nexaris Angio-CT

At the nexus of treatment innovation

A nexaris Therapy Suite
Expanding precision medicine

Image-guided therapy relies on the versatility of medical imaging to improve the localization and targeting of diseased areas and control the quality of results. Over the past few years, image-guided minimally invasive interventions have emerged as a complement to some invasive approaches.

Our aim is to provide clinicians and hospitals with solutions that help them pioneer new procedures and make them safer, faster, and less costly. We are constantly working to bring new, innovative multi-modality imaging solutions to both single and multi-room settings. With technology that lets you seamlessly combine imaging along the entire clinical pathway, you gain greater flexibility and can achieve better clinical outcomes for your patients.

Close collaboration with strategic partners in therapy delivery and device manufacturing is helping us co-create the best therapy ecosystem possible. Together with our clinical and industry partners, we can realize therapy suites that unlock a multitude of opportunities for you to advance therapy outcomes.
Staying ahead in today’s healthcare market

For healthcare providers, the industry-wide shift from fee-for-service models to value-based reimbursements is creating increased economic pressure. The needs of the growing aging population add to this—and patient demand for safer and more effective treatment creates further challenges due to the associated costs. Advancements in medical imaging enable hospitals to stay ahead by developing and performing innovative minimally invasive procedures.

**Aging population pressure**
By 2020, the number of people older than 60 years is expected to surpass the number of children younger than five years of age. The aging population confronts health systems with challenges, particularly with regard to cancer treatment that requires intervention.

**The rise of intraprocedural imaging**
The market for intraprocedural imaging is expanding rapidly: Angio, MRI, and CT systems have steadily been making their way into interventional suites and even ORs of modern hospitals. Over the next five years, projected market growth will be in the double digits.
Image guidance enables cost-effective procedures\(^3\)

With conventional treatment, costs are difficult to contain. Medical imaging helps optimize procedures for individual patients, which could potentially lead to shorter hospital stays and fewer reoperations. Optimal integration of imaging along the treatment path represents an opportunity to improve patient care and minimize costs.

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Multi-modality imaging that expands precision medicine

Every day interventional radiologists take on new challenges. Every day you tackle increasingly complex cases as you strive to meet clinical, operational and financial goals – and improve patient care.

This pioneering work calls for creativity, and intelligent imaging technology that likewise breaks new ground. Precision technology maximizes efficiency by combining imaging modalities and streamlining workflows. That puts you at the nexus of interventional innovation, with the peace of mind all pioneers require to thrive.

That technology is nexaris Angio-CT.
One suite for imaging, one springboard for IR

In complex IR cases, you may need more than one imaging modality to give patients the best possible care. nexaris Angio-CT seamlessly integrates angio, CT and ultrasound in one suite, making it easier than ever to leverage the strengths of each modality during a single IR procedure.

**New capabilities**

nexaris Angio-CT slides over the patient table to give you direct access to the imaging modality you need. It is the first hybrid suite with a common coordinate system. The stunning result is Instant Fusion, with crystal-clear overlays and roadmaps at your fingertips. Wireless ultrasound probes now transmit images to the large table-side display so you can see angio, CT and ultrasound at a glance.* The information on one IR monitor is now more complete. Multi-room configurations further boost efficiency, allowing separate teams to share a CT gantry – and drive up utilization rates. With access to three modalities, you have better control to reach the target and an added safety net. Should complications arise, you can detect them easier and react faster.

**New possibilities**

With its innovative new features and world-class imaging technology, nexaris Angio-CT gives IR pioneers the control and peace of mind to explore exciting new procedures, devices and clinical pathways.

**New potential**

These benefits give stakeholders right across the healthcare system the opportunity to enhance performance. From department and service-line heads through management and the enterprise level of hospital chains, nexaris Angio-CT is your springboard to fulfill potential – be it clinical, operational or financial.

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*Optional
Peace of mind for pioneers

- Ideal modality always at hand
- Better control helps you reach your target
- Safety net for complications
- Advancing therapy outcomes
Welcome to the nexus of treatment innovation

Combining multiple imaging modalities has always been a challenge. Not anymore. nexaris Angio-CT marries the strengths of SOMATOM CT, Artis Angio systems and ACUSON Freestyle ultrasound to simplify procedures, streamline workflows and open up new clinical pathways.

It offers an unprecedented level of system integration, including immediate and seamless access to the three imaging modalities most commonly used in IR.
“Combining angio with CT is a real game changer. It allows us to do challenging IR procedures with greater ease and safety.”

Mark Wilson, MD
Chief of Interventional Radiology, Zuckerberg San Francisco General Hospital

“We wanted to increase capacity with the same space, the same staff and without additional overhead. Only three months after installing the combined angio-CT we went from 500 to 600 cases per month, increasing capacity by 20%.”

Todd Kranpitz
Executive Director of Radiology, Iowa Methodist Hospital, Des Moines, Iowa, USA
Seamless combination

nexaris Angio-CT overlays CT-arteriograms on live fluoro visuals, and delivers instantaneous roadmaps. The stunning result we call 'Instant Fusion'. But a world-class hybrid system delivers more than that.

Combining ablation and embolization in one session is just as easy. The Quick Switching feature lets you slide the patient table back and forth between the angio and CT in seconds.

Versatile design

Multi-room options make it possible to share equipment between rooms, so these can host a wider variety of disciplines. By enhancing versatility, multi-room design can boost utilization rates, efficiency and even ROI¹.

With Instant Fusion you can overlay CT-arteriograms on live fluoro – delivering instantaneous roadmaps. The bold lines and icons on the above images have been added for visualization purposes. They are not used in a clinical setting.

If need be, overlays appear alongside wireless ultrasound images on one large display, cable-free.

This next level of integration extends into the control room, where every image is accessible from a single cockpit.

Pioneering potential

New clinical pathways and interventional procedures continue to emerge in both palliative and acute care. For example, tumor metastases in the spine and pelvis are increasingly treated with ablation, cementoplasty and screw fixation.² With access to the optimal imaging modality, you can take on new challenges with peace of mind when you need it most.

With access to the optimal imaging modality, you can take on new challenges with peace of mind when you need it most.

References:


From conventional separation to seamless combination.

World-first technology allows nexaris Angio-CT to combine angio and CT data more effectively than ever before. But this Instant Fusion is just one part of its seamless universe.
**Instant Fusion**

*Experience the next level of integration*

Powered by the world’s first common coordinate system in a hybrid suite, nexaris Angio-CT gives you Instant Fusion of two imaging modalities. For example, overlays of CT arteriograms on live fluoro images that make time-consuming manual overlay a thing of the past. Access to relevant visuals is fast, complex embolization pathways are clear, and navigation is easy.
The IR challenge
Until recently, extra steps and the need for additional radiation dose made fusion of angio and CT images cumbersome for IR specialists. Registering data sets together required either a complete 3D run with the angio system or two fluoro shots at different angulations. Together with image-based registration algorithms – typically based on landmarks within the images – you relied on this data to fuse angio and CT images into one. nexaris Angio-CT changes that.

The nexaris solution
The world’s first system with Instant Fusion, nexaris Angio-CT eliminates the cumbersome registration process and the extra dose. How is this possible? The CT scanner and angio system simply share geometrical information, in one common coordinate system, which means the angio and CT data are always registered. The result is Instant Fusion – and images that you can access whenever you want.

The clinical case on the following page shows the benefits of treating metastasis of the spleen in a nexaris Angio-CT hybrid suite.
Combined embolization and ablation in a hybrid suite

The patient was a 59-year-old male with a metastasis measuring 1.9 cm in the superior aspect of the spleen. This was treated with percutaneous, CT-guided microwave ablation and a pre-ablation super-selective embolization of the feeder vessels to the tumor – to reduce the risk of bleeding.

Outcome
After two months, follow-up CT imaging showed primary efficacy of the combined embolization-ablation procedure with no residual disease.
Combined workflow
Since embolization is an intra-arterial therapy, it is traditionally performed in an angiography suite, while ablation – a percutaneous procedure – is often performed using CT or ultrasound imaging. However, the combination of a CT scanner and angiography system allowed Dr Odisio’s team to perform these two procedures in the same setting and with successful interplay of the technical and imaging information between the two procedures. For example, the team used intra-arterial CT imaging to accurately identify the vessels feeding the splenic segment harboring the tumor during the embolization procedure under angiography imaging.

Similarly, they performed an immediate post-ablation assessment of potential bleeding and ablation margins, respectively, using DSA and CT imaging acquired with intra-arterial access. As a safety measure, they also performed a CT-guided hydrodissection to avoid ablation of critical structures, and maintained femoral access for angiographic detection and embolization of possible bleeding.

Conclusion
The team found that combining CT and angiography systems enables not only these complex combined techniques but – importantly – also facilitates additional safety measures such as hydrodissection.
Quick Switching

Two procedures in one
Quick Switching makes it possible to perform combined catheter-based, endovascular and needle-based, percutaneous procedures in one session and on one table. For example, CT-guided ablation and angio-guided embolization.

The smoother the better
With Quick Switching, there’s no risk of wires and needles moving when the patient is transferred between separate angio and CT rooms. The table simply slides between the two modalities, with smart collision protection to enable safer handling. In this way, Quick Switching boosts efficiency and potential for novel synergies.
Integrated wireless ultrasound

Ultrasound goes cable-free
With optional wireless ultrasound probes and cable-free connection to the angio system, you can now refer to angio, CT and ultrasound sources side-by-side – on a single, large display. Vascular access has never been this easy, and the information on one IR monitor has never been so complete.

One room, three views
Wireless ultrasound completes the imaging trinity.
Control-room overview

Access more with less
The less clutter in the control room, the easier it is to focus on what matters. With just one monitor required to display any image from the hybrid suite, the Artis cockpit gives you an unparalleled overview form the control room.

Common patient registration
With nexaris Angio-CT, there’s no longer the need to register the patient twice. A single registration at the start is all that’s required.
From one-room specialization to multi-room cooperation.

Utilization is a key challenge for any hospital investing in the premium equipment that pioneering therapy often requires. With the added versatility of customizable room design and the multi-disciplinary workflows this entails, nexaris Angio-CT can raise utilization rates from day one.
“The two-room solution can help to increase the utilization rate and enhance the return on investment.”

Fabian Hubacek, CEO
310Klinik, Nuremberg, Germany

Multi-room flexibility

Unparalleled versatility

The flexible design of nexaris Angio-CT allows two rooms to share one angio system and one CT gantry that slides from one room to the other through a retractable wall – on rails up to 12 meters long. This enables different disciplines to carry out a wide variety of procedures in parallel, potentially increasing throughput, utilization rates and ROI.

Patient-centric care.

A two-room solution can accommodate a shared CT gantry and one or two angio systems. You can even add a third room to include MR with nexaris Angio-MR-CT. Whichever configuration is installed, the principle remains the same: The system comes to the patient, not the other way round.

Two-room configurations with more than one angio system are customized solutions and may not be commercially available in all countries. For regulatory reasons its future availability cannot be guaranteed. Please contact your local Siemens organization for further details.
Access all areas

Pole positions for key personnel
With the angio in the inactive foot-side position¹, key personnel have the space they need to concentrate on patient care without the distraction of working around large devices. For anesthetists, the popular position to the left of the patient’s head is freed up. Uninterrupted access to the patient is guaranteed.

Park and hide
When the angio and CT are not in use, it’s easy to make space for key personnel by moving them out of the way. The CT gantry slides into a dedicated ‘garage’ behind closed doors while the angio swings easily into the foot-side park position¹.

¹ The angio foot-side park position is a customized solution and may not be commercially available in all countries. For regulatory reasons its future availability cannot be guaranteed. Please contact your local Siemens organization for further details.
From routine procedures to pioneering pathways

The emergence of new clinical pathways, devices and procedures is expanding the scope of IR, in both palliative oncology and acute care. Although personalized therapy and intraprocedural endpoint determination remain major challenges, nexaris Angio-CT allows you to explore these unchartered territories with confidence and peace of mind.

The new solution inherits the outstanding track records of the Artis, SOMATOM and syngo platforms that continue to make needle and catheter-based procedures quicker and easier – all over the world.
Bone metastasis treated with ablation, cementoplasty and screw fixation
Froedtert & The Medical College of Wisconsin, Milwaukee, USA

Comprehensive stroke assessment LMU Großhadern, Germany
“Combined angio-CT offers the best performance for treating our patients at the present time of development. The greatest advantage of the combined solution is its accurate diagnosis of arterial blood flow.”

Daisuke Abo, MD and Yusuke Sakuhara, MD
Department of Diagnostic and Interventional Radiology, Hokkaido University Hospital, Sapporo, Japan

Pioneering procedures
nexaris Angio-CT enables you to treat patients with increasingly complex, minimally invasive procedures. With immediate access to multiple modalities, you can reach your target with greater accuracy and you may be able react more effectively should complications arise.

Bone metastases in the pelvis and spine
Both conditions are increasingly treated with ablation, bone cement and screw fixation. CT imaging can be used for the ablation, and cement injected with fluoroscopic imaging guidance – on the same table and in the same room.

Blunt poly trauma
In time-critical procedures, no other system delivers relevant, high-resolution images as quickly and reliably as nexaris Angio-CT. CT imaging allows visualization of a bleeding, which can be stabilized directly under angiographic guidance.

Acute stroke
When every second counts, the time it takes to transfer the patient from diagnosis to thrombectomy may influence the therapeutic outcome. Angio-CT technology helps minimize time lost with CT diagnosis and angiographic clot retrieval in the same room.
CT-Body perfusion imaging with up to 23cm of whole-organ coverage
LMU Großhadern, Germany

A dual-energy map shows contrast retention in a liver tumor which may serve as a surrogate marker for outcome (Images on left and right represent different cases)
Hybrid angio-CT suites offer the multi-modality imaging tools to address the evolving needs of the interventional radiologist/oncologist going forward.

Response assessment and personalization

Patients respond differently to treatment but nexaris Angio-CT gives you the advanced imaging capabilities to improve endpoint assessment, and to tailor further treatment to each patient’s individual needs. It puts the full set of assessment tools at your disposal.

Whole-organ perfusion & 4D CT-angiography

Adaptive 4D Spiral CT technology can help to assess the treatment response during the procedure (e.g. TACE). It extends dynamic 4D coverage beyond the width of the detector. It offers organ coverage for neuro perfusion up to 10 cm, for body perfusion up to 16.7 cm and for dynamic studies incl. 4D-CTA up to 30 cm.

CT TwinBeam Dual Energy

Dual Energy imaging delivers quantitative iodine maps to assess tumor contrast retention – which may serve as a surrogate marker of treatment response.

As the late Professor Wallace pointed out, cone-beam CT has made the IR community aware of the importance of 3D imaging in the angio suite. Now we must build on both 3D and potential 4D imaging to improve efficacy and safety. We can also begin to tackle the topic of endpoint assessment for interventions.

The late Prof. Michael J. Wallace, MD
Formerly Department of Interventional Radiology, Division of Diagnostic Imaging, The University of Texas MD Anderson Cancer Center, Houston, Texas, USA

We respectfully commemorate and acknowledge Prof. Wallace as a pioneer of the combined angio-CT concept and deeply appreciate his open and friendly collaboration over many years.
An automatically generated roadmap reveals tumor feeder vessels
Hanover Medical School, Germany

The roadmap of liver-tumor vessels overlaid on a fluoro image
The iControl remote unit is anything but remote. It allows IR personnel to effectively operate imaging modalities and intervention software, and stay close to the patient.

The Adaptive 3D Intervention Suite software facilitates near real-time needle guidance in complex anatomies, even at difficult oblique angles.

**A proven platform**

As an IR pioneer, you rely on visionary technology from a partner you can trust. Our hybrid, multi-modality suites combine cutting-edge advances with an established platform that always performs.

**Embolization guidance software**

syngo Embolization Guidance software makes light of finding tumor feeding vessels. It can automatically detect tumor feeder vessels for complete embolization of liver tumors. It is a convenient one-click solution for fast and easy procedure planning right at tableside. It may help you with efficient and standardized procedure planning for increased quality of care. Of course, displayed at trademark clarity.

**Efficient workflow**

It gives you a standardized, one-click workflow based on intra-arterial CT-angiography, which makes it easier and quicker to plan embolizations, even at the table-side. This helps you provide better quality care.

Cross-hair laser-assisted needle guidance is an intuitive and accurate technology for determining the skin-entry point. For example percutaneous cases can be initiated under angio with laser guidance to intuitively obtain the entry point and needle angulation. Next the needle can be further advanced to the target accurately while avoiding critical surrounding structures with CT cross-sectional image-guidance.
Mix and match

Versatility is a key feature of angio-CT hybrid technology and the nexaris portfolio likewise allows you to pick and choose components according to the individual demands of your institution.

**C-arm**
- Projections 330° and +/-100° orbital
- 5-parameter Automatic Exposure Control, laser cross-hair guidance

**X-ray tube**
- Up to 80 / 90 kW at 125 kV, max. tube current 800 mA / 1000 mA, grid-pulsed flat emitter no / yes

**Detector**
- as 40HDR 30 x 40, 16-bit, high resolution, A-Si with CsI

**Models**
- Standard, tilt and OR
- Recommended tabletop
  - Long
- Max. CT scan range
  - 135 cm with long tabletop
- Max. table load
  - 390 kg / 750 lbs

**CT Sliding Gantry Multi-purpose Table**
- Max. CT scan range
  - 200 cm
- Max. table load
  - 227 kg / 500 lbs
- Table feed speed
  - Manual
- Vertical table travel range
  - 678–1048 mm
- Vertical travel speed
  - 20–50 mm/s

**Artis zee / Q Ceiling**

**ACUSON Freestyle Access Ultrasound**
- Cable-free solution
- Ultrasound images displayed on the Artis Large Display
- Automated transfer of patient registration
- Auto-sending of ultrasound images to PACS
- Optional

**Artis Tables**

**CT Sliding Gantry Multi-purpose Table**
<table>
<thead>
<tr>
<th>Max. Travel length</th>
<th>12 m</th>
<th>12 m</th>
<th>12 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of detector rows</td>
<td>64</td>
<td>64</td>
<td>32</td>
</tr>
<tr>
<td>Max. slices / rotation</td>
<td>128 (acquired slices) / 384 (reconstructed slices)</td>
<td>128 (acquired slices) / 384 (reconstructed slices)</td>
<td>64 (acquired slices) / 192 (reconstructed slices)</td>
</tr>
<tr>
<td>Rotation times</td>
<td>0.28 s, 0.33 s, 0.5 s, 1.0 s</td>
<td>0.33 s, 0.5 s, 1.0 s (optional 0.28 s)</td>
<td>0.33 s, (optional 0.3 s)</td>
</tr>
<tr>
<td>Generator power</td>
<td>100 kW</td>
<td>80 kW (optional 100 kW)</td>
<td>80 kW (optional 100 kW)</td>
</tr>
<tr>
<td>Aperture</td>
<td>78 cm</td>
<td>78 cm</td>
<td>80 cm</td>
</tr>
<tr>
<td>Tube voltage</td>
<td>70, 80, 90, 100, 110, 120, 130, 140 kV</td>
<td>70, 80, 90, 100, 110, 120, 130, 140 kV</td>
<td>70, 80, 100, 120, 140 kV</td>
</tr>
</tbody>
</table>
“The machine every interventional radiologist wants.”

David L. Lacey, MD
Department of Interventional Radiology,
Iowa Methodist Hospital Des Moines,
Iowa, USA

6 nexaris
1. Instant Fusion
2. Multi-room
3. Quick Switching
4. Artis cockpit with common patient registration
5. Park the angio foot-side
6. CT
Why Siemens Healthineers

At Siemens Healthineers, our purpose is to enable healthcare providers to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, and improving patient experience, all enabled by digitalizing healthcare.

An estimated 5 million patients globally everyday benefit from our innovative technologies and services in the areas of diagnostic and therapeutic imaging, laboratory diagnostics and molecular medicine, as well as digital health and enterprise services.

We are a leading medical technology company with over 170 years of experience and 18,000 patents globally. With more than 48,000 dedicated colleagues in 75 countries, we will continue to innovate and shape the future of healthcare.

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