The Aquilion ONE dynamic volume CT, from Toshiba Medical Systems, has most recently been installed in two leading academic hospitals in Europe. With systems already in use in Japan, the USA and Canada and further orders received from all over the world, the Aquilion ONE is already starting to create new global standards in imaging diagnostics. Leiden University Medical Centre (LUMC) in Leiden, the Netherlands, and the Charité University Hospital in Berlin, Germany, were the first in Europe to acquire this new technology.

During the installation of the Aquilion ONE in Leiden, VISIONS talked to Claude Moinier, Service Support Manager, Kees Kalkman, Senior Product Specialist of the Technical Support Group from Toshiba Medical Systems Europe and Koji Umehara, Deputy Manager CT Systems Division from Toshiba Medical Systems Corporation in Japan. They explained to VISIONS what was involved in installing the Aquilion ONE.
**First installation of the Aquilion ONE in the Leiden University Medical Centre**

**VISIONS:** LUMC is one of the first European hospitals to acquire the Aquilion ONE. What has prompted the decision to install the system?

**Claude Moinier:** Providing outstanding regional, national and international medical services and research, LUMC is affiliated to Leiden University in the Netherlands. It has 867 beds, approximately 7000 staff and clinical departments in all medical specialties. The hospital acts as a tertiary referral centre for the northern part of the province of South Holland, as well as coordinating a wide range of research programmes in both clinical and basic medical research. LUMC holds an internationally recognised position as a centre of excellence in research. Its special units include neurosurgery, cardiothoracic surgery, neonatal and paediatric surgery and intensive care, paediatric oncology and a level I trauma centre. The wide area detector of the Aquilion ONE, being 16 cm, covering entire organs in just one rotation, allows clinicians to visualize flow and dynamic motion, giving not only morphological but functional information. Faster and more precise diagnostics for a wide range of applications are now in reach of clinicians and patients.

**Kees Kalkman:** LUMC and Toshiba Medical Systems have a long-standing relationship over many years. Having started with nuclear medicine, back in the 70s, this cooperation was extended several years ago to CT (computed tomography). The new Aquilion ONE CT system, which is being installed at the hospital, complements a 64-slice and a 16-slice CT, both of which are Toshiba scanners.

**Koji Umehara:** The hospital takes pride in providing the best possible quality regarding both medical technology and patient care. It committed eagerly to the state-of-the-art Aquilion ONE CT, towards making further improvement to the hospital’s (already excellent) record in quality and time of diagnosis, and to effect a further reduction in costs. LUMC was highly impressed by the system’s advanced capabilities and fully confident in Toshiba’s consistent support services.

**VISIONS:** Are there any special considerations that need to be made before installation of the Aquilion ONE can begin?

**Kees Kalkman:** Toshiba’s installation team ensured that LUMC was well prepared to receive the new system. It goes without saying that this new technology requires specially trained engineers for installation and what’s more important, to assure high-quality service. Therefore, we received extensive training in Japan. Also Japan supported the first European installation by sending their most skilled engineers, all to ensure that the new Aquilion ONE will run smoothly from day 1 onwards.

**VISIONS:** How was the system transported to its operational site?

**Kees Kalkman:** The Aquilion ONE was manoeuvred through the LUMC building and into the CT room with the aid of a crane. To facilitate transport and lifting, the Aquilion ONE has been designed with special winching hooks.

**VISIONS:** The Aquilion ONE is more powerful than the present generation of CT scanners, is it also much bigger?

**Kees Kalkman:** The system itself is very much comparable to our Aquilion 64 and Aquilion 16. However, due to a larger scannable range the Aquilion ONE requires a slightly larger working space. Accurate testing of all CT scanner parameters is a crucial part of a good quality control programme. This is done using phantoms – these are cylindrical, water-filled structures used for calibrating CT (and MRI) systems to ensure the quality of images.

**VISIONS:** What about the power requirements of the Aquilion ONE?

**Koji Umehara:** Aquilion ONE is a significantly more powerful machine than presently available CT scanners. Both in diagnostic performance as well as in processing the big amount of clinical images. It
goes without saying that adequate capacity for dealing with the heat, generated by the powerful reconstruction units must be taken into consideration. The existing power supply and cooling capacity of the CT room at Leiden was examined when planning the machine installation and proved to be sufficient for the system.

The Aquilion ONE has been designed to be as energy efficient as possible. It reuses the kinetic energy produced in the breaking of rotations to reduce total energy consumption. This is known as an ‘ecodrive’ function and can help reduce the overall energy requirements.

**VISIONS:** With these distinctive product features in mind, is the technical installation of the system also different?

**Koji Umehara:** The installation time of the new Aquilion ONE has proved to be very similar to that for the Aquilion 64. A great deal of effort has been made to ensure that the Aquilion ONE is as easy and efficient to install as other Toshiba machines.

**Claude Moinier:** This is largely due to the fact that the installation design has deliberately been kept as close to the Aquilion 64 as possible. Toshiba Medical Systems not only considers the needs of end users of its systems in all stages of product development – the hospital’s clinicians, technicians and patients - but also of the Toshiba service engineer as an integral part of the process. The faster and easier the system can be installed, the less investment is required by the customer. In addition, any margin for error is absolutely minimized.

What’s more the close resemblance in user interface not only facilitates interventions by service staff, but also assures that Toshiba customers can learn the scanning procedures on the Aquilion ONE in a considerable shorter period.

**Koji Umehara:** The installation has been kept as simple as possible through the use of well-labelled connections and one-fit-only connections. From the drawing board through every stage of development, Toshiba has considered the needs of the service engineer and, in-turn, optimized efficiency of installation.

**VISIONS:** Are there any operational considerations with the Aquilion ONE which Toshiba’s installation team helps prepare its customers for?

**Claude Moinier:** There are a small number of operational differences with the Aquilion ONE which customers need to consider before installation is complete. Toshiba’s installation team provides expert advice to ensure that every aspect of operation has been considered in setting up the system and integrating it seamlessly into daily use.

**Kees Kalkman:** Visualization of dynamic processes over a wide area, without the need to move the patient, will generate a large amount of clinical images which need to be reconstructed and visualized at high speeds. Toshiba has incorporated many more optical connections inside the machine to enable it to deliver data faster and with greater volume.

**VISIONS:** Does the more complex internal architecture of the Aquilion ONE mean it is more difficult to integrate, operate and interact with?
Claude Moinier: Absolutely not! The new Aquilion ONE is entirely geared towards PC compatibility, giving even more flexibility than previous systems. As mentioned earlier the operator interface is very very similar to the Aquilion 64. The image quality handling procedure for calibration and maintenance follows that of the Aquilion 64, too.

VISIONS: Once the system is installed, is maintenance the same as the Aquilion 64?

Claude Moinier: Some aspects are the same; most notably that Toshiba continues to provide a comprehensive technical support system, as it has done effectively at LUMC for many years. Toshiba’s service team can help with solving any problems via remote access – as with the majority of our later CT systems. InnerVision is our remote diagnostic service which provides proactive support and quality assurance. The system periodically monitors our imaging equipment to ensure it is always delivering the clinical excellence required.

If a problem is detected, highly trained service staff of our “StandbYou” service are available to carry out online diagnostics to identify and resolve the issue. Experts are able to explore online solutions
and frequently resolve them without the need for an on-site service.

Preventive measures mean less unscheduled downtime for the hospital. Automated predictive diagnostics alert Toshiba to a potential issue before it becomes a problem. Proactive monitoring helps minimize costly downtime and the need to reschedule examinations and helps in the long-term improvement of quality standards in our products.

Kees Kalkman: Toshiba offers various levels of maintenance for more security and insurance appropriate for the advanced science of the Aquilion ONE.

VISIONS: Aside from effective installation and maintenance is there anything else which can ensure the longevity of the Aquilion ONE?

Koji Umehara: Toshiba thinks ahead to the next five to ten years in product design and invests only in technology that has long-term prospects. This ensures that all our systems deliver optimal performance for the maximum time from installation to eventual replacement. The Aquilion ONE has been designed to be relatively easily upgradeable. All our systems are also developed with the same principle in mind.

VISIONS: So installation of the Aquilion ONE is not just a distinct technical procedure for Toshiba, but part of a continuum of interactive and integrated service and development?

Koji Umehara: My focus is on the CT business, including CT design interface with service, marketing and quality. An important part of my role is to relay our Aquilion ONE installation experiences at LUMC to Toshiba Medical Systems global headquarters in Japan. Installation issues are a critical part of product and service design and through this, and many other channels, our expertise can be honed further into the future.

Claude Moinier: At Toshiba, a CT installation is not carried out by an isolated team. The European Service Group delivers training, education, service plans and if necessary troubleshooting. In this way, installation becomes an integrated aspect of service, which optimizes every aspect of delivery to our customers. The teams operate all over Europe and also work on all modalities.

Kees Kalkman: Despite the fact that the Aquilion ONE is such an advanced product, its installation and operation are virtually identical to a 64-slice CT scanner. The role of every person who contributes to the installation, operation and end use of the machine has been well considered in design and development not just of the product itself, but also of the supporting services.

VISIONS: Thank you!