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Solutions Without Limitations

Patient anatomy can change from day to day and even moment to moment. The goal of Adaptive Radiation Therapy (ART) is therefore to ensure that the therapeutic dose is delivered precisely to the target and that healthy tissue is spared as planned. To achieve this goal, it is necessary to image the patient just prior to treatment, verify that the patient position is correct, and adapt to any anatomical changes immediately before, or even during, treatment.

For ART to be applied to every patient, clinicians need to have a full complement of advanced imaging and treatment delivery tools. Ideally, these tools would be available from a single integrated solution that provides immediate, efficient access to a virtually unlimited choice of applications.

The ARTISTE™ Solution makes ART a practical reality. As an integrated imaging and therapy workflow solution designed specifically for ART, ARTISTE offers a comprehensive portfolio of image-guided and advanced treatment delivery tools. ARTISTE enables clinicians to choose the appropriate treatment technique for each patient, make critical adjustments on the spot, and deliver true ART according to individual patient needs. Precisely. Consistently. Confidently.
The ART Solution of Choice

The technological flexibility of ARTISTE enables large and small clinics throughout the world to treat patients with greater precision and confidence.

Choose the Imaging Modality
With ARTISTE, clinicians can select the optimal Image-Guided Radiation Therapy (IGRT) application for the preferred treatment approach:

• Megavoltage (MV)
• Kilovoltage (kV)
• In-room CT

Choose the Configuration
Modular components make it easy to tailor ARTISTE to meet unique clinical requirements.

Choose the Investment Level
Clinics can invest in a solution that best fits today’s needs, while knowing that ARTISTE provides a clear upgrade path for the incorporation of changes in clinical scope as well as future treatment advances. ARTISTE is an investment that continuously delivers long-term value.
Siemens’ In-Line™ technology is an elegant, fully integrated IGRT solution that offers a new level of clinical confidence and efficiency. The in-line design provides the opportunity to streamline workflow and maximize safety from collision. Therapists are offered clear access to the patient during setup and treatment monitoring.
In Step with the Future

ARTISTE combines an impressive array of trendsetting new technologies that improve the management of complex radiation therapy procedures without compromising time, safety, or patient comfort.

**Powerful, Unique MV Imaging**

With MVision™ Megavoltage Cone Beam (MVCB) Imaging, the source used for treatment also images the patient’s 3D anatomy, offering unique possibilities for tumor visualization and alignment. The newly designed robotic flat-panel positioner enables flexible off-isocenter imaging, supporting verification of patient positioning – even for larger patients.

**Flexible, Efficient kV Imaging* **

Siemens’ signature In-Line kVision™ Kilovoltage Cone Beam Imaging delivers excellent 3D soft-tissue contrast, particularly for pelvic and thoracic targeting. By visualizing the target in-line (rotated 180 degrees), the kV geometry further streamlines imaging workflow and provides open access to the patient.

**Fast, High-Contrast CT Imaging**

CTVision™ brings the same fast, high-contrast diagnostic imaging standard used for treatment planning into the treatment room. This unique approach allows direct comparison of daily patient anatomy to the original planning data, thereby opening up opportunities to implement benchmark concepts such as daily replanning.

**High-Resolution, Accurate Field Shaping**

With a small, 5 mm leaf thickness over the full field, the 160 MLC™ Multileaf Collimator provides better conformity to the actual tumor shape, for homogeneous dose coverage independent of tumor size. The 160 MLC’s high leaf speed and extremely low leakage optimize treatment delivery by reducing patient on-table time and dose to normal tissue.

**Precise Patient Positioning**

The 550 TxC™ Treatment Table meets the growing demand for accuracy, stability, and precision, while offering the mechanical strength to accommodate a patient weight capacity of up to 550 lbs (250 kg).

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* kVision does not yet have a certificate of conformity and is not presently available for commercial distribution.
The ART of Flexibility

With its versatility and superb workflow, ARTISTE moves beyond the limits of conventional technology to enable a broad range of advanced treatment techniques. With ARTISTE, clinicians have unprecedented flexibility to select a treatment approach based on individual patient needs.

Using ARTISTE, the radiation oncology team can readily perform:

- Conformal Radiation Therapy (CRT)
- Intensity-Modulated Radiation Therapy (IMRT)
- IGRT
- Gated treatments
- High-precision radiation therapy and radiation surgery (SRT/SRS)
- Future advanced adaptive therapies, such as Dose-Guided Radiation Therapy™ (DGRT™), as they become available

The portfolio of complementary imaging and delivery technologies offered by ARTISTE means that treatments can now be consistently delivered with precision and confidence, ultimately leading to better outcomes.
## The ARTISTE Advantage

### Clinical Benefits
- High level of accuracy achieved from components designed to work seamlessly together
- Minimized dose to healthy tissue, maximized dose to target
- Broad selection of imaging options to address daily clinical challenges
- Image-based target verification

### Patient Benefits
- Treatments tailored to individual patients' needs
- Enhanced comfort from a treatment environment that is quiet, spacious, and unobstructed
- Improved safety due to open design and large patient clearance
- Treatment options for patients weighing up to 550 lbs (250 kg)

### Economic Benefits
- Ability to cover multiple approaches to clinical care with one integrated solution
- Competitive advantage by having the trendsetting technologies of ARTISTE, increasing attractiveness to patients and referring physicians
- Time savings and enhanced throughput from intuitive, simple workflow that adapts to the department's processes
The clinical scenarios presented on the following pages illustrate how the flexibility and workflow efficiency of the ARTISTE Solution help clinical teams address even the most challenging cases.
The Challenge

Precise positioning and treatment are compromised by the location of the tumor in the lung. Day-to-day variations in respiration modify the frequency and amplitude of the intrafractional motion, making it difficult to safely minimize the dose to normal tissue and ensure target coverage.

The ARTISTE Solution

By aligning the kVision or MVision dataset with the 4D planning CT, the lesion is aligned and positioned to the isocenter prior to treatment. Adaptive Targeting™ on the syngo® RT Therapist® workspace automatically fuses the imaging dataset and the treatment plan and calculates the position correction. Additionally, imaging of the target can be optimized with the variable start and stop angles of kVision or MVision.

Using the ANZAI breathing belt system in combination with ARTISTE fluoroscopic-based image verification, clinicians have the advantage of precisely verifying the predicted-to-actual tumor motion during the breathing cycle.

Having a common gating system for CT and kV/MV imaging and treatment means that the clinical team can confidently rely on the calibration values being used.

*syngo RT Therapist does not yet have a certificate of conformity and is not presently available for commercial distribution.
Complete Confidence

• Daily image-based identification for accurate target location and positioning

• Pretreatment fluoroscopic-based motion verification supports precise treatment delivery

• A common gating system for CT, MV, and kV imaging and treatment, ensuring workflow efficiency and data consistency

• One highly efficient workflow for both imaging and treatment delivery, promoting ease of use, rapid treatments, greater accuracy, and enhanced throughput

kV Fluoroscopic-Based Motion Verification

Siemens’ In-Line technology makes it possible to verify motion of the target or critical structures along the treatment beam axis. ARTISTE’s automated kV fluoroscopic imaging option offers pretreatment real-time motion tracking with low dose. The result is accurate dose delivery for tumors with intrafractional motion.

• Unique In-Line technology provides the best possible perspective for detecting motion

• An adjustable field size of up to 26 cm x 26 cm optimally covers the tumor while simultaneously limiting additional dose to radiosensitive areas

• Correlation verification with the ANZAI gating system delivers proven motion prediction

• Image download and storage supports offline evaluation such as trend analysis, and provides information necessary for replanning as appropriate
The Challenge

Movement of the prostate from treatment to treatment makes tumor localization difficult, particularly in larger patients. In addition, differentiation of the prostate from surrounding anatomy requires excellent soft-tissue contrast.

The ARTISTE Solution

Daily 3D imaging with MVision clearly differentiates the prostate tissue from surrounding structures, providing accurate information on the target location just prior to treatment. With MVision, the dose used for pretreatment imaging can also be incorporated into the treatment plan, allowing clinicians to accurately monitor the delivered dose.

By using the same radiation source for imaging and treatment, the need for add-on imaging hardware is eliminated.
Complete Confidence

- Volumetric MV imaging minimizes artifacts and provides the soft-tissue resolution required for accurate verification of prostate position.
- The 550TxT Treatment Table enables accurate and safe patient setup, even for patients weighing up to 550 lbs (250 kg).
- Entire prostate IMRT procedures, including patient setup, position verification, and treatment delivery, can be performed quickly and efficiently with the syngo RT Therapist workspace.

MVision and kVision

By offering both MV and kV cone beam imaging, the ARTISTE Solution provides clinicians increased flexibility in tailoring patient treatments.

MVision delivers outstanding soft-tissue resolution, especially in challenging cases such as imaging prostheses and large patients. Doses applied from the MV imaging system can be calculated into the dose prescription to ensure that organs at risk receive the planned dose.

Alternatively, kVision offers detailed high-contrast images for determining changes in target position and surrounding anatomy. With its In-Line geometry, kVision allows unobstructed patient access and optimal patient comfort.

MVision and kVision offer:

- Variable start and stop angles to enable lower doses to organs at risk and avoid potential patient collisions with the gantry during imaging.
- Variable field size to provide the necessary information for patient positioning, while minimizing the imaging dose – all without compromising image quality.
- Extended field-of-view (EFOV), which is particularly useful for large patients and tumors located off-isocenter. This feature improves image quality by minimizing artifacts.
The Challenge

Treating breast cancer presents a number of challenges, including patient clearance, interfractional motion, and frequent repositioning. Care must also be taken to spare healthy tissue, particularly the contralateral breast as well as the heart and lungs.

The ARTISTE Solution

MV-based 2D electronic portal imaging, the current standard for image-based patient positioning, is used to verify accurate treatment delivery. The OPTIVUE™ 1000ART amorphous silicon (a-Si) portal imaging system offers low-dose, high-resolution image quality, making the technique precise and applicable for daily clinical routines.

When additional imaging information is required during the course of treatment, clinicians can easily choose 2D kV imaging and kVision as alternatives.
Complete Confidence

• Automated display filters optimize contrast resolution, resulting in high-contrast image quality

• 43 cm isocenter clearance enables safe, automated treatment delivery

• Ability to select the imaging technologies that best suit individual patient requirements

CTVision

In cases where in-room, high-contrast diagnostic image quality is preferred, ARTISTE offers Siemens’ high-precision SOMATOM® CT-on-Rails gantry. SOMATOM Sensation Open combines the advantages of a large-bore CT with fast, multi-slice CT technology.

With Sensation Open, patients with breast cancer, lung cancer, or Hodgkin’s lymphoma, as well as those weighing up to 550 lbs (250 kg), can be scanned in the correct treatment position with unparalleled image quality.

• Gold-standard diagnostic image quality allows implementation of benchmark concepts such as daily replanning

• 82 cm gantry bore for large patients and patient positioning that requires greater clearance (e.g., breast imaging and treatment)

• A field-of-view (FOV) up to 82 cm captures comprehensive anatomical information
Clinical Scenario

Irregular Treatment Field: Head & Neck

Gender: Male
Age: 71
Tumor Type: Upper respiratory
Stage: T2 N2 M1

The Challenge

Radiation therapy for cancers in the head and neck often requires large, irregularly shaped treatment fields. In these cases, the target is frequently in close proximity to organs at risk, such as the eyes and brain stem, making accurate treatment planning and delivery crucial.

The ARTISTE Solution

Taking advantage of the fine leaf resolution of the 160 MLC over the full field, clinicians can achieve exceptional large-field conformity and minimize the dose to organs at risk, independent of field size.

Integrated into syngo RT Therapist, the 160 MLC is fully automated and verified, allowing for precise and efficient IMRT delivery.
The ARTISTE Solution | Irregular Treatment Field: Head & Neck

Complete Confidence

• The high resolution and leaf-positioning accuracy of the 160 MLC deliver the highest conformality and flexibility for IMRT treatments

• The syngo Suite for Oncology* enables highly accurate IMRT simulation, planning, and treatment by providing all members of the radiation oncology team with the tools and information they need to perform their respective tasks quickly and efficiently

160 MLC

When treating large, irregular tumors with IMRT, precise field shaping is essential. The ARTISTE Solution includes the new 160 MLC, featuring 5 mm leaf width over the full FOV with a leaf-positioning accuracy of 0.5 mm.

• 160 leaves for high conformality

• Small penumbra, resulting in a steep dose gradient

• Lowest transmission and leakage, minimizing dose to normal tissue

• Fast leaf motion (4 cm/sec) for quick and efficient treatment delivery

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*COHERENCE™ Suite of Oncology Workspaces is currently being rebranded to syngo Suite for Oncology. syngo RT Therapist and syngo RT Workflow do not yet have certificates of conformity and are not presently available for commercial distribution. All other workspaces may currently be purchased under the brand name COHERENCE.
The Challenge

In cases where a target is wrapped around the spine, it is difficult to deliver highly conformal treatment isodoses while minimizing dose to the organ at risk. In this case, image-based patient verification is particularly difficult due to the implanted hardware and the resulting artifacts.

The ARTISTE Solution

The daily use of high-resolution MVision Megavoltage Cone Beam Imaging provides artifact-free confirmation of patient positioning. Additionally, the spinal clamp can be used as a 3D reference object for even greater target positioning confidence.

Adaptive Targeting on syngo RT Therapist produces fast and reliable automatic registration of images with the planning CT. This process promotes better visualization of not only the tumor, but also the identified reference structures – enhancing confidence that the target is being treated as intended.

Gender: Female
Age: 62
Tumor Type: Paraspinous high-grade sarcoma at T3
Stage: T2 N0 M0
Comment: Spinal clamp near tumor
Complete Confidence

- MVision offers an alternative approach to IGRT in the presence of orthopedic hardware

- Optimized imaging workflow enables rapid and precise patient positioning, making it possible to efficiently use MVCB imaging on a daily basis

MVision

Using the same radiation source for imaging and treatment makes complex IGRT treatment applications faster and more accurate. MVision is a unique, fully integrated technology that provides excellent 3D target images while the entire procedure, including reconstruction and offset calculation, is often reduced to less than three minutes.

- One source, one beam, one detector

- Soft-tissue resolution allows clinicians to "see inside" the patient

- With EFOV, large objects can be imaged without changing patient position

- Adaptive Targeting software includes automated registration and visualization tools for rapid, user-friendly patient setup verification
Optimizing Workflow
for an image-rich environment
syngo Suite for Oncology

To realize the full potential of ART, clinical team members rely on having the necessary data, patient information, and images at their fingertips.

With the syngo Suite for Oncology®, clinics benefit by having scalable workspaces that enable each member of the clinical team to not only customize applications based on individual requirements, but readily share information with one another.

The result? Streamlined clinical workflow that significantly enhances efficiency and patient care.

Workspaces That Work Harder

syngo RT Therapist

A single integrated system that enables the therapist to perform patient setup, imaging, verification, and treatment delivery with one fast, highly efficient workflow. syngo RT Therapist® also offers optional transparent connectivity with major oncology information systems.

Clinics preferring to perform treatment and image data preparation and review away from ARTISTE can work from an independent syngo RT Therapist workspace that offers tools and data access identical to the one used for treatment.

syngo RT Oncologist

Provides the oncologist with all necessary data and applications required for localizing and contouring the target and critical adjacent structures, visualization, and review of prior treatment history – all in the privacy of the oncologist’s office.

syngo RT Physicist

The physicist can monitor the operational integrity of the ARTISTE Solution and all other linear accelerators within the department to ensure that optimal care is delivered to each and every patient.

syngo RT Dosimetrist

Combines virtual simulation and high-resolution image fusion to allow for accurate tumor localization and beam placement. Leading-edge dose calculation and optimization enable high-quality treatment planning without the need for additional workspaces.
**syngo RT Workflow – More Flow, Less Work**

A versatile option in the syngo Suite for Oncology, syngo RT Workflow* is a data and workflow manager for radiation oncology departments.

Acting as the interface to the central archive for loading and storing all DICOM-compatible data and images, syngo RT Workflow ensures data consistency and eliminates the risk of unwanted data duplication.

Intuitive data access readily facilitates the task management and alert features of syngo RT Workflow. By translating departmental activities into a streamlined flow of data and communication, syngo RT Workflow enables optimum efficiency within the department – enhancing accuracy, patient throughput, and patient care.

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“By offering an individualized treatment, we can provide our patients with the most effective and safe therapy. The integrated approach of ARTISTE will help MAASTRO Clinic achieve this strategy.

“We are very proud to be one of the first customers worldwide to apply the ARTISTE Solution in clinical practice.”

MAASTRO Clinic
University of Maastricht, The Netherlands
Infinite Flexibility. Complete Confidence.
The ARTISTE Solution is backed by one of the most extensive service and support organizations in the world, offering a wide range of programs specifically designed to meet the needs of its radiation oncology customers.

- Siemens Oncology Learning Center offers comprehensive training on the efficient and effective operation and service of linear accelerator equipment and software
- **VELOCITY™** is an exclusive service that can speed commissioning time from three weeks to three days
- **MOMENTUM™** is a suite of services that allows customers to apply the latest treatment techniques with greater efficiency, speed, and effectiveness
- Siemens On-Site Oncology Applications Specialists work on-site with treatment staff to streamline workflow processes and develop greater user comfort and confidence with new technology and procedures
- Siemens Remote Service (SRS) is a comprehensive infrastructure for optimizing system availability, preventing unscheduled downtimes, and improving patient planning and throughput
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KCMY are common to both 6.5k and 1k versions on PMS 5425 only