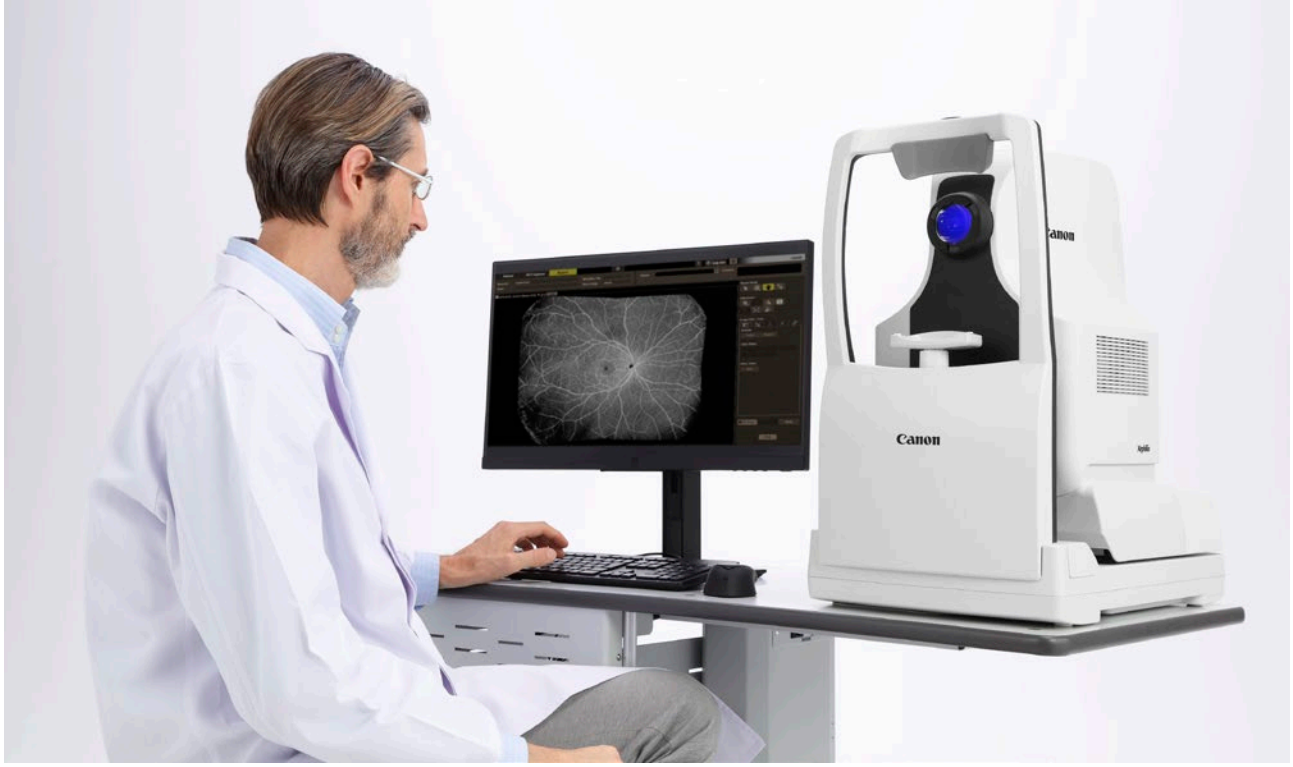
*With the improved visualization of the choroid layer; the Choroidal Sclera interface can now be detected.*

### *Normative Database*

*The capabilities of the Xephilio OCT-S1 were extended by comparing a patient's retinal nerve fiber layer (RNFL) and macular thickness measurements to a normative database, clinicians can more accurately identify deviations from normal values, aiding in the early detection of conditions like glaucoma and macular degeneration. The ability to track changes in retinal structures over time is crucial for managing chronic ocular diseases.*

*Finally, serves as a reliable reference point, enhancing the precision of measurements and ensuring consistent, reproducible results across different patient populations.*

***Click HERE or scan this code to discover more about the Xephilio OCT-S1 latest functionalities!***




*"It is fantastic to see that our state-of-the-art device continues to be a game-changer in the field of ophthalmic diagnostics at the hospital."*

*Abdul Jahangir, Sales Director at Sense Medical.*

SenseMedical.

he said. "Our audit has demonstrated increasing uptake with scans providing valuable information for individual patient management and overall decrease in need for fluorescein angiography."

## AI-based Image Processing Provides Enhanced Clarityy

Prof. Aslam has found the Xephilio OCT-S1's sophisticated, AI supported, image post-processing with 3D projection artefact removal ensures excellent image quality.

"OCTA can be harder to interpret than standard OCT due to the complexity of the images and additional dimensions and artifacts introduced, requiring a dynamic assessment of multimodal OCTA outputs, including enface scans of different layers, and B scans with flow signals," he said., "However, the user interface of the Xephilio OCT-S1 is convenient and practical to allow for this and the artificial intelligence-enhanced images also improve clarity.

## Smooth Adoption

Canon Medical Systems and SenseMedical supported Prof. Aslam and his team throughout the adoption and implementation of the Xephilio OCT-S1.

"There are specific needs for NHS procurement, data storage, screen resolutions, computer terminal capacity and so on, in the UK, that Canon has helped us ensure were adequate to allow us to acquire, and then fully utilize the imaging," he explained.

## Potential to Revolutionize Care for Retinal Vascular Disease

Through research and use in clinical practice for more than one year, Prof. Aslam has discovered the benefits of the Xephilio OCT-S1 are numerous.

"Wide field OCTA and the Xephilio OCT-S1 have definite potential to revolutionize the care of patients with retinal vascular disease," said Prof. Aslam.

"We were delighted to offer Manchester Royal Eye Hospital access to the cutting-edge Xephilio OCT-S1 through charitable funds over a year ago. It is fantastic to see that our state-of-the-art device continues to be a game-changer in the field of ophthalmic diagnostics at the hospital," said Abdul Jahangir, Sales Director at Sense Medical, the official distributor of Canon eye care in the UK and Ireland. //

***Click HERE or scan this code to find out more about the use of the Xephilio OCT-S1 in imaging retinal vascular disease by watching the "Wide Field OCTA in Diabetic Patients" webinar, that Prof. Aslam moderated and presented.***

# Progress in Stroke Treatment with State-of-the-Art Magnification Technology

**Tina Götting**

New angiography system enables interventions even on small brain vessels.

Stroke, cerebral hemorrhage, aneurysm, vasoconstriction: for these vascular diseases, angiography not only enables precise diagnosis but also allows for minimally invasive, often life-saving treatments to be performed simultaneously.

Since the summer of 2023, a new, extremely powerful angiography system (Alphenix Biplane) from Canon Medical has been installed at the Institute of Diagnostic and Interventional Neuroradiology at Hannover Medical School (MHH). The Alphenix Biplane has a very high-resolution image detector, which enables optical magnification of the brain vessels by a factor of two and reduces radiation exposure. This means that patients can be offered even better treatment, for example, in the event of a severe stroke.


*Professor Lanfermann (left) and his team are delighted about the new angiography equipment. Copyright: Karin Kaiser / MHH.*

*Alphenix Biplane.*

## Thrombectomy Removes Blood Clots

Every year, the Interventional Neuroradiology department treats around 700 people with various vascular diseases of the brain, spine, or spinal cord, as well as tumors of the head and neck. Around 220 of these are patients who have suffered a stroke.

The aim is to remove the blood clot in the cerebral vessel responsible for the stroke as quickly as possible in order to restore the blood supply to the brain. If this cannot be achieved with medication, a thrombectomy can be performed using angiography imaging. "This involves inserting a telescopic catheter system from the groin or forearm into the affected cerebral vessel and either aspirating the clot or pulling it out," explains Dr. Friedrich Götz, Head of Interventional Neuroradiology.

## Proven Treatment Becomes Even More Effective

"The possibility of applying thrombectomy of brain supplying vessels soonest after stroke onset has significantly improved the stroke treatment success rate in recent years," says Prof. Heinrich Lanfermann, Director of the Institute of Diagnostic and Interventional Neuroradiology. Until now, the procedure has mainly been used when large blood vessels in the brain are blocked by a clot. The new angiography system installed in the department, Alphenix Biplane, now provides excellent additional options in this area.

Thanks to the high magnifications and excellent image quality, even smaller vessels that supply the speech center in the brain can now be shown very well, so that thrombectomies can also be carried out there under the best possible control. "This is a great benefit for the patients concerned," emphasizes Prof. Lanfermann.

## New Possibilities, Less X-Ray Radiation

Another technical innovation of the system is the so-called AlphaCT Stent feature. It creates high-contrast CT-like slices of very small vessels and implanted stents. This is advantageous, for example, for the treatment of aneurysms (i.e., vascular protrusions): "The images allow us to see exactly whether the vessel wall apposition of the stent inserted for stabilization is sufficient or whether we still need to optimize its position." explains senior physician Dr. Omar Abu-Fares.

The neuroradiologist is also enthusiastic about another innovation, Alphenix Spot ROI: "With this innovation, the system works with less X-ray radiation. Only the selected target area is exposed to the necessary dose of radiation, while the surrounding tissue receives significantly less dose."

## More Flexibility in Emergencies

The new angiography system fits perfectly into the existing technical equipment at the institute. It is located close to the CT and the extended and newly equipped anesthesia induction rooms. This means that patients do not have to be moved far during treatment. "The best thing, however, is that we now have not just one, but two angiography units with identical technical equipment," explains Dr. Götz. "With these two devices, we are now extremely flexible. We can carry out planned interventions and also treat emergencies at the same time."

## Close Collaboration with Other Specialty Areas

Diagnostic and interventional neuroradiology does not work on its own but in close cooperation with other specialties such as neurology, neurosurgery, anesthesia, angiology, vascular surgery, and ear, nose, and throat medicine. For example, neuroradiology is a permanent partner of the supra-regional certified stroke unit (i.e., the stroke unit of the Clinic for Neurology). It offers all diagnostic and therapeutic procedures for stroke patients around the clock, 365 days a year - including thrombectomy. Professor Lanfermann is certain that "Especially in stroke treatment, the new angiography system will bring us another big step forward." //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