



From left to right

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## Infinix-i 4D CT Supports Pioneering Interventional Radiology in France

The Saint Louis Hospital in Paris, France, part of the city's public hospital system (Assistance Publique – Hôpitaux de Paris - AP-HP), is emerging as a global center of excellence in oncology. With a new Infinix™-i 4D CT system from Toshiba Medical, it is pioneering new interventional radiology techniques. Mrs. Eve Parier, General Manager of the hospital and Prof. Eric de Kerviler, Head of Interventional Radiology, explain how the new system supports progress in interventional radiology and oncology.



**S**aint Louis Hospital is recognized as a leading cancer center in France worldwide. It has developed expertise in the treatment of patients with breast-, skin-, colorectal-, and urinary tract cancers in particular.

“Our three main missions are care, research and teaching. We are dedicated to further developing complete care for patients and strengthening our expertise in oncology,” Mrs. Parier remarked. “Our challenge is to support our experts and provide the best services possible for the patient. In radiology, the main development focus is on advancing interventional radiology. We have been committed to this field for several years.”

### **New facilities**

To advance its interventional radiology capabilities, the radiology team recently redesigned and renewed their radiology suite.

“We had to renew two CT scanners in the department, one of which was mostly dedicated to interventional radiology,” said Prof. De Kerviler. “I initially considered installing a new, regular CT, leaving some room between the patient table and the gantry, and to use an additional mobile C-arm – A hybrid solution. At the time, I was convinced that this was the optimal solution. However, at the CIRSE (Cardiovascular and Interventional Radiological Society of Europe) congress in Lisbon, Portugal, back

in 2015, I became aware of Toshiba Medical’s Infinix-i 4D CT, and realized that this was exactly what I needed.”

### **First impressions**

impressed by the Infinix-i 4D CT, Prof. De Kerviler wanted to know more about how the new system performed in clinical practice. “Initially, I was not entirely convinced that it was a good idea to put two imaging assets - an angiosuite and CT - in the same room. It was difficult to imagine how to move from modality one to another and to see how flexible the system could be,” he said. “However, I had the opportunity to visit some facilities in Japan already using the system, including the Shizuoka Cancer Center, an oncology facility in the Shizuoka

*"It takes less than one minute to move from the CT system to the C-arm, and vice versa."*

Prefecture and the Saitama Jichi University Hospital, a research hospital serving the Saitama Prefecture, which was an outstanding experience. It was great to see the teams in action. Of course, they were well-trained, but I could see how easily they could place a catheter using the C-arm, carry out a CT scan with the catheter in place, and move back to the C-arm: it was really great, very impressive, flawless: the Infinix-i 4D CT seemed very easy to work with."

#### **Flexible & compact**

Compared with other systems, the Infinix-i 4D CT offers the possibility to move automatically from one modality to the other.

"I was absolutely astonished by the outstanding image quality obtained with the C-arm in fluoroscopy. The system provides a very good trade-off between dose and image quality. It takes less than one minute to move from the CT system to the C-arm, and vice versa," he remarked. "I was also

impressed by the width of the bore of CT system that I saw during my visit to Japan. For interventional procedures, free-movement of instruments within the gantry is very important. It is best if we can place the needle and re-orientate it without having to moving the patient in- and out of the scanner. With the large bore of the Infinix-i 4D CT, we can carry out all procedures easily inside the gantry. That's what's great about the system. It is very convenient for all interventional radiology procedures."

Compact enough for small imaging rooms, the Infinix-i 4D CT is a flexible option that can support a wide range of interventional radiology settings and procedures.

"When you see the scanner in a picture, you might think that you need a very big room to accommodate it, but it is not the case. While our scanning room here at the hospital is quite spacious, I think the average interventional room in Japan is



smaller - every square meter of space is very expensive in Japan," Prof. De Kerviler continued. "So, for many medical centers with limited space, it is very reassuring that the system can fit completely in quite a smaller room. However, I knew that in our new radiology room, we would still have plenty of room alongside the new system for TACE (transarterial chemo-embolization) guidance systems, resuscitation equipment and everything required for the anesthesiologist. This was quite a plus point."

#### **Groundbreaking research**

The new Infinix-i 4D CT system from Toshiba Medical, installed at the beginning of this year, contributes to the team's efforts to extend the boundaries of interventional radiology. Most recently they have pioneered a new technique in the treatment of liver- and pancreatic conditions.

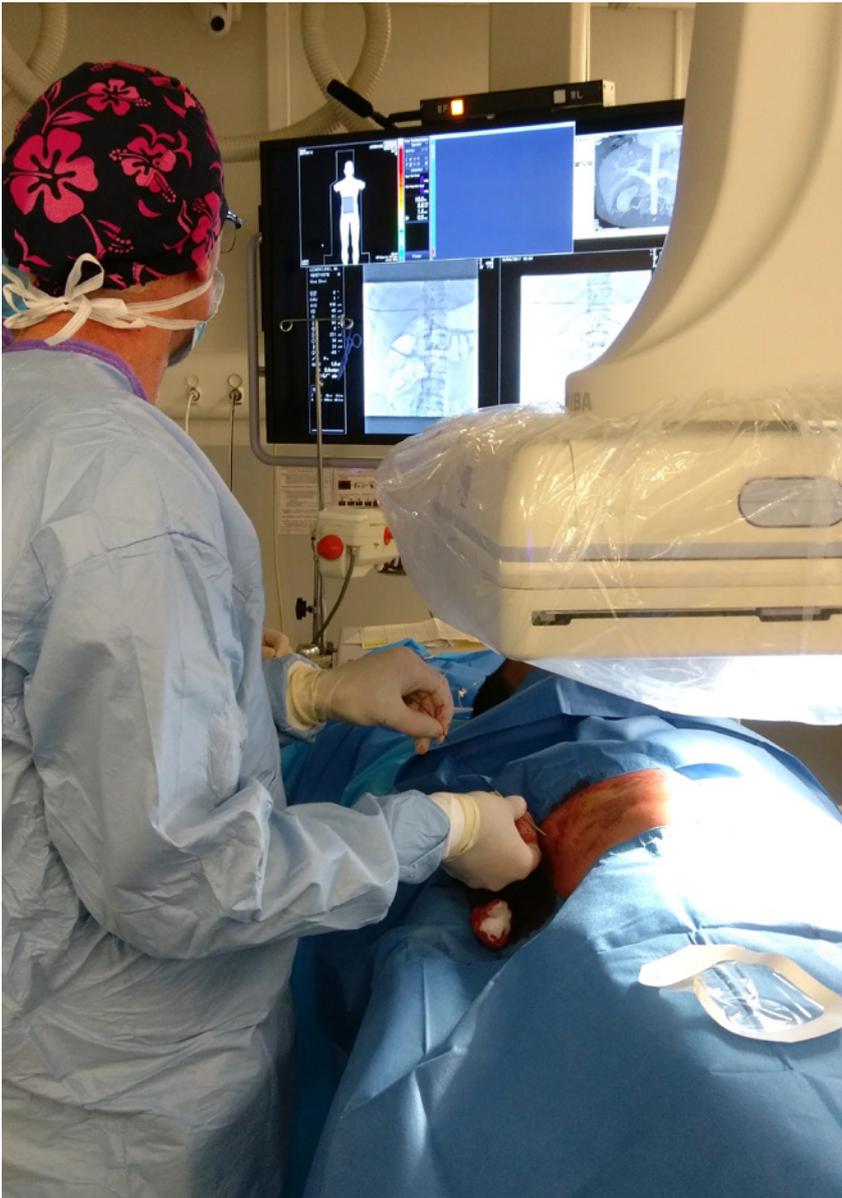
#### **Mrs. Eve Parier**

Mrs. Eve Parier has worked in hospital management for more than 20 years. She is the General Manager of the Saint Louis Hospital and the CEO of three hospitals in the Paris public hospital system (Assistance Publique - Hôpitaux de Paris - AP-HP).

#### **Prof. Eric de Kerviler**

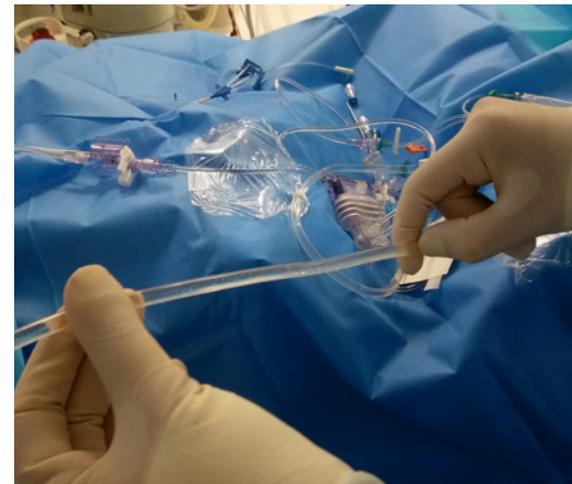
Prof. Eric de Kerviler has more than 20 years experience in radiology. He studied and trained in Medicine, Nuclear Medicine and Radiology at the University of Paris, France and worked for most of his career in the Saint Louis Hospital. He is now the Head of the Radiology Department and specializes in interventional radiology and tumor research.





### **Islet cell transplantation technique**

The islet cell transplantation technique for Type 1 diabetes treatment involves several steps. Firstly, the pancreas of a deceased organ donor is excised by surgeons. Then, the islets cells of this pancreas are isolated and processed. Lastly, purified the islet cells are infused through a catheter placed into the portal vein of the recipient patient by the interventional radiologist. The procedure is carried out under local anesthesia and is completed in around one hour.



“Islet cell transplantation is a very smart technique that involves injecting a suspension of islet cells within the hepatic portal vein of a recipient and then grafting the islet cells in the liver. Subsequently, the liver of the recipient will be able to secrete insulin by itself. This is very useful in patients with refractory diabetes, who have a lot of resistance to insulin,” Prof. De Kerviler explained. “It’s a very promising technique that we began working with a few years ago, but until now, the procedure was carried out in the operating room by catheterizing the mesenteric vein section of the hepatic portal vein. Now, we are able to perform this technique in our new interventional radiology suite using the Infinix-i 4D CT in one hour. We carried out our first successful islet cell transplantation on this system very recently.”

### **Development partnership**

Another reason that led to his decision to opt for the Infinix-i 4D CT was Toshiba Medical’s collaboration program.

“Following my trip to Japan, I felt that Toshiba Medical had a strong will to collaborate with us and offered real partnership in development,” he said.

The visit inspired Prof. De Kerviler to think of further applications for the system.

“My only concern at the time, was that while we already carry out quite a range of interventional procedures here one of the most important diseases in Japan is hepatocellular carcinoma, or HCC, which is not currently our major focus,” he said.

“This made me think about how I could use the new tool for other procedures in other organ systems: for example, urinary- or ablation procedures.”

With these experiences in mind, Prof. De Kerviler changed his plans for the new interventional radiology suite.

We started another story. Investing in an Infinix-i 4D CT is different to investing in a regular CT system,” he remarked. “The framework of the collaboration with Toshiba Medical provided a good deal, and my colleagues also became convinced of the potential benefits of investing in the Infinix-i 4D CT. We started with a ‘blank sheet of paper’, so to speak - we were able to completely designed a new room especially for the CT.



*"The Infinix-i 4D CT and collaboration with Toshiba Medical have contributed towards enabling us to meet the growing challenges in oncology."*



This is always easier than fitting equipment into an existing room. We designed our new imaging suite to our exact needs in direct collaboration with Toshiba Medical. We were able to create an environment very similar to that of an operating room – sterile, with different pressure between rooms to ensure renewal of the air. We worked closely with Toshiba Medical, starting directly at the ship-

ping of the equipment from Japan, which was exactly on time. The installation was completed without any delays - We started on the exact day that we agreed upon."

"We were impressed with the efficient installation of the Infinix-i 4D CT system and the medical team is very pleased and satisfied with the system," Mrs. Parier

remarked. "So far, training of the technicians and the radiologists has gone very well and the continued support of the Toshiba Medical team has been outstanding.

#### **Integrated into clinical practice and research**

The radiology team and clinicians initially found the new system a bit more complex

than a regular CT to use, but they quickly became confident in using it. The system is in use for a variety of procedures, such as biopsies, tumor ablation, drainage and nephrostomies. For procedures, such as spiral requisition and cryoablation in particular, the Infinix-i 4D CT offers the advantage that the system can be maneuvered without interfering with the equipment required.

"Everyone is now happy very pleased to work with the Infinix-i 4D CT and can see the potential of it," remarked Prof. De Kerviler. "With our previous system, we were focused on CT procedures. The Infinix-i 4D CT has opened up a new field of possibilities in fluoroscopy. Following installation, we have steadily increased the number of fluoroscopy-guided procedures. With this, we are able to treat new indications and develop and use new procedures. We anticipate moving towards performing an equal number of CT- and fluoroscopy-guided procedures, and in some cases, we may be able to combine both techniques. With this new clinical concept, we are now convinced that we will be able to push the boundaries of interventional radiology, and develop and perfect more involved techniques, such as fluoroscopy-guided placement of PEG LINES and gastrostomies."

With the success of the recent islet cell transplantation technique, the next focus for the interventional radiologists at Saint Louis Hospital is to use the Infinix-i 4D CT to advance the treatment of metastatic liver cancer.

"While we have few patients with HCC - a primary liver cancer - we often have to treat patients with metastatic liver cancers, because of the tendency of other types of cancers, including breast-, and colorectal cancer and malignant melanoma, to spread to the liver," Prof. De Kerviler said. "We are hoping to increase the number of treatment options for the treatment of metastatic liver cancer by testing new clinical applications using the Infinix-i 4D CT. If patients have solitary metastases, we can ablate the tumor. When the patient has several metastases, we plan to develop techniques to place a catheter in the hepatic artery and inject chemotherapy-agent directly into the liver through this. In case, we will need to change the anatomy of the liver, because sometimes we want to expand one side of the liver and decrease the other side of the liver, we should be able to embolize the portal vein or some segments of the portal vein, we hope to achieve this in the next six months."

## Growing challenges

In addition to developing pioneering new interventional radiology techniques, Saint Louis Hospital, of course, faces the same challenges as other medical facilities: growing demand for interventional procedures, increasing complexity of interventional procedures and pressures to treat patients sooner.

"Despite the fact that our radiology team grows annually with the addition of approximately six interventional radiologists, we face challenges not only in terms of number of interventional procedures required, but also in terms of increased complexity of procedure. This means that for some procedures the average time that is needed is higher," explained Mrs. Parier. "Our team still have to push boundaries and to extend their working hours to be able to cure and to manage the patient within a reasonable amount of time. In addition, as life generally speeds up, we must be able to react faster, in the best interests of the cancer patient too. The Infinix-i 4D CT and collaboration with Toshiba Medical have contributed towards enabling us to meet the growing challenges in oncology. It is a good partnership and I think it is a good investment for the Radiology Department and for the Saint Louis Hospital." //

