

visions

MAGAZINE FOR HEALTH PROFESSIONALS // NO. 33 // AUGUST 2019

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Canon



With the acquisition of Fysicon over a year ago, Canon Medical is now able to provide the best image quality with an intuitive hemodynamic monitoring solution, a powerful combination in cardiac care. Read the full interview on page 18.

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Publisher

Canon Medical Systems Europe B.V.
Zilverstraat 1
NL-2718 RP Zoetermeer
+31 79 368 92 22
[https://eu.medical.canon/
marketing.eu@eu.medical.canon](https://eu.medical.canon/marketing.eu@eu.medical.canon)

Editor-in-chief

Jacqueline de Graaf
jacqueline.degraaf@eu.medical.canon

Design & Layout

Boerma Reclame
boermareclame.com

Printmanagement

Printweb Media B.V.
printweb.nl

Photography

Cojan van Toor
www.cojanvantoor.nl

Text contributions and editing

Mélanie Rouger - Journalist and content manager
Sara Sharp - The Creative Practice

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// EDITORIAL

Canon became the first company to sign the “Official Sponsor” contract for the Rugby World Cup that will take place within the next few weeks in 12 cities across Japan¹ between 20 September and 2 November 2019. It was the company’s second sponsorship contract with the event, following a previous tournament held in England in 2015. With the Rugby World Cup as an example, the Canon Group is continuously contributing to the advancement of sports through the use of Canon products and technologies.

At Canon Medical, we are glad that we can add our carefully constructed SportsMed strategy and years of experience to this important direction of our parent company.

Across Europe, we are working with many well-known elite sporting organizations, such as Manchester United Football Club, FC Barcelona and Real Madrid C.F. However, it is not just about premier football clubs. Many of our imaging systems and technologies are being used at a local-, national- and international levels in, for example, tennis, basketball, rugby and cycling. What all these sports partnerships have in common is the aim to push the boundaries of anatomical and physiological understanding of the human body and investigate how it functions under pressure from various types of sport or high exertion. We believe that expertise in elite sports medicine will unlock future innovations and knowledge to widen clinical diagnosis and treatment for all.

So, the next time you see the well-known white Canon zoom lenses used by the professional photographers in sports, it may just be that behind-the-scenes medical professionals are working with our innovative products and technologies on earlier prevention, screening, diagnosis and treatment for their teams and players.

Kind regards,

JACK HOOGENDOORN
Senior Marketing & Brand Manager
Canon Medical Systems Europe BV

Reference

¹ Sapporo City, Iwate Prefecture and Kamaishi City, Saitama Prefecture and Kumagaya City, Tokyo Metropolitan, Kanagawa Prefecture and Yokohama City, Shizuoka Prefecture, Aichi Prefecture and Toyota City, Osaka Prefecture and Higashiosaka City, Kobe City, Fukuoka Prefecture and Fukuoka City, Kumamoto Prefecture and Kumamoto City, Oita Prefecture. (Host responsibilities will be shared by Cities and Prefectures written together).

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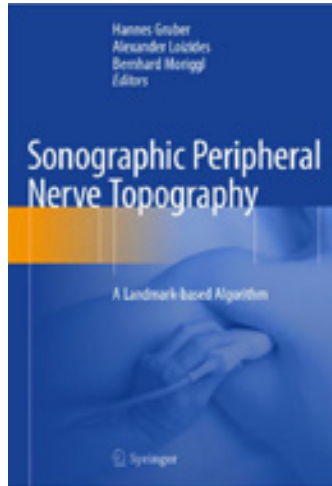
Sonographic Peripheral Nerve Topography – a Landmark-Based Algorithm

This first of its kind richly illustrated book provides a tabular and schematic representation of all the peripheral nerves in the human body using a standardized landmark-based algorithm for the definition of the nerve's "Point of optimal visibility (POV)".

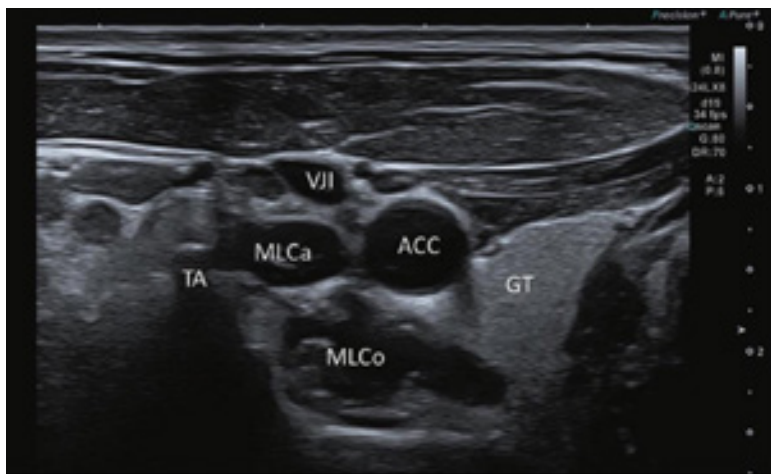
In this atlas the nerves of the human body are depicted with high-frequency ultrasound probes with frequencies up to 24 MHz: it presents not only the "known" large nerves (N. ischiadicus, N. femoralis, N. medianus etc.), but also the tiny nerves you have learned in your anatomy sessions but forgotten in the course of time!

Based on clear illustrations using palpable/visible external and easily accessible internal landmarks, it offers "nerve sonographers" a clear sonoanatomic guidance on how to easily find the nerve. Additionally, it describes the exact positioning of the probe so that each nerve can be found at its point of optimal visibility.

These mental maps for nerve sonographers are intended not only for beginners but also for "advanced" specialists requiring instructions on how to easily find even tiny peripheral nerves: especially for neurologists, anaesthesiologists, radiologists, pain practitioners, rheumatologists and surgeons who seek a clear standardized step by step manual on "Where do I find a nerve the easiest?" //



Editor: Gruber Hannes, Loizides Alexander, Moriggl Bernhard



Characteristic dorsal shadowing of the mighty tuberculum anterius (TA) of the processus transversus C6. The glandula thyroidea (GT) is depicted medial to the vena jugularis interna (VJI) and the arteria carotis communis (ACC). Deep to the fascia cervicalis profunda: musculus longus colli (MLCo) and musculus longus capitis (MLCa).

Rembrandt Reality App

The Rembrandt Reality app is about Rembrandt who, when he was 25, was commissioned to make a group portrait of the Amsterdam surgeons on the occasion of the anatomy lesson of doctor Tulp. Now experience this for yourself! Travel to the year 1632 and step into Rembrandt's painting "The Anatomy Lesson of Dr Nicolaes Tulp".

Place the gate and walk around the Anatomical Theater. Look through the eyes of Rembrandt and see how Dr Tulp and his fellow doctors study the body of the criminal Aris Kindt.

Discover all the stories behind the painting. For example, did you know that the body of Aris Kindt only had one hand?

The Rembrandt Reality app is free to [download](#). The app uses Augmented Reality (ARKit).

That is why your device must support this technology (iPhone SE, 6S and newer models + iPad Pro, iPad 2017 and newer models). //



Innovative Technology Designation for the Alphenix Platform

Canon Medical Systems announces its Alphenix family of interventional angiography systems has received a 2019 Innovative Technology designation from Vizient Inc., the largest member-driven health care performance improvement company in the USA. The designation was based on the recommendations of health care experts serving on a member-led council who interacted with the product shown at the Vizient Innovative Technology Exchange.

The council determined the technology had the potential to enhance clinical care, patient safety, health care worker safety or improve business operations of health care organizations.

The innovative line of interventional systems delivers images with greater clarity and precision. It combines industry-leading dose optimization technologies, enhanced workflow and a new set of features to help clinicians provide patients with safe, accurate and fast imaging. The Alphenix Biplane and Alphenix Core + systems also include the Hi-Def Detector (High-Definition Flat Panel Detector) with the highest image resolution in the market to help clinicians see details during complex interventional procedures, such as stent positioning and stent apposition, wire and catheter navigation through the stent struts, and observation of coil deployment.



“Canon Medical is proud to be recognized for our commitment to innovation in medical imaging technology through the Alphenix family, a platform that is redefining what is possible in intervention,” said Casey Waldo, managing director, Vascular Business Unit, Canon Medical Systems USA, Inc. “This product line represents an important advancement in improving clinical care and patient safety by enabling health care providers to prioritize clinical decisions and patient outcomes through higher quality imaging.” //

Canon ranks #4 in “Best Japan Global Brands 2019”

Interbrand Japan, Japan’s largest branding company (headquartered in Shibuya, Tokyo), has announced Best Japan Brands 2019, a ranking of Japanese brand values using an unique brand valuation method to convert brand value into monetary value.

1 TOYOTA 15,000 Bn ¥1%	2 HONDA 15,000 Bn ¥1%	3 DAIICHI 12,213 Bn ¥1%	4 CANON 10,500 Bn ¥1%	5 SONY 8,270 Bn ¥1%	6 MITSUBISHI 6,807 Bn ¥1%	7 Panasonic 6,200 Bn ¥1%	8 DAIICHI 6,200 Bn ¥1%
9 DAIICHI 4,200 Bn ¥1%	10 DAIICHI 4,214 Bn ¥1%	11 SMBC 4,200 Bn ¥1%	12 DAIICHI 3,200 Bn ¥1%	13 MIZUHO 4,200 Bn ¥1%	14 KDDI 3,200 Bn ¥1%	15 SHIHO 4,200 Bn ¥1%	16 SUZUKI 3,274 Bn ¥1%
17 DAIICHI 1,200 Bn ¥1%	18 HONDA 1,700 Bn ¥1%	19 DAIICHI 1,700 Bn ¥1%	20 DAIICHI 1,200 Bn ¥1%	21 DAIICHI 1,200 Bn ¥1%	22 DAIICHI 1,200 Bn ¥1%	23 DAIICHI 1,200 Bn ¥1%	24 HITACHI 1,200 Bn ¥1%
25 YAMAHA 1,100 Bn ¥1%	26 DENSO 1,100 Bn ¥1%	27 DAIICHI 1,100 Bn ¥1%	28 Yakult 800 Bn ¥1%	29 RICOH 800 Bn ¥1%	30 OMRON 870 Bn ¥1%	31 ASICS 800 Bn ¥1%	32 Aij 800 Bn ¥1%
33 NOBILIA 800 Bn ¥1%	34 Kikkoman 800 Bn ¥1%	35 DAIICHI 800 Bn ¥1%	36 ISUZU 800 Bn ¥1%	37 Kubota 800 Bn ¥1%	38 FUJITSU 800 Bn ¥1%	39 TERUMO 700 Bn ¥1%	40 DAIICHI 700 Bn ¥1%

It is really fantastic to see how Canon shines on the fourth position. Something that we can certainly benefit from at Canon Medical. We no longer need to explain who Canon is, but of course there is still a lot of work to do, to link this to our product and technology portfolio and related (and highly valued) services.

Best Japan Brands 2019, the 11th release since 2009, announces the top 40 brands of two sections: Japan’s Best Global Brands (JBGB), featuring global Japanese brands (over 30% overseas sales), and Japan’s Best Domestic Brands (JBDB), featuring Japanese domestic brands (less than 30% overseas sales). //

http://www.interbrandjapan.com/ja/bjb/global_brands/2019.html

Five Years' Partnership Contract with Hospital Sainte Anne



In May this year, Canon Medical Systems Europe and Canon Medical Systems France, have signed a partnership contract with the Centre Hospitalier Sainte Anne, Paris, France.

Sainte Anne is one of the most famous hospitals in psychiatry, neurology, neurosurgery, neuro-imaging and addic-tology in France. The partnership signed for five years includes the installation of a Vantage Galan 3T XGO and a research collaboration on neurological and neurodegenerative diseases and psychiatric disorders.

While the installation of the Galan 3T XGO will start in September 2019, the works for the installation of the MRI system have already started. During the realization of this project, Canon Medical worked hand in hand with two special-ists in their field: Professor Catherine Oppenheim and Professor Jean-François Meder and with the head of Sainte Anne hospital, Jean Luc Chassaniol. We hope this agreement will be the beginning of a productive collaboration between CMSE and Sainte Anne. //

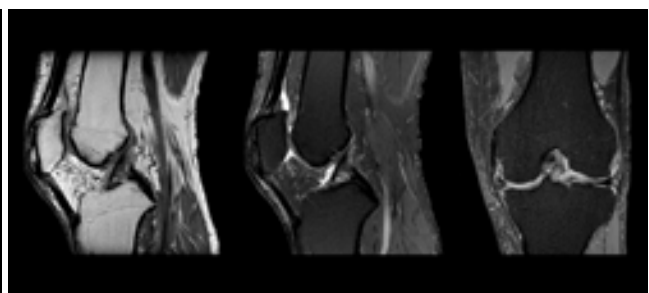
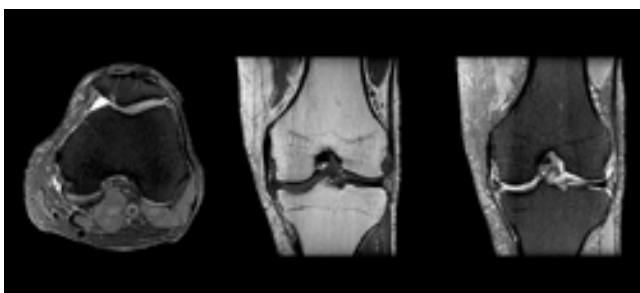
From left to right: Kenji Murabe (MRI, Canon Medical Systems Corporation), Tomoaki Fukuhira (CFO, Canon Medical Systems Europe), Wolter de Graaf (MR Clinical Scientist, Canon Medical Systems Europe), Bruno Triaire (Director Clinical Collaborations MR, Canon Medical Systems Corporation), François Vorms (Director at Canon Medical Systems France) and Patrice Coudray (Product Manager BE, Canon Medical Systems France).

MR Software Upgrade Streamlines Workflow and Enhances Patient Experience

With the latest software upgrade for Vantage Galan 3T and Vantage Orian 1.5T Canon Medical introduces new software features to enable clinicians to further streamline workflow by consolidating the usual processes of MR exams, saving time while helping to provide a better patient experience.

SUREVOI Knee and KneeLine+ allow clinicians to do quick automated localizing scans of the knees to speed up the workflow. The automated software analysis automatically aligns anatomy for over 95 percent accuracy in determination and placement of standard knee view scans in just one step.

The new software is an addition to the unique workflow enhancement suite which already includes automated detection and alignment features for neuro, spine and cardiac examinations. //



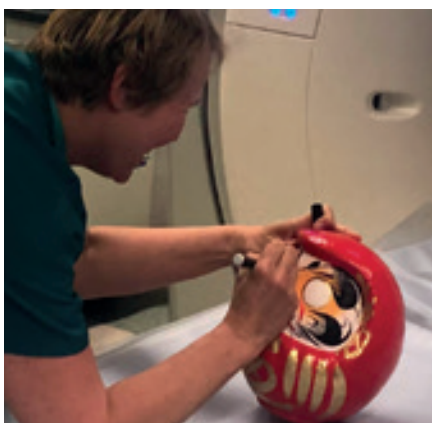
The 200th Refurbished CT Installed in Finland

Secondlife
CERTIFIED REFURBISHED EQUIPMENT

In May 2019 Canon Medical Secondlife reached a milestone by delivering in collaboration with Canon Medical's Channel Partner Tromp Medical Finland, the 200th refurbished CT system, the Aquilion PRIME, to the Raaseporin Hospital in Tammisaari in Finland.

During the inauguration, which was held in June, Jussi Santaniemi (Director of Tromp Medical Finland) and Johan Vochteloo (Senior Manager Refurbished Equipment Secondlife), handed over a Japanese Daruma doll* to Mrs Tua Nurmi, Head of the Radiology department at the Raaseporin Hospital. //

**A Daruma doll is a Japanese traditional doll and are seen as a symbol of perseverance and good luck. Both eyes of Daruma dolls are often blank white when sold, so the recipient of the doll fills in one eye upon setting the goal or wish, and once the desired goal is achieved, the right eye is filled in.*



Aquilion Start - New Entry-Level CT Equipped with Premium Technology

The new Aquilion Start will provide the opportunity for medical institutions to extend their radiology practice.

With the smallest installation footprint in its class, low power requirements and integrated dose-reduction technologies. Aquilion Start has the potential

to fit into small X-ray rooms while providing high-quality 3D CT imaging at lowest possible dose. Built around the needs of patients and clinicians. Aquilion Start incorporates a spacious gantry to allow for scanning large patients in a comfortable environment. Intuitive controls and increased

automation help clinical staff to quickly familiarize with system operation. Advanced technologies ensure optimized patient safety, accelerated clinical decision-making and improved workflow efficiency. Read more about the Aquilion Start on our website <https://eu.medical.canon/>. //

Quality care for all





Aplio a

Advanced. Seamless.
Integrated.

Take care of your clinical needs today and long into the future with our scalable, high-performance ultrasound solution.

Aplio *a-series*

Advanced

See more, act faster

With Canon Medical's groundbreaking beam forming technology, *Aplio a* delivers best-in-class image quality for faster, earlier and more accurate diagnoses that can lead to improved outcomes for your patients.

Seamless

Get the most out of your day

To simplify your workflow even more, we have channelled some of our most premium technologies into a solution that's smart, intuitive and compact, allowing you to work in any clinical setting – from a busy imaging department to your patient's bedside.

Integrated

Any scan, any patient

Aplio a is compatible with a range of multi-purpose transducers and speciality probes, so you can get the high-resolution images you need – whether you are conducting a routine scan or diving deeper with a more complex procedure.

Designed to work around you

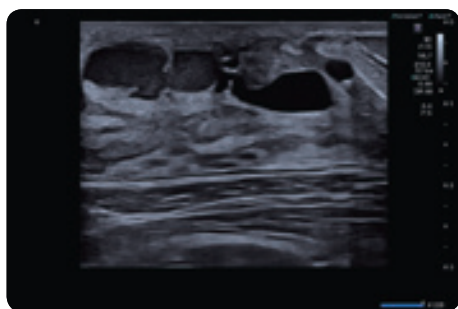
Developed with an open architecture, *Aplio a* features a range of clinical applications, including advanced imaging and quantification tools, to help you customize it any way you need to.

More comfortable for everyone

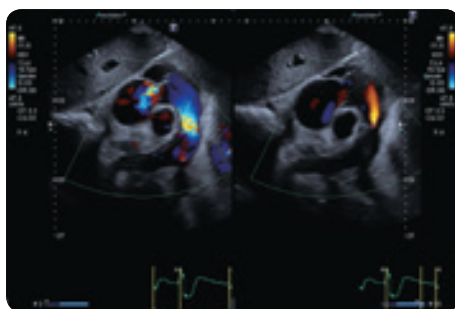
Crafted with the latest iSense ergonomics, *Aplio a* can lessen the physical strain of everyday scanning, enabling you to deliver a higher standard of patient care without compromising your own wellbeing.

A system that grows with you

We have built *Aplio a* with the future of your business in mind. It's versatile, affordable, and engineered with total flexibility, so you can upgrade and expand



Breast-inflamed galactocele



Color Doppler subcostal short axis view in tricuspid regurgitation (left) and pulmonary regurgitation



Fetal brain with Doppler Luminance



“One for all, all for one!”

To our valued customers, we would like to express our gratitude for your continued support and for using our products and services.

This June in Tokyo, an event to mark the 100-day countdown to the opening of Rugby World Cup Japan 2019 was held. Mr. Mitarai, the chairman and CEO of Canon Inc., also serves as the chairman of the Rugby World Cup 2019 Organising Committee, signifying Canon Group's strong commitment to supporting this historic Rugby World Cup, the first to be held in Japan. Many players from the Canon Eagles, Canon's company rugby team, have been selected to play for Japan's national team, and Canon Medical will provide enthusiastic support as a member of the Canon Group.

Diagnostic imaging systems play an important role in the fields of sports medicine and orthopedics, which involve many sports such as rugby and football. It is expected that diagnostic imaging systems (particularly CT, MRI, and ultrasound systems, in which significant imaging resolution improvements have been developed in recent years) will lead to greater precision in the evaluation of muscles, joints, cartilage, and other structures that could not be visualized

before. Top-level athletes must always be in peak physical condition, and the latest diagnostic imaging systems are essential in the treatment of athletes who have been injured or who are undergoing rehabilitation so that they can make a full recovery as quickly as possible. The diagnostic imaging systems produced by Canon Medical play a key role in providing the best possible healthcare for the Canon Eagles.

The sentiment “One for all, all for one!” is often associated with the sport of rugby. It is my hope that Canon Medical will fully adopt this team spirit to foster a corporate environment in which all employees work in close cooperation to achieve our shared goals and objectives.

A handwritten signature in red ink, reading "Toshio Takiguchi". The signature is stylized and written in a cursive-like font.

TOSHIO TAKIGUCHI

*President and Chief Executive Officer
Canon Medical Systems Corporation*



*Interview with Dr Pellenc and
Dr Juliard from Bichat-Claude
Bernard Hospital in Paris, France.*



New Hybrid OR Boosts Treatment Possibilities in the North of Paris

Hybrid procedures are set to increase in the future, making interventional systems like Canon Medical's Infinix-i Hybrid + relevant in a large variety of clinical scenarios. Two physicians at Bichat-Claude Bernard Hospital in Paris, France, explained how the system helps them carry out more treatments and improve their visibility in the European cardiovascular landscape.

With its unique double sliding C-arm the Infinix-i Hybrid + provides ultra-fast whole body 3D coverage, free head access and a unique lateral C-arm stroke for better ergonomics, improved productivity and stunning 3D images from head to toe.

The system's great flexibility makes it fit to use in a large variety of settings across different clinical disciplines. These benefits convinced Bichat-Claude Bernard Hospital, to open a hybrid OR equipped with X-ray and intraoperative 3D imaging in September 2018.



Vascular and Cardiac team, Bichat-Claude Bernard Hospital in Paris, France.

Wide range of procedures

“The system enables to perform all the structural interventional cardiology interventions, some of which we used to perform in the catheter lab, in a dedicated environment for cardiologists and anaesthesiologists. The room is also an operating room for a simultaneous intervention of cardiologists and cardiac surgeons in some complex procedures,” Dr Juliard, interventional cardiologist, said.

Dr Juliard uses the system to carry out his structural interventions - percutaneous aortic valve implantation, and valve-in-valve and valve-in-ring implantation for mitral and tricuspid diseases - and percutaneous closure of PFOs, ASDs and LAAs as well as paravalvular leaks and MitraClip procedures.

The Infinix-i Hybrid + increases the range of treatments that the unit can

offer to patients, Dr Pellenc, vascular surgeon at Bichat, added: “Now we can offer all endovascular modern techniques and treat more patients. The Infinix-i Hybrid + room has the particularity of combining a high-quality preoperative imaging and an ergonomic surgical table offering the highest security for the patient in case of unscheduled surgical procedure or open surgical conversion.”

Every standard thoracic (TEVAR) and abdominal (EVAR) aortic stent grafts are now also performed in the hybrid room. Dr Pellenc and his colleagues have increased the number of F-B EVAR procedures and can also perform digestive arteries angioplasty and stenting in the superior mesenteric artery or celiac trunk.

“The combination with the Magnus Maquet operating table allows us

to perform a lot of common hybrid procedures, such as supra aortic trunk debranching during TEVAR or retrograde superior mesenteric open stenting, but also complex endoleaks after stentgrafts, thanks to high quality imaging,” Dr Pellenc said.

Raising the profile of the institution

The Bichat-Claude Bernard Hospital was funded in 1980 and is part of the prestigious Assistance Publique - Hôpitaux de Paris (AP-HP) network. In 1999, upon the arrival of Prof Alec Vahanian, a world famous leader in percutaneous balloon mitral valvuloplasty, the hospital's activity spread to structural interventional cardiology.

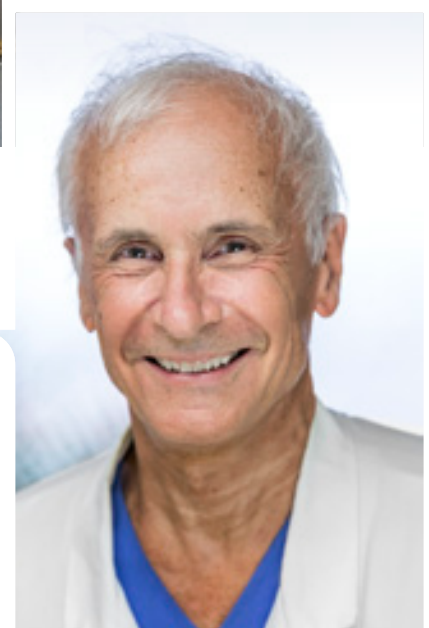
With another recognised expert in percutaneous aortic valve implantation, Dr Dominique Himbert, in the team, the centre soon became a leading hub in France.



Cardiac team with Dr Juliard at Bichat-Claude Bernard Hospital.

“The system enables to perform a wide range of procedures for both interventional cardiologists and cardiac surgeons.”

Dr Jean-Michel Juliard, interventional cardiologist at Bichat-Claude Bernard Hospital.



Dr Juliard has worked mainly in acute coronary syndromes management together with Dr Himbert and Dr Gabriel Steg, one of the finest specialists in the field. “With the Infinix-i Hybrid + the hospital can now boast about being one of Europe’s centres of excellence,” Dr Juliard explained. “The Cardiology department is at the same level as other European centres, for example the one in Munich or Leipzig in Germany.”

Opening the hybrid room also led to an increase of TEVAR and TAVI procedures, which will further increase the hospital’s attractiveness and national visibility, Dr Pellenc believes.

The institution is now well placed to offer complex hybrid interventions and innovative techniques, for example percutaneous treatment of functional tricuspid regurgitation.

“New innovative techniques are also in progress for percutaneous treatment of tricuspid and mitral valve diseases, and probably implantation of dedicated mitral valves, with either a transeptal or apical approach,” Dr Juliard said.

Multidisciplinary experience with the system

To carry out all these procedures, vascular and thoracic surgeons work

hand in hand, together with anaesthesiologists, cardiac surgeons and pneumologists. It is particularly useful to use the Infinix-i Hybrid + in that context, Dr Pellenc explained.

“We are a pioneering team in the creation of a digestive stroke centre in collaboration with the Gastroenterology

and Digestive Surgery departments of our hospital. This very specific activity is quite unique in France and is particularly adapted to the use of a hybrid room such as the one provided by Canon Medical,” Dr Pellenc said.

Dr Juliard particularly appreciates the vast area of the room, the large screen display

and the possibility to have multi-modality imaging on the same screen. “Many other screens are available in the room for all the operators, echocardiographers, anesthesiologists and visitors,” he said.

The room is currently shared between cardiologists (3 days per week) and vascular surgeons (2 days per week).

“We can now offer all endovascular modern techniques and treat more patients. Furthermore, the image quality is excellent and the digital zoom is very useful for complex procedures.”

Dr Quentin Pellenc, vascular surgeon, at Bichat-Claude Bernard Hospital.



Vascular team with Dr Pellenc at Bichat-Claude Bernard Hospital.



Bichat-Claude Bernard Hospital in Paris, France.

We are with 4 surgeons and 4 junior surgeons.

The project of installing the hybrid room started nearly a decade ago and faced many challenges due to local building constraints. But the final result is as good as expected for all specialists involved.

“Our experience with the Infinix-i Hybrid + is recent but thanks to the simplicity of handling, we progress really fast - even the older surgeons. We really appreciate the ergonomics of the room. The C-arm can be positioned in a multitude of angles, allowing combined approaches from femoral and upper body access during the same

surgery. Furthermore, image quality is excellent and the digital zoom is very useful for complex procedures such as fenestrated and branched stent grafts,” Dr Pellenc said.

The system presents many dose reduction tools - live zoom, spot fluoroscopy, Dose Tracking System (DTS) fluoro roadmap -, which are essential during complex aortic repair or mesenteric stenting, which imposes lateral views. Dr Pellenc and his team of vascular surgeons have heartily welcomed these new tools: “Dose reduction compared with the use of a mobile C-arm is significant. This is a key advance for both patients and physicians.”

Surgeons were also happily surprised by the system’s ease of use. “We are not radiologists and we were a little bit worried about using a hybrid suite. We were amazed by the simplicity of the interface,” Dr Pellenc said.

The main challenge when working within hybrid OR is not using the equipment, but rather cooperating between medical and administrative staff. “The key was to involve all the medical teams from the beginning. With the Infinix-i Hybrid + room, we now have a suitable tool for all our medical and surgical specialists,” he concluded. //



VISIONS spoke with Eric van Antwerpen,
Chief Commercial Officer at Fysicon.

A Complete, In-House Solution for Cardiology

With the acquisition of Fysicon over a year ago, Canon Medical is now able to provide the best image quality with an intuitive hemodynamic monitoring solution, a powerful combination in cardiac care. Eric van Antwerpen, Chief Commercial Officer at Fysicon, discusses how in areas such as interventional radiology and stroke Canon Medical's solutions and its sister company can better fit the needs of the customer and improve patient outcomes.

With the inclusion of Fysicon, Canon Medical now has a broad range of solutions across different modalities, clinical scenarios and workflow systems designed to add real value to the services offered by the hospital. This ability to provide a complete, in-house solution is one of the company's strongest points, according to Eric. "We are the only ones who can supply a complete portfolio; a one-stop-shop. Having a single solution means you don't have any integration issues. Everything works together seamlessly."

Improving and expanding cardiac care

Fysicon's most well-known product is QMAPP, a hemodynamic monitoring system. QMAPP beautifully completes the powerful Alphenix interventional system with cardiac workflow, cardiovascular reporting system and database, to deliver our best possible cardiac imaging and workflow solution. "Today everything inside the hospital is IT-connected. Fysicon adds greater IT connectivity and workflow management to enhance our cardiac solution," he said.



QMAPP attached on Canon Medical's X-Ray system Alphenix.

Combined with the Alphenix cardiovascular X-ray system, QMAPP provides a complete solution for the cardiac lab. For hemodynamic applications, the system typically needs to be replaced after seven years.

The average lifetime of cardiac or x-ray equipment in a dedicated lab or x-ray room, is between eight to ten years. Everything can be planned directly with the customer, to renew equipment and IT when it best makes sense, on a case-to-case basis.

Used in combination with the Alphenix Core, QMAPP also enables to perform cardiac imaging inside a catheter lab, which may prove a smart business decision for small hospitals, Eric explained: "In a general district hospital you facilitate 300 to 350 procedures a year. In a cath lab, that's too expensive. But by having a system like the Alphenix Core and an upgrade

kit such as QMAPP, you can perform cardiac care in this setting, and save money for your hospital."

Information on stents, balloons, devices, valves and any implants are also stored on QMAPP, and can be sent to registries. If companies have an issue with their product, they can consult QMAPP data to find out.

If a facility performs 320 procedures per year in their cath lab, they would break even within approximately five years, while it usually takes a decade for a cardiac lab to generate benefits. "With optimal workflow, customers can add one or two patients per day, which is good from a budget perspective. For patients, it means shorter waiting times before they can have their procedures done," he added.

DataLinQ is another workflow management system used to facilitate a

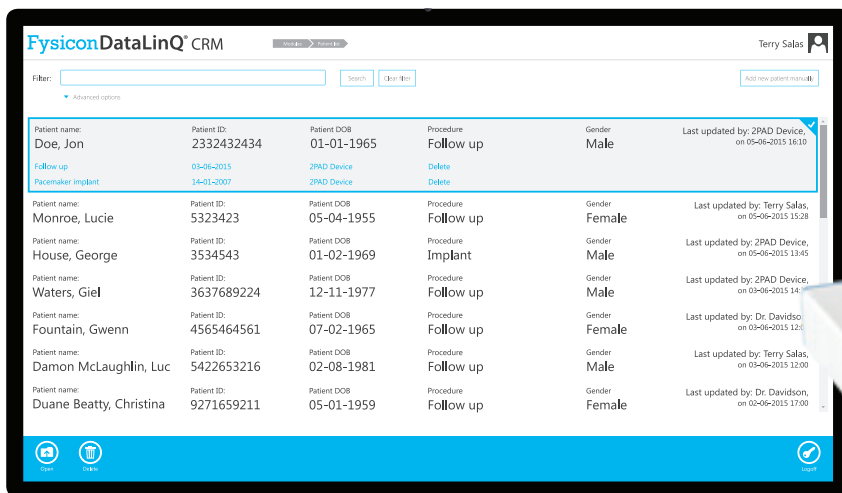
paperless pacemaker clinic and make pacemaker follow-ups more efficient and less costly. Usually, pacemakers are implanted in the cardiac catheter lab. Fysicon facilitates an IT solution where all the data from the pacemaker is directly fed into the database. Pacemaker follow-ups are usually performed once or twice a year. In the past, all the data generated by the pacemaker in that time was printed on paper, in 4-12 pages-long reports, which were then put into files. When the patient returned to the hospital for a follow-up, the physician don't have time to go through the long reports and would typically read only the first pages.

"An IT system, allows you to directly access all key information on battery state, lead wires, settings etc. and, if necessary, plan a replacement in time based on the trends. You can better follow-up patients and track any changes in their behavior. These trends become evident as all the data on the patient's wellbeing is stored in the system," Eric explained.

With DataLinQ Remote Device Management it is also possible to integrate data from remote device systems into DataLinQ Cardiac Rhythm Management. A message is automatically displayed in the inbox when data from remote device systems are delivered through the hospital server. Both follow-up as well as remote follow-up data are integrated into one database. All the data generated by DataLinQ is exported to national registries, helping to collect data to activate alerts and appropriate chain of actions in case a defect is spotted.

Future applications

The burden of cardiovascular disease (CVD) is set to increase drastically over the next decades. CVD is already the most common cause of death in Europe, responsible for 3.9 million deaths each year. It is a major cause of disability and reduces quality of life. Longevity, improved survival, obesity and the rapidly increasing prevalence of diabetes will continue to boost the number of patients with CVD.



These factors directly have an impact on rising costs for healthcare and put further strain on healthcare resources. It is currently estimated that CVD costs € 210bn a year to the EU.¹

Optimized workflows and improved resource utilization are crucial to help buckle the trend. The combination of Alphenix and QMAPP can help detect CVD at an early stage, before any complications, such as stroke, arise. Other modalities can also be used to help in the early diagnosis of CVD. The focus should now be on multi-modality sales and along clinical pillars - i.e. cardiology, oncology.

“Selling modalities doesn’t work anymore. It’s important to think across the clinical pillar because we can offer a whole approach, for example a complete cardiac solution. You can’t do everything with one device and that’s why you need to use the whole portfolio.”

Canon Medical has several high profile academic sites equipped with Alphenix 4D CT, a sliding CT system integrated with an interventional system that can also be combined with ultrasound. This one-room solution avoids the complications and time delays of patient transfer.

“We are continuously looking for opportunities to make the current workflow more efficient, by combining additional modalities, and improving integration and usability,” Eric said.

Stroke and oncology are areas in which Canon Medical combined with Fysicon have a lot to offer. Interventional radiology is another area to explore and grow, as procedures are getting more complicated and greater patient monitoring is required.

Connectivity is another important direction with regard to workflow and interoperability, and Fysicon continues to acquire experience in this field.

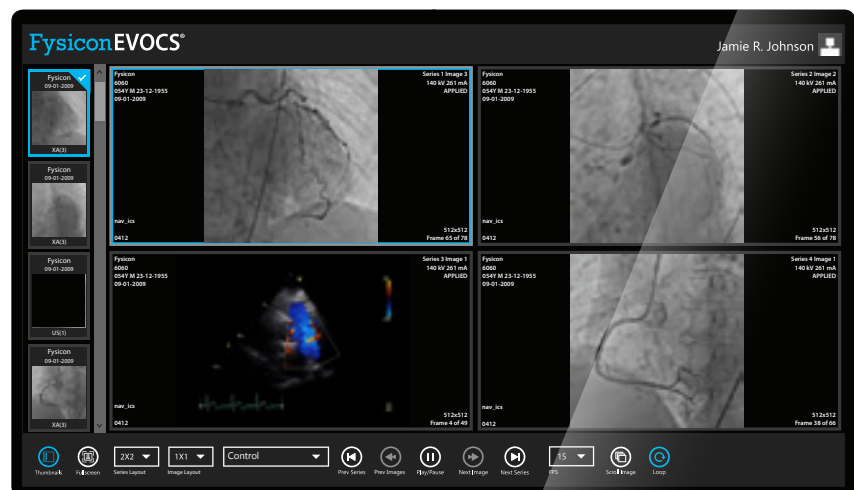
Smarter, safer and cheaper image transfer

Since 2004, Fysicon develops products based on real world needs, for example, from observations made in hospitals. “We saw a nurse walking by in a cardiac thoracic center with a shopping trolley full of CDs and film scans. These imaging studies were being returned by mail to the hospital that created

the images, where, according to Dutch legislation, they had to be stored. We thought: this is a wasteful practice. We have to facilitate the transfer of images, and make it more reliable and efficient,” Eric said.

That was the inception of EVOCS. EVOCS is an image and document sharing system, which transmits images from one hospital to another over a secure Internet connection. With EVOCS, the risk of losing or damaging the images disappears, transfer process is expedited and the data anonymized.

The network was created for cardiology, but could be extended to other departments, which are still using CDs and USB sticks to transfer images – for instance oncology. Oncology would be an interesting area as images from





“With the inclusion of Fysicon, Canon Medical now has a broad range of solutions to add real value to the services offered by the hospital.”

Eric van Antwerpen

Joined the Fysicon team in 1996 as freelance application specialist. Before that he had been working as a radiographer, specializing in angiography and diagnostic cardiac care for over ten years.

different hospitals are used in expert panels, for example, in university medical centers involved in large studies and concentrating the data of patients with certain types of cancer.

Stroke is another potential use for EVOCS. Time is brain in stroke management, and EVOCS can help make a difference. “We can help save time when a patient CT information is sent to the neurovascular reference center, to help the neurosurgeon to get the data as soon as possible and trigger the appropriate chain of actions - i.e. keep the patient in observation or prepare the OR right away, when there’s a major bleed that needs to be coiled. This is a much more efficient and cheaper workflow compared to current processes.” EVOCS proved its benefits in the Mr Clean Study, which is the fundament for the Dutch Stroke program.²

Cybersecurity

Cybersecurity is an essential consideration in all IT systems, especially when the systems are exposed to the internet. Fysicon was the first company in the Netherlands that provided data-processor agreements as part of its EVOCS contract. Today such

agreements are a commodity. “We periodically perform penetration tests to ensure that the data is secure.”

Cybersecurity in pacemaker follow-up is crucial. DataLinQ does not communicate with the devices itself, but with the pacemaker programmer and the Remote Monitoring Devices. This prevents any possibilities for a breach.

Data acquired on all Fysicon solutions is encrypted. The used encryption algorithm is the same as with banking and credit card transactions. SSL and network certificates are being used and the access to all systems is secured though username, passwords, user groups and rights, and in some cases even two-factor authentication. These security measures are approved by the US Department of Defense.

Cybersecurity is everyone’s concern inside the hospital: the equipment and IT providers, but also the staff. “We do our software part but expect the hospital to do something. We still see passwords written directly on the computer in some hospitals. Such behavior endangers data security. We must all make appropriate efforts,” he concluded. //

Fysicon
creating medical solutions

About Fysicon

Fysicon designs and develops applications as well as a manufacturing services for Canon Medical. Fysicon was founded 25 years ago as a third-party vendor, which provided systems in combination with all brands to get best of breed for the end-user. Fysicon was acquired by Canon Medical in March 2018, to combine the best of both companies.

Fysicon may not be available in all regions or countries, please contact your local Canon representative for more details.

¹ World Health Organization [www.who.int/
cardiovascular_diseases/en/
European Cardiovascular Disease Statistics 2017](http://www.who.int/cardiovascular_diseases/en/European_Cardiovascular_Disease_Statistics_2017)
[http://www.ehnheart.org/cvd-statistics/cvd-
statistics-2017.html](http://www.ehnheart.org/cvd-statistics/cvd-statistics-2017.html).

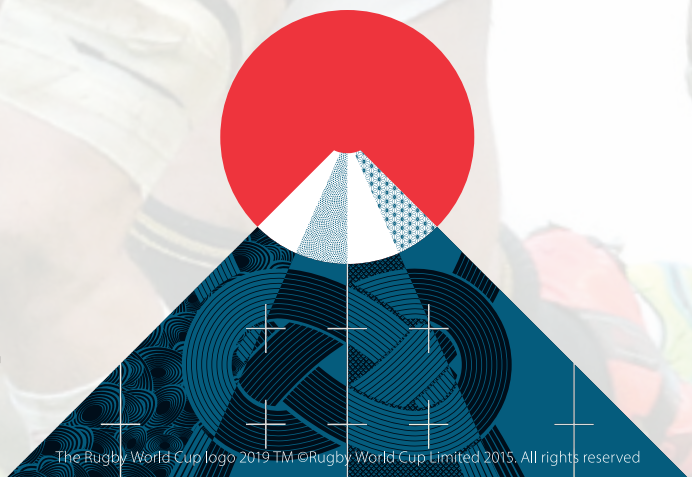
European heart health charter
<http://www.heartcharter.org>
² <https://www.mrclean-trial.org/>
[https://www.spoedzorgnet.nl/sites/default/files/
documents/protocol_regionale_inrichting_
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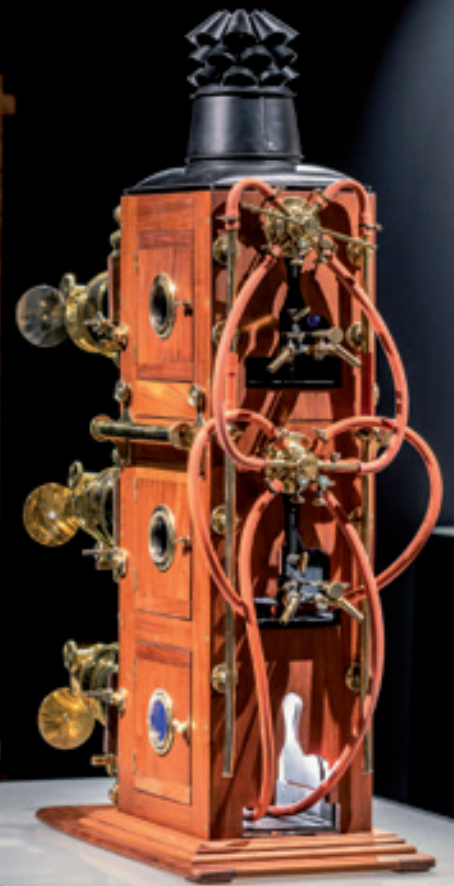
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'Laterna Magica – the Simple Device that Changes the Way We View the World'

Marie-Anne Leonard



The Laterna Magica – or Magic Lantern – was like the iPhone of its time.

The idea sounds basic now - a slide projector and a light source projecting hand-painted slides onto a screen - but the device reinvented the way people saw the world throughout the centuries and its impact is still felt today.

The Devil on the Wall

The reformation in Europe in the 16th Century was a very spiritual time where the Catholic Church ruled in matters of morality and law, until the



An illustration of a projection of hellfire or purgatory from Jesuit scholar Athanasius Kircher's 1671 study 'Ars Magna Lucis et Umbrae'.

Protestants challenged their dogma. The Reformers made use of the printing radical plan.

"The Jesuits were very important for the Roman Catholic Church because they were multimedia people," explains Dr Andreas Scheucher, curator of the AV Stumpfl Museum in Austria. "They founded a special form of spiritual theatre and used the Magic Lantern. The first projected images were images of the devil."

Reinhold Stumpfl, the owner and founder of Canon partner AV Stumpfl, is an avid collector of this fascinating memorabilia. He asked his friend, Dr Scheucher, a recognized expert in visual storytelling, to curate the AV Stumpfl museum, where over two hundred artefacts from the history of projection technology are exhibited.

"The 'devil on the wall' shows how miraculous this technology would be for simple country people. The Jesuits

"The idea of telling stories with pictures is as old as humanity itself"

*Reinhold Stumpfl,
owner and founder of
Canon partner AV Stumpfl*

travelled widely using the Laterna Magica to spread church propaganda, and to show that if you were not a good Catholic, you would go to Hell. There's a connecting line beginning from the middle ages, right through to today where powerful images in projections are used to shock and influence."

This was probably the first use of broadcast images for the purposes of propaganda. As wealth moved from the hands of the church and aristocracy and into the hands of merchants, so did the use of the Laterna Magica.

'Phantasmagoria' – The Theatre of Horror

At the time of the French Revolution (1789-1799), stage magician Étienne-Gaspard Robert discovered how to project from two Magic Lanterns mounted on rails and used this simple invention to take full advantage of the mood of the Parisian people, who lived in a city shaken by riots. He performed terrifying shows of supernatural spectacles called 'Phantasmagoria', where his audiences were locked into a pitch-black 'dungeon' and subjected to all manner of moving projected horrors that increased or decreased in size, accompanied by eerie sound effects and phantom voices.

An explosion of limelight

The early 19th Century was a time of great progress, filled with scientific discoveries and the exploration of new and exotic lands. One particular invention allowed images of these incredible spectacles to be broadcast in a huge and exciting way, breathing fresh air to the Laterna Magica, Dr Scheucher explains.

"In the middle ages, an oil lamp was used with the projecting apparatus, but when the oxy-hydrogen lamp was invented, it was a sensation. Hydrogen and oxygen were mixed, creating a

tremendous temperature in a chemical reaction so that a limestone began to glow with a very white light. This 'limelight' was about 6000-8000 lumen, which is brighter than average car headlights, so remembering that at this time the most people had seen was the light of a yellow oil lamp, you can imagine how they responded."

Astonishing images from around the world were meticulously hand-transferred onto glass slides in crisp, beautiful detail, and the "limelight" then allowed them to fill huge screens with news, discoveries and catastrophes, such as erupting volcanoes.

By the Victorian industrial revolution its popularity peaked and thousands of people descended upon the Royal Albert Hall, clamouring to see these

"There's a connecting line beginning from the early times of mankind, right through to today where powerful images in projections are used by powerful people to shock and influence."

*Dr Andreas Scheucher,
curator of the AV Stumpf Museum.*

projection shows. "Many people believe that the Magic Lantern was a toy for children, but in this case it wasn't. It was very powerful and the apparatus used were big projectors with three lenses, dissolve units and limelight. It was the cinema projector of the 19th century."

Because "limelight" went on to be used in the illumination of theatres, the term has endured to this day to describe someone who is centre stage. This is just one of the legacies of the Laterna Magica.

The slides themselves have since become very desirable objects. "They are unique in colour and every slide is a piece of art. They are only about 8x8 centimetres big and more than 100 years old, yet the colours are so clear and when projected on a big screen, you see every detail.

You use your smartphone to view a slideshow. The word 'slide' comes from the Laterna Magica. It had a wooden slider to insert the image into the optical system and project it out, and this became the word we now use. In some ways you could say that the Magic Lantern is still alive"

The AV Stumpf Museum is open for group visits during AV Stumpf opening times, where you can see Reinhold Stumpf's unique collection in full and experience three cinemas, showing broadcast technology from throughout the ages – including the Laterna Magica. //



Laterna Magica slides are meticulously painted and exceptionally detailed. (© AV Stumpf)



VISIONS spoke with PD Dr Hannes Gruber (in the front) and PD Dr Alexander Loizides (in the back) from the Medical University Innsbruck.



The WOW-Effect in Sonography

In the center of Tyrol and thus also situated in the middle of the Alps, the Medical University Innsbruck (Medizinische Universität Innsbruck) offers best conditions for successful research, studies and teaching at an attractive location. Its core tasks include teaching and education as well as research on the highest level and the continuous improvement of state-of-the-art medicine.

The Medical University Innsbruck is a research center of long tradition. In 2004, it was founded as an independent university. However, its roots date back much further than that: in 1562, the Jesuits built a high school in Innsbruck. Building on this school, Emperor Leopold I. founded a university of which evolved The Medical University Innsbruck was one of the four founding faculties. In its 350 years old history, it has always been one of the most important flagships of the university. Three of the four Nobel Prize winners worked at the Medical University Innsbruck at the 'Institute für Medizinische Chemie'

(Institute for Medical Chemistry), for instance. Today, the Medical University Innsbruck with a total of approx. 3,000 students and approx. 2,000 employees is the most important medical research and education institution in Austria.

Research, diagnostics and treatment are among the core tasks of the Medical University Innsbruck. The Innsbruck physicians gain international recognition with new therapy methods and research findings. One locational advantage is the close structural and spatial proximity of theory and practice. Patients from all over the world come to Innsbruck for treatment.

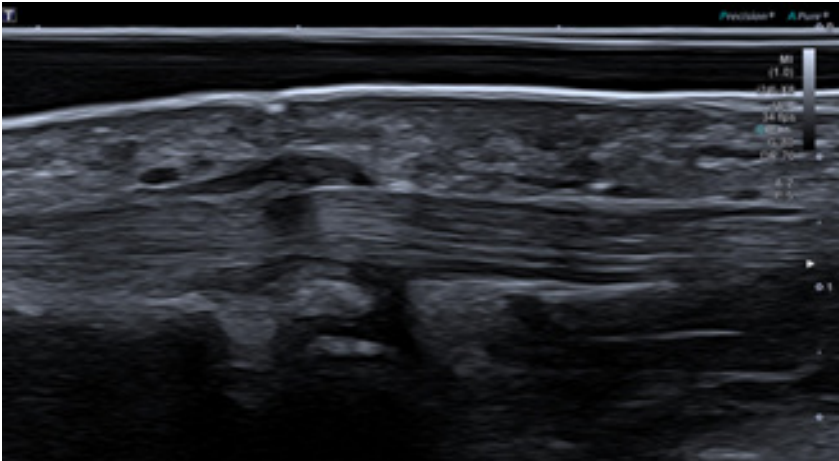


Figure 1: Massive thickening of the A1-Pulley in a 53-year old patient with tendovaginitis stenansans.

As is well known, four eyes see more than two. This particularly applies to the senior consultants PD Dr Hannes Gruber, head of the Department of Interventional and Diagnostic sonography of Radiology of the Medical University Innsbruck/Tirol Kliniken and “ÖGUM Working Committee Nerve Sonography” and PD Dr Alexander Loizides, head of the “ÖGUM Working Committee Musculoskeletal Sonography and Interventional Sonography” and vice-head of the Department of Interventional and Diagnostic sonography of Radiology of the Medical University Innsbruck/Tyrol Hospitals.

Due to their sonographic know-how and competence, the two radiologists see what many physicians can often only dream of, like e.g. the tiniest of nerves and their pathologies. The application of high-frequency ultrasound allows them to make medical diagnoses and carry out pain therapies which turns out to be a win-win situation both for the attending physician and the patient.

You are running a state-of-the-art center for sonography and also do scientific work in ultrasound research; how did this come about?

PD Dr Gruber: Already as a young medical student at the anatomic institute for ultrasound applications, I was interested in musculoskeletal issues. When I joined the University Hospital here and met two colleagues who began to very intensively deal with the subject of nerve sonography,

I received the chance of intensively developing myself in this direction. Already at that time, we were able to identify nerve pathologies and anomalies of which others could only dream of and thus became pioneers in the sonographic acquisition of such details.

Can you give us an example what it was about?

PD Dr Gruber: At the beginning, we were even happy when we were able to differentiate between tendons and nerves which could not be taken for granted given the sonographic and resolution qualities of the ultrasound devices in the nineties. We then started from the “big” pathologies, like the carpal tunnel syndrome or the cubital tunnel syndrome, continued via traumatology and ended up at more complex nerve pathologies and nerve topographies. We had never

believed at that time, that we would see, depict and diagnose today tiny structures with probes up to 33MHz. In addition to these morphological diagnoses, the treatment of pain by using Ultrasound guidance showed an astonishing development. This was not only interesting from a scientific standpoint but allowed for bridging the gap between the diagnosis at the peripheral nervous system and the targeted and image-guided pain therapy.

Did you cooperate with other disciplines when you started to develop this image guided pain therapy?

PD Dr Gruber: Until then, neurosurgeons had been used to perform pain therapy intraoperatively by means of fluoroscopy. Both involve considerable time and effort. When we then started to gradually use sonography more and more, we were initially sneered at quite frequently. Today, we are able to perform targeted pain therapy at the entire spine using sonographic image control. The only cases where we cannot offer those interventions are patients with e.g. significant scar tissue or with a body mass index of over 45 - which affects at most 10% to 15% of all patients.

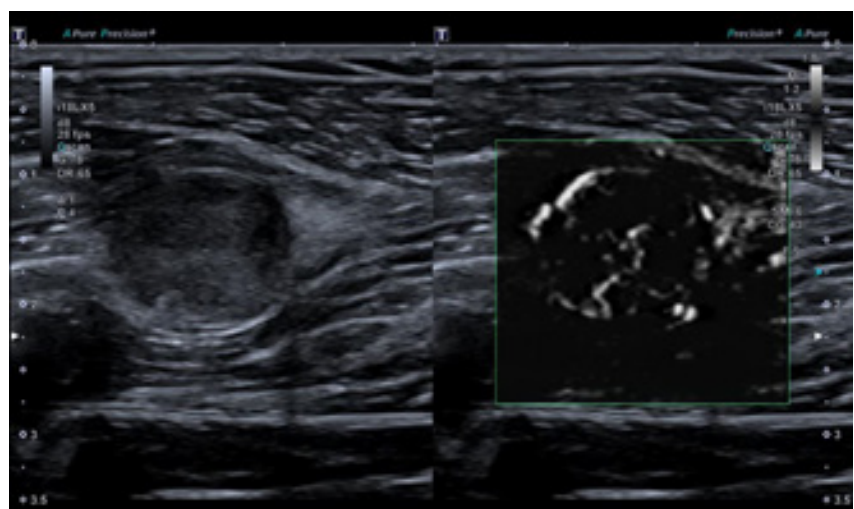


Figure 2: Grey scale US and SMI of a typical Schwannoma of a muscular branch of the soleus muscle.



“We have become an international training center over the past few years visited by colleagues from all over the world to learn about ultrasound guided infiltrations in the spine.”

PD Dr Alexander Loizides, head of the “ÖGUM Working Committee Musculoskeletal Sonography and Interventional Sonography” and vice-head of the Department of Interventional and Diagnostic sonography of Radiology of the Innsbruck Medical University/ Tyrol Hospitals.

PD Dr Hannes Gruber and PD Dr Alexander Loizides, Medical University Innsbruck.

Why has nerve imaging experienced such a boom recently?

PD Dr Loizides: In times of 10 MHz probes, we could mainly display and assess large nerves: Thanks to technical advances in hardware and software, optimized post processing and especially due to the development of ultra-high frequency probes with frequencies of up to 33 MHz, even tiniest nerves and nerve branches with diameters markedly below one millimeter may be imaged in detail and assessed with high accuracy. This is a groundbreaking development in nerve sonography and this detailed imaging elicits a “wow” from us and our colleagues time and again.

What are further important applications of the high-frequency probes?

PD Dr Loizides: Besides imaging of the peripheral nervous system, high-frequency

ultrasound is also used widely in the evaluation of soft tissues and in particular in musculoskeletal tumor diagnostics. As a radiological reference center with an orthopedic department, we have raised the tumor diagnosis to a new level. Using a standardized examination algorithm, we can create an overall image of the tumor by evaluating the lesion sonographically and obtaining precise biopsies from sonographically predefined areas. The inconclusive histologies were around 20% in earlier times; by integrating the contrast-enhanced sonography into our examination algorithm in a standardized way, we were able to reduce such histology practically to zero: in this way, we can image vital tumor parts for the subsequent ultrasound navigated biopsy next to assessing the vascularization of a lesion which is fundamentally different between benign and malignant tumors.

What are the concrete advantages of high frequency sonography in radiological imaging?

PD Dr Gruber: Thanks to the technical progress made in recent years, people succeeded in designing and constructing new ultrasound probes able to generate ever higher sound frequencies. This did not only significantly improve the temporal but especially the spatial resolution of the imaging process. There is no other modality offering a comparable win-win situation for patients and attending physicians alike due to low costs and zero radiation dose.

Do patients know about these advantages?

PD Dr Gruber: Patients today have very good knowledge and often come to us for a second opinion. Not seldom, they endured extended periods of suffering

with many imaging studies and several unsuccessful therapies. If then the examination including an eventual therapy takes maximum 15 minutes results with a clear benefit for the patient.

What makes the Innsbruck Sonography internationally so well known, successful and unique?

PD Dr Loizides: We are one of the leading centers that has already been dealing with nerve sonography and pain therapy for a long time and therefore has gained an enormous amount of experience and expertise. The ultrasound navigated pain therapy in the spine has mostly been developed and was first published in Innsbruck. These infiltrations were of course evaluated in prospective randomized studies as valid results and the scientific evidence are an important concern to us. In the meantime, these infiltrations have been standardized and are offered as a routine procedure in our department offering an

alternative modality to time-consuming procedures and above all to methods prone to radiation exposure like fluoroscopy and computer tomography. Due to these publications and the acquired technical know-how and competence, we have become an international training center over the past few years visited by colleagues from all over the world to learn about ultrasound guided infiltrations at the spine.

You rank worldwide among the leading physicians who have clinically used the latest 33MHz Active Matrix Transducer of the Aplio i800. What was your first impression?

PD Dr Loizides: Already with the 24 MHz probe, we were among the first given the opportunity to use it in our daily routine. When talking about a highlight at that time, we are talking about THE ultimate 33MHz probe now. This refutes the entire collected knowledge in nerve

sonography as so far it had been general knowledge that tiny nerves/nerve branches are monofascicular. Now, we know that this is not true: by using way of the ultra-high-resolution of the 33 MHz probe, we can prove that these smallest branches consist of several fascicles after all. This insight leads to entirely new approaches in the diagnosis and therapy of nerve pathologies.

Ultrasound provides both anatomical as well as tissue perfusion information. Can you give examples where you implement this state of the art ultrasound flow imaging in your work?

PD Dr Gruber: From neurosurgery we know that nerves appear reddened and swollen during operations in case of compression syndromes. However, we never had a correlated image to prove it to visualize preoperatively this pathological perfusion of compressed nerves and our current data lead us to hope that this will be a big step forward in diagnostics: we might come closer to finding a possible "vascular" cause of compression neuropathy.

The innovative SMI ultrasound technology means a big step forward in the duplex sonography and thus in the diagnostic accuracy. We are nowadays able to diagnose pathologies of patients not only based on questionable reliable surrogate markers but rather directly and thus more in detail. This reflects the distinct efficiency of our work but also leads to conclusion that the circumstance that radiologists and sonographers need to improve their knowledge and learn to apply these new acknowledges. A big challenge is that we need and want to bring on board colleagues from other medical disciplines.

What special challenges do these new findings bring along?

PD Dr Gruber: In the first place, not so much in medicine but rather due to the fact that we have to bring colleagues from many medical disciplines on board. It will be crucial to convince e.g. neurosurgeons, trauma surgeons and orthopedists but

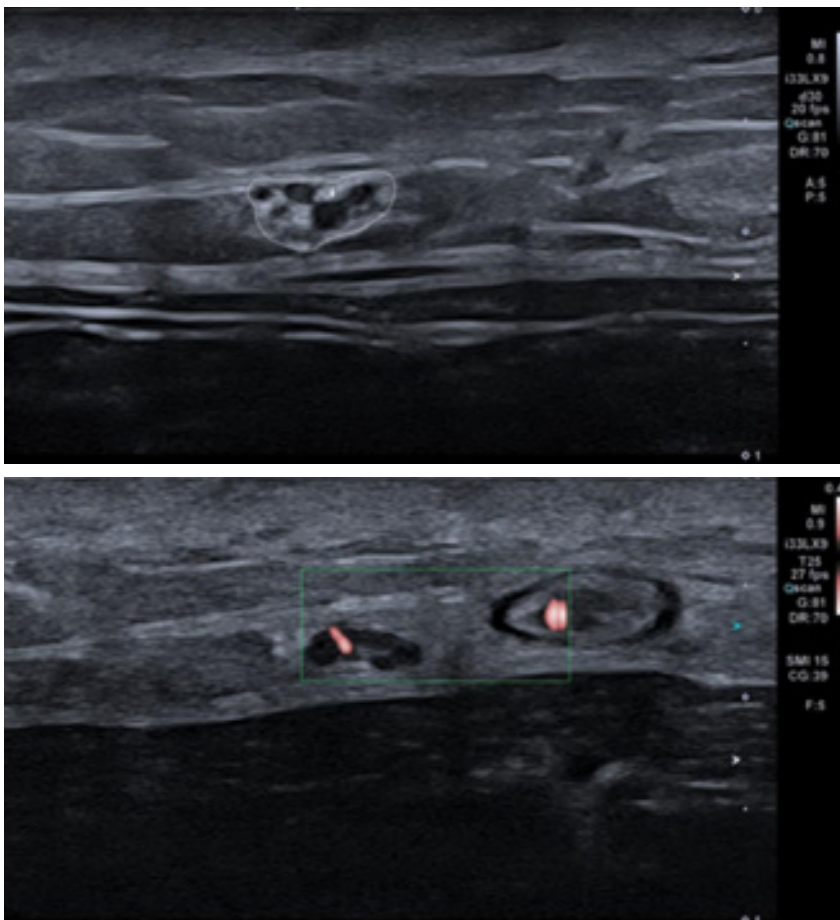


Figure 3: Depiction of the sural nerve (dotted line) with illustration of more than 7 nerve fascicles (arrow) including even an intraneural vessel using a 33 MHz probe.

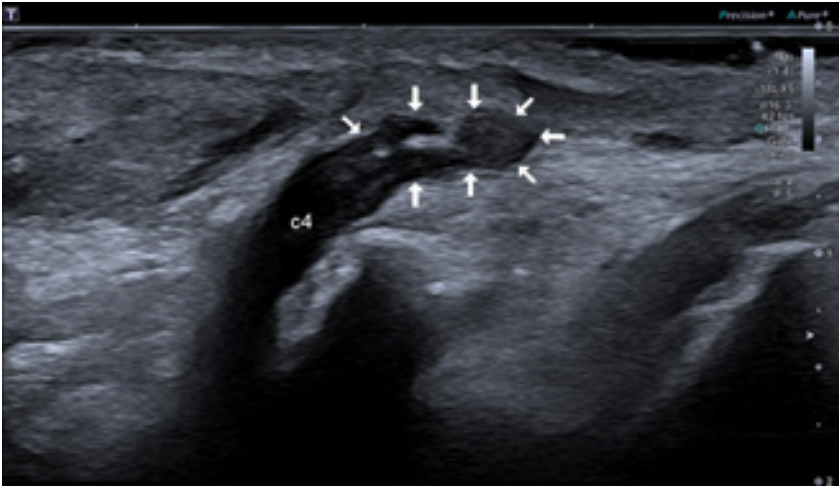


Figure 4, Neurotmesis of the C4 nerve root in a patient after sharp neck-injury.

also the radiologists that especially we radiologists specialized in ultrasound diagnostics are able to provide a faster and more accurate diagnosis based on the now available technologies without meaning to discredit the other medical disciplines. We must work together to find concrete solutions for the correct treatment of patients and the related correct procedures based on these technologies.

In recent years, you have held numerous ultrasound courses together with your team: Why do you think it so important to pass on your ultrasound expertise?

PD Dr Gruber: What was the stethoscope in earlier times is more and more replaced by ultrasound today. In nearly every medical discipline, ultrasound is part of the training schedule as the diagnosis is fast, simple and comprehensible. However, it is not enough to be a fan of ultrasound, what counts is the professional practice which definitely needs to be trained. I am honestly glad to share my know-how as I also see it as part of my physician's responsibility in the sense of the Hippocratic Oath.

We have been holding workshops for around 15 years - from all sub disciplines of diagnostic sonography, especially on nerve sonography, musculoskeletal sonography and courses about sonographically targeted pain therapies - and I see active practice as central part of these courses; only those who make and learn from their mistakes improve their

skills under the guidance of experts will then be able to successfully work at the patient using ultrasound in daily practice. The high demand confirms that we are walking in the right direction.

How do you see the role of sonography as a diagnostic instrument in medicine in the future?

PD Dr Loizides: Sonography is and will continue to be an indispensable instrument for every physician and I assume that further developments and progress in this field will let us see even more however this will depend on the work of the device manufacturers. Of course, we also have to report back our new findings to the companies as this is the only way to set further milestones in sonography. In our latest book release "Sonographic Peripheral Nerve Topography – A Landmark-based Algorithm", we have tried to put the specific value of sonography for the clinical user in perspective. This book presents the topographic anatomy of almost all peripheral nerves in ultrasound focusing on special landmarks using for the first time. The German version of the book has been downloaded more than 7,000 times in just nine months - which has exceeded our expectations by far and proves the high need for this knowledge. Now, many are under pressure to take action because the knowledge is there which obliges the colleagues to also acquire that know-how to be able to treat patients appropriately - what was intended. Sonography is more than just a radiological modality! //

Publications:

Nerve

1. Sonographic Peripheral Nerve Topography - A Landmark-based Algorithm. Gruber H, Loizides A, Moriggl B. 2019, Springer Verlag.

Spine

- ¹ A new simplified sonographic approach for paravertebral injections in the lumbar spine: a CT-controlled cadaver study. Loizides A, Gruber H, Peer S, Brenner E, Galiano K, Obernauer J. AJNR Am J Neuroradiol. 2011 May;32(5):828-31. doi: 10.3174/ajnr.A2389. Epub 2011 Feb 24.
- ² Ultrasound guided versus CT-controlled paravertebral injections in the lumbar spine: a prospective randomized clinical trial. Loizides A, Gruber H, Peer S, Galiano K, Bale R, Obernauer J. AJNR Am J Neuroradiol. 2013 Feb;34(2):466-70. doi: 10.3174/ajnr.A3206. Epub 2012 Jul 19.
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- ¹ Optimizing ultrasound-guided biopsy of musculoskeletal masses by application of an ultrasound contrast agent. Loizides A, Widmann G, Freuis T, Peer S, Gruber H. Ultraschall Med. 2011 Jun;32(3):307-10. doi: 10.1055/s-0029-1245713. Epub 2010 Oct 11.
- ² Perfusion pattern of musculoskeletal masses using contrast-enhanced ultrasound: a helpful tool for characterisation? Loizides A, Peer S, Plaikner M, Djurdjevic T, Gruber H. Eur Radiol. 2012 Aug;22(8):1803-11. doi: 10.1007/s00330-012-2407-4. Epub 2012 Mar 13.
- ³ Soft-Tissue Tumor Contrast Enhancement Patterns: Diagnostic Value and Comparison Between Ultrasound and MRI. Gruber L, Loizides A, Luger AK, Glodny B, Moser P, Henninger B, Gruber H. AJR Am J Roentgenol. 2017 Feb;208(2):393-401. doi: 10.2214/AJR.16.16859. Epub 2016 Dec 13.



VISIONS spoke with Rob de Jong (European Service Director at Canon Medical Systems Europe) and Afshin Hamzei (Senior Service Manager at Canon Medical Systems Europe).

Service is in our DNA

Aiming for the best service and highest customer satisfaction

Providing cutting edge medical imaging technology goes way beyond selling equipment; it's also about serving customers through thick and thin, in the most diverse and challenging scenarios. Canon Medical Service Management explained how they cope with healthcare budget cuts, cyber threats and obsolescence, and why predictive service may be the most interesting path to explore to pre-empt systems outage.

A unique vision of service

"Maintaining medical equipment is no ball game. It requires special care and highly trained service professionals. We need strong skills to deliver the best possible service," Rob de Jong, European Service Director at Canon Medical Systems Europe, said.

Canon Medical has excelled in this capacity ever since it started its business over a hundred years ago. In Europe, over 700 service professionals now strive to provide the highest customer satisfaction for an installed base of over 55,000 units. Its level of expertise also allows the organization to support service professionals in the Middle East and Africa.

Canon Medical Systems Europe provides its services through a network of 49 companies covering 52 countries. It is a mix of Canon Medical Group companies as well as Canon Medical partners. The relationship with these partners goes way beyond dealership, Rob explained. "It's really a partnership. We work closely together to deliver the best possible customer service experience."

Canon Medical Systems Europe handles approximately 25,000 service parts each year in the 52 countries. Providing cross border service comes with a series of challenges. Export control and custom clearance can potentially slow down parts delivery.

“It’s our job to let physicians focus on patients, by happily taking away the burden of maintaining the equipment.”

Rob de Jong, European Service Director at Canon Medical Systems Europe.



Although distances and regulations are pretty straightforward within the EU, shipping equipment parts to remote areas on time may prove challenging. Nonetheless, Canon Medical Systems Europe has a fill rate of over 98% in all parts activity, meaning it almost always delivers the parts onsite at expected date.

“We strive to reach 100%. We do everything in our power to keep customers happy,” Rob said.

Aging equipment, new tricks

One of the main challenges in servicing medical imaging devices is that equipment is aging. According to the latest COCIR report on age profile, for example 21% of all CT and MRI scanners installed in Europe are older than ten years. More than 2,000 CT systems in clinical use are obsolete, which raises a number of issues.

“It’s challenging for customers and service organizations to keep equipment in good conditions. For example a ten year-old system potentially is more vulnerable to cyber attacks than a new one,” Rob said.

Because of significant financial pressure on healthcare budgets, hospitals are increasingly forced to work with scanners that are ten, sometimes 15

years old. CMSE monitors its installed base closely, to be able to best predict the aging effects in order to treat them appropriately.

Cyber Security impact

The number of cyber attacks has increased tremendously over the past few years. According to HIPAA Journal, between 2009 and 2018, there have been 2,546 healthcare data breaches, involving more than 500 medical records. Those breaches have resulted in the theft or exposure of 189,945,874 healthcare records, which equates to nearly 60% of the United States’ population. Healthcare data breaches are now being reported at a rate of more than one per day in the US alone.

Among a host of patient-focused solutions, Canon Medical is using whitelist antivirus on its equipment. Whitelist antivirus explicitly marks a file signature as safe where it is part of necessary software structure and stops everything else. “This is way more secure than traditional anti virus. And that’s one of the reasons why back in 2017, when the WannaCry ransomware attack hit the world, we remained almost unharmed. Should our security measures not have been in place, we could have been much more hurt,” Afshin Hamzei, Senior Service Manager at Canon Medical Systems Europe, said.

Everybody is familiar with the concept of a cyber attack. Yet enduring behaviors may put hospital systems unnecessarily at risk; for instance, plugging a USB stick in a computer outside the hospital and then back on hospital equipment again.

It’s important to continuously work with software developers to improve cybersecurity by designing appropriate strategies. But it does take a mutual and global effort to raise awareness and better protect systems, Rob explained. “It’s a shared responsibility. We need hospital’s IT departments, manufacturers and users to collaborate in order to provide best healthcare to patients in the safest possible environment.”

Canon Medical’s dedicated Product Security incident Response Team (PSIRT) in Japan communicates with all relevant global organizations in this field. PSIRT observes, assesses and offers solutions if any threat appears on its radar.

In Europe, the initiative is relayed by Canon Medical’s Cyber Security Incident Response Team (CIRT), which reports potential risks in each country, before they reach international level, to PSIRT.

Having strong security technology is important as equipment pieces are increasingly connected within hospital

networks. “While we like to keep the system isolated for safe keeping, there are necessary connections that can’t be avoided. As soon as you open a connection, whether it’s PACS, printer, hospital HIS/RIS or remote services, you open a door and that door should be secure,” Afshin said.

Canon Medical’s multi-layered Patient data protection plays a critical role in that respect. This is why it is so important to update the equipment’s software with the latest security patches provided by Canon Medical as part of its service contracts.

Remote assistance, predictive service

Remote technology offers new opportunities that push the boundaries of service. Canon Medical Systems Europe manages roughly 50,000 remote connections per year to monitor its equipment throughout Europe, using its remote service system Innervision, which issues automatically created alerts to prevent downtime. Alerts are generated and sent to the engineers in charge, to determine which course of action to take. “We see things happening even before the equipment user is aware,” Afshin said.

Preventing outage at a distance is extremely important, as it enables to resolve problems earlier and reduces

both cost and downtime. “By doing more remote troubleshooting we can bring the cost down and fix problems more quickly than by sending an engineer onsite. We don’t always need to be onsite to provide optimal service. This is true in every industry today. Of course, if there’s a part that needs to be fixed onsite, there’s always someone available,” Rob said.

There is a growing trend towards predictive service in healthcare, as the break and fix model is becoming obsolete, he continued. “Customers prefer to know in advance what is going to happen with their equipment. That can have a positive effect on both cost and downtime. They can plan what they will need to spend to keep their equipment up and running. This is the biggest change we will see in the near future.”

Customer satisfaction is a cornerstone of Service and Canon Medical has developed efficient tools to collect feedback. One of these tools is the customer satisfaction survey which enables clients to share their opinion on the service that was provided. It only takes a few minutes to fill in the survey, which is sent to the customer automatically a few days after repair. Information is instantly forwarded to the relevant department and immediate action is taken if necessary.

Another key condition to keep customers happy is to adapt to their particular needs. Canon Medical offers contracts that can be tailored to each customer. Pressure on the healthcare budgets is factored in. What never changes is quality of the service that is being provided. “We want to give access to the best possible service and never compromise quality. If our customers do not wish to completely outsource financial risk, we can partner with them,” Rob said.

What really pays off, at the end of the day, is the motivation to provide the best performance for both customers and patients. Canon Medical Service professionals are eager to accomplish that mission. “We can’t achieve our high level of customer satisfaction without the enthusiasm of our hard working colleagues from service throughout Europe. Customer focus and care is very high on our agenda. Equipment may need service sometimes, it’s a fact, but it shouldn’t make a difference to patient access to healthcare. It’s our job to let physicians focus on patients, by happily taking away the burden of maintaining the equipment.” //



“Having strong security technology is important as equipment pieces are increasingly connected within hospital networks.”

Afshin Hamzei, Senior Service Manager at Canon Medical Systems Europe.

Artificial Intelligence: Oncology's New Secret Weapon

Dr Sandy Weir, Dr Keith Goatman, Dr Kevin Blyth, Sarah Vloothuis.

Since the 1970s the western world has seen a steady increase in cases of asbestos-related disease, the most devastating of which has to be Malignant Pleural Mesothelioma (MPM), commonly known as 'asbestos cancer'. While rare, when compared to other types of cancer the prognosis for MPM is considerably bleaker, as it is incredibly difficult to diagnose in its early stages and there are no effective treatments.

MPM doesn't grow like other cancers, which presents a number of challenges for radiologists. Unlike most types of tumour, which are roughly spherical in shape, MPM fills the cavity between the lungs, the chest wall and diaphragm, called the 'pleura', which contains the fluids that allow the lungs to expand and contract without friction. Eventually the tumour starts to wrap itself around the lung, causing breathlessness, chest pain, persistent coughing and weight loss, among other symptoms. From this point, even with treatment, life expectancy is short.

But in Edinburgh, Scotland, something quite remarkable is happening. The challenge of staging and managing this most difficult of cancers formed the basis of a proposal from Canon Medical Research Europe (CMRE) to the Scottish Cancer Innovation Challenge in mid-2018. Having previously investigated the rationale, clinical need, and theoretical feasibility of a method to automatically identify MPM tumours and their boundaries in CT images (a process known as 'image segmentation'), CMRE and their partners, NHS Greater Glasgow and Clyde, were subsequently awarded a second phase of funding worth € 180,000 towards devel-

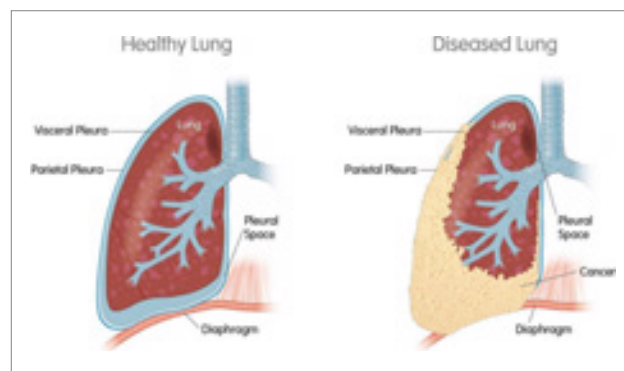
opment of a prototype algorithm which combines Artificial Intelligence (AI) and imaging technology that would put this theory into action – a project that could pave the way to saving time, money and lives in the fight against cancer.

Dr Sandy Weir, Technical Manager at Canon Medical Research's Centre of Excellence in AI and his team of Data Scientists, led by Dr Keith Goatman, have been working with NHS Greater Glasgow and Clyde, Dr Kevin Blyth, Consultant Respiratory Physician & Professor at the University of Glasgow to develop a deep learning algorithm – or 'convolutional neural network' – to create an automatic RECIST measurement for MPM tumours that rapidly and accurately segments the tumour in chest CT. This knowledge is essential in treating patients with the disease.

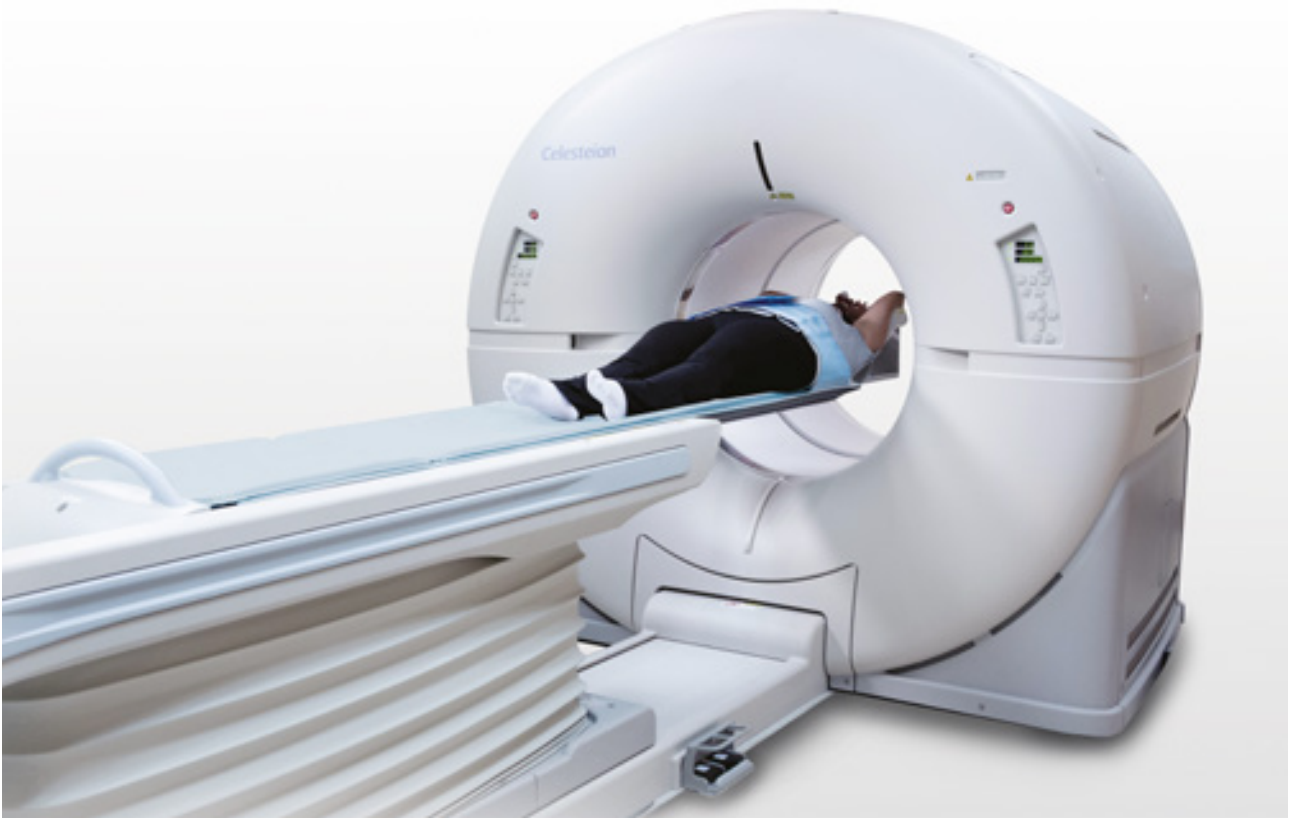
The unusual non-spherical presentation of MPM means that automatically segmenting MPM tumour volumes is extremely complicated and challenging, even for the most experienced of radiologists. Sandy explains that the successful algorithm would automatically "segment and identify the tumour in the lung cavity, ideally at the very

Asbestos

We now know that asbestos is a killer, but in the last century it was used widely in industry, valued for its heat and fire-resistant properties. It could be found in the structure of all kinds of buildings and power stations as insulation on ships and even in the manufacture of all manner of household appliances. So, while buildings went up, ships were built, and industry boomed, no one realised that microscopic asbestos fibres were being inhaled into workers' lungs.



Illustrated image of Lungs and Pleura (©Image copyright Mesothelioma UK, used with permission, all rights reserved).



The Celesteion offers a new standard of performance in PET/CT with many features that put patient comfort first.

early stages” and is already seeing positive results. “When we compare results of automatic segmentation of large tumours against manual segmentation by an expert, we can see that our results compare very favourably. So, we know that our algorithm is showing extremely good promise. The next stage is an evaluation period where we’ll look at the effect of our algorithm on data from a small patient cohort where we have imaging before and after chemotherapy. This will allow us to compare the volumetric change and assess the correlation of our algorithm with expert mRECIST measurements.”

MPM is now thankfully in decline in Europe. However, there are mesothelioma hotspots all over the world and it’s unfortunately on the increase in developing countries. The World Health Organisation estimates that about 125 million people in the world are currently exposed to asbestos at the workplace. But crucially, the AI prototype being developed

by Sandy and his team has the potential to be transferrable to other types of tumour, “By starting with the most challenging diagnosis of mesothelioma, we hope to be able to use the techniques we develop to improve the performance and accuracy for other tumours which present in less challenging ways” he explains, so the knock-on effect of this research could reach far beyond just MPM.

The project team also hopes that an AI-based assessment tool could have a positive impact on the cost of cancer drugs, as clinical trials may become more efficient to stage, requiring fewer patients, using AI tools to determine whether new drugs are having a useful effect. It’s still early days, but this prototype could play a vital part in the future of cancer diagnosis, and is certainly contributing to the growing body of evidence supporting the use of AI in global medical advancements. //



Dr Sandy Weir
Technical Manager
at Canon Medical
Research’s Centre
of Excellence



Dr Keith Goatman
Principal Scientist
at Canon Medical
Research’s Centre
of Excellence



Dr Kevin Blyth
Consultant Respiratory
Physician & Professor
at the University
of Glasgow



Sarah Vloothuis
Canon Europe Ltd.

Aalst's General City Hospital (ASZ) Has Put Itself on the Map with Two Canon Medical Scanners

"It just always works." With these words, Dr Eddy Van Hedent, medical imaging specialist at Aalst's General City Hospital (Belgium), concludes our conversation, as his colleagues Dr Laurence Trappeniers and Dr William Simoens, head of radiology at ASZ Aalst, nod in agreement.

We met with the three radiologists from ASZ Aalst to talk to them about the recent purchase of the Aquilion ONE GENESIS for the Aalst campus and the Aquilion Prime SP for the Wetteren campus. In just a short time, the two CT scanners have managed to secure a very prominent position within the hospital.

With 570 beds, 1,500 employees, 260 doctors, and just under 25,000

admissions, 68,000 polyclinic appointments, 44,000 emergency cases and over 1,000 births every year, ASZ Aalst can be considered a medium-sized hospital.

But at the same time, this hospital is a major authority when it comes to medical imaging, due not only to the wealth of experience shared by the three doctors, but also to their vision: minimizing patients' exposure to radiation whilst optimizing image quality.

Low radiation

As Dr Van Hedent puts it, the objective is to have the radiation dose for each and every examination score under the 25th percentile of the Belgian Federal Agency for Nuclear Control (FANC), with the additional aim of developing a screening program for lung tumors that exposes patients to no more radiation than a traditional chest X-ray.

With this in mind, ASZ Aalst very consciously opted for the Aquilion ONE GENESIS by Canon Medical. The Aquilion ONE GENESIS – the show-piece – is now installed at the ASZ Aalst campus, while its 'little brother', the Aquilion Prime SP, is installed in Wetteren. All three doctors consider the Aquilion Prime SP to be a 'fantastic workhorse': a system that can realize tremendous patient throughput, whilst achieving a best-in-sector performance in terms of radiation exposure and noise levels.

Though they are full of praise for the Aquilion Prime SP, which is perfectly equipped for all possible clinical indications with its 4 cm detector and iterative reconstruction capabilities, the Aquilion ONE GENESIS garners even greater acclaim. This is partly due to its 16 cm detector, but its image reconstruction potential thanks to the application of AI stands out as its greatest strength.



Dr Eddy Van Hedent.



Dr Laurence Trappeniers.

“We are extremely proud that ASZ Aalst is the first Belgian hospital to install the Aquilion ONE GENESIS with AiCE, making it a European pioneer in AI-driven CT scans”, Dr Trappeniers tells us.

Artificial Intelligence

Canon Medical has named the AI application built into the Aquilion ONE GENESIS ‘AiCE’, which stands for ‘Advanced Intelligent Clear-IQ Engine’. AiCE is the first Deep Learning reconstruction method using AI to produce highly detailed images with extremely low noise, which will become the new standard thanks to future deep-learning algorithms. With its eight powerful graphics cards, the Aquilion ONE GENESIS surpasses the computing power of IBM’s Watson allowing AiCE to be used in clinical routine with no disruption to workflow.

The doctors from Aalst confirm the high quality of the AI reconstruction developed by Canon Medical. All three have experienced, throughout their clinical practice, how difficult it can be

“Aquilion ONE GENESIS and Aquilion Prime SP take CT examinations in Belgium to a higher level.”

to properly visualize different densities when fat comes into play. The appendix, for instance, is naturally situated in slightly fatty surroundings, which can make it difficult to locate right away, and the same applies to small liver cysts. When employing Iterative Reconstruction (IR), it can be difficult to maintain the contrast resolution.

But that has now become a thing of the past. Powered by AiCE, the Aquilion ONE GENESIS is capable of clearly distinguishing various types of soft tissues, even at low radiation doses

and without any contrast material. Naturally, AI does not stop here, according to Dries Mahieu, CT/MR Product Specialist at Canon Medical Systems Belgium. Canon Medical is currently working on implementing AI in its Vitrea post-processing platform, which will soon enable the platform to automatically indicate that a certain pathology has been potentially detected in a particular patient. Based on the data collected from all scans, it will also be able to guide doctors which patients should be prioritized and which cases are not quite as urgent.

Dual Energy

Though it is not unique to Canon Medical, Dual Energy CT, or DECT, is a key optional functionality of the Aquilion series. Using DECT gives doctors more information than conventional CTs, as it not only provides data on the morphology of tissue and substances, but also on their chemical composition, detailing uric acid and calcium levels, for instance. Aquilion systems measure radiation attenuation in the patient to determine material-specific differences, allowing for more accurate diagnoses.

Another advantage of Dual Energy is that it requires the use of less intravenous contrast, thanks to improved detection and image quality. This makes DECT an ideal solution for patients with a hypersensitivity to intravenous contrast and avoids the need for more invasive diagnostic methods, such as punctures.

According to the ASZ doctors, the combination of AI applications like AiCE with the system's unique elements, such as the Area Finder, which makes it possible to perform a scan without a scanogram, make the Aquilion ONE GENESIS the key reference system in today's market. They also mention SEMAR, Single Energy Metal Artifact Reduction, which is a reconstruction technique that Aquilion systems use to reduce metal artifacts in the scan, removing implants, clips, pacemakers or prostheses from the scan and thereby optimizing the display of adjacent or underlying soft tissue. Aquilion users can include SEMAR in the scan protocol for a fully automated reconstruction that requires no further intervention by the user. "Previously, it was virtually impossible to see the prostate in patients with two hip replacements, but the SEMAR technology integrated into the Aquilion series now allows us to image this organ perfectly", Dr Trappeniers explains.

Low radiation, part 2

Though Dr Trappeniers, Dr Van Hedent and Dr Simoens are lyrical about all of these technological innovations, they are mainly excited about the huge advantage the system offers for patients: a tremendous reduction in radiation doses. This is crucial for scans on children, for instance, with the ASZ Aalst already achieving values that outperform those of the Cone Beam CT. Of course, this development is also more than welcome for adult patients, especially for those who regularly undergo CT scans in the context of cancer follow-ups.

Whilst on the topic, Dr Van Hedent explains that the most common CT examinations in ASZ Aalst are thoracic and abdominal CT scans. "In the past, an annual exposure of 10 millisievert was hardly unusual. We've now managed to reduce this to an annual level of less than 5 mSv, because each



Dr William Simoens, head of radiology.

thoracic and abdominal scan only requires about 1 mSv of radiation.”

The future

Immediately, the doctors switch to the future of CT. After all, no matter how good the current technology may be, the ASZ doctors expect Canon Medical to maintain its high rate of innovation, or even to accelerate it. For example, they would like to see Computer Aided Diagnostics (CAD) for CT further improved with the help of Artificial Intelligence. Personally, Dr Trappeniers hopes that the future will bring even more possibilities in the field of tissue composition. “I would like to be able to quickly and unambiguously determine whether there is air in the abdomen, for instance, or whether there is any internal bleeding or fat infiltration. That would enable us to make major progress, to the benefit of our patients.”



Dr Laurence Trappeniers.

On the other hand, Dr Van Hedent is very interested in the continued development of coronary CT scans, which – not entirely coincidentally – is one of Canon Medical’s main focus areas. “Based on the results produced by the Aquilion ONE GENESIS, I expect that CT will soon surpass MR scans once and for all,” he states. “MR cannot measure up to the spatial resolution offered by CT, making it difficult to capture coronary movements properly. Currently, this has to be done in

a triggered fashion, with all the challenges and peripheral processes, like beta-blocking, that this entails. That’s why I believe it’s only a matter of time before CT becomes the diagnostic tool of choice for coronary examinations. Now that we have the Aquilion ONE GENESIS, with its 16 cm area detector, we’re one step closer. My experience with the Aquilion ONE GENESIS till now has shown simply that every single scan works, and it’s only going to get better.”

A final word

Canon Medical is an important partner for ASZ Aalst, but the hospital is just as important for Canon Medical.

“At ASZ Aalst, we have three extremely experienced CT specialists, who do not shy away from experimentation. We can learn a lot from them”, says Dries Mahieu. “For Canon Medical Systems Belgium, for all hospitals in Belgium, and even for current and future users all over Europe, ASZ Aalst is a reference center. The doctors here know how to test the limits of the system and keep fine-tuning the applications we have developed day in, day out.”

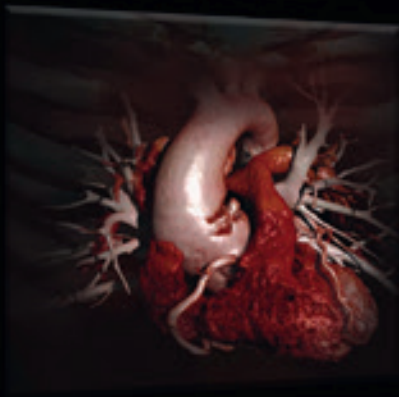
Summarizing the many benefits of the system, the ASZ doctors could not agree more. “The Aquilion ONE GENESIS and Aquilion Prime SP are extremely energy-efficient. And though this may be a side issue for us and our patients, it is rather pleasing for environmental and financial reasons. The user-friendliness, both for us and for our patients, is optimal, the speed, low radiation and image quality are fantastic, and the future prospects are phenomenal.” //



Dr William Simoens and Bjorn Dumont.

Global Illumination

Global Illumination is a new revolutionary 3D/4D rendering technique to help provide a more photorealistic view of human anatomy. Users can stay at the forefront of their industry by using new cutting-edge real-time photorealistic rendering techniques delivered by Global Illumination, share findings more easily with both Multi-Disciplinary Teams and patients as well as seamlessly integrate photorealistic images into routine clinical workflow. //



“Right now, we use Global Illumination on a daily base for all MSK cases and for all forensics cases.”

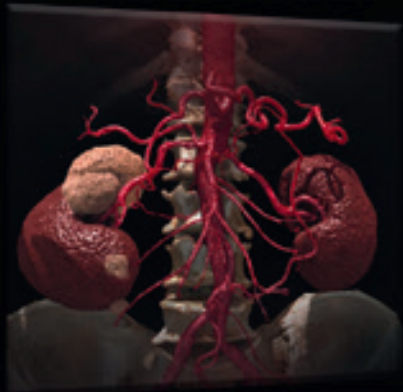
Prof Alain Blum, CHRU Nancy, France





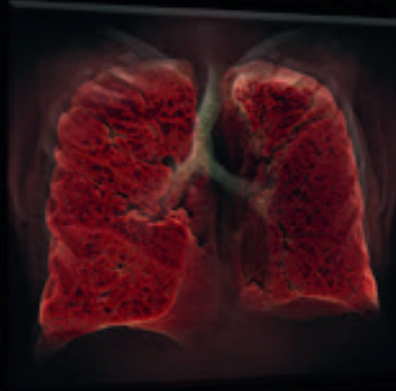
“What I think is very cool about Global Illumination is that you’ve brought the technology from the film industry and game industry into clinical practice to show the anatomy of patients.”

*Dr Ewoud Smit,
Radboud UMC, the Netherlands*



“Global Illumination is a real breakthrough when it comes to visualization of radiological images.”

*Prof Mathias Prokop,
Radboud UMC,
the Netherlands*





One of the Secondlife mobile CT trailers, equipped with Canon Medical's Aquilion Prime SP. The mobile trailers have the same environment as a hospital: a CT examination room, a console room, dressing rooms, and a washing area. Everything inside the trailer is connected to the hospital network and archive.



VISIONS spoke with Johan Vochteloo,
Senior Manager Secondlife
at Canon Medical Systems Europe.

Secondlife
CERTIFIED REFURBISHED EQUIPMENT

Giving Used Medical Equipment a Secondlife

What happens to Canon Medical's demo equipment that doesn't sell? Is it locked forever in a warehouse, its potential for improving healthcare slowly fading away? The answer is no. Canon Medical Systems gives it a second life.

In October 1984, Johan Vochteloo started working for Canon Medical Systems in logistics and later moved on to manage the European demo equipment. In this role, he gained a unique insight into the demo equipment's lifecycle that laid the premises for a brand new project.

"We had a huge warehouse, full of outstanding demo equipment. There was an enormous amount of equipment stored. Part of it was able to be sold, the rest was returned to the European Head Office. I thought: what am I going to do with all this excellent equipment that hasn't been sold yet? I have to sell it!" Johan remembers.

He couldn't sell already used equipment as brand new though. He had to sell it differently. First by cleaning it up. But customers expected something more and better. They would expect a full refurbishment. And just like that, the idea for Secondlife was born.

A daunting task

In 1998, Johan settled to his new task with tons of enthusiasm, but little idea of how much effort he would have to pour into the new scheme.

"I just saw the tip of the iceberg, not the abyss of work that lay below the surface. Working in refurbishment means to comply with an enormous set of rules and regulations, especially in the medical area. You have to be 100% sure that what you refurbish is 100% correct," he said.

As all Secondlife systems are refurbished according to the highest industry standards including the COCIR Good Refurbishment Practice. The Secondlife refurbishment program is a quality-controlled process and certified according to ISO 13485:2003, an industry first. Our Secondlife systems will be delivered with the latest applicable software upgrades, the systems can be configured to the customer wishes, and will include one full year of warranty.



New refurbishment center at Canon Medical Systems Europe in Zoetermeer, the Netherlands.

Refurbishing medical equipment demands a lot of work around regulations and legal aspects. Tackling these issues inside Europe, where a myriad of rules and regulations exist on the topic, is something of a Titanic fight

“I have a sort of Bible, in which every piece of equipment that qualifies as refurbished equipment is defined. We just had to write refurbishment manuals for each type of equipment we were using, besides prepping the equipment itself.”

Rules and regulations change over-time, and so do systems. The task of writing and updating manuals can thus seem endless. “You have to write your manual over and over again.”

It took more than ten years to get the baby on its feet. But it did. The name Secondlife was branded a year later, in 2009. Today the operation is a complete success and Secondlife equipment sells everywhere across Europe.

Chasing for space to accommodate the equipment shipped back from all over Europe, Johan moved the service from Zoetermeer (the Netherlands) to Belgium and later on to Denmark in 2009, and recently back to the Headquarters in Zoetermeer, the Netherlands again. It took six months to get the current facility up and running.

The new facility contains several areas dedicated to each step of the process; containing an inbound area where the dismantled materials will be received and checked on completeness, and damages. A cleaning and disinfection area, where all units will be cleaned and disinfected before it is handed over to the engineers.

We have two CT refurbishment booths and one multi-modality booth where we can handle CT's and larger X-Ray models including interventional ceiling mounted systems. The multi-modality booth can also be used for trainings and to receive customers to inspect their new system. For Ultrasound we have a dedicated area where we can handle three systems on the same time, where every engineer has his own work facility.

When the systems are ready they will be moved to the outbound area where the system will be packed and crated for shipment and the necessary paper work will be added.

Canon Medical's Secondlife team now has two CT engineers, three Ultrasound engineers, two mechanical engineers, two account managers and one trade desk coordinator to properly refurbish its equipment fleet across Europe.

A stepwise approach

The refurbishment process unfolds in several steps. First a technician carries out an inspection of the system, orders the parts that are missing, and then starts the disinfection and cleaning process. Meanwhile another engineer may also work on hacking



“Canon Medical Secondlife guarantees equipment good as new, only more affordable.”

*Johan Vochteloo, Senior Manager Secondlife
at Canon Medical Systems Europe.*



a new system, photographing and labelling. An engineer follows up to revamp the system. Only one engineer is responsible for the same piece of equipment, including testing after refurbishment, to ensure that the job is done thoroughly.

The average time for refurbishing a CT system is three weeks. But this time depends on how fast problems are solved and on the condition of the system. “Some systems have hardly ever been used, others extensively. No matter of the condition of the systems every system undergoes and intensive process. On an average, Canon Medical refurbishes three CT systems and ten Ultrasound systems a month in Europe. The refurbishment center also takes care of the technical health and preparation ultrasound demo pool, which can run up to 50 units per month.

A lot of the equipment that goes through the refurbishment process of Secondlife comes from demo in the clinical setting, but a big part also comes from the trade desk, which remains the heart of Canon Medical’s business.

Hospitals that renew their medical equipment needs to have their older systems dismantled before anything new can be installed.

The Secondlife team has a dismantling procedure in place, it concerns the site planning were it describes from the inside to the outside of the building were equipment is located and what is needed to remove the system in the most efficient way without any disturbance for the hospital staff and patients.

During the process and before disconnecting the system from the power a technical check will take place according to a Secondlife procedure to detect if the system is still in full function order. Sometimes equipment is just too old or damaged to be refurbished. Equipment older than nine years for example, does not qualify for Secondlife anymore. For the older equipment we will find another destiny somewhere in the world or will be used for parts to maintain older units which are still going strong but needs to be maintained.

Secondlife Mobile Solutions

The lapse of time between dismantling old equipment and installing a new system can be a hassle for customers, who still needs to deliver healthcare to their patients. To bridge new equipment installations, temporary high workloads, or screening programs, we provide short-term installations and a wide range of mobile solutions through our Secondlife refurbishment program.

Our Secondlife mobile CT trailers are equipped with the newest equipment and have the same environment as the hospital: CT examination room, a console room, dressing rooms, and a washing area. Everything inside the trailer is connected to the hospital network and archive.

The truly multitasking environment of our mobile CT scanners makes high patient throughput easily achievable even in a mobile setting, without compromising on patient care, workflow or image quality. On-board facilities ensure you have everything at your disposal. Ensuring the lowest possible radiation dose to the patient, whilst maintaining the optimal level of image quality, we can offer CT systems with a comprehensive package of dose reduction features including iterative reconstruction algorithm (AIDR3D) and Active Collimation.

The trailer has become very popular, Johan explained: “Instead of having to wait six or eight weeks until the new scanner is installed, as when a system will be replaced the hospital will take the advantage to remodel the examination rooms, we can offer a temporary solution. We position the mobile CT trailer directly in front of the hospital so that customers can keep on scanning patients just like on any other day.



Unforeseen applications

An increasing number of customers have grown fond of the Refurbished Equipment Secondlife, which guarantees equipment good as new, only more affordable.

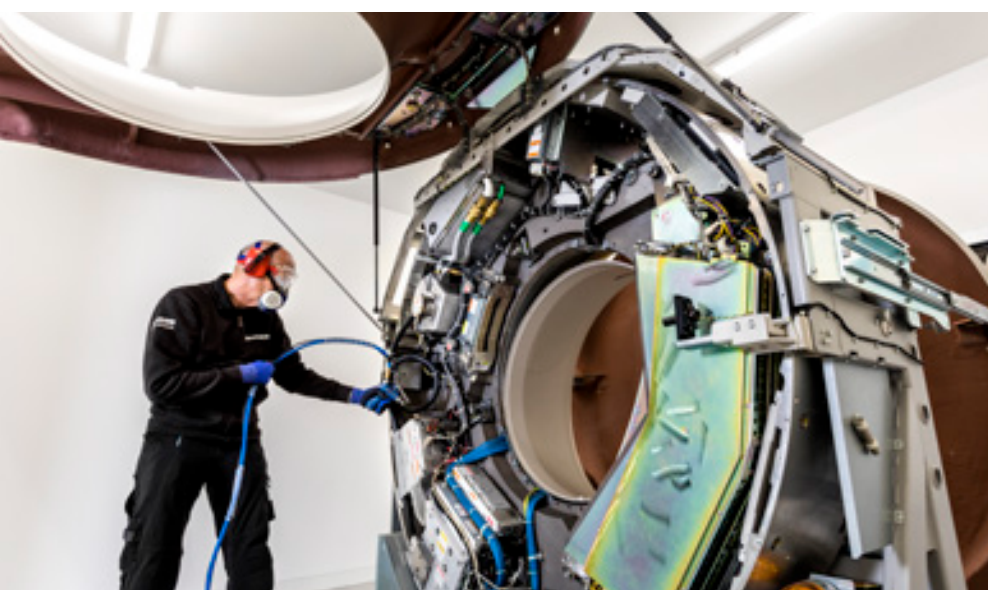
An unsuspected niche has emerged on the market and veterinarians are increasingly relying on refurbished equipment to examine their patients. These customers traditionally have thinner budgets for purchasing medical imaging equipment, thus have to find innovative solutions to meet the growing demand for healthcare from pet owners.

“People spend more and more money on their pets’ health - sometimes even more than on themselves. Refurbished diagnostic equipment is a very popular program within the veterinarian world the demands and needs from veterinarians and their customers brings the diagnostic requirements to a higher level we see that the investments by veterinarians and groups are rapidly increasing. When veterinarians refer their patients to a specialist, for example a neurologist or a cardiologist, they call a second line centre, where dedicated imaging equipment is available. Second line centres are a booming business and deserve more attention in the future,” he said.

Another potentially interesting niche is horse sports imaging. These specimens can cost hundreds, thousands of euros, and their typical injuries - after jumping or racing - require the best diagnostic equipment. Even before they buy these expensive horses, owners have to be 100% sure that they are in top shape, especially the neck, back, and legs are critical which needs full attention as these are the most delicate parts of the animal.

“The veterinary business is a very fast growing market and we adapted our company strategy to become a major partner in this field. Our clinical solutions are designed to be adapted from small domestic animals up to horses. Especially in this last one we are very successful based on our CT’s with the largest Bore in the market and the extremely high image quality in Ultrasound.” said Johan.

“I believe we will be in a wonderful position. In their testimonies, customers say they are very happy, very surprised about the quality of the refurbished equipment. They never expected the equipment to work that well. They say it looks like brand new. This is a big compliment for the staff but not a moment to rest as there is always room for improvement and efficiency. //



UK Facilities Choose the Ultimax-i to Widen Examination Range and Boost Patient Comfort

North Manchester General Hospital and Spire Gatwick Park Hospital recently reinforced their x-ray fleet with Canon Medical Systems' Ultimax-i system, a powerful solution that allows covering a wide range of clinical imaging and interventional needs, whilst improving patient experience.

Flexibility and versatility are at the core of the new Ultimax-i system, enabling to perform countless examinations from contrast studies of the GI tract to angiography, with a large field-of-view and outstanding image quality.

The technology is so efficient that North Manchester General Hospital, part of the Pennine Acute Hospitals NHS Trust, decided to install the latest version of the Ultimax-i in its ERCP room, after having worked with the system for the past two years.

For Helena Hill, a specialist interventional/fluoroscopy radiographer at North Manchester, there was no doubt at the time of purchasing the equipment. "We

chose Canon Medical as we have had previous experience of the company's x-ray equipment, and we have found the Ultimax-i to be extremely reliable and hardworking. In addition, it has always provided the best image quality and dose reduction," she said.

Multi-purpose imaging and increased patient comfort

The Ultimax-i's x-ray tube with liquid metal bearings as standard reduces wear on the system and noise, which in turn lowers environmental stress for the patient. To improve visualization in fluoroscopy, which is critical in many examinations, the system uses the new imaging technology 'Super Noise Reduction Filter' (SNRF).

The system comes with a 43 x 43 cm flat panel detector (FPD), which provides a large image field for a wide variety of examinations, and includes an integrated C-arm that eliminates the need for the patient to be moved from the table, as the region of interest can be observed from various angles.

This innovative design enables to perform all gastrointestinal studies, interventional radiology and angiographic procedures, with anatomical coverage from head-to-toe and shoulder-to-shoulder on even the tallest patients. Following the initial positioning of the patient, the equipment can be moved to any orientation required, without the need

"We have found the Ultimax-i to be extremely reliable and hardworking. In addition, it has always provided the best image quality and dose reduction."

Helena Hill, specialist interventional/fluoroscopy radiographer at North Manchester General Hospital.



Shown left to right: Jackie Coleman, Endoscopy; Gemma Sangster, Senior Radiographer; Colin Murray, Account Manager, Canon Medical Systems Ltd.; Esther Falade, Endoscopy; Helena Hill, Lead Radiographer; Andrew Mayes, Clinical Applications Specialist, Canon Medical Systems Ltd.; and Gillian Hill and Vivian Waller, Endoscopy.



Shown left to right: Di Hunter, Lead Radiographer; Ritch Ahorro, Radiographer; Laura McLennan, Acting Imaging Manager; Dr Sona Biswas, Consultant Radiologist and Jamile Siddiqui, Account Manager, Canon Medical Systems Ltd.

for additional patient movement. The system offers a laser projector for the under-table tube, which improves accuracy when the x-ray tube is positioned on top, bottom, or on either side laterally. In addition, the ergonomic design of the long, wide handgrips improve patient confidence and comfort in any position.

The Ultimax-i has also integrated anti-collision technology to protect the patient at all times and uses a comprehensive dose reduction program that ensures maximum diagnostic information at the lowest possible dose.

This long list of benefits has convinced Spire Gatwick Park Hospital, a leading private facility on the Surrey and Sussex border that also provides care to NHS patients, to add the new system to its x-ray screening room.

“The versatility of the C-arm configuration facilitates a wider variety of procedures to be performed in this room, allowing us to relocate some work previously performed in the theatre. The radiologists have been impressed by the superb image clarity and ease-of-use, as well as the reduction in patient dose. The room has had significant refurbishment and the new Ultimax-i certainly enriches this, providing an enhanced patient experience,” Di Hunter, x-ray lead radiographer at Spire Gatwick Park Hospital, said.

“The radiologists have been impressed by the superb image clarity and ease-of-use, as well as the reduction in patient dose. The room has had significant refurbishment and the new Ultimax-i certainly enriches this, providing an enhanced patient experience.”

Di Hunter, x-ray lead radiographer at Spire Gatwick Park Hospital.

Lowering dose and upgrading service

Impact of the Ultimax-i on workflow is extremely positive even in the sensitive ERCP setting, Helena Hill explained. “We now have two Ultimax-i systems in place and they have helped to reduce our waiting lists significantly, and also to reduce dose. With one of the rooms, it has enabled us to continue with ERCP procedures, as, without the room being replaced, these could not have gone ahead. We have also been able to reduce our doses significantly with our two new rooms. For the installation last year, the room was redecorated and remodeled to provide an extra door into the room for safety reasons.”

North Manchester Hospital is a long-time partner of Canon Medical, having worked with a Canon image intensifier-based system for twelve years before replacing it with the new Ultimax-i.

Not only is Canon Medical's technology outstanding, the customer service is also unequalled, Hill explained:

“Another of the main reasons for our choice is the customer service that Canon Medical provides. The company stood out over other suppliers, as we find the customer service second-to-none. Having local engineers makes such a difference as to how quickly we can get an answer to a query or fault. An engineer is always available, either on the phone, or will attend the hospital, if needed. The response is very prompt – we have never waited long for assistance and the personnel at the end of the phone are very friendly and helpful. The applications' training was superb and we have found the specialists always willing to answer any questions, no matter how trivial. They are excellent at what they do and we know that we are always able to call on them if needed.” //



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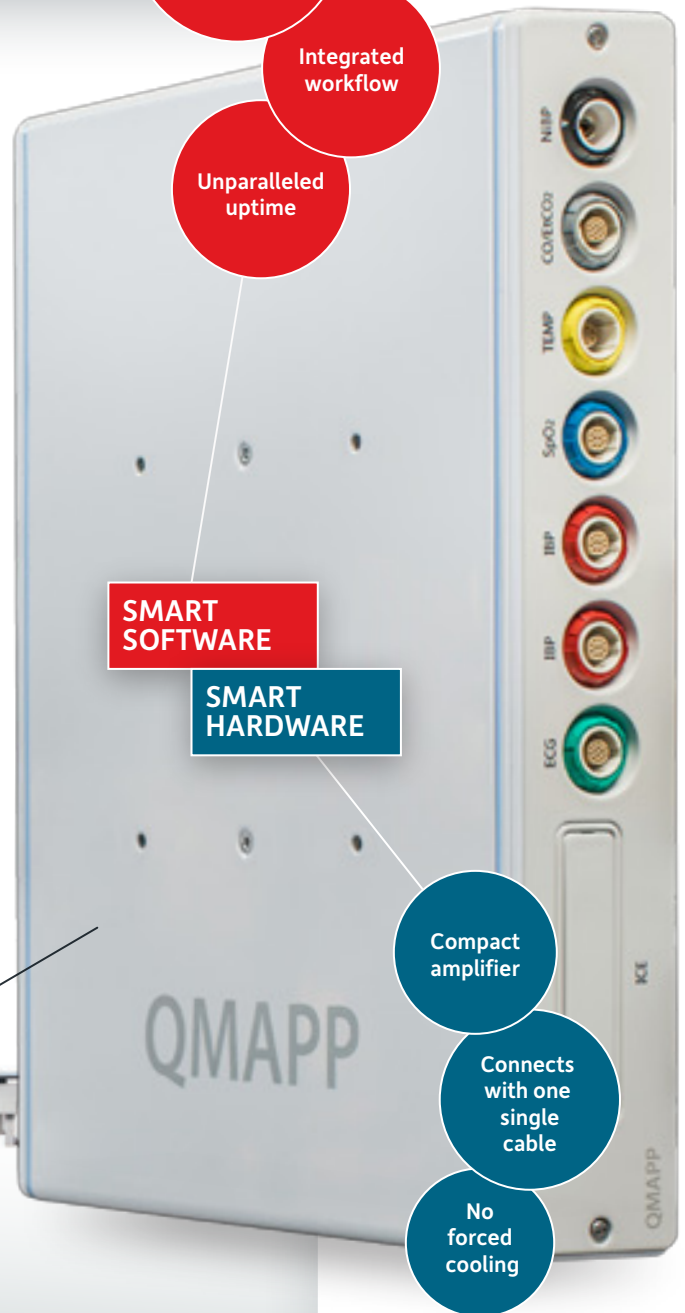
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