



Artis zeego Robotic Technology with Human Benefits

With the introduction of the Artis **zeego**, the first multi-axis C-arm system based on robotic technology from Siemens Healthcare, physicians at Oslo's Rikshospitalet are achieving new levels of flexibility, efficiency and 3D imaging quality in a wide range of clinical environments, from cardiology, body and neurointerventional radiology suites to high-end imaging in the OR.

By Nils Lindstrand

The Interventional Center Rikshospitalet in Oslo, Norway is a cutting-edge imaging department that is widely known for being at the forefront of medical technology and methodology. As part of a partnership with Siemens, the Center recently installed the Artis **zeego**, the newest generation of flexible interventional imaging systems. The robotic technology built into the Artis **zeego** makes it possible to position the C-arm exactly according for the view required,

anywhere in a sphere around the patient. The movement of Artis **zeego** can also be coordinated with the operating table. The coordination between the table and the C-arm means that the physician is allowed to operate at an optimal position. The advanced imaging capabilities of Artis **zeego** give the physician visual support beyond earlier technologies, and its software also helps physicians choose the optimal approach, says Erik Fosse, M.D., head of

the Interventional Center at Rikshospitalet in Oslo, Norway. The Center has been working with Artis **zeego** since December 2007, and doctors here are very satisfied with the new features it provides.

Per Kristian Hol, M.D., manager of radiology research at the Interventional Center, agrees that this new generation of the Siemens C-arm systems, the Artis **zee** family for interventional imaging, provides enhanced support for critical decisions. "High quality 3D imaging, such as cross-sectional imaging with *syngo* DynaCT and others, has been significantly improved and is executed in real time, more so than ever before," says Hol. We used to have to wait for the 3D images that provide us with vital information, but Artis **zeego** has the capacity to create them in seconds. Needless to say this means a lot for a

Highlights of Artis zeego

- Unique positioning flexibility
- Frame rates from 0.5f/s to 7.5 f/s native, optional up to 30 f/s
- Large Volume *syngo* DynaCT for visualization of the whole abdomen and thorax.
- Portrait *syngo* DynaCT increases coverage in the z-plane to image the complete thoracic aorta.
- Flexible isocenter adapts table height to the surgeon's needs
- Table tracking automatically aligns the C-arm movements to the table position
- Multiple park positions away from OR table



team making critical decisions with very narrow margins.”

Hol also points to the benefits of the new C-arm in planning surgical procedures. “When we plan an operation in the limited space of an OR, the increased flexibility with Artis **zeego** means that we don’t have to restrict ourselves to avoid problems with the C-arm,” he says. “Instead, we can make the plan with a full focus on the patient and the best procedure for the operation at hand.”

Rikshospitalet: A Leader in Medical R&D

Siemens Healthcare has been working with the doctors and engineers at Rikshospitalet Intervention Center for many years, taking OR technology to new levels of flexibility and imaging quality. And the new techniques and knowledge that the facility has gained through this partnership also has a ripple effect. The Intervention Center welcomes visiting colleges virtually every week, and has invested in very advanced systems for broadcasting operations to other hospitals and medical universities all over the world.

“The Intervention Center at Rikshospitalet is set up to be a department for the development of new procedures and the introduction of new technologies,” says Fosse. “The traditional way of doing this has been to just carefully implement them when treating patients. But with healthcare putting increasingly advanced technology into service, becoming more industrial if you like, we saw the benefits of setting up a department dedicated to development and working in pretty much the same way as a similar department would do in industry.” What the department is doing with the Artis **zeego** is therefore a natural process, including hosting a staff of equal numbers of doctors and engineers.

“One of the things we are working on is improving the benefits of Artis **zeego** even further by designing and building a new lighting system,” says Fosse. “We

“When we plan an operation in the limited space of an OR, the increased flexibility with Artis **zeego** means that we don’t have to restrict ourselves to avoid problems with the C-arm.”

Per Kristian Hol, MD, Manager of Radiology Research at the Interventional Center, Rikshospitalet, Oslo, Norway



The unique park positions of Artis **zeego** are extremely helpful to keep the system out of the way when not needed and create sufficient space round the operating table.



With the C-arm stored away, there is always enough space for the anesthesia equipment and free access to the head of the patient.



have bought an LED system designed for follow-spots in the theater. This allows us to place the operating lamps at a greater distance, thus giving ourselves and the C-arm a better chance to move without blocking the light, and avoiding

hitting the lamps.” The lighting system is not yet completely finished; the software still has to be further developed. But when the project is finished, the surgeons will finally be able to get both good lighting and the

full support of the C-arm wherever they need to move around the patient. “Surgeons have been striving for many years to get better access to the patient when operating,” says Fosse. “With Artis **zeego** and the new lighting system, we

will really have come a long way towards the optimal solution.”

Artis zeego: A Versatile Tool

Artis **zeego** could be considered the ultimate technological answer to the development of new procedures and new working environments like the hybrid room. When hospitals bring radiology and cardiology together with the surgeons, the flexibility and imaging capacities of the Artis **zeego** provides the optimal support for the team at work. “The new technologies help us to create better hybrid rooms,” says Fosse. “Well-functioning hybrid rooms mean we can save lives, and allow us to always choose the least invasive procedures. This means less risk for the patient and shorter hospitalization as well as huge cost savings for society.” Radiologists and cardiologists have been performing more and more advanced interventions, and even though they perform them well, this means greater risks if the planned procedure needs to be changed for any reason. Hol is equally positive about working in the hybrid room, and agrees that the new technologies such as Artis **zeego** mean new ways to improve procedures. “By combining knowledge and technologies from radiology, cardiology and surgery, we may even develop new tailor-made procedures and techniques,” he says. “It is also a major improvement that the advanced imaging systems can give you immediate confirmation that the procedure was performed correctly and gave the expected results. When

expertise and technology are scattered, you always are at risk of losing precious time if something needs to be adjusted. The Artis **zeego** decreases that risk.”

The Artis **zeego** C-arm offers better support for physicians across any clinical environment, from body and neurointerventional radiology suites to ORs and hybrid rooms. The adjustable isocenter enables off-center rotational angiography for all parts of the body. 3D imaging techniques include Siemens technologies like *syngo* DynaCT, *syngo* iPilot and *syngo* iGuide.

syngo iPilot enables faster and more precise catheter navigation through 3D roadmapping that superimposes 3D reconstructions onto live 2D fluoroscopy images, 2D roadmaps or digital subtraction angiography (DSA). The application provides real-time updates of C-arm and table movements, as well as changes in zoom and source-to-image distance. *syngo* iGuide is designed to bring needle procedures back into the interventional suite, allowing them to be executed faster and with greater confidence. All in all, the Artis **zeego** C-arm has removed numerous obstacles for the doctors at Rikshospitalet in their pursuit of the ideal environment for invasive procedures. It’s a happy combination of advanced technology that benefits physicians and patients alike.

Nils Lindstrand is a freelance business, medical and technology writer based in Stockholm, Sweden.

“Surgeons have been striving for many years to get better access to the patient when operating. With Artis **zeego** and the new lighting system, we will really have come a long way towards the optimal solution.”

Erik Fosse, MD, Head of the Interventional Center, Rikshospitalet, Oslo, Norway

Contact
georg.nollert@siemens.com