



Inauguration of the Alphenix 4D CT at CHUV
(from left to right): Mr. Nobuyuki Hatakeyama
(President & CEO Canon Medical Systems Europe),
Prof. Alban Denys (Head of Interventional
Radiology at CHUV), Prof. Reto Meuli (Head
of Radiology at CHUV) and Roelof Hoekstra
(Director Canon Medical Systems Switzerland).



*Interview with Prof. Alban Denys,
Head of Interventional Radiology and
Jennifer Natan, Biomedical Engineer
at the CHUV (Le Centre Hospitalier
Universitaire Vaudois) Lausanne
University Hospital in Switzerland,
about their experiences with the
Alphenix 4D CT.*

Alphenix 4D CT – Cutting-Edge Innovation in one Single Room

The CHUV (Le Centre Hospitalier Universitaire Vaudois) Lausanne University Hospital in Switzerland is ranked as one of the ten best hospitals in the world¹. With a continuous and growing demand for its Interventional Radiology services, it has recently acquired a Canon Medical Alphenix 4D CT Interventional Suite. With combined Aquilion CT, Alphenix Angiography and high-quality Ultrasound capabilities in one room, the CHUV has the potential to increase workflow and enable more complex procedures to be performed with far greater ease and confidence. VISIONS explores how this is proving true in practice.

The Lausanne University Hospital is one of five university hospitals in Switzerland. Its Interventional Radiology Department comprises of three teams: Neurology, Peripheral and Oncology. The Interventional Radiology Team's technical needs are monitored and supported by the Biomedical Engineering Department, who are experts in technical development and multi-year planning of equipment acquisition. Prof. Alban Denys, Head of Interventional Radiology and Jennifer

Natan, Biomedical Engineer at the CHUV, have worked together on bringing in the right system to enable the Department to advance its aspiration and clinical capabilities, as well as meet growing demands. With a constant increase in workload of 5-7% annually, Canon Medical's 4D CT Interventional Suite offered the Hospital the opportunity to reduce delays through its combined modality in one room, which simplifies, streamlines and adds more certainty to procedures.



“With good results and low morbidity the techniques possible with the Alphenix 4D CT system provide high-quality patient care at low medical cost.”

Prof. Alban Denys, Head of Interventional Radiology at CHUV.

Informed choice

The Alphenix system was chosen after in-depth research by a team of CHUV experts in various fields.

“Our project team comprised of the Prof. Denys, who provided expert opinion on clinical and medical issues; a Medical Radiology Technician, who collaborated on required system ergonomics and interfaces; me as the Biomedical Engineer, who specified technical characteristics, implementation and project management; and a Medical Physicist, who assessed dose parameters,” explained Ms. Natan.

“Other stakeholders have also been involved in the acquisition, such as the IT Department for the integration of the equipment with the information system and the Purchasing Department for the management of contractual aspects.”

“The aim of our project was to contribute to the creation of an interventional technical platform, bringing together the Angio-CT platform with a second interventional scanner that is used for simpler procedures, such as drainages, biopsies, or punctures, with the goal of developing better patient management in all visceral oncology,” she continued. “This installation has many advantages: It supports and enhances the current synergies with the Oncology

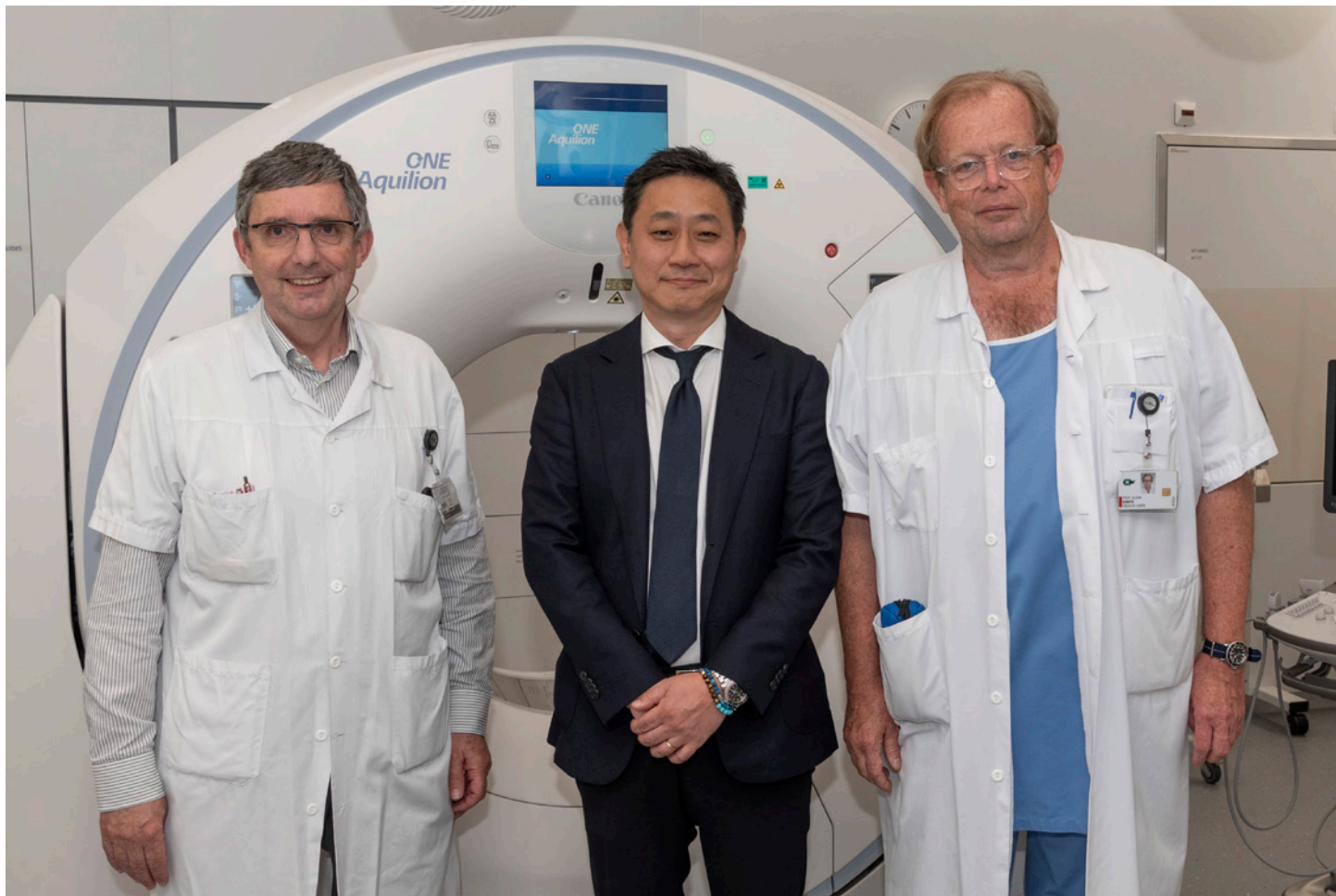
Department, or peripheral hospitals and the Nuclear Medicine Department; it reinforces the participation of the Radiology Department in the development of a care network with a high level of skills and training; it optimizes the flow of patients and reduces the time of hospitalization; and it promotes the opportunity to choose a type of care that is minimally invasive for the patient.”

Meeting a wide range of needs

“Our oncologic activities involve four staff and two fellows. We run two interventional suites. One is the Alphenix 4D CT from Canon Medical, in which we perform all the complex oncologic and abdominal interventions, including percutaneous ablations, Transarterial Chemoembolization (TACE), Selective Internal Radiation Therapy (SIRT), Transjugular Intrahepatic Portosystemic Shunt (TIPS), and liver venous deprivations. The other is a simpler CT interventional suite with the Aquilion Prime SP from Canon Medical, in which biopsies, drainages and gastrostomies are carried out,” said Prof. Denys. “Altogether, we complete around 3,000 oncology-related procedures annually in these two interventional suites. We face a constant increase in workload, with a 5-7% increase in demand for oncologic interventions every year. Opening a 4D CT interventional suite initially offered a chance to reduce

delays. It has proved so pivotal that three months after opening, the room was fully booked. We always use both Angio and CT images in the same procedure for TACE, SIRT, ablations, TIPS, prostate embolization, but we also perform CT-guided only cases, such as lung tumor ablation or purely Angiographic interventions, like fibroid embolization.”

“The opportunity to get a high-quality Angio, a 16cm detector Volume CT, and a high-quality Ultrasound system (Aplio i600 from Canon Medical) in the same interventional room has really simplified our lives and secured our procedures. All the combined procedures, like TACE and/or SIRT plus Ablations are done within the same interventional session. Fusion software helps a great deal in finding tumor feeders, but also in ensuring that the ablation zone fully encompasses the tumor and its margins,” continued Prof. Denys. “Switching between C-Arm and CT position takes only seconds. Changing from Angio to Arterial CT is very fast, and we do not hesitate to perform this, if we feel that the tumor feeder may also have branches to another territory. This is very helpful in prostate embolization, TACE and SIRT procedures. Compared to Cone Beam CT (CBCT), intra-arterial CT scans require far less contrast and provides superior image quality.”



Prof. Reto Meuli (Head of Radiology at CHUV), Mr. Nobuyuki Hatakeyama (President & CEO Canon Medical Systems Europe), Prof. Alban Denys (Head of Interventional Radiology at CHUV).

Research into technology

The choice for the Alphenix 4D CT was made on the basis the results of a comparative study carried out by the CHUV's Institut de Radiophysique Appliquée (IRA) (Institute of Applied Radiophysics) on the dosimetry of commercially available systems. The

study focused on the maximum dose rate in fluoroscopy and subtraction angiography (DSA). In addition, two technologies were observed in detail: Spot Fluoro option, which reduces the patient's dose area product as well as the peak skin dose received, without altering the operator's reading com-

fort; and the Dose Tracking System (DTS), which can be advantageous when there are risks of tissue effects to the patient.

With the new system fully installed and operational, some research still continues.

"This installation meets the CHUV's strategic plan for patients, relatives and care partners, as well as development of the oncology activity."

Jennifer Natan, Biomedical Engineer at CHUV.





“We are working on the SIRT workup comparing intra-arterial CT with perfusion to Technetium-Macroaggregated Albumin (MAA) SPECT/CT,” said Prof. Denys. “We are also working on solutions for ablation margins evaluation.”

Perfect integration

The Alphenix 4D CT has made a positive impression on both technical and clinical staff.

“I was impressed from a technical point of view by the coupling and perfect integration of the two heavy imaging modalities: an angiography room coupled to a scanner - with all the implementation constraints that

can be associated with the installation of this type of system, such as ceiling structure, floor rails, and site coordination,” remarked Ms. Natan.

“The system runs very well and is reliable. Switching from Angio to CT positioning is smooth and fast. The quality of both systems, in terms of both dose and image-quality, is excellent,” commented Prof. Denys. “It has taken a little time to gain experience and understand all the possibilities of such a combination and learn how to use it optimally. Compared to other systems, we particularly like the dose control on the Angio-like Spot Fluoro and Live Zoom. On the CT side, the subtraction

images are really excellent for evaluation of tumor or tissue perfusion at the end of a procedure.”

Holistic support

Canon Medical's support in terms of project management, support during the different phases of study and implementation, as well as at the application level and technical follow-up was very much appreciated.

“The support from Canon Medical was efficient and their expert team was keen to provide rapid solutions for unexpected problems. This is extremely valuable,” said Prof. Denys.

“With any project, despite the initial planning, some unexpected events can occur that can impact the technical coordination and the commissioning schedule,” said Ms. Natan. “Each issue encountered in installation of the Alphenix system was dealt with quickly and appropriately, demonstrating the flexibility of the Canon Medical Team in adapting to its customer's expectations.” //

Alphenix 4D CT – Streamlined and Safe

The Alphenix 4D CT offers more possibilities to deliver safer, better treatment to your patients across a wide range of clinical applications. With a streamlined workflow in a single setting, there is no need to transfer patients between rooms, which improves patient care and boosts productivity. Switch easily between CT and angiography system to diagnose, treat and verify.

Canon Medical's Aquilion CT and the Alphenix angiography system work in concert to provide real improvements in efficiency, workflow and clinical confidence. The unique ^{SURE}Guidance feature synchronizes positional data of the region of interest between modalities. CT gantry, C-arm and table move automatically to do the rest. 3D road-mapping to superimpose a CT-derived 3D volume onto the Fluoro image allows navigation during the angio procedure with greater confidence and accuracy.

References

¹ <https://www.newsweek.com/2019/04/05/10-best-hospitals-world-1368512.html>