





VISIONS spoke with Prof. Gangi, Dr. Garnon, Mr. Gautier and Mr. Gignoux, from the University Hospital Strasbourg, about their experiences with the Infinix-i 4D CT and Ultrasound system Aplio i800.

# Expanding horizons in Interventional Oncology in a state-of-the-art Angio-CT environment

Since the installation of the Infinix™-i 4D CT and Aplio™ i800 ultrasound system in last November, the University Hospital Strasbourg has been able to expand its research program in Interventional Radiology with several advanced techniques that could bring about major changes in the discipline.

The University Hospital of Strasbourg is one of the most prestigious University Hospitals in Europe. Affiliated to the University of Strasbourg, it forms part of a medical technologies campus with growing expertise in R&D using cutting-edge technologies in healthcare. The Hospital employs more than 12,000 people, including 3,000 physicians and leads groundbreaking global research in several disciplines, including transplantation, minimally-invasive surgery, Immunology and Interventional Radiology.

## An emerging world-class specialist facility

The Radiology Department's highly specialized Interventional Imaging Service has grown steadily since 2011.

"Interventional Radiology is of crucial importance for our University Hospital for several reasons, and we have invested significantly

in this field," remarked Mr. Gautier, General Manager of the Hospital. "Most importantly, it brings numerous benefits to our patients. It drastically improves the treatment of specific tumors, patients benefit from less invasive procedures, with improved outcomes and shorter hospitalization and it has also proved useful in pain treatments."

Led by Prof. Gangi, Head of Interventional Radiology, and Chairman of the Radiology and Nuclear Medicine Department, the large Interventional Radiology Department has grown in recent years and is currently staffed by nine Interventional Radiologists and 10 Radiology Technicians.

"Thanks to the dedication of Prof. Gangi and his Team to our patients, and to their research interests, the University Hospital has established an outstanding reputation in Interventional Radiology, at national- and international levels," continued Mr. Gautier.

## “High-quality true CT scanning during a complex intervention is key for us.”

“We are very proud indeed of their technical and medical accomplishments.”

This skilled team carry out hundreds of interventional procedures every year (including spinal injections, biopsies, TACE, cementoplasty, ablation and embolization) using a range of imaging equipment based in three dedicated Interventional Radiology rooms. Alongside rooms housing an interventional MR and a C-arm based system with cone-beam CT capability, the latest suite to be added is equipped with an Infinix-i 4D CT and Aplio i800 ultrasound system from Canon Medical Systems.

The Radiology Team chose these systems specifically to increase the range of Interventional Radiology procedures possible at the Department, as well as reduce patient waiting-time.

### Groundbreaking concept

“We were one of the first research institutes in the world to combine fluoroscopy and CT modalities in the same room,” said Prof. Gangi. “When I was a Resident Radiologist back in 1990, I could already see the advantage of placing a mobile C-arm in front of the CT-scanner. At first, people questioned what it could bring, but it proved



Prof. Gangi - University Hospital Strasbourg.

so successful in imaging that it eventually became a new concept, and was ultimately adopted commercially by Canon Medical Systems.”

The Hospital's Interventional Imaging Service performs an increasing range of interventional procedures ranging from simple infiltration to complex therapeutic treatments, sometimes combined with surgery.







When it came to creating an additional Interventional Radiology suite to provide the resources to keep up with growing demand for new imaging services, the Hospital turned to Canon Medical Systems for a solution.

### **A uniquely integrated solution**

"The Infinix-i 4D CT combines two different imaging modalities within the same environment, which will allow us to treat new medical indications in the different fields with pioneering Interventional Radiology techniques," said Mr. Gautier.



Dr. Garnon - University Hospital Strasbourg.

"We are convinced that installing this high-level CT system will help us reach our main goal, which is to continuously enhance the quality and safety of the healthcare that we offer to our patients."

"We chose the Infinix-i 4D CT initially on the basis of the exceptionally high-quality CT scanning that is possible with the system. It is key for us. It's the heart of the system," added Prof. Gangi. "There are not many systems as mature as the Infinix-i 4D CT available on the market. Both angio and CT modalities communicate and work together, enabling our Interventional Radiologists to use them with maximum ease-of-use. They can move from one system to another without any steps. A seamless combination of top CT scan and high-end level angiogram: an ideal option for us."

*"The range  
of possibilities  
is huge."*

The new equipment replaced a 128-slice CT system and a mobile C-arm. Installation of the Infinix-i 4D CT and the Aplio i800 ultrasound system was carried out in collaboration with the Canon Medical Systems project management team. Installation of the new imaging suite required considerable planning.

"When we decided to change our CT-suite, we were hoping to achieve many objectives: to improve the quality of our CT-imaging; to combine high-quality fluoroscopy and CT; to optimize ease-of-use and versatility in one machine; to reduce radiation significantly; and to support new procedures," said Dr. Garnon, Interventional Radiologist at the Hospital. "The new system meets all of these needs."



Radiology Team at the University Hospital Strasbourg.



Mr. Gautier – General Director University Hospital Strasbourg.

*“Infinix-i 4D CT will help us to improve patient outcomes and shorten hospitalization time.”*

“Given the context of our expanding research, we realized that replacing our mobile C-arm with a motorized ceiling-suspended C-arm with Flat Panel Detector, would allow us to push our current limits, cover new indications and enable us to perform complex vascular-, as well as percutaneous procedures,” said Mr. Gigueux, Biomedical Engineer. “Our choice focused on the Infinix-i 4D CT, because of its versatility. In addition to the advantages of the C-arm in interventional work, the system offers great flexibility, for

example, the C-arm can assume a dedicated parking position for procedures that require use of the CT only.”

#### **Combining two modalities in one room**

Previously, the Interventional Radiology Team used to carry out angiographs in one room, and then moved the patient into a second room for the CT. This step is no longer necessary with the higher quality Infinix-i 4D CT.

“The implementation of the solution combining two modalities in a single room was one of the first points that we studied together with Canon Medical Systems

project management team when installing the system,” said Mr. Gigueux. “Implementation of the project was quite complex, but the collaboration between the Hospital's technical teams, the various sub-contractors and the entire Canon Medical Systems Team was excellent.”

“As the modalities are combined in one system with the Infinix-i 4D CT, many procedures that we were previously performed in two steps can now be completed in one,” remarked Prof. Gangi. “The system will not only improve the quality and safety of our standard Interventional Radiology procedures, but will increase the number of indications that we are able to treat.”



*Infinix-i 4D CT  
with Aplio i800.*

“Our work includes vascular- and percutaneous interventions, and our Team includes specialists in these techniques. In many cases, the procedures are performed separately, but when both approaches are required, we can work together, side-by-side, with the new system. The Infinix-i 4D CT clearly offers new perspectives in combined therapies and enables us to perform much more complex procedures in this field,” added Dr. Garnon.

### **Infinix-i 4D CT: State-of-the-Art in CT**

“There are plenty of new possibilities on the horizon,” said Prof. Gangi. “We plan to introduce real, combined procedures, including angiographic-, percutaneous- and surgical procedures. So, we’ll have specialists from three disciplines working together in the same room. This is what will make the difference: the ability to perform multi-modality, multi-disciplinary, interventional procedures.”

The advanced CT imaging and fluoroscopy capabilities of the Infinix-i 4D CT will enable the team to combine procedures, such as ablation and embolization, or ablation



and bone consolidation, alongside use for more regular Interventional Radiology procedures.

“We want to perform true hybrid interventions, which involve Interventional Radiology, but also other specialties, such as surgery, pneumology, or others, depending upon the case,” said Dr. Garnon. “The range of possibilities is huge: image-guided coelioscopy, real-time image-guided fibroscopic biopsies, and potentially many other applications. The goal is to overcome the

limitations of each technique by combining everything together.”

### **Aplio i800: The ultimate in ultrasound**

Along with the Infinix-i 4D CT, the new Interventional Radiology suite at the Hospital is equipped with an Aplio i800 ultrasound system from Canon Medical Systems. Prof. Gangi and his team are impressed with the image quality of this additional system and the potential new options that it brings to complex Interventional Radiology work.



*Prof. Gangi and Dr. Garnon.*



Mr. Gigueux - Biomedical Engineer University Hospital Strasbourg.

"As someone who didn't believe much previously in ultrasound when I was younger, I have to admit that I have been impressed by the huge amount of progress made in ultrasound over the last three- or four years. Today, the diffusion capabilities with ultrasound are substantial.

## "Complex implementation requires excellent collaboration with a partner."

We cannot now carry out interventional procedures without a high-end ultrasound in the room," he said. "The quality of the Aplio i800 is so good. Despite not really using much ultrasound previously, I am now happy to have the Aplio i800 nearby the CT- and angio systems. It gives me a lot of confidence - the ultrasound is a really important part of the suite."

"The Aplio i800 is a game-changer in ultrasound guidance. The image quality is really incredible and the system includes

features that are perfectly suited to Interventional Radiology, such as dedicated micro-convex probes, fusion imaging, and needle-tracking," added Dr. Garnon. "With the help of fusion and small probes, we can perform procedures that were previously not thought to be within the scope of ultrasound-guidance, including some lung biopsies, mediastinal biopsies, and even selected bone biopsies. Liver ablation capabilities are definitely improved with the Aplio i800, as the optimal approach can be selected with fusion, and the quality of







ablation can be checked with contrast. Pre- and post ablation images can be compared to ensure that safety margins have been included with ultrasound fusion.”

### Expanding research horizons

Combining the outstanding capabilities of the Aplio i800 and Infinix-i 4D CT has potential for application in other organs, such as kidney and soft-tissues.

“Used alone, the Aplio i800 is of great value, but in combination with use of the Infinix-i 4D CT, is, of course, even better. By combining the high contrast quality of the ultrasound system with the high-precision 3D of CT, the optimal approach to treating target lesions in liver or soft-tissues could be chosen to ensure with 100% confidence that ablation with safety margins have been completed in all directions,” said Dr. Garnon.

“For kidney and bone there is still much progress to make in applications using the two modalities,” added Prof. Gangi. “There are still many challenges to overcome with multi-modality, multi-disciplinary approaches, but with the new systems in place, the potential of these techniques looks very promising.”

Supporting advances in Interventional Radiology Faced with the challenge of an increase in patient throughput of approximately 18-20% each year, Prof. Gangi and his team are certain that the investment in the Infinix-i 4D CT and Aplio i800 will help them to make significant progress.

“I believe ultimately that we can advance Interventional Oncology with the Infinix-i 4D CT,” said Dr. Garnon. “It should help us to reduce the waiting time for an intervention, whatever the procedure is. And that’s a critical point when dealing with patients, especially in Oncology.”

“I have collaborated with Canon Medical Systems for many years and my experience has always been very positive,” said Prof. Gangi. “With the installation of the Infinix-i 4D CT and Aplio i800, we are able to develop something very new in our department. I am fully confident that the dynamic of our team and that of Canon Medical Systems, our continued collaboration and the accumulation of knowledge and expertise, will ensure that this is a success.”

“We are extremely proud to have acquired an Infinix-i 4D CT,” said Mr. Gautier. “Only

three other hospitals in Europe currently benefit from this technology. The system helps to confirm our position at the forefront of Interventional Radiology.” //