Data sheet

syngo.via
Software Version VB80C

siemens-healthineers.com/*syngo*.via

SIEMENS
Healthineers

Contents

Introduction

Let's advance the digitalization of healthcare with *syngo*.via

As an intelligent, integrated imaging software, *syngo*.via[1] helps you address and overcome issues from increasing pressure and workload in radiology.

It offers multi-modality reading and fast 3D results to speed up and enhance daily routine. We provide the latest innovations and AI-enabled features that take your reading and report creation to the next level. *syngo*.via offers powerful tools and actionable results that are accessible for better care delivery. *syngo*.via is more than just a software; it brings the flexibility to adapt to your work style – and the power to advance your clinical decision-making. It is the definition of "reading as it should be".

Simplifying Routine

syngo.via makes many of your daily tasks more fluent: It provides intelligent tools for an easier and more productive diagnostic workflow. With its fast, reliable, and seamless performance across modalities, you can read and report with ease and confidence. *syngo*.via enables actionable results that are accessible for better care delivery, whatever challenges your clinical environment may bring.

Empowering Innovation

Clinical progress never stops, and *syngo*.via is always up to date, applying the latest technologies like AI to help boost your diagnostic performance. As an open platform, *syngo*.via allows you to easily integrate your choice of apps and research prototypes, thereby enabling you to pioneer new practices.

Adapting to you

It's all about flexibility: From workstation to multi-site, *syngo*.via integrates seamlessly into your IT environment, meeting all your medical and operational demands. Maximize your financial flexibility with the right licensing for your enterprise. With each new upgrade, you can optimize your processes further, including all the training and services you need.

[1] *syngo.via can be used as a standalone device or together with a variety of syngo.via-based software options, which are medical devices in their own right. syngo.via and the syngo.via-based software options are not commercially available in all countries. Due to regulatory reasons, its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.*

System Overview

Client-Server Architecture

syngo.via is based on a client-server architecture:

- The server processes and renders the data from the connected modalities.
- The client provides the user interface.

syngo.via meets the demands of 3D routine and advanced visualization in radiology, cardiology, oncology, and nuclear medicine, and enables fast and efficient diagnostics.

syngo.via clients can access multiple servers[1].

Unique User Interface

The graphical user interface of *syngo*.via has the following features:

- Workflow guidance and context-sensitive tool sets
- One-click access to a patient case
- Up to 4 patient cases can be loaded simultaneously
- Corner menus in each segment allow for fast access to tools while eyes remain focused on images
- Automatic tracking of findings and measurements through the unique Findings Assistant

ALPHA Technology

ALPHA stands for Automatic Landmarking and Parsing of Human Anatomy. With this, *syngo*.via automatically recognizes anatomical landmarks in the acquired images available on the server. This information is used in various features to accelerate the reading workflow.

Workflow Approach

syngo.via provides workflows that can be adapted to several medical indications based on clinical needs, integrating disease-specific applications. Each application provides case preparation (data pre-processing, auto-layouts), structured case navigation, features for quantitative reading and disease orientation.

syngo.via OpenApps

syngo.via OpenApps is a software framework which provides immediate and open access to an ever-growing variety of clinical applications.

With OpenApps, *syngo*.via connects to the Siemens Healthineers Digital Marketplace, offerings software applications for clinical use and research purpose, manufactured by Siemens Healthineers or software partner.

syngo.via [Frontier] research applications open up your routine *syngo*.via to a world of research. Explore the potential of advanced post-processing research applications and bridge the gap in translational research.

You are able to launch and use the interface to the Digital Marketplace directly within the MM Reading and MI General workflows. This allows you to focus on your case and exchange results.

Findings Assistant

Findings and measurements are tracked and listed by the Findings Navigator or Findings Assistant.

Context-specific Reports

Context-specific report information can be created in *syngo*.via. These context-specific reports are stored either as DICOM encapsulated PDF[2] or as DICOM Secondary Capture Image objects and can be archived in the PACS.

In addition, reports can be saved in the file system. The stored PDF or DOCX reports can be viewed and printed by the clinical user. The report can be sent as HL7 message, as a CDA Level 3 document or as a PDF document to other information systems. Interactive report sharing with third-party applications is supported by using the FHIRCast web-based data interface as part of this version. Using the FHIRcast, findings can automatically populate reports into Nuance PowerScribe One.

Structured Reporting

Enhance documentation and communication of results integration with structured reporting. Creation and management of structured findings considering body regions, automatic classification according to standards and reporting guidelines.

Multi-Server Access

Allows for easy access from one client to up to eight *syngo*.via servers.

Up to 4 patient cases from different servers can be loaded simultaneously. Every *syngo*.via comes with the following multi-modality reading functionality and applications, suitable for many needs in the clinical routine. *syngo*.via also supports automatic loading of studies from different customer sites

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[1] The software version and hotfix level of server and syngo.via client must match.
[2] PACS must be able to support storing and retrieving DICOM encapsulated PDF objects.

with different Medical Record Numbers but same EMPI (Electronic Master Patient Index)[3].

Multi-modality 2D/3D/4DReading

Allows for an easy side by side comparison of images from different modalities and time points.

Supported modalities

CT Reading

Enables reading of 2D, 3D, and 4D CT data.

MR Reading

Enables reading of 2D, 3D, and 4D MR data.

SPECT and SPECT/CT Reading

Enables reading of SPECT and SPECT/CT 3D and 4D and NM planar data, and quantification in SUV where enabled by the reconstruction.

PET, PET/CT and PET/MR Reading

Enables reading and quantification of PET, PET/CT and PET/MR 3D and 4D data, and quantification in SUV.

CR Reading

Enables reading of CR and digital X-ray images.

RF & XA Reading

Enables reading of fluoroscopy and angiography images, including *syngo* DynaCT images.

Ultrasound Reading

Enables reading of 2D Ultrasound images (including movies).

MG Reading

Enables reading of mammography and tomosynthesis incl. synthetic images with the integration of breast ultrasound images.

syngo **News:** Information channel keeping user up-to-date with any news relevant.

syngo.via MM Reading includes:

- Image manipulation: zooming, panning, windowing

- Image evaluation: Distance, Angle, Marker, Assisted Perpendicular tool, Region of interest, Volume of interest, Arrow, Pixel lens, Plane annotation text, Synchronized Scrolling based on Anatomical Registration

- Image presentation: 2D, MPR, MPR thick, MPR/MPR fusion, MIP, MIP thin, MinIP, VRT, VRT thin, Cinematic VRT

- Image processing: Clip plane slab, Clip box, Punching, Bone removal, Table removal, Parallel & radial ranges, Curved Ranges, 2D & 3D reference lines, 3D reference point, Movie (incl. export), Interactive Segmentation Tools (including: Region Growing, Automatic Organ segmentation, and further semi-automatic segmentation tools), Volume measurement on segmentation objects, Automatic Spine and Rib Labeling, lung nodules segmentation using Lesion Quantification tool, Lung nodules navigation tool, Time Curve tool for 4D analysis, CT Lung Change tool for quick review and assess changes in the lung, CT Trauma Layouts[2].

MM Vessel tool (incl. Automatic Heart and Coronary Tree Isolation), segmentation, display in curved views, and evaluation of vessels for CT and MR data.

- Automated Cinematic Rendering[1]: Case specific automated Cinematic VRT image results.

MR Generic tools (incl. Calculation, Motion Correction, Image Filter, 2D/3D Distortion Correction, ADC & b-value calculation, and Composing) MR Neuro Perfusion workflow integrated, results can be transferred between the workflows.

Interactive Spectral Imaging

Interactive Spectral Imaging allows change of monoenergetic+ keV levels right within *syngo*.via MM Reading as well as visualizing non-editable iodine maps, Mixed and Virtual Unenhanced Images (VUI). This allows easy comparison between multiple Dual Energy studies from different timepoints in *syngo*.via MM Reading.

syngo.via common features

- Patient Browser
- Case Navigator
- Findings Assistant
- Auto-Sorting and Processing of DICOM data
- Auto-Layouts
- Anatomical registration
- Offline Filmsheet Editor
- Image Text Editor
- Flexible application change
- Summary Series
- Online Help

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[1] *Some features are available with optional license only.*

[2] *CT Trauma Layouts works best in combination with scanners reconstructions generated by compatible scanners.*

[3] *Please contact your local sales representative for further information on availability in your region, technical requirements, and limitations.*

syngo.via Clinical Packages and Applications

syngo.via reading capabilities are available as separate apps or in a packaged model for specialized workstations to departmental or enterprise-wide systems.

All grades offer a wide range of multi-modality 3D reading capabilities to support the basic needs of image processing and reading. A broad variety of clinical applications are available for *syngo*.via to extend it for specific clinical needs[1]. These applications are commercially available either as single applications or in a package model.

Application packages are available for clinical specialties, for entire modalities or all-in enterprise access[2]. For dedicated clinical use cases individual applications can be obtained.

	CT	MR	MI	Others	
Acute Care	Acute care CT				
Neurology	Neurology CT	Neurology MR	Neurology MI		
Oncology	Oncology CT	Oncology MR	Oncology MI	Mammography	RT Image Suite
Cardiovascular	Cardiovascular CT	Cardiovascular MR	Cardiology MI		
Routine	Routine CT	Routine[3] MR	Routine MI		
Multi-modality	Automate and Routine		Reporting		Connect

[1] *Medical devices in their own right.*

[2] *All-in modality and all-in enterprise packages are exclusively available as subscription offering.
In general, third-party contents are not included in the subscription packages. Exception: Breast Care contains MeVis license.*

[3] *MR Routine is prerequisite for all other MR packages.*

Multi-modality Routine Packages

Multi-modality Routine Packages provide the software foundation for *syngo*.via and enable 2D to 4D reading as well as basic AV. The packages improve reading and reporting efficiency by dedicated and optimized workflows, tools and automation.

syngo.via MM Reading

Automate & Routine

syngo.via multi-modality software foundation

Dedicated workflows for multi-modality, CT Cardiac, CT Vascular, CT Dual Energy[1], MM Oncology, MI General, and MR Reading

Tools and technologies:

- *syngo*.via Cinematic VRT
- *syngo*.via OpenApps[2]
- Interactive Spectral Imaging
- *syngo*.via CT Lung Change
- Lesion Quantification – Follow-Up Support
- CT Lung Assistant enabled
- *syngo*.via Time Curve Tool
- *syngo*.MR Composer
- ALPHA Technology[3]
- Rapid Results Technology for ALPHA

Reporting

- Report templates and editor
- Findings infrastructure
- Report customization and advanced report template management
- Integrated diagnostic guidelines for TNM staging, Lung-RADS, CAD-RADS, LI-RADS

Connect

- HL7 Patient Information Reconciliation (PIR) for data consistency with, e.g., RIS, HIS
- HL7-based report export to connected information system

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[1] syngo.CT Dual Energy includes Monoenergetic, Optimum Contrast and syngo.CT DE Rho/Z.

[2] syngo.via OpenApps is not yet commercially available in all countries. Due to regulatory reasons, its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further information.

[3] Automated and standardized reconstructions; one-click segmentation of heart, lung, aorta; Anatomical Range Presets; AutoView with one-click access to the right anatomical view; CT and MR presets for auto ranges (musculoskeletal, cardiovascular, body regions, organs)

Multi-modality Routine Packages

An all-inclusive package option combining all functionality is available as an alternative.

Automate & Routine

- *syngo*.via multi-modality software foundation providing general 2D/3D/4D capabilities for routine reading and basic AV
- *syngo*.via MM Reading provides efficient and automated reading with integrated tools and technologies

syngo.via Cinematic VRT

syngo.via Cinematic Rendering enables photorealistic 3D views of CT and MR datasets through highly sophisticated photon simulations, such as ambient occlusion, shadows, scattering, and high dynamic range that achieves high resolution views of anatomical details within seconds. Furthermore Cinematic Insight[1]: Case specific automated Cinematic VRT images, with optimized & self-contained visualization for different organs and tissues.

syngo.via OpenApps

syngo.via OpenApps framework provides immediate and open access to an ever-growing variety of clinical and research applications from Siemens Healthineers and other partners – directly in *syngo*.via.

Interactive Spectral Imaging

Interactive Spectral Imaging provides the ability to interactively switch between different data representation (VNC, Iodine, Mixed, Conventional CT, Monoenergetic Plus, Fused) for Dual energy acquisitions. For Monoenergetic Plus, the image impression can also be switched between various keV levels ranging from 40–190 keV.

CT Lung Assistant[1,2]

CT Lung Assistant allows radiologists to annotate a Region of Interest (ROI) in Chest CT images in order to call up a web service for providing visually similar reference CT images for a wide range of interstitial lung diseases enriched by textbook disease information coming from Georg Thieme Verlag KG.

ALPHA Technology

ALPHA Technology speeds up the workflow by automating and standardizing reconstructions. For example, automated and standardized reconstructions and one-click segmentation of heart, lung, aorta. It improves consistency in image presentation with Anatomical Range Presets and AutoView with one-click access to the right anatomical view, as well as CT and MR presets for auto ranges (musculoskeletal, cardiovascular, body regions, organs).

Rapid Results Technology for ALPHA

Rapid Results Technology for standardized and automated anatomical ranges creation and archiving, triggered from the CT scanner.

Tools for efficient multi-modality reading

- *syngo*.via Time Curve Tool to calculate and visualize time/phase dependent intensity distributions.
- *syngo*.via CT Lung Change for automatic comparison of CT Lung studies from two different timepoints and visual highlights of changes.
- *syngo*.via Basic Onco Tool for auto-perpendicular measurements.
- *syngo*.MR Composer for full-format images from overlapping MR volume data sets acquired at multiple stages.
- *syngo*.MR Neuroperfusion is accessible within MM Reading.

Dedicated workflows optimize reading for multi-modality, CT Cardiac, CT Vascular, CT Dual Energy[3], MM Oncology, MI General, and MR Reading:

syngo.CT Cardiac includes review marker, plaque visualization, heart isolation, movie (beating heart), cardiac planes, curved & cross-section MPR, integrated and context-specific.

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[1] *This feature is available with optional license only.*
[2] *The use of CT Lung Assistant requires the client to be connected to the internet.*
[3] *syngo.CT Dual Energy includes Monoenergetic, Optimum Contrast and syngo.CT DE Rho/Z.*

syngo.CT Vascular includes manual vessel tracking, plaque visualization, Single Energy calcification removal, combined oncology and vascular workflow.

syngo.CT Dual Energy[1] includes preparing and viewing of Dual Energy data, mixed image calculation, monoenergetic, optimum contrast, and Rho/Z (electron density/effective atomic number).

syngo.MI General includes visualization and quantification including SUV where supported by the reconstruction of NM, SPECT and SPECT/CT. Automatic reorientation of functional data to cardiac planes and automatic brain reorientation of functional data to AC-PC line. Dedicated layouts for hybrid reading.

syngo.MM Oncology includes navigation synchronized across segments, semi-automated RECIST/WHO/Volume measurement, image registration and fusion, basic PET and SPECT quantification including SUV support.

syngo.MR Reading includes basic workflow with customization, follow-up support, rescan handling, context-specific reporting.

Reporting

- Reporting package providing out-of-the-box report templates and editor capabilities.

- Report creation with predefined report templates and automatic population of image-based findings for structured and free-text reporting.

- Customized creation of reports with advanced report template management and editor capabilities also enabling structured data entry.

- Automatic population in HL7-based report export.

- Efficient and structured communication of *syngo*.via results into a diagnostic report as Text, HTML and RTF, into file system as DOCX and PDF, into PACS as DICOM SC and as DICOM encapsulated PDF.

- Evidence-based, structured reporting with integrated diagnostic guidelines for TNM staging, Lung-RADS, CAD-RADS, LI-RADS, PI-RAD

- Cross workflow reporting to combine results in one document.

Connectivity

The package ensures that the patient data between *syngo*.via and an existing information system are consistent, and that the report can be transferred to a connected system.

Following HL7 interface functions are supported:

- HL7 Patient Information

- Reconciliation (PIR) messages A08, A34, and A40 (receiving patient update information from, e.g., RIS, HIS).

- FHIRcast interface for bi-directional findings exchange with third-party reporting solutions

Report Export License enhances the HL7 interface by the CDA (Clinical Document Architecture) Level 3 standard, pdf content.

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[1] *Works with Dual Energy images from the whole SOMATOM Family (Single Source and Dual Source Dual Energy).*
For NAEOTOM Alpha, images Rho/Z and DirectSPR are not available.

Computed Tomography

The CT Clinical Packages

Routine CT Package	Acute Care CT Package	Cardiovascular CT Package	Neurology CT Package	Oncology CT Package
syngo.CT CaScoring	*syngo*.CT ASPECTS[3]	*syngo*.CT Cardiac Function	*syngo*.CT ASPECTS[3]	*syngo*.CT Body Perfusion
syngo.CT Colonography	*syngo*.CT Bone Reading	*syngo*.CT Cardiac Function-Enhancement	*syngo*.CT DE Bone Marrow[1]	*syngo*.CT Bone Reading
syngo.CT DE Calculi Characterization	*syngo*.CT Coronary Analysis	*syngo*.CT Cardiac Function–Right Ventricle	*syngo*.CT DE Brain Hemorrhage[2]	*syngo*.CT Colonography
syngo.CT DE Gout	*syngo*.CT DE Bone Marrow[1]	*syngo*.CT CaScoring	*syngo*.CT DE Direct Angio[2]	*syngo*.CT Colonography–Advanced
syngo.CT DE Monoenergetic Plus	*syngo*.CT DE Brain Hemorrhage[2]	*syngo*.CT Coronary Analysis	*syngo*.CT DE Hardplaque Display[2]	*syngo*.CT Colonography-PEV
syngo.CT Dental	*syngo*.CT DE Direct Angio[2]	*syngo*.CT DE Direct Angio[2]	*syngo*.CT DE Monoenergetic Plus	*syngo*.CT DE Monoenergetic Plus
syngo.CT Neuro DSA	*syngo*.CT DE Lung Analysis[1]	*syngo*.CT DE Hardplaque Display[2]	*syngo*.CT Dynamic Angio	*syngo*.CT DE Bone Marrow[1]
syngo.CT Vascular Analysis	*syngo*.CT DE Monoenergetic Plus	*syngo*.CT DE Heart PBV[2]	*syngo*.CT Neuro DSA	*syngo*.CT DE Virtual Unenhanced[4]
	syngo.CT DE Virtual Unenhanced[4]	*syngo*.CT DE Monoenergetic Plus	*syngo*.CT Neuro Perfusion	*syngo*.CT Lung CAD
	syngo.CT Dynamic Angio	*syngo*.CT Myocardial Perfusion	*syngo*.CT LVO Detection[5]	*syngo*.CT Pulmo 3D
	syngo.CT Neuro DSA	*syngo*.CT Vascular Analysis	*syngo*.CT Brain Hemorrhage[5]	*syngo*.CT Segmentation
	syngo.CT Neuro Perfusion	*syngo*.CT Vascular Analysis-Autotracer	*syngo*.CT Brain Quantification[5]	*syngo*.MM Multi-Timepoint Evaluation
	syngo.CT Vascular Analysis			*syngo*.CT Lung Lobe Segmentation[5]
	syngo.CT Vascular Analysis-Autotracer			
	syngo.CT Brain Hemorrhage[5]			
	syngo.CT Brain Quantification[5]	Optional : *syngo*.CT vendor independent Rapid Results Technology		
	syngo.CT LVO Detection[5]	*syngo*.CT Liver Analysis		

Optional : *syngo*.CT vendor independent Rapid Results Technology
syngo.CT Liver Analysis
syngo.CT AI-RAD Pulmo Density
syngo.CT TAVI Valve Pilot
syngo.CT Onco Function-Hepatic AEF

[1] *Not available for NAEOTOM Alpha in the U.S. Future availability cannot be guaranteed.*

[2] *Not available for NAEOTOM Alpha. Future availability cannot be guaranteed.*

[3] *syngo.CT ASPECTS can either be purchased as standalone application or as part of syngo.CT Neuro Perfusion.*
syngo.CT ASPECTS is not available in all countries. Future availability cannot be guaranteed.

[4] *Liver ECV and Liver Fat Maps are not available for NAEOTOM Alpha. Future availability cannot be guaranteed.*

[5] *Not available for the U.S. Future availability cannot be guaranteed.*

Routine CT Package

syngo.CT CaScoring

- Calculation of vessel specific and total Agatston equivalent score of coronary arteries
- Preferred loading of Agatston-equivalent low kV series
- Rapid Result Technology for standardized and automated total CaScore result

syngo.CT Colonography[1]

- Parallel flight prone/supine visualization
- 3D Reading (Fly-through)
- Global View (Solid/ Semi-transparent)
- Registered navigation (prone/supine)
- Delete small intestine
- Distance to rectum
- Stool tagging
- Panoramic View
- Polyp measurements in 3D endo-luminal view

syngo.CT DE Calculi Characterization

- Visualization of the chemical differences between kidney stones by decomposing the kidney stones into its component parts: tissue, uric acid, and oxalate (calcium stone).
- Provides tools to analyze kidney stones and navigate through them.

syngo.CT DE Gout

- Distinguish between urate, bone, bone marrow, and contrast agent.
- The materials are highlighted with different colors.

syngo.CT DE Monoenergetic Plus

- Simulation of images that are equivalent to images scanned with a single photon energy beam, depending on the energy (keV). Changing the energy (keV), can enhance the contrast between different materials.
- Improved algorithm for noise reduced images
- Parallel display of multiple Monoenergetic Plus ROIs and their respective attenuation curves
- Saving of Monoenergetic Plus ROI information for statistical evaluations

syngo.CT Dental

- Pre-surgical planning for dental operations by reformatting of curved panoramic and paraxial views along the jawbone, as well as, definition of the mandibular canal

syngo.CT Neuro DSA

- Remove/Suppress bone structures in CTA (CT Angiography) scans to provide a bonefree view of the cerebral vessel system/vasculature
- Improve visualization of vascular structures in the area of the skull base and assist in delineating aneurysms and other vascular diseases.

syngo.CT Vascular Analysis

- Curved & cross-sectional ranges
- VesselSURF
- Vessel tracking (2-click centerline)
- Stenosis measurement
- Single Energy Calcification Removal
- Bone & vessel isolation mode for selective highlighting of high contrast structures
- Rapid Results Technology for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) range series of the aorta and left/right runoffs
- Rapid Results Technology for automatic generation and archiving of bone and table removed VRT/MIP Radial Ranges
- Export segmentation meshes as DICOM objects for third-party usage
- Cinematic VRT: Cinematic Rendering for high resolution photorealistic 3D views of the vessels

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[1] *The usage of two monitors with maximal resolution of 3 MP or one monitor in split screen mode with maximal resolution of 6 MP is mandatory in order to achieve reasonable performance.*

Computed Tomography

Acute Care CT Package

syngo.CT ASPECTS[3]

- Support assessment and severity of ischemic changes on non-contrast CT head scans
- Automatic calculation of the ASPECT score (Alberta stroke program early CT score) based on a 10-point quantitative topographic CT scan.
- Automatically calculate ASPECT score and send standardized results to PACS with Rapid Results Technology
- Support assessment and severity of ischemic changes on non-contrast CT head scans

syngo.CT Bone Reading

- Unfolded view of the ribs to view the complete rib cage on a single image
- Unfolded view of the spine to view the complete spine anatomy
- Automated rib and spine labeling and numbering
- Automated results generation and archiving in PACS (through Rapid Results Technology)

syngo.CT Coronary Analysis

- Angio view
- VesselSURF for navigation along coronaries
- Automatic coronary tracking and labeling (major coronary branches)
- Single-click stenosis measurement
- Single-click coronary vessel tracing
- Image sharpening for stent/ calcified lesion evaluation

- Rapid Results Technology for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) of LAD, RCA, and CX.
- Export segmentation meshes as DICOM objects for third-party usage
- Cinematic VRT (CRT) Cinematic Rendering for high resolution photorealistic 3D views of the heart

syngo.CT DE Bone Marrow[1]

- Creation of VNCa (virtual non-calcium) images by performing a three-material decomposition into bone mineral, yellow marrow, and red marrow.

syngo.CT DE Brain Hemorrhage[2]

- Distinguish a contrast agent extravasation from a hemorrhage in the brain.

syngo.CT DE Direct Angio[2]

- Remove bone or dense plastic from CT angiography (CTA) data sets.
- Includes two application classes: Head Bone removal and Body bone removal.
- **Head Bone Removal:** This application class is particularly designed for the visualization of head angiographies, including carotid scans.
- **Body Bone Removal:** This application class is particularly designed for the visualization of the contrast agent in the body and extremities, for example, for runoff CT angiography.

syngo.CT DE Lung Analysis[1]

- Enables the visualization and quantification of the local iodine concentration in the lung parenchyma and vessels in mg/ml

syngo.CT DE Monoenergetic Plus

- Simulation of images that are equivalent to images scanned with a single photon energy beam, depending on the energy (keV). Changing the energy (keV), can enhance the contrast between different materials.
- Improved algorithm for noise reduced images
- Parallel display of multiple Monoenergetic Plus ROIs and their respective attenuation curves
- Saving of Monoenergetic Plus ROI information for statistical evaluations

syngo.CT DE Virtual Unenhanced[4]

- Visualize the contrast agent concentration in soft body tissue without the need of an additional non-contrast scan.
- Generation of virtual non-contrast (VNC) images by subtracting iodine from the Dual Energy data sets. The VNC images can be used for baseline density measurements.

syngo.CT Dynamic Angio

- Perform an analysis of vascular dynamics in one workflow
- Calculate and display time attenuation curves and quantitative information.
- Support in the assessment of blood vessels following 4D acquisition, and visualizing clot location and size

[1] *Not available for NAEOTOM Alpha in the USA. Future availability cannot be guaranteed.*
[2] *Not available for NAEOTOM Alpha. Future availability cannot be guaranteed.*
[3] *syngo.CT ASPECTS can either be purchased as standalone application or as part of syngo.CT Neuro Perfusion. syngo.CT ASPECTS is not available in the U.S. Future availability cannot be guaranteed.*
[4] *Liver ECV and Liver Fat Maps are not available for NAEOTOM Alpha. Future availability cannot be guaranteed.*

syngo.CT Neuro DSA

- Remove / Suppress bone structures in CTA (CT Angiography) scans to provide a bonefree view of the cerebral vessel system/vasculature
- Improve visualization of vascular structures in the area of the skull base and assist in delineating aneurysms and other vascular diseases

syngo.CT Neuro Perfusion

- Tissue-at-risk model with user-defined perfusion parameters (e.g., CBF, SBV, TTD, TTS, TTP, MTT, Tmax, rCBF)
- Differentiate between penumbra and core infarct regions.
- Hypoperfused area and mismatch ratio are automatically calculated
- Allows visual inspection of time attenuation curves
- Custom mismatch parameters definition
- 5-step workflow available both as guided or automated (AutoStroke, Rapid Results Technology)
- Rapid Results Technology automatically processes CT perfusion datasets for stroke evaluation without any user interaction and with direct transfer to a defined DICOM node
- Stroke Layout provides an overview of all relevant stroke results (e.g., ASPECTS[1], Neuro Perfusion etc.) in one single view. The application will automatically load Stroke results in a dedicated layout to get an overview of all treatment decision relevant results

syngo.CT Vascular Analysis

- Curved & cross-sectional ranges
- VesselSURF
- Vessel tracking (2-click centerline)
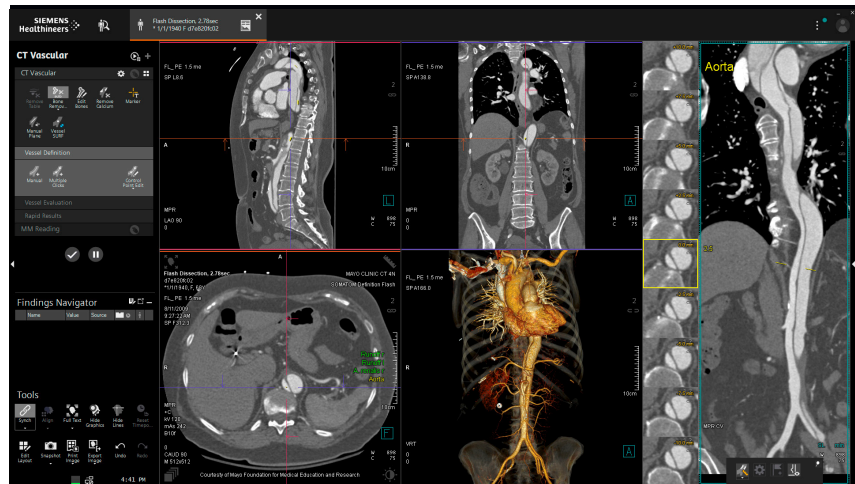
syngo.CT Vascular Analysis

- Stenosis measurement
- Single Energy Calcification Removal
- DE Direct Angio for Bone and Calcification Removal
- Bone & vessel isolation mode for selective highlighting of high contrast structures
- Rapid Results Technology for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) range series of aorta, carotid arteries and left/right runoffs
- Rapid Results Technology for automatic generation and archiving of bone and table removed VRT/MIP radial Ranges
- Export segmentation meshes as DICOM objects for third-party usage
- Cinematic VRT: Cinematic Rendering for high resolution photorealistic 3D views of the vessels

syngo.CT Vascular Analysis – Autotracer

- Automatic tracking and labeling of main vessels (zero-click)

syngo.CT Brain Hemorrhage[2]

- Support for emergency triage of suspected intracranial hemorrhage (ICH)
- Detects and flags up ready-to-read suspected ICH including subarachnoid hemorrhages
- Helps under-pressure radiologists spot suspected bleeding and prioritize a non-contrast scan

syngo.CT Brain Quantification[2]

- Automatic identification and localization of brain hyperdensities, with contour segmentation and total volume calculation of the hyperdensities per case
- Automatic identification of landmarks that support the user in quantifying the shift of the brain midline

syngo.CT LVO Detection[2]

- Automated support for emergency triage of suspected large vessel occlusion
- Detects and flags suspected LVO, ready-to-read on *syngo*.via
- Helps under-pressure radiologists spot LVO and prioritize patients

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[1] *syngo.CT ASPECTS can either be purchased as standalone application or as part of syngo.CT Neuro Perfusion. syngo.CT ASPECTS is not available in the U.S. Future availability cannot be guaranteed.*
[2] *Not available for the U.S. Future availability cannot be guaranteed.*

Computed Tomography

Cardiovascular CT Package

syngo.CT Cardiac Function

- Left Ventricular Analysis (LVA)
- Automated left ventricular segmentation
- MinDose capability
- Left ventricular volumetry
- Left ventricular wall analysis
- 17-segment 2D polar maps
- Single-click navigation to aortic and mitral valve plane
- Cinematic VRT (CRT) Cinematic Rendering for high resolution photorealistic 3D views of the heart
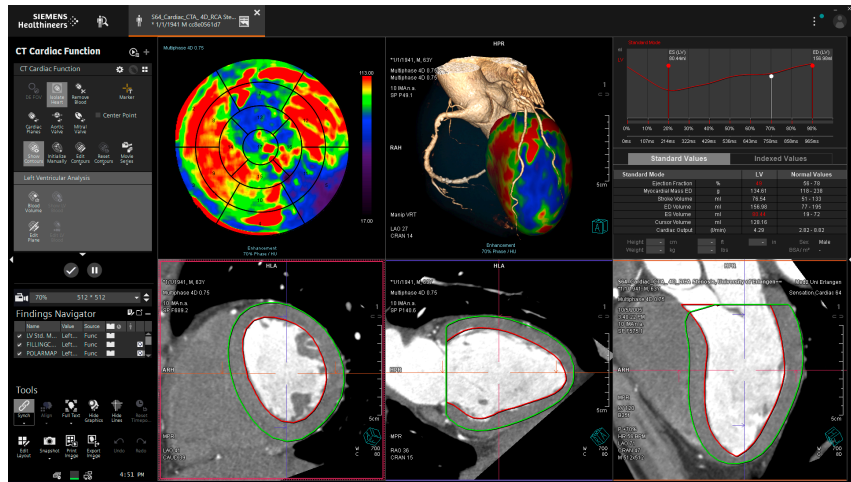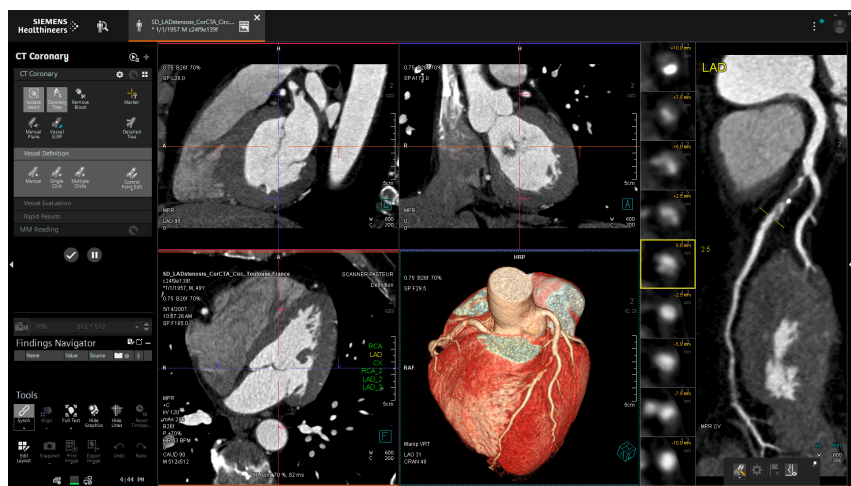
syngo.CT Cardiac Function – Enhancement

- Visualization of first pass, Dual Energy, and dynamic myocardial perfusion data
- AHA-conform 17-segment polar maps for visualization of all types of myocardial perfusion data

syngo.CT Cardiac Function – Right Ventricle

- RVA – Right Ventricle Volumetry

syngo.CT CaScoring

- Calculation of vessel specific and total Agatston equivalent score of coronary arteries
- Preferred loading of Agatston-equivalent low kV series
- Rapid Result Technology for standardized and automated total CaScore result.

syngo.CT Cardiac Function

syngo.CT Coronary Analysis

syngo.CT Coronary Analysis

- Angio view
- VesselSURF for navigation along coronaries
- Automatic coronary tracking and labeling (RCA, LM, CX, major coronary branches, and saphenous vein grafts)
- Single-click stenosis measurement
- Single-click coronary vessel tracing
- Image sharpening for stent/ calcified lesion evaluation
- Rapid Results Technology for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction), LAD, RCA, and CX
- Export segmentation meshes as DICOM objects for third-party usage
- Cinematic VRT (CRT) Cinematic Rendering for high resolution photorealistic 3D views of the heart

syngo.**CT DE Direct Angio¹**

- Remove bone or dense plastic from CT angiography (CTA) data sets.
- Includes two application classes: Head Bone removal and Body bone removal.
- **Head Bone Removal:** This application class is particularly designed for the visualization of head angiographies, including carotid scans.
- **Body Bone Removal:** This application class is particularly designed for the visualization of the contrast agent in the body and extremities, for example, for runoff CT angiography.

syngo.**CT DE Hardplaque Display¹**

- Visualization of calcified plaques within large vessels even if they have CT values that are comparable to the neighboring contrast agent

syngo.**CT DE Heart PBV¹**

- Visualization of the contrast agent uptake in the myocardium.

syngo.**CT DE Monoenergetic Plus**

- Simulation of images that are equivalent to images scanned with a single photon energy beam, depending on the energy (keV). Changing the energy (keV), can enhance the contrast between different materials.
- Improved algorithm for noise reduced images

- Parallel display of multiple Mono-energetic Plus ROIs and their respective attenuation curves
- Saving of Monoenergetic Plus ROI information for statistical evaluations

syngo.**CT Myocardial Perfusion**

- Visualization of time-variant multislice or volumetric data
- Calculation of various volumetric perfusion parameter images
- Inputs of target volumes of interest (VOI) and volumetric segmentation of myocardium
- Composite images allowing a merged display of an anatomical image with a color parameter display in the target VOI
- VOI and ROI (region of interest) measurement tools for a detailed analysis of perfusion characteristics
- Color display of perfusion parameter
- Assessment and quantification of the perfusion of the myocardium

syngo.**CT Vascular Analysis**

- Curved & cross-sectional ranges
- VesselSURF
- Vessel tracking (2-click centerline)
- Stenosis measurement
- Single Energy Calcification Removal
- DE Direct Angio for bone and Calcification Removal

- Bone & vessel isolation mode for selective highlighting of high contrast structures
- Rapid Results Technology for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) range series of aorta and left/right runoffs
- Rapid Results Technology for automatic generation and archiving of bone and table removed VRT/MIP radial Ranges
- Export segmentation meshes as DICOM objects for third-party usage
- Cinematic VRT: Cinematic Rendering for high resolution photorealistic 3D views of the vessels

syngo.**CT Vascular Analysis – Autotracer**

- Automatic tracking and labeling of main vessels (zero-click)

Neurology CT Package

syngo.**CT ASPECTS²**

- Support assessment and severity of ischemic changes on non-contrast CT head scans
- Automatic calculation of the ASPECT score (Alberta stroke program early CT score) based on a 10-point quantitative topographic CT scan.
- Automatically calculate ASPECT score and send standardized results to PACS with Rapid Results technology.

¹ Not available for NAEOTOM Alpha. Future availability cannot be guaranteed.
² syngo.CT ASPECTS can either be purchased as standalone application or as part of syngo.CT Neuro Perfusion.
  syngo.CT ASPECTS is not available in the U.S. Future availability cannot be guaranteed.

Computed Tomography

syngo.CT DE Bone Marrow[1]

- Creation of VNCa (virtual non-calcium) images by performing a three-material decomposition into bone mineral, yellow marrow, and red marrow.

syngo.CT DE Brain Hemorrhage[2]

- Distinguish a contrast agent extravasation from a hemorrhage in the brain.

syngo.CT DE Direct Angio[2]

- Remove bone or dense plastic from CT angiography (CTA) data sets.
- Includes two application classes: Head Bone removal and Body bone removal.
- **Head Bone Removal:** This application class is particularly designed for the visualization of head angiographies, including carotid scans.
- **Body Bone Removal:** This application class is particularly designed for the visualization of the contrast agent in the body and extremities, for example, for runoff CT angiography.

syngo.CT DE Hardplaque Display[2]

- Visualization of calcified plaques within large vessels even if they have CT values that are comparable to the neighboring contrast agent

syngo.CT DE Monoenergetic Plus

- Simulation of images that are equivalent to images scanned with a single photon energy beam, depending on the energy (keV).

Changing the energy (keV), can enhance the contrast between different materials.

- Improved algorithm for noise reduced images
- Parallel display of multiple Mono-energetic Plus ROIs and their respective attenuation curves
- Saving of Monoenergetic Plus ROI information for statistical evaluations

syngo.CT Dynamic Angio

- Perform an analysis of vascular dynamics in one workflow
- Calculate and display time attenuation curves and quantitative information
- Support in the assessment of blood vessels following 4D acquisition, and visualizing clot location and size

syngo.CT Neuro DSA

- Remove / Suppress bone structures in CTA (CT Angiography) scans to provide a bonefree view of the cerebral vessel system/vasculature
- Improve visualization of vascular structures in the area of the skull base and assist in delineating aneurysms and other vascular diseases

syngo.CT Neuro Perfusion

- Tissue-at-risk model with user-defined perfusion parameters (e.g., CBF, SBV, TTD, TTS, TTP, MTT, Tmax, rCBF)
- Differentiate between penumbra and core infarct regions.
- Hypoperfused area and mismatch ratio are automatically calculated

- Allows visual inspection of time attenuation curves
- Custom mismatch parameters definition
- 5-step workflow available both as guided or automated (AutoStroke, Rapid Results Technology)
- Rapid Results Technology automatically processes CT perfusion datasets for stroke evaluation without any user interaction and with direct transfer to a defined DICOM node

syngo.CT Brain Hemorrhage[3]

- Support for emergency triage of suspected intracranial hemorrhage (ICH)
- Detects and flags up ready-to-read suspected ICH including sub-arachnoid hemorrhages
- Helps under-pressure radiologists spot suspected bleeding and prioritize a non-contrast scan

syngo.CT Brain Quantification[3]

- Automatic identification and localization of brain hyperdensities, with contour segmentation and total volume calculation of the hyperdensities per case
- Automatic identification of land-marks that support the user in quantifying the shift of the brain midline

syngo.CT LVO Detection[3]

- Automated support for emergency triage of suspected large vessel occlusion
- Detects and flags suspected LVO, ready-to-read on *syngo*.via
- Helps under-pressure radiologists spot LVO and prioritize patients

[1] *Not available for NAEOTOM Alpha in the U.S. Future availability cannot be guaranteed.*
[2] *Not available for NAEOTOM Alpha. Future availability cannot be guaranteed.*
[3] *Not available for the U.S. Future availability cannot be guaranteed.*

Oncology CT Package

syngo.CT Body Perfusion

- Fast simultaneous multislice calculation of blood flow, blood volume, permeability images
- Automated motion correction for improved anatomical alignment
- Guided workflow, for example, predefined evaluation templates for tumor and liver
- User-defined individual evaluation templates
- VOI measurement tool for perfusion
- Composite images – merged anatomical and color parameter display
- Dedicated liver perfusion analysis

syngo.CT Bone Reading

- Unfolded view of the ribs to view the complete rib cage on a single image
- Unfolded view of the spine to view the complete spine anatomy
- Automated rib and spine labeling and numbering
- Automated results generation and archiving in PACS (through Rapid Results Technology).

syngo.CT Colonography

- Parallel flight prone/supine visualization
- 3D Reading (Fly-through)
- Global View (Solid/ Semi-transparent)

- Registered navigation (prone/supine)
- Delete small intestine
- Distance to rectum
- Stool tagging
- Panoramic View
- Polyp measurements in 3D endo-luminal view

syngo.CT Colonography Advanced

- Polyp Lens
- Stool Removal
- Virtual Dissection for an unrolled, sliced open and flattened display of the colonic surface

syngo.CT Colonography – PEV

- Polyp Enhanced Viewing (PEV)
- PEV marker
- Auto-processing

syngo.CT DE Bone Marrow[1]

- Creation of VNCa (virtual non-calcium) images by performing a three-material decomposition into bone mineral, yellow marrow, and red marrow.

syngo.CT DE Virtual Unenhanced[2]

- Visualize the contrast agent concentration in soft body tissue without the need of an additional non-contrast scan.
- Generation of virtual non-contrast (VNC) images by subtracting iodine from the Dual Energy data sets. The VNC images can be used for baseline density measurements.

syngo.CT DE Monoenergetic Plus

- Simulation of images that are equivalent to images scanned with a single photon energy beam, depending on the energy (keV).
- Changing the energy (keV) can enhance the contrast between different materials.
- Improved algorithm for noise reduced images
- Parallel display of multiple Monoenergetic Plus ROIs and their respective attenuation curves
- Saving of Monoenergetic Plus ROI information for statistical evaluations

syngo.CT Lung CAD

- Adjunct concurrent first reader or second reader tool
- Solid Nodule detection
- Partial solid and Ground-Glass Nodule (GGN) detection
- Auto-processing
- Mini-Toolbar
- Rapid Results Technology for standardized and automated Lung CAD results creation and archiving
- Multivendor CT support

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[1] *Not available for NAEOTOM Alpha in the USA. Future availability cannot be guaranteed.*
[2] *Liver ECV and Liver Fat Maps are not available for NAEOTOM Alpha. Future availability cannot be guaranteed.*

Computed Tomography

syngo.CT Pulmo 3D

- Segmentation of lungs
- Evaluation: lung volume, mean lung density, and standard deviation
- Calculation of evaluation index, subranges, percentiles, and clusters
- Result presentation in tables and histograms
- Measurement of airways
- Context-specific reporting
- Segmentation of lung lobes and evaluation of airways (trachea and bronchi) with color-coded display

syngo.CT Segmentation

- Volume rendering of segmentation
- Semi-automated RECIST 1.0 or 1.1 calculation
- Semi-automatic segmentation of solid and subsolid lung nodules, liver, lymph nodes and general lesions
- Choi criteria in report
- Dual Energy support of *syngo*.CT DE Virtual Unenhanced
- Advanced HU Statistics with color coding of hypodense areas of lesions (potential indicator for necrosis)

syngo.MM Multi-Timepoint Evaluation

- Dual-time point comparison
- 8-time point visualization
- Quantify tumor growth rates between time points

syngo.CT Lung Lobe Segmentation[2]

- The application provides automatic lung lobes volume segmentation.
- Automated results generation and archiving in PACS (through Rapid Results Technology).

Optional Licenses

syngo.CT Liver Analysis[1]

- Pre-processing for complete liver segmentation
- Semi-automated segmentation of liver lesions
- Semi-automated segmentation of arterial, portal venous, and venous vascular and bile ducts tree
- 3D semi-automated mapping of vascular supply areas onto liver tissue
- Virtual dissection planes and sub-sequent volumetric calculation of resected and residual liver
- Review of results on available MRI datasets

syngo.CT AI-Rad Pulmo Density[1]

- CT-based quantitative assessment of lung areas with elevated and high opacities, which may occur in the context of pneumonia.
- Provides automated evaluation and documentation by 3D quantification of lung lobes, left, and right lung.
- The CT Pulmonary Density has been shown to generate quantifiable results on COVID-19 infected lungs (percentage and ml affected in correlation to total lung and lung lobe volumes).

syngo.CT Onco Function Hepatic AEF[1]

- Dedicated color-coded visualization of arterial enhancement fraction (AEF) values calculated from routine abdominal multi-phase CT
- Enables assessment of hepatic arterial perfusion compared to the total perfusion.

syngo.CT TAVI Valve Pilot[1]

- Display of the aortic annulus plane based on aortic valve hinge points.
- All measurements for quantitative annulus assessment (annulus area, annulus perimeter min and max diameters, effective diameters based on annulus area or perimeter) are ready for review as the case is opened.

[1] This feature is available with optional license only.
[2] Not available for the U.S. Future availability cannot be guaranteed

CT Clinical Packages Overview

✓ Included	Routine	Acute Care	Cardiovascular	Neurology	Oncology	Dual Energy Adv./ Spectral Imaging	Routine Light	Acute Care Light	Cardiovascular Light	Neurology Light	Oncology Light
			Clinical Packages						Clinical Light Packages		
syngo.CT ASPECTS[1]		✓		✓				✓		✓	
syngo.CT Body Perfusion					✓						
syngo.CT Bone Reading		✓			✓			✓			✓
syngo.CT Cardiac Function			✓						✓		
syngo.CT Cardiac Function Enhancement			✓						✓		
syngo.CT Cardiac Function RVA			✓						✓		
syngo.CT CaScoring	✓		✓				✓	✓	✓		
syngo.CT Colonography	✓				✓		✓				✓
syngo.CT Colonography Advanced					✓						✓
syngo.CT Colonography PEV					✓						✓
syngo.CT Coronary Analysis		✓	✓					✓	✓		
syngo.CT DE Bone Marrow[4]		✓		✓	✓	✓					
syngo.CT DE Brain Hemorrhage[2]		✓		✓		✓					
syngo.CT DE Calculi Characterization	✓					✓					
syngo.CT DE Direct Angio[2]		✓	✓	✓		✓					
syngo.CT DE Gout	✓					✓					
syngo.CT DE Hardplaque Display[2]			✓	✓		✓					
syngo.CT DE Heart PBV[2]			✓			✓					
syngo.CT DE Lung Analysis[4]		✓				✓					
syngo.CT DE Monoenergetic Plus	✓	✓	✓	✓	✓	✓					
syngo.CT DE Virtual Unenhanced[3]		✓			✓	✓					
syngo.CT Dental	✓						✓				
syngo.CT Dynamic Angio		✓		✓				✓		✓	
syngo.CT Lung CAD					✓						✓
syngo.CT Myocardial Perfusion			✓								
syngo.CT Neuro DSA	✓	✓		✓			✓	✓		✓	
syngo.CT Neuro Perfusion		✓		✓				✓		✓	
syngo.CT Pulmo 3D					✓						✓
syngo.CT Rapid Stent Planning		✓							✓		
syngo.CT Segmentation					✓						✓
syngo.CT Vascular Analysis	✓	✓	✓				✓	✓	✓		
syngo.CT Vascular Autotracer		✓	✓					✓	✓		
syngo.MM Multi-Timepoint Extension					✓						✓
syngo.CT LVO Detection[4]		✓		✓				✓		✓	
syngo.CT Brain Hemorrhage[4]		✓		✓				✓		✓	
syngo.CT Brain Quantification[4]		✓		✓				✓		✓	
syngo.CT Lung Lobe Segmentation[4]					✓						✓

[1] syngo.CT ASPECTS can either be purchased as standalone application or as part of syngo.CT Neuro Perfusion.
  syngo.CT ASPECTS is not available in the U.S. Future availability cannot be guaranteed.
[2] Currently not available for NAEOTOM Alpha. Future availability cannot be guaranteed.
[3] Liver ECV and Liver Fat Maps are not available for NAEOTOM Alpha. Future availability cannot be guaranteed.
[4] Not available for NAEOTOM Alpha in the U.S. Future availability cannot be guaranteed

Magnetic Resonance

The MR applications and clinical packages make it easier to add advanced applications to clinical routine thanks to the capability of *syngo*.via to take out the complexity of advanced post-processing.

Standardization of the results is improved through robust algorithms and user-defined automation of the processing steps. Finally, communicating the results to the referring physician in a meaningful way is made possible by structured reports following clinical recommendations.

MR Routine Package	MR Oncology Package	MR Neurology Package	MR Cardiovascular Package
syngo.MR General	*syngo*.MR 3D Lesion Segmentation	*syngo*.MR Neuro fMRI	*syngo*.MR Cardiac 4D Ventricular Function
syngo.MR Composing	*syngo*.MR BreVis	*syngo*.MR Neuro Perfusion	*syngo*.MR Cardiac Flow
	syngo.MR Oncology	*syngo*.MR Neuro Perfusion Mismatch	*syngo*.MR Cardiac Perfusion[1]
	syngo.MR OncoTrend	*syngo*.MR Spectro CSI	*syngo*.MR Vascular Analysis
	syngo.MR Spectro CSI	*syngo*.MR Spectro SVS	
	syngo.MR Spectro SVS	*syngo*.MR Spectro Extension	
	syngo.MR Spectro Extension	*syngo*.MR Spectro Research	
	syngo.MR Spectro Research	*syngo*.MR Tractography	
	syngo.MR Tissue 4D		

Optional: Brain MR Morphometry[2]
Prostate MR[2,3]
syngo.mMR General

[1] *This feature is not commercially available in the U.S.*

[2] *Available with optional license only*

[3] *Prostate MR is not commercially available in some countries. Due to regulatory reasons their future availability cannot be guaranteed.*
Please contact your local Siemens Healthineers organization for further details.

MR Routine Package

syngo.MR General

- MR Basic workflow with Easy Reading Mode for intuitive reading of examinations from different body regions. Fast interactions to select, fuse, and compare series in suitable layouts.

- MR Neurology workflow for efficient reading of neuro examinations with customizable layouts. With the respective licenses, the tools for advanced DSC perfusion analysis (Perfusion Maps[1], specific Mean Curve[1], Mismatch[2]) and semi-automated lesion segmentation[3] are centrally accessible within the workflow.

- Includes MR Breast Reading workflow for synchronized reading of 2D, 3D, and 4D images with on-the-fly mean curve analysis and BIRADS reporting.

- Includes MR Prostate Reading workflow for simultaneous reading of anatomical, diffusion, and T1-weighted dynamic images with PI-RADS™ v2 prostate reporting and prostate biopsy support (RTSS export).

- MR Cardio-Vascular Reading Workflows: Cardiac Reader (incl. Tissue Volume Quantification tool) and MR Angiography.

- MR Evaluation: Mean Curve analysis, Image Filter, 2D/3D Distortion Correction, Elastic Motion Correction, Addition, Subtraction, Multiplication and Division.

- Diffusion tools: Generation of ADC maps and computed b-value images with interactive preview.

syngo.MR Composing

Composing of images from different table positions

- Automatic and manual composing of sagittal and coronal images

- Dedicated algorithms for spine and angiography

- Dedicated algorithm to combine multiple axial series (e.g., DWI examinations)

- Integration of the composing step in the Angio Multi Station and Whole Spine workflows

- Supporting the standardization of whole-body MRI for treatment response monitoring

MR Oncology Package

syngo.MR 3D Lesion Segmentation

- Semi-automated volumetric evaluation of lesions

- Two possible modes: Box-based and brush-based initialization of segmentation

- Longest lesion diameter provided

- Correction tools

syngo.MR BreVis

syngo.MR BreVis provides advanced tools for contrast-enhanced MR mammography and enables efficient breast reading and reporting.

- Elastic motion correction

- Automatic subtraction

- Automatic synchronization of 2D, 3D and 4D datasets

- Parametric analysis of dynamics: wash-in, wash-out, curve type, enhancement rate, PEI

- Set of predefined layouts suitable for breast reading on one or two monitors

- Automated calculation of intuitive color-coded maps as overlay on anatomy

- On-the-fly ROI-based and VOI-based curve analysis

- Computation of enhancing volume

- Graphical volume statistics of lesion enhancement

- Reporting according to BI-RADS standard

[1] *Requires syngo.MR Neuro Perfusion*
[2] *Requires syngo.MR Neuro Perfusion Mismatch*
[3] *Requires syngo.MR 3D Lesion Segmentation*

Magnetic Resonance

syngo.MR Onco

*syngo*.MR Onco provides an intuitive way to deal with the high amount of data generated in oncological studies.

- RECIST evaluation tool
- Additional specific Oncology layouts
- Dedicated follow-up layout
- Structured report for communication of the results

syngo.MR OncoTrend

- VOI and ROI-based histogram analysis
- Intuitive color definition for three histogram domains
- Presets for histogram analysis can be saved
- Back-mapping of histogram colors on the image of reference
- ADC-based whole-body tumor burden assessment and trending
- Efficient and reproducible workflow with quantitative results, supporting the standardization of whole-body MRI for treatment response monitoring
- Supporting the standardization of whole-body MRI for treatment response monitoring

syngo.MR Spectro CSI

- Integrated quality check
- Automatic post-processing of the spectrum (including baseline and phase adjustment)
- Improved algorithm based on extended prior knowledge modeling
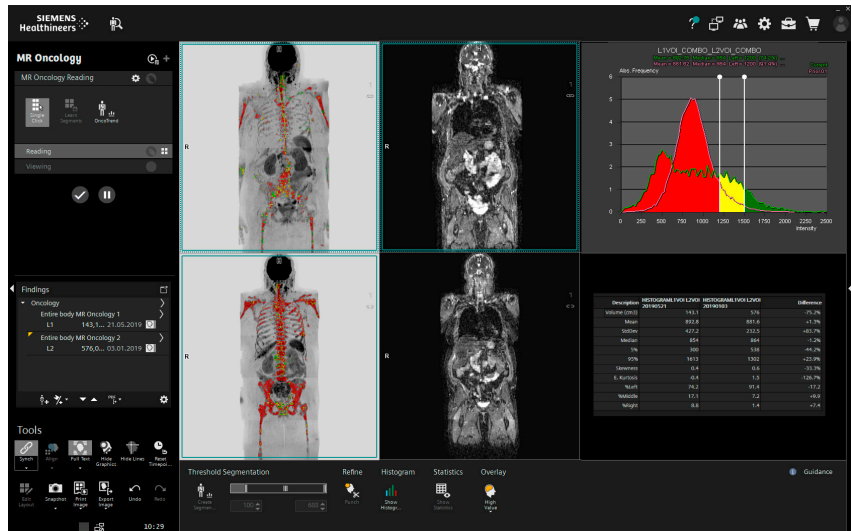
syngo.MR OncoTrend

- Automatic display of color-coded metabolite images (preset or user-defined) with possibility of 3D coloring interpolation
- Automatic display of the fit on the spectral map
- Automatic MPR creation for reference images (Inline MPR creation to match slice positioning of CSI slice(s))
- Real-time display of CSI spectra
- Integration in the prostate workflow: The pre-processed results are automatically displayed in the main reading step

syngo.MR Spectro SVS

- Integrated quality check
- Automatic post-processing of the spectrum (including baseline and phase adjustment)

- Improved algorithm based on extended prior knowledge modeling
- Ad-hoc possibility

syngo.MR Spectro Extension

- Quality check criteria can be defined by the user
- More display possibilities (e.g., real/imaginary parts)
- Creation of new metabolite templates

syngo.MR Spectro Research

- Support of multi-nuclear option
- Manual phase correction
- Additional fitting line for single metabolites
- Advanced export functionalities: raw data, model signal files, and curve result value data (gda format)

syngo.MR Tissue 4D

syngo.MR Tissue 4D provides advanced tools for T1 perfusion evaluation.

- Elastic motion correction

- Registration of dynamic data on anatomical data

- Manual or automated selection of the processing volume (spheroid or cuboid)

- Qualitative model: wash-in, wash-out, iAUC, TTP, AT, PEI

- Quantitative model (Tofts model): Ktrans, Kep, Ve. Three predefined arterial input functions are available

- Overlay of parametric maps on selectable MR images

- On-the-fly, ROI-based, and VOI-based curve analysis

- Tissue 4D is configurable to automatically perform the motion correction, registration, and initial computation of the pharmaco-kinetics analysis readily in the pre-processing phase

- Integration in the prostate workflow: The pre-processed results are automatically displayed in the main reading step

- Export of processing results as DICOM or .CSV format
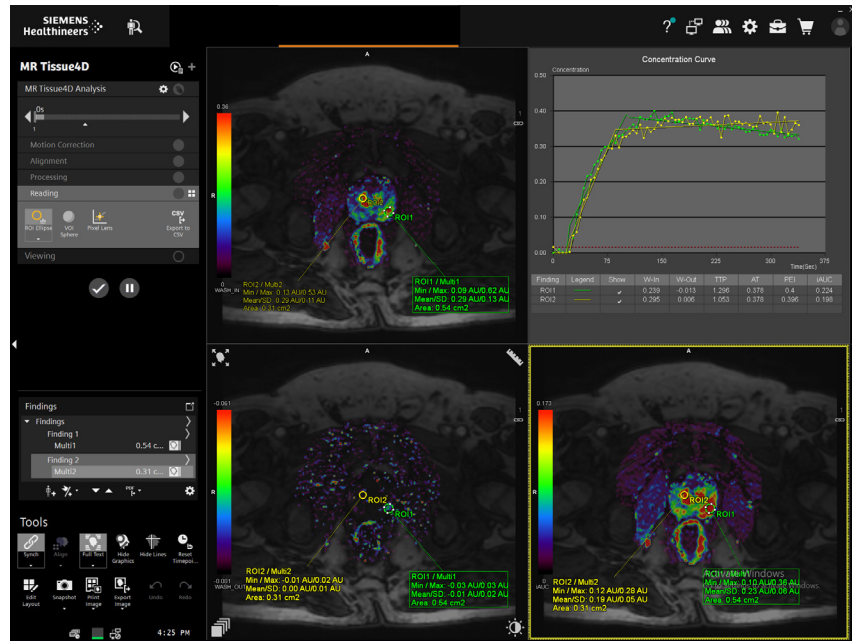
syngo.MR Tissue 4D

MR Neurology Package

syngo.MR Neuro fMRI

- Multi-contrast evaluation of up to 4 fMRI contrasts with simultaneous overlay in 2D and 3D

- Automatic selection and registration of BOLD datasets across multiple sessions

- 3D Visualization: Color t-value maps on anatomical datasets

- LUT, thresholding, clustering, and interpolation settings can be customized and saved for automatic later reuse

- Volume navigation and display possibilities: Zoom, pan, rotate, cut planes, split planes, head mask, brain mask

- Analysis of Signal Time Curves: Time course layout (3D Fused MPR and dynamic BOLD data), interactive analysis with up to 10 VOIs, shrink to activation functionality, side by side display of signal time and motion curves

- Offline calculation of statistical maps from BOLD data (t-value maps with t-test or with GLM)

- Export of processing results as DICOM or RGB data. Additionally, all color fused images and results can be stored or printed

- If the respective option is available, results from *syngo*.MR Tractography can be displayed and exported together with fMRI results and anatomy

Magnetic Resonance

syngo.**MR Neuro Perfusion**

syngo.MR Neuro Perfusion enables processing of brain perfusion datasets within the MR Neurology workflow

- Rigid Motion Correction and spatial filter
- Computation of relative Mean Transit Time (relMTT), relative Cerebral Blood Volume (relCBV), relative Cerebral Blood Flow (relCBF), Time to Peak (TTP), Time to Maximum (TMAX), and Percentage of Baseline at Peak (PBP)
- Global AIF, Global AIF with delay correction, local AIF, and local AIF with T1 correction for perfusion maps generation.
- Preprocessing functionality for map generation using local AIF methods
- Dedicated stripes layout for perfusion map reading
- Mean Curve Evaluation with up to 10 ROIs
- Summary table displaying results with .CSV export functionality
syngo.MR Neuro Perfusion Mismatch
- One-click mirror ROIs on the contralateral side with ratio computation
- Mismatch evaluation between any series with same frame of reference
- Evaluation based on ROIs or combination of ROIs
- Summary table displaying results with .CSV export functionality

syngo.**MR Spectroscopy**

syngo.**MR Spectro CSI**

- Integrated quality check
- Automatic post-processing of the spectrum (including baseline and phase adjustment)
- Improved algorithm based on extended prior knowledge modeling
- Automatic display of color-coded metabolite images (preset or user-defined) with possibility of 3D coloring interpolation
- Automatic display of the fit on the spectral map
- Automatic MPR creation for reference images (Inline MPR creation to match slice positioning of CSI slice(s))
- Real-time display of CSI spectra
- Integration in the prostate workflow: The pre-processed results are automatically displayed in the main reading step

syngo.**MR Spectro SVS**

- Integrated quality check
- Automatic post-processing of the spectrum (including baseline and phase adjustment)
- Improved algorithm based on extended prior knowledge modeling
- Ad-hoc possibility

syngo.**MR Spectro Extension**

- Quality check criteria can be defined by the user
- More display possibilities (e.g., real/imaginary parts)
- Creation of new metabolite templates

syngo.MR Spectro Research

- Support of multi-nuclear option
- Manual phase correction
- Additional fitting line for single metabolites
- Advanced export functionalities: raw data, model signal files, and curve result value data (gda format)

syngo.MR Tractography

- Automatic selection and registration of DTI datasets
- Tracts from different tensor acquisitions can be combined
- Offline calculation of tensor from DTI raw data for tractography post-processing. The following diffusion maps can additionally be generated: ADC, b0, Trace-Weighted, FA (Fractional Anisotropy), AD (Axial Diffusivity), RD (Radial Diffusivity)
- Automatic whole brain tractography with user-customizable settings
- Easy definition of DTI seed regions with VOIs, planes, and logical combination of both
- Freehand ROI
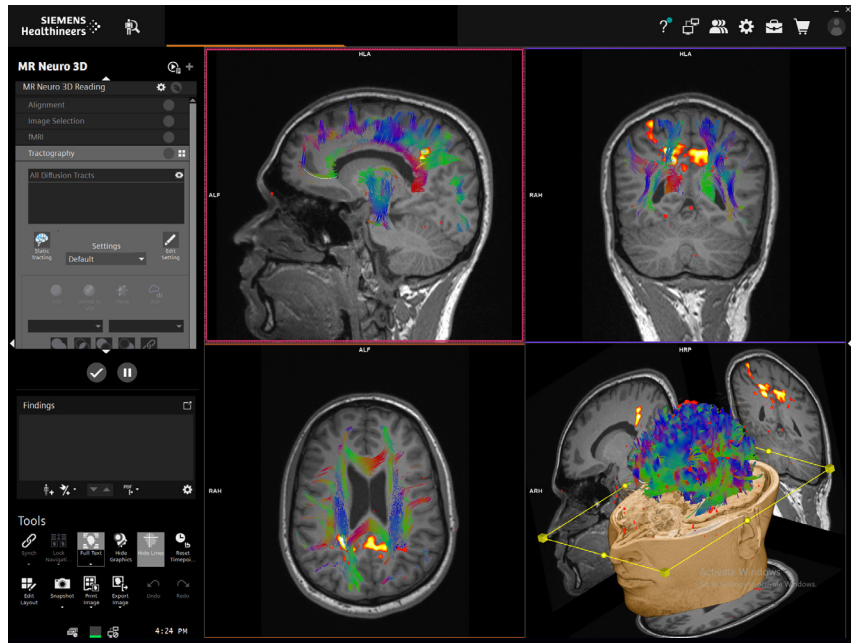
syngo.MR Tractography

- On-the-fly tracts exploration by moving the VOI over the dataset
- Flexible parameters adjustment to generate tracts
- DTI seed generation using fMRI activated voxels.
- Simultaneous display of diffusion maps (ADC, FA, RD, AD, trace-weighted) and tractography results with anatomical images

- DTI Evaluation step: Side by side display of multiple diffusion maps for simultaneous evaluation
- Volume navigation and display possibilities: Zoom, pan, rotate, cut planes, split planes, head mask, brain mask

Magnetic Resonance

MR Cardiovascular Package

syngo.MR Cardiac 4D Ventricular Function

- Fully automatic left ventricle and semi-automatic right ventricle segmentation
- Volume-time curves
- MyoMaps provides pixel-based myocardial quantification
- 4D visualization
- Easy user guidance with graphical selection of ED, ES, basal, and apical slices
- Volumetric and regional wall motion analysis
- Export of result images containing relevant contours
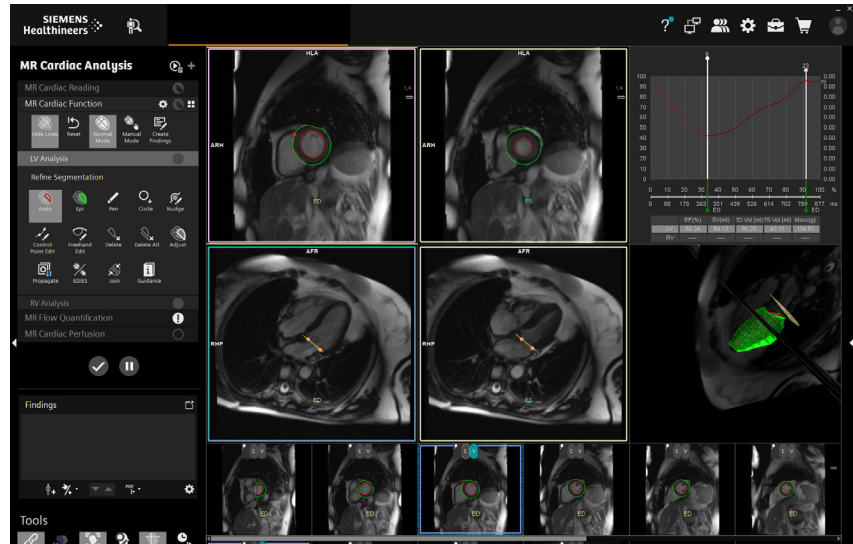
syngo.MR Cardiac 4D Ventricular Function

syngo.MR Cardiac Flow

- One-click vessel segmentation
- Color-coded display of velocity values
- Calculation of flow and velocity parameters (e.g., peak velocity, average velocity, flow, integral flow), regurgitation fraction
- Inversion of polarity of flow-encoding direction (mirror flow curves)
- Export of result images containing relevant contours

syngo.MR Cardiac Perfusion[1]

- Fully automated motion correction of perfusion series
- Specific synchronization of rest and stress series
- Generation of parametric maps: TTP, AUC, Slope
- Interactive pixel-based time course analysis
- Evaluation of Time-to-Peak, Peak Value, Uptake Slope, Area under the Curve
- Graphical display of results in parametric bull's-eye plot

syngo.MR Vascular Analysis

- Viewing with VRT, MPR, or MIP mode
- Special CPR reformatting along the vessel centerline
- Semi-automatic detection of vessel segments
- Quantitative assessment of vascular lesions (e.g., stenosis degree)
- Integration in the Angio workflows

[1] This feature is not commercially available in the U.S.

Single Application

syngo.mMR General

syngo.mMR General is an application providing dedicated features for analysis of MR-PET images.

- Dedicated MR-PET layouts
- Dedicated layout for MR-PET and PET-CT comparison
- SUV units supported: SUV_bw, SUV_lbm, SUV_bsa
- SUV parameter GUI
- VOI isocontour: PET-segmentation tool
- Copy-Paste of ROIs and VOIs between MR and PET
- MR-PET dedicated reporting
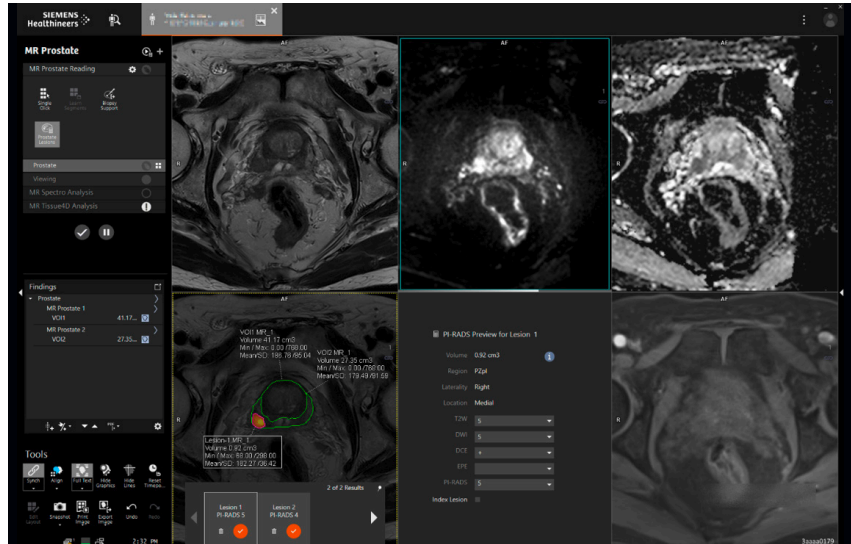
Prostate MR

Prostate MR[1,2]

Prostate MR provides an automated detection and classification of suspicious prostate lesions that need to be approved by a radiologist

- lesion classification according to PI-RADS v.2.1 standard
- pre-population of PI-RADS report
- automated prostate segmentation

Brain MR Morphometry[1]

Brain MR Morphometry extends the MR Neurology workflow, contained in a comprehensive package for the automatic measurement of the volume properties of different brain structures using MPRAGE data sets, which are required for a typical MR image of the head

- Preprocessing functionality for automatic segmentation and volumetry of MPRAGE data, integrated into the workflow MR Neurology
- Calculation of label maps (display of brain segmentation) and partially combined label maps (fused with the processed MPRAGE data)

- Calculation of deviation maps (representation of brain status in relation to reference data) and partially combined deviation maps (fused with the processed MPRAGE data)
- Creation of an image series for a morphometry report
- Automatic transfer of generated maps and morphometry report to the PACS
- Follow-up measurement, rate of change can be calculated for two time points

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[1] *Some features are available with optional license only.*

[2] *Prostate MR is not commercially available in some countries. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.*

Molecular Imaging

The MI Clinical Packages visualize, measure, and report disease at a functional level, with disease-specific software applications – complementary to your PET/CT, PET/MR, SPECT, or SPECT/CT.

Clinical capabilities may be enhanced by performing organ-specific reading while multiple time-point cases are all registered with each other using ALPHA technology. Measure therapy response with quantitative tools and EQ PET for normalized and comparable results.
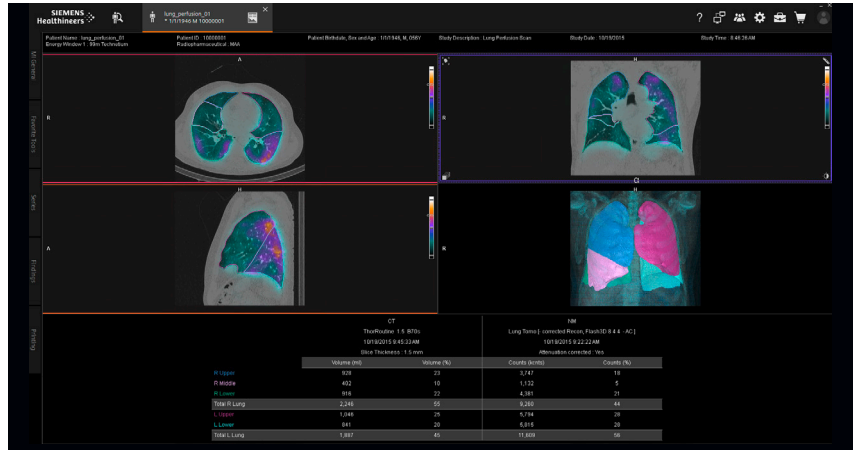
Auto Lung 3D

syngo.MI Oncology	*syngo*.PET Neurology[2]	*syngo*.SPECT Neurology[2]	*syngo*.MI Neurology[2]	*syngo*.NM Organ Processing
syngo.MM Multi-Timepoint Eval	*syngo*.PET DB Comparison	*syngo*.SPECT DB Comparison	*syngo*.PET DB Comparison	MI General
syngo.MI Segmentation	*syngo*.PET Striatal Analysis	*syngo*.SPECT Striatal Analysis	*syngo*.SPECT DB Comparison	NM Organ Processing
syngo.CT Segmentation	*syngo*.PET Cortical Analysis	*syngo*.MI Neuro Subtraction	*syngo*.MI Neuro Subtraction	
syngo.PET Dynamic Analysis			*syngo*.PET Striatal Analysis	
syngo.MM Therapy Interface			*syngo*.SPECT Striatal Analysis	
			syngo.PET Cortical Analysis	

Optional: *syngo*.NM Auto Lung 3D
syngo.PET Auto ID[1]
syngo.MI Anatomy Insights

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[1] *syngo*.PET Auto ID is available as optional purchase and not commercially available in some countries. Due to regulatory reasons its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

[2] Provided as OpenApps in Digital Marketplace.

syngo.**MI Cardiology 4DM**[1]	*syngo*.**PET Cardiology Cedars**[1]	*syngo*.**SPECT Cardiology Cedars**[1]	*syngo*.**MI Cardiology Cedars**[1]	**Cardiology Options**[1]
syngo.PET Corridor4DM	*syngo*.PET Cedars Suite	*syngo*.SPECT Cedars Suite	*syngo*.PET Cedars Suite	*syngo*.CT Extension Corridor4DM
syngo.SPECT Corridor4DM	*syngo*.PET Myocardial Blood Flow		*syngo*.SPECT Cedars Suite	*syngo*.CT Extension Cedars
syngo.PET Myocardial Blood Flow			*syngo*.PET Myocardial Blood Flow	*syngo*.PET Extension Corridor4DM CFR
				syngo.MI Cedars Reporting

[1] *Provided as OpenApps in Digital Marketplace*

Molecular Imaging

syngo.MI Oncology

syngo.MM Multi-Timepoint Eval

- Dual-time point comparison
- 8-time point visualization
- Quantify tumor growth rates between time points

syngo.MI Segmentation

- Functional quantification including SUV, Peak, MTV, TLG/Total Activity, and Deauville five-point score
- Immediate and continual quantification of Max SUV at your mouse pointer
- Reporting and quantifiable treatment response assessment by using Lesion Scout for automated whole-body segmentation
- Projection image creation and display for NaF Whole Body Exams
- Automated reference regions in the liver and blood pool
- Calculate PERCIST threshold for selecting reportable lesions
- Hybrid VRT/MIP illustrating the distribution of functional uptake with the anatomical reference, in a single image and hybrid tools to create measurements
- Hybrid tools to create measurements on functional and anatomical aspects with ease
- EQ•PET harmonizes SUVs across scanners and reconstructions
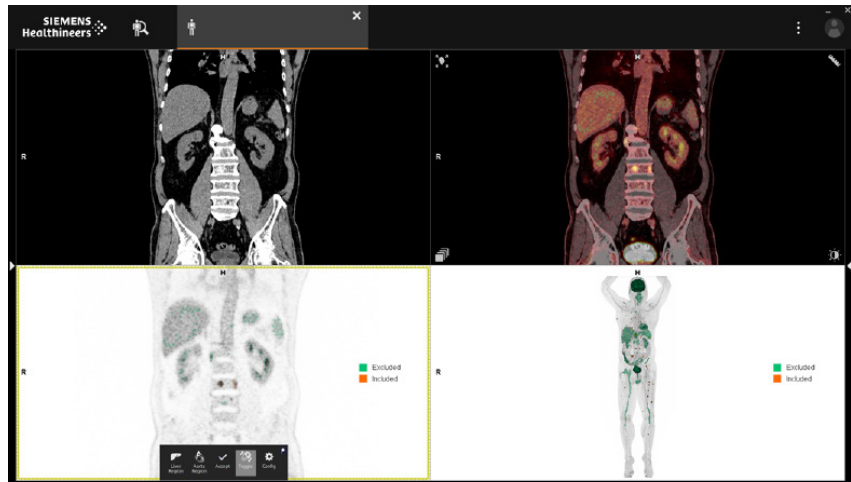
Lesion Scout with Auto ID

syngo.CT Segmentation

- Volume rendering of segmentation
- Semi-automated RECIST 1.0 or 1.1 calculation
- Semi-automated segmentation of lung, liver, lymph node, and general lesions
- General segmentation
- Choi criteria in report
- Dual Energy support of *syngo*.CT DE Virtual Unenhanced[1,2,3]
- Advanced HU Statistics with color-coding of hypodense areas of lesions (potential indicator for necrosis)

syngo.PET Auto ID[4]

- Auto ID for FDG provides suggestions for findings inclusion or exclusion for whole-body tumor burden (MTV/TLG) that need to be confirmed by a reading physician.

syngo.PET Dynamic Analysis

- Evaluate volumetric regions of interest on dynamic acquisitions
- Generate time activity curves (TAC) for standard PET metrics

syngo.MM Therapy Interface

- Copy diagnostic segmentations onto a planning CT as a Target Volume and create an RTSS
- Freehand editing of Target Volumes with nudge tool
- Synchronized temporal navigation and side by side or fused visualization of phase-matched PET/CT respiratory gated data

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[1] Configuration of CT Clinical Packages can vary depending on CT scanner type.

[2] Works with Dual Energy images from the whole SOMATOM Definition Family (Single Source and Dual Source Dual Energy). syngo.CT DE Virtual Unenhanced for Single Source Dual Energy.

[3] Requires at least one user license of syngo.CT DE Virtual Unenhanced.

[4] syngo.PET Auto ID is available for optional purchase and not commercially available in some countries. Due to regulatory reasons its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

syngo.MI Anatomy Insights[1]

- Fully automated deep-learning based segmentation of liver, lungs, prostate, spleen, skeleton and brain on CT images
- Quantification of organ volume
- Lesion segmentations on functional imaging are automatically localized to corresponding organ
- Organ-specific tumor burden summaries include number of lesions, MTV (Molecular Tumor Volume), TLA (Total Lesion Activity), and disease percentage

syngo.PET Neurology

syngo.PET DB Comparison

- Display and quantification of PET brain scans
- FDG normals databases
- Creation of custom databases for different tracers for use in PET or SPECT DB Comparison

syngo.PET Striatal Analysis

- Reproducible visual assessment of FDOPA brain scans
- Quantification of, e.g., left/right ratios and striatum to background ratios
- FDOPA normals database

syngo.PET Cortical Analysis

- SUVR quantification of amyloid plaque and/or tau PET scans
- Compare against normals databases for Florbetapir or Florbetaben

syngo.SPECT Neurology

syngo.SPECT DB Comparison

- Display and quantification of SPECT brain scans
- HMPAO and ECD normals databases
- Creation of custom databases for different tracers for use in PET or SPECT DB Comparison

syngo.SPECT Striatal Analysis

- Reproducible visual assessment of Ioflupane brain scans
- Quantification of, e.g., left/right ratios and striatum to background ratios
- FP-CIT (Ioflupane) normals databases

syngo.MI Neuro Subtraction

- Assesses epileptic seizure patients with SISCOM subtraction
- Measures the difference in cerebral blood flow between seizures
- Display and quantification of subtraction

syngo.MI Neurology

syngo.PET DB Comparison

- Display and quantification of PET brain scans
- FDG normals databases

syngo.SPECT DB Comparison

- Display and quantification of SPECT brain scans
- HMPAO and ECD normals databases

syngo.MI Neuro DB Creation

Creation of custom databases for different tracers for use in PET or SPECT DB Comparison

syngo.PET Striatal Analysis

- Reproducible visual assessment of FDOPA brain scans
- Quantification of, e.g., left/right ratios and striatum to background ratios
- FDOPA normals database

syngo.SPECT Striatal Analysis

- Reproducible visual assessment of Ioflupane brain scans
- Quantification of, e.g., left/right ratios and striatum to background ratios
- FP-CIT (Ioflupane) normals databases

syngo.PET Cortical Analysis

- SUVR quantification of amyloid plaque and/or tau PET scans
- Compare against normals databases for Florbetapir or Florbetaben

syngo.NM Organ Processing

- Enables reading, measurement and reporting of General Nuclear Medicine data by visualizing and quantifying physiology characteristics
- Provides quality control and organ-based processing activities

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[1] syngo.PET Auto ID is available for optional purchase and not commercially available in some countries. Due to regulatory reasons its future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

Molecular Imaging

Quality Control

- Motion and quality evaluation through use of cinematic images and a reference line that corresponds to a sinogram, lingoram and summed image
- Automatic and manual motion correction
- Review of gated histograms

Organ-based Processing

Enables the user to further evaluate specific organ systems with automatic or manual region of interest determinations

Cardiac Planar Gated Blood Pool

- Provides left ventricular analysis
- Outputs result tables, functional images and curves for further filling and emptying analysis

Planar Lung Quantification

- Presents left and right lung perfusion quantification through geometric mean calculation
- Allows total or segmented quantification
- Produces functional V/Q image results, ratios, and statistical tables

Thyroid Analysis

- Enables 6- and 24-hour uptake from scanner using dose calibrator or syringe methods
- Presents count-rate, area and volume calculations
- Allows single lobe processing

Renal Analysis

- Utilizes patient and dose-specific information to evaluate many different renal exams including
  - MAG3
  - Lasix
  - Transplant
  - ltoh ERPF
  - Gates GFR
  - Oberhausen
  - Oriuchi
  - Bubeck
  - Captopril Comparison
- Available dose calibrator or syringe methods
- Yields detailed curve analysis and results summary including $T^{1/2}$ extrapolation

Gastric Emptying Analysis

- Delivers gastric emptying and retention results for liquid/solid single or dual isotope protocols
- Automatically applies geometric mean, decay, and background corrections
- Provides $T^{1/2}$ and emptying % with optional extrapolation using curve fitting routines

Hepatobiliary

- Cholecystic Ejection Fraction results for hepatobiliary protocols with CCK
- Calculates gallbladder curve and results table

Image Manipulation

- Manipulate and perform arithmetic on NM images such as curve interrogations, filtering, masking, adjusting matrices, addition, subtraction, scaled subtraction, multiplication, division, geometric mean and static merge.

syngo.NM Auto Lung 3D[1]

An extension to MI General, Auto Lung 3D provides the ability to view and quantify lung ventilation and lung perfusion SPECT/CT scans. A deep learning powered algorithm automates lung segmentation to the lobe level to streamline CT volume, SPECT perfusion and SPECT ventilation analysis.

syngo.MI Cardiology 4DM

syngo.PET Corridor4DM

- Corridor4DM for PET MPI and LV function
- Generation of left ventricle inner and outer surfaces and valve plane from LV short axis perfusion PET data with Rb82-Rubidium and NH3-Ammonia
- Normals database comparison
- Generation of stress, rest, and reversibility surfaces and 2D polar maps
- Generation of segmental perfusion scores (17 and 20 model)

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[1] *This feature is available with optional license only.*

- Computation of functional metrics including LV EF volume/time, ED, ES, SV, EF, and Summed Motion score
- Viability Quantification of mismatch or scar between perfusion and viability scans
- Structured Reporting including export to the ASNC ImageGuide Registry

syngo.SPECT Corridor4DM

- Corridor4DM for SPECT MPI and LV function
- Generation of left ventricle inner and outer surfaces and valve plane from LV short axis perfusion SPECT data with Tc99m Mibi or Tl 201
- Normals database comparison
- Generation of stress, rest, and reversibility surfaces and 2D polar maps
- Generation of segmental perfusion scores (17 and 20 model)
- Computation of functional metrics including LV EF volume/time, ED, ES, SV, EF, and Summed Motion score
- Phase Analysis
- Quantitative Bloodpool SPECT Analysis
- Planar Gated Bloodpool Analysis
- Structured Reporting including export to the ASNC ImageGuide Registry

syngo.PET Myocardial Blood Flow

- Quantification of MBF and CFR for Rb82 and NH3-Ammonia
- Normals database comparison
- Motion compensation
- NH3 residual activity correction
- Normalize by rate pressure product

syngo.PET Cardiology Cedars

syngo.PET Cedars Suite

- Cedars Cardiac Suite for PET MPI and LV function
- Generation of left ventricle inner and outer surfaces and valve plane from LV short axis perfusion PET data with Rb82-Rubidium and NH3-Ammonia
- Normals database comparison Generation of stress, rest, and reversibility surfaces and 2D polar maps
- Generation of segmental perfusion scores (17 and 20 model)
- Computation of functional metrics including LV EF volume/time, ED, ES, SV, EF, and Summed Motion score
- Viability Quantification of mismatch or scar between perfusion and viability scans
- Quantification of MBF and CFR for Rb82 and NH3-Ammonia
- NH3 residual activity correction

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- Normals database comparison
- Generation of stress, rest, and reversibility surfaces and 2D polar maps
- Phase Analysis
- Quantitative Bloodpool SPECT Analysis for left- and right-ventricular function
- Planar Gated Bloodpool Analysis

Molecular Imaging

syngo.MI Cardiology Cedars

syngo.PET Cedars Suite

- Cedars Cardiac Suite for PET MPI and LV function
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- Quantification of MBF and CFR for Rb82 and NH3-Ammonia
- NH3 residual activity correction

syngo.SPECT Cedars Suite

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- Normals database comparison
- Generation of stress, rest, and reversibility surfaces and 2D polar maps
- Generation of segmental perfusion scores (17 and 20 model)
- Computation of functional metrics including LV EF volume/time, ED, ES, SV, EF, and Summed Motion score
- Phase Analysis
- Quantitative Bloodpool SPECT Analysis for left- and right-ventricular function
- Planar Gated Bloodpool Analysis

syngo.PET Myocardial Blood Flow

- Quantification of MBF and CFR for Rb82 and NH3-Ammonia
- Normals database comparison
- Motion compensation
- NH3 residual activity correction
- Normalize by rate pressure product
- Calculate spill-over factors

Cardiology Options

syngo.CT Extension Corridor4DM

- Extends Corridor4DM with CT fusion display and Calcium Scoring

syngo.CT Extension Cedars

- Extends Cedars Cardiac Suite with CT fusion display

### *syngo*.PET Extension Corridor4DM CFR

- Extends *syngo*.PET Corridor4DM with quantification of MBF and CFR for Rb82-Rubidium and NH3-Ammonia
- NH3 residual activity correction

syngo.MI Cedars Reporting

- Offers the capability to generate reports directly inside Cedars Cardiac Suite
- includes support for PDF and ASCII text
- HL7 output
- ASNC image guide registry

MAMMOVISTA B. smart

The progressive reading software MAMMOVISTA B.smart is designed for addressing the arising needs for speed and efficiency especially when coping with enormous volumes of tomosynthesis data in screening and diagnostic environments. Full spectrum multimodal diagnostics and next-gen AI powered tools enable to focus on fast diagnosis with high confidence.
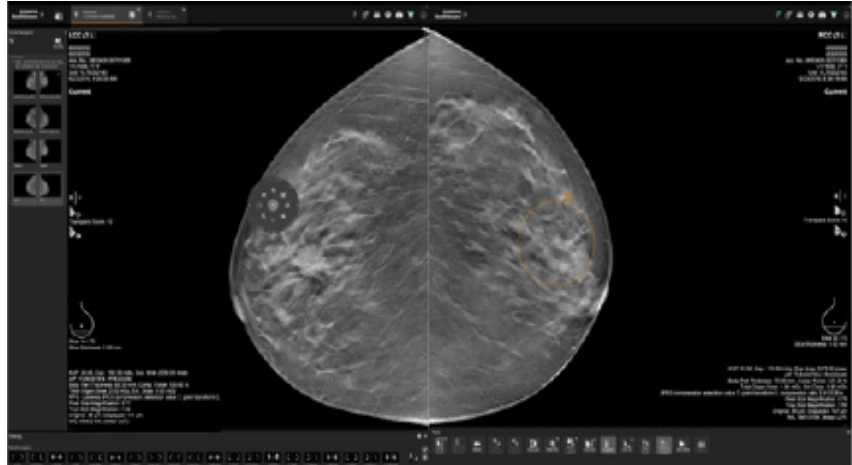
MAMMOVISTA B.smart

General software features

- Image manipulation, e.g., Zoom, Pan, Windowing
- Image evaluation, e.g., Distance, Marker, Region of Interest, Pixel lens
- Automatic prefetching of prior patient studies from PACS or other DICOM noded triggered by incoming images
- Configuration of reading worklists and user specific demo lists, e.g., all of today's examinations
- Browsing patient data of remote DICOM nodes
- Printing of MG images and tomosynthesis slices, not for diagnostic use
- Exporting images and creating patient media
- Integrated reporting functionality with Bi-RADS categorization and direct findings transfer

Clinical Packages	Contained Applications / Functionality
Single Applications	MAMMOVISTA B.smart Reading
	MAMMOVISTA B.smart Advanced[1]
	MAMMOVISTA B.smart One-click[1]
	MAMMOVISTA B.smart MR Advanced
	MAMMOVSITA B.smart Double Blind

MAMMOVISTA B.smart Reading

Formats and layouts:

- Dedicated layouts for mammograms (DICOM MG) including current-prior comparison layouts
- Dedicated layouts for Digital Breast Tomosynthesis (DBT) exams (DICOM CT, DICOM DBT) including comparison with current and prior mammograms
- Dedicated multi-modality layouts for comparing mammograms and ultrasound studies of the same patient

- Integrated display of MAMMOMAT Revelation Insight BD and Volpara Breast Density values
- Dedicated layouts for Contrast Enhanced Mammography and Insight CEM images
- User-configurable keyboard shortcuts to preferred layouts
- Layout editor with private and public layouts and configurable stacks
- Support of Insight 2D (synthetic mammogram) and Insight 3D (rotating MIP)
- Support for HD Breast Biopsy and InSpect datasets

[1] *Available as option*

MAMMOVISTA B. smart

- Multi-vendor support for Generated 2D images (synthetic mammograms)
- Display of CAD markers indicating calcifications and masses in 2D datasets
- Configurable CAD thresholds

Usability and user interface advantages:

- Multiple user-configurable workflows (ReportFlow®) with ReportFlow editor
- Configurable, automatic ReportFlow assignment
- ReportFlow visualization
- Interactive Image Text for accessing stacks, VOI LUTs and timepoints
- Configurable Image Text
- Highly flexible, dockable panels
- Smart Select menu for fast tool access
- Sizing modes: one-click for all segments
- Quadrant zooming
- Configurable time-point grouping
- Thumbnail views for easy image selection
- Remaining images concept to ensure complete reporting
- Fast toggling through VOI LUTs
- All sizing modes and magnifying functions available for 2D and 3D images
- Marking and annotation tools including 3D

- Pictogram for real time orientation in tomosynthesis volumes
- Tomo slabbing with presets and via keyboard shortcuts
- Fast Tomo reading feature set with ReportFlow Movie link and dedicated Tomo Slab layouts
- Slabbing functionally for individual slice thickness adaptations including presets and shortcuts
- Integrated reporting functionality with Bi-RADS categorization and direct findings transfer

General features:

- Multi-vendor compatible
- Supports a user-configurable workflow keypad

MAMMOVISTA B.smart Advanced

- MR diagnostic tools including dynamic layouts, motion corrected data, user-specific measurements, on the fly subtraction calculation
- Display CAD markers indicating calcifications and masses in DBT datasets
- Link-it: Interactive correlation for anatomical areas within the breast between different views. Works for current and prior DICOM MG, tomosynthesis and synthetic images of various vendors

MAMMOVISTA B.smart One-click

- Automatic and immediate display of required distances from the specified lesion in 2D to skin line, nipple and chest wall
- Automatic calculation of the quadrant and o'clock position for the specified lesion in 3D datasets: algorithms calculate the value independently of the reader or the image orientation

Interactive Decision Support by ScreenPoint Medical: Transpara®[1]

- Fully integrated in MAMMOVISTA B.smart, Transpara® allows for AI supported reading on demand.
- Based on deep-learning algorithms, it provides clinically proven decision-support tools.
- Region Analysis with intuitive, color-coded indication and percentage of malignity of the selected data
- Interactive lesion correlation between FFDM, synthetic 2D and DICOM BTO tomosynthesis datasets
- Global Exam Score: individual score from 1 to 10 that reflects the level of suspiciousness of the entire exam
- Perception Aid: provides a closer inspection of the mammogram indicating automatically calcifications and suspicious areas
- Smart Sort Technology: automated sorting of cases according to the Exam Score for optimized case triaging

[1] *Available as option*

CAD systems validated for use with MAMMOVISTA B.smart:

- ScreenPoint Medical Transpara®
- iCAD SecondLook® Digital
- iCAD PowerLook® with SecondLook Premier
- iCAD Profound AI (R)
- VuComp M-Vu
- R2 CAD

Client Hardware requirements

Minimum Client Hardware:

- CPU Speed 2.5 GHz, e.g., Intel Core i5
- CPU Cores 4
- RAM 8 GB
- Hard Drive ≥ 1.5 GB free space
- Graphic Card Supports OpenGL 2.1 or higher
- Graphic Card Memory 1 GB

Recommended Client Hardware:

- CPU Speed 3.1 GHz, e.g., Intel Core i5-7500
- CPU Cores 4
- RAM 32 GB
- Hard Drive ≥ 50 GB free space
- Graphic Card Supports OpenGL 2.1 or higher
- Graphic Card Memory 8 GB

MAMMOVISTA B.smart MR Breast

- Numerous MR layouts (e.g., DWI, Kaiser and MPR) with a comprehensive toolset for contrast-enhanced MR mammography reading
- Direct access to real-time MR analyzer tools like Time Curve Measurements with ROIs and pixel lense
- Configurable Color overlays
- Segment synchronization
- Current-prior comparisons of MR data
- Side-by-Side comparison of MG, Tomo and MR images

MAMMOVISTA B.smart Double-blind

- Automatic recognition of screening cases based on study description
- Support of double-blind reading workflow requirements
- User specific savings of comments and measurements not visible for second reader
- Additional consensus role to display previous user comments on demand

Mammography Applications

When dealing with the enormous number of cases in mammography screening and diagnostics, it is key to ensure efficient reading and reporting processes. *syngo*.Breast Care delivers individual and automated workflows with highly innovative reading tools to increase your diagnostic performance. Seamlessly combining multi-vendor 2D and 3D mammography images, synthetic views, multi-modality images, contrast enhanced mammo-graphy and new applications to come it is prepared to grow with your clinical needs.

Easily integrate CAD display, and interactive decision support, breast density software, advanced speech driven reporting and voice commands for fast results to be shared throughout your institution.
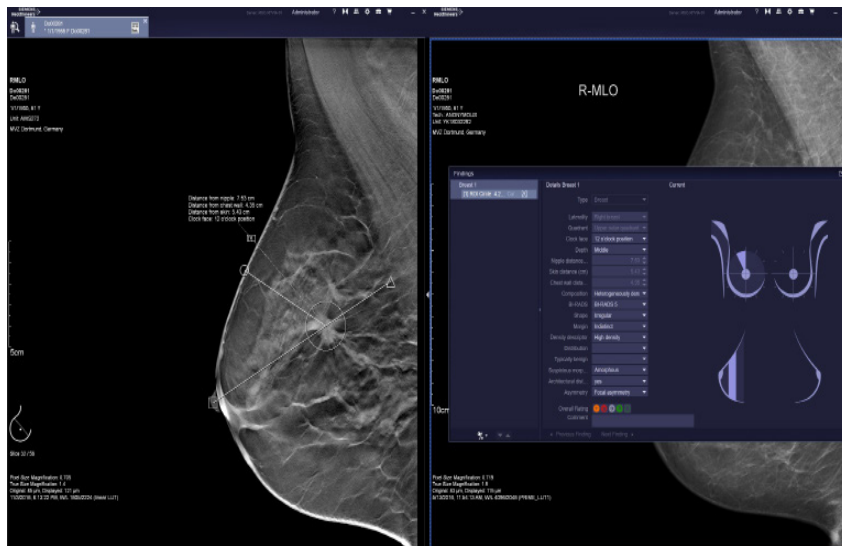
syngo.Breast Care One-Click

Clinical Packages	Contained Applications/Functionality
Single Applications	*syngo*.Breast Care Reading*
	syngo.Breast Care Tomo
	syngo.Breast Care CAD Display
	syngo.Breast Care Link-it
	syngo.Breast Care One-Click

syngo.Breast Care Reading

- User-configurable shortcuts to preferred layouts
- Integrated display of Insight BD[1] information
- Dedicated layouts for Contrast Enhanced Mammography and Insight CEM[1] images
- Dedicated layouts for mammograms (DICOM) including current-prior comparison layouts

- Dedicated multi-modality layouts for comparing mammograms and ultrasound studies of the same patient
- Sizing modes: one-click for all segments
- Multiple user-configurable workflows (ReportFlow®)
- Configurable time point grouping
- Magnifying glass, quadrant zooming, and global inversion
- Fast toggling through VOI LUTs

- Supports client-configurable workflow keypad
- Multi-vendor compatible
- Integration of 3D ultrasound reading (sUSBA Smart Open)
- Integration of Volpara Breast Density values
- Thumbnail view for easy image selection
- Remaining images concept to ensure complete reporting

[1] *Available with MAMMOMAT Revelation only.*
* *Disclaimer: Breast Care is not available for net new sales. Please refer to MAMMOVISTA B.smart.*

syngo.Breast Care One-Click[1]

- Automatic and immediate display of required distances from the specified lesion in 2D
  - Skinline
  - Nipple
  - Chest wall
- In 3D additional automatic calculation of the quadrant and o'clock position for the specified lesion
- Intuitive and interactive breast pictogram in Findings Assistant
- BIRADS aligned report creation possible for reproducible and fast results and all over the entire institution

syngo.Breast Care Tomo[1]

- Fast Tomo Reading feature set with ReportFlow Movie link and dedicated Tomo Slab layouts
- Support for HD Tomo Biopsy and InSpect datasets
- Tomo slabbing with presets and shortcuts
- Dedicated layouts for Digital Breast Tomosynthesis (DBT) exams (DICOM CT, DICOM DBT) including comparison with (current/prior) mammograms
- All sizing modes and magnifying functions available for tomosynthesis
- User-configurable workflow (ReportFlow®) including tomosynthesis exams
- Marking and annotation tools including 3D
- Various scrolling tools by mouse, keypad, or automatic cine mode

- Synchronized scrolling through datasets
- Pictogram for real-time orientation in tomosynthesis volumes
- Support of Insight 2D (synthetic mammogram) and Insight 3D (rotating MIP)
- Multi-vendor support for Generated 2D (synthetic mammogram), images including DICOM MG and generated 2D images in DICOM BTO format

syngo.Breast Care Link-it[1]

- Interactive correlation of 2D and/or 3D anatomical areas
- Works for current and prior DICOM MG images of various vendors
- Applies for tomosynthesis images together with *syngo*.Breast Care Tomo[2]

syngo.Breast Care CAD Display[1]

- Displays 2D and 3D CAD markers indicating calcifications and masses
- Adds quantitative lesion information
- Based on DICOM SR objects generated by various CAD systems

In combination with the software option *syngo*.Breast Care, the display of mammography images for diagnosis on *syngo*.via is possible, as *syngo*.Breast Care is FDA-cleared for this purpose.

Following systems are validated for the use with *syngo*.Breast Care: iCAD PowerLook® with SecondLook Premier

- VuComp M-Vu
- R2 CAD

TransparaTM Decision Support systems are validated for the use with *syngo*.Breast Care, with the following feature set:

- TransparaTM case score display in Patient Browser
- Interactive lesion correlation between FFDM / synthetic 2D and/or DICOM BTO Tomosynthesis datasets
- Additional lesion information display

The following displays are approved for diagnostic use for mammography Eizo −5 MP monitors: RX560, GX540. They can be operated with the *syngo*.Breast Care medical device in configuration of up to 2 × 5 mega pixels, plus up to 2 additional monitors of up to 1536 × 2048 mega pixels.

Operating other monitors approved for mammography reading is possible and lies within the customer's responsibility. Further details are described in the *syngo*.via Breast Care Workplace Datasheet.

[1] Optional
[2] Available with MAMMOMAT Revelation only
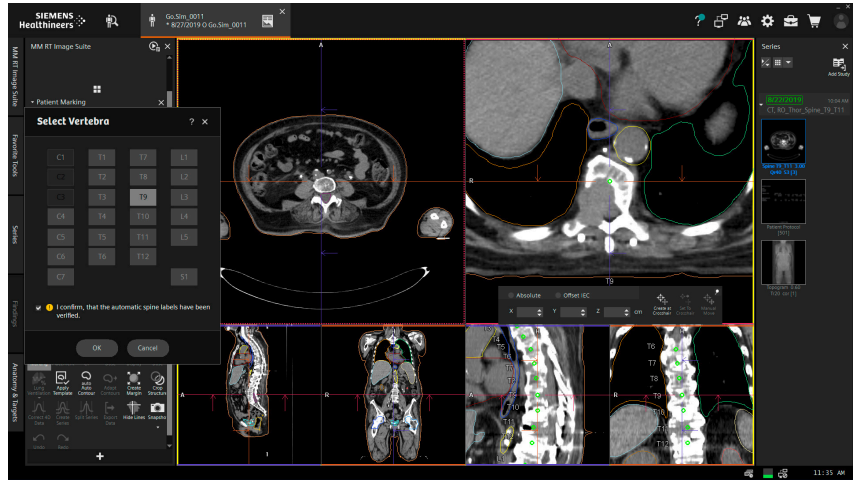
Multi-modality for Radiation Oncology

syngo.via RT Image Suite

syngo.via RT Image Suite is a dedicated RT software that is designed to make simulation, image assessment, and contouring easier and better integrated – while also offering capabilities such as assessment of tumor motion, use of dual energy, and MR-based Synthetic CT[1].

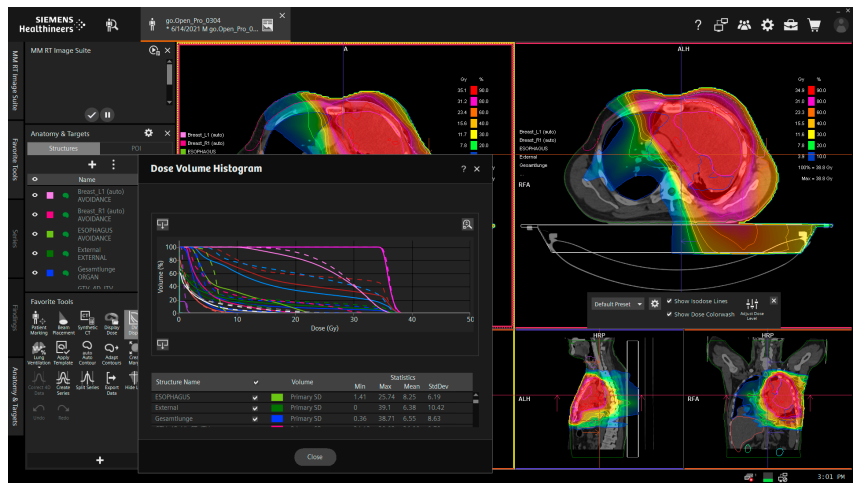## Clinical packages

syngo.via RTiS Advanced Sim package

- CT Simulation features
- Designed for therapist and physicist

syngo.via RTiS RadOnc Excellence package

- Efficient Multimodality and 4D contouring features
- Designed for physicist and radiation oncologist

syngo.via RTiS Advanced Sim package with Patient Marking for vetebra as isocenter

syngo.via RTiS RadOnc Excellence package with RT Dose Display

[1] *Optional*

| RT Image Suite Licenses	*syngo*.via RTiS Advanced Sim	*syngo*.via RTiS RadOnc Excellence
RT Image Suite Basic		
• Concurrent display of up to a total of 4 image series (2 single or 2 fused series) over 2 image panels • 3D data handling (CT, PET, PET/CT, MRI, and CBCT) • 4D CT, PET CT and MRI visualization with phase splitting, tMinIP, tMIP, AverageCT and ITV generation • Quantitative assessment of 3D tumor trajectory and semi-automatic calculation of the mid-ventilation phase • SUV peak/max based contour on PET images • Parallel contouring: contouring performed on any image is reflected on all other images • Contouring functionalities: adaptive smart brush contour cropping, contour copy and warping[1] between image series, contour preview, contour re-size, organ templates, axial cut tool, isodose-to-contour conversion • Rigid Registration per image pair with saving as a new image series • Checkerboard/spyglass to evaluate the alignment when volumes are loaded	✔	✔
Patient Marking		
• Reference point/isocenter management • Direct Laser Steering for compatible LAP lasers[1] • DICOM data exchange with LAP lasers, text file-based data exchange with other laser manufacturers • Virtual Laser View for display of laser lines on 3D patient model (VRT) • Semi-automated isocenter placement for breast and spinal metastases	✔	N/A
Beam Placement		
• Beam Placement including DRR, Source to Surface Distance • Configurable beam templates	✔	N/A
RT Dose Display and 8 series display		
• Display dose volumes overlaid on any supported image type and side-by-side • Display related dose-volume histograms (DVH) • Use deformable registration between current and prior dose volumes for dose accumulation[2] • Concurrent display of up to a total of 8 image series (4 single or 4 fused series) over 4 image panels	N/A	✔
Lung Ventilation[3]		
• Anatomical lobe wise quantification of ventilation • Calculate lung ventilation by selecting maximum inhale and exhale breathing phases from a (4D) CT	N/A	✔

[1] *Requires compatible laser system. DLS license is additionally required*
[2] *Deformable registration required*
[3] *Ventilation results produced by syngo.via RT Image Suite should not be used as the sole diagnostic tool*

Multi-modality for Radiation Oncology

RT Image Suite Licenses	*syngo*.via RTiS Advanced Sim	*syngo*.via RTiS RadOnc Excellence
Deformable Registration (incl.contouring propagation)		
• Semiautomatic contour propagation over 4D CT breathing phases and ITV generation • Deformable Registration with region-of-interest based registration and multiple registrations per image pair • Save registrations and save aligned or deformed images as a new image series • Deformation Registration check with colored vectors	Optional	✓
MR-based Synthetic CT		
• Enables the user to generate density information for further dose calculations for photon therapy • It supports using MR as primary imaging modality for RT treatment preparation of brain and pelvic cancer patients • Quick patient-specific geometric check with the checkerboard tool	Optional	Optional
AutoContouring[1]		
• Zero-click RT AutoContouring using deep-learning based organs-at-risk (OAR) and lymph nodes with Rapid Results Technology • One-click AdaptiveContours for re-planning data using Deep Learning AutoContouring	Optional	Optional
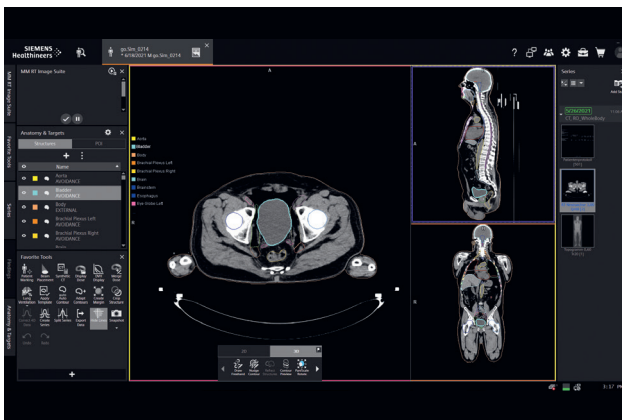
syngo.**via** RTiS with AutoContouring[2]
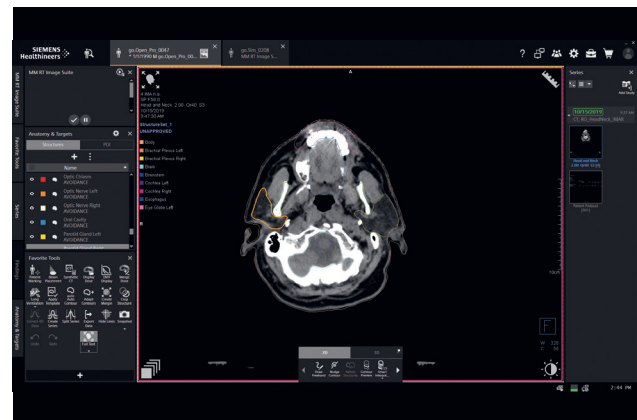
[1] *This refers to the functionality syngo.via RT Image Suite*
[2] *Optional*

Interventional Oncology – support for your percutaneous procedure

syngo.via myAblation Guide

myAblation Guide is a software that provides an environment to maximize the usage of imaging to support percutaneous ablative treatments through an integration between imaging and ablation systems and capabilities such as planning of ablation targets, ablation needle position confirmation prior to ablation, and assessment of target coverage post-ablation.

## Clinical Packages

syngo.via myAblation Guide

- Designed for intra-procedural support of complex interventional percutaneous ablative procedures
- Efficient Multimodality contouring with automation for liver tumors and ablation zones
- Dynamic 3D needle planning and verification – refine your needle path and your virtual ablation zone for complete coverage to adjust your planning to reality

- Multimodality registration for procedure planning, ablation needle positioning, and post-procedure ablation assessment
- Connecting the Siemens Healthineers and Varian Medical Systems interventional imaging and treatment environment

myAblation Guide Base License

- 3D data handling (CT, PET, PET/CT, MRI, and CBCT)
- Contouring functionalities: adaptive smart brush contour cropping, contour copy and warping between image series, axial cut tool, semi-automatic segmentation for liver tumors and liver ablation zones
- Parallel contouring: contouring performed on any image is reflected on all other images
- Rigid Registration per image pair with saving as a new image series

- Checkerboard/spyglass to evaluate the alignment when volumes are loaded
- Deformable Registration with region-of-interest-based registration and multiple registrations per image pair
- Deformation Registration check with colored vectors
- Transmission of treatment parameters to IntelliBlate Microwave ablation system by Varian Interventional Solutions (requires both systems in hospital network)
- Drawing of needle paths with visualization of virtual ablation zone
- Export of needle paths in format readable by myNeedle Guide3D on Siemens Healthineers SomarisX scanners (VB10) and Q- and Icono C-Arm systems
- Save and re-load of all created structures and needle paths
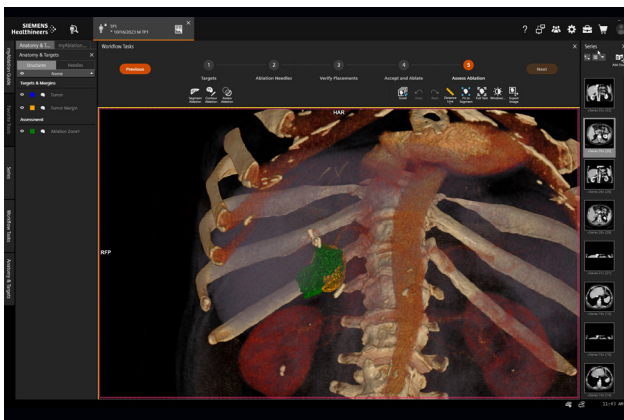
syngo.via myAblation Guide
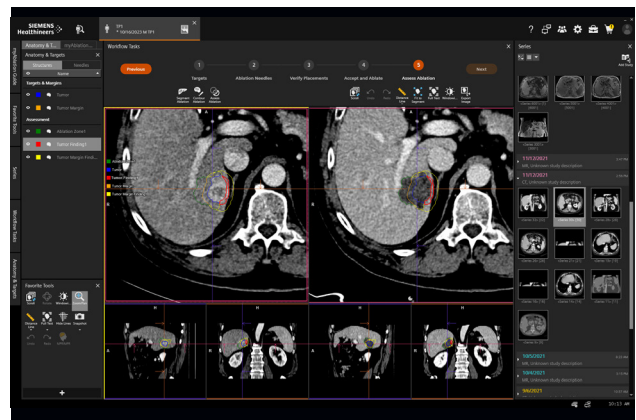
Mapping Table

Medical Devices to Applications

Medical Device	Clinical Application

myAblation Guide VB80
is a software application for image processing, 2D/3D visualization, and comparison of medical images imported from multiple imaging modalities. The software is controlled by the end user via a user interface on a workstation with DICOM connectivity or as an integrated version on a Siemens CT scanner workstation. The application is used to assist in the preparation and performance of ablative procedures, including contouring of ablation targets, virtual ablation needle placement and contouring of ablation zones, as well as supporting the User in their assessment of the treatment.

The application supports anatomical datasets from CT, MR, CBCT, as well as PET/CT.

The application includes means and functionalities to support in:

- Multimodality viewing and contouring of anatomical, functional, and multi-parametric images such as CT, CBCT, PET/CT, MRI
- Multiplanar reconstruction (MPR) thin/thick, minimum intensity projection (MIP), volume rendering technique (VRT)
- Freehand and semi-automatic contouring of regions-of-interest on any orientation including oblique
- Manual and semi-automatic registration using rigid and deformable registration
- Expansion of created contour structures to visualize a safety margin
- Functionality to support the user in creating virtual ablation needle paths and associated virtual ablation zones derived from manufacturer data
- Export of virtual needle paths in a format readable in the myNeedle Companion application on SomarisX and C-Arm Systems
- Supports the user in comparing, contouring, and ablation needle planning based on datasets acquired with different imaging modalities
- Supports multimodality image fusion
- Supports user's procedure flow via a task stepper

Licensing and Server Grades

Licensing

Multi-modality routine reading functionality comes with every *syngo*.via system and is available to all users (that is, it is not licensed per user or seat). All other optional *syngo*.via applications and clinical packages are licensed per concurrent user.

syngo.via software and licenses can be purchased as an investment or as a subscription model. This provides full flexibility for all business needs.

The limit over multiple clinical packages/apps is set by the available HW resources.

syngo.via software grades

The *syngo*.via software can be ordered in dedicated software grades as listed below:

- *syngo*.via XL Server (recommended for enterprise scenarios limited to 25 kppy[1], ideal for 1–15 concurrent users)
- *syngo*.via L Server (recommended for departmental scenarios limited to 15 kppy[1], ideal for 1–7 concurrent users)
- *syngo*.via Workstation (recommended for multi-modality standalone scenarios, limited to 7 kppy[1], ideal for 1–2 concurrent users)
- *syngo*.via Workplace for CT, MI, MAMMOVISTA B.smart, and RT (recommended for single-modality standalone scenarios, limited to 7 kppy[1], for 1 concurrent user)

When choosing the hardware configuration for the *syngo*.via software, the following need to be considered.

Number of concurrently rendered studies/slices:

- Number of concurrent users
- Duration in which images should be available in short term storage of *syngo*.via

Data volume and server sizing are also dependent on the footprint of particular clinical packages and applications in use. In addition, the increasing number of images within a study as well as a general increased number of studies that results in an increased short-term storage utilization over time need to be considered

[1] *kppy: kilo procedures/studies per year*

Licensing and Server Grades

Hardware Specifications and Virtual Deployments

The *syngo*.via software can be delivered with dedicated Hewlett Packard Enterprise based hardware grades or deployed and operated in virtualized environments based on VMware and Hyper-V.

The Hewlett Packard Enterprise based hardware grades are designed to enable performant and reliable operations for the available software grades with the below defined load profiles (number of concurrently rendered slices) and total number of slices stored in *syngo*.via short-term storage.

New orders will be delivered with following Hewlett Packard Enterprise based hardware grades.

HPE-based Hardware[1]	Hardware Type	Workstation/ Workplace	L Server	XL Server	High Performance Server
	CPU	1× Intel® Xeon® Silver	1× Intel® Xeon® Silver	2× Intel® Xeon® Gold	2× Intel® Xeon® Gold
	RAM	96 GB	192 GB	192 GB	384 GB
	GPU	RTXA4000	RTXA4000	RTXA4000	RTXA4000
	Storage	~ 1.9 TB	~ 6.5 TB	~ 10 TB	~ 17 TB
	Network	1× Dual NIC ports (1 GbE)	1× Ethernet 1Gb 4-port BASE-T Adapter 1× Ethernet 10/25Gb 2-port without Transceiver	1× Ethernet 1Gb 4-port BASE-T Adapter 1× Ethernet 10/25Gb 2-port without Transceiver	1× Ethernet 1Gb 4-port BASE-T Adapter 1× Ethernet 10/25Gb 2-port without Transceiver
Max. number of concurrent slices[2]		16.000	46.000	46.000	92.000
Max. number of slices in short term storage uncompressed[3]		~ 540,000	~ 2,100,000	~ 4,500,000	~ 9,100,000

The *syngo*.via VB80 software can be upgraded on existing hardware, hosting older versions of *syngo*.via. For sizing orientation, find the following details oriented on the above load profiles.

	Workstation/ Workplace	L Server	XL Server
Minimal memory	48 GB	96 GB	128 GB
Recommended memory	96 GB	128 GB	192 GB

[1] *The HPE HW details (CPU/GPU types, RAM, and Disk space) may be subjected to change. For more details please refer to the syngo.via HW Datasheets. The actual number of slices is varying since it depends on the case mix. Advanced workflows consume more storage due to multiple auxiliary data like segmentation, and secondary DICOM data.*

[2] *Concurrent rendering of slices is based on 512 × 512-bit image matrix.*

[3] *The actual number of slices are varying since it depends on the case mix. Advanced workflows consume more storage due to multiple auxiliary data like segmentation, and secondary DICOM data.*

Server Virtualization

This option allows you to utilize own virtualized infrastructures, and this smoothly integrates *syngo*.via in the existing IT Infrastructure. For sizing orientation, find the below details oriented on the above load profiles.

	Workstation/ Workplace	L Server	XL Server
vCPU cores	16	32	48
Memory	96 GB	192 GB	192 GB
Data store disc size (recommended)	2.3 TB	5.7 TB (5 TB STS + remaining discs for OS, DB, backup and service)	10.9 TB (10 TB STS + remaining discs for OS, DB, backup and service)

If the latest NVIDIA vGPU technology OpenGL and GRID cards are available, it is recommended to enable GPU support.[1] NVIDIA vGPU supports VMware features vMotion and snapshot with the new GPU-GRID card technology.[2]

For more information on the technical requirements and limitations, please contact the local sales representative in your region.

Note:
It is the operator's responsibility

- to provide a virtual machine to host the *syngo*.via application server.
- to provide the Microsoft Server Operating System Server 2022.
- to ensure that the license for the Microsoft Operating System (Windows Server) running in the *syngo*.via virtual machine complies with the Microsoft terms and conditions for operations in a virtualized environment.

[1] *By default, syngo.via will compute software-based rendering using the CPU, which is sufficient for most syngo.via applications. Certain applications require a physical Graphics Processing Unit (GPU) with unrestricted and dedicated access to run the imaging algorithms. GPU support must be enabled for syngo CT Colon and is recommended for the following applications: syngo.CT Liver Analysis, syngo.MR Neuro fMRI, syngo.MR Neuro Tractography.*
[2] *Only supported with dedicated GPU assigned*

Network Requirements

The server requires two static IP addresses, which must be provided by the customer. Please contact your sales representative for further information.[1]

Ports used by the system are listed in *syngo*.via Security White Paper and Manufacturer Disclosure Statement (MDS[2]).

As a faultless communication between *syngo*.via server and *syngo*.via client is crucial to the operability of the system, a reliable and performant network is a precondition for a successful integration.

Transmissions of images between server and client can be compressed depending on configuration profiles.

- The default setting for displaying images is lossless compression for the final displayed images on the monitor. During image interaction, the images might be shown with a reduced resolution.

- The user is constantly informed about the current image quality.

	Minimum	Recommended
Hospital-internal network connection	100 Mbit/s for Workstation-based server 1 Gbit/s for M/L/XL/High Performance-Grade server	1 Gbit/s for Workstation-based server 10 Gbit/s for M/L/XL/High Performance-Grade server
Remote Client Connection[2]	Download: 10 Mbit/s Upload: 1.5 Mbit/s Latency: 20 ms–25 ms (sporadic use for viewing data remotely)	Download: 30 Mbit/s Upload: 2 Mbit/s Latency: 10 ms (routine use in clinical routine)

[1] *Note: Some application require Internet connection to operate properly.*

[2] *Transmission between server and client can be compressed depending on configuration profiles. The default setting for displaying images is lossless compression for the final displayed images on the monitor. During image interaction, the images might be shown with a reduced resolution. The user is constantly informed about the current image quality.*

syngo.via Clients

Hardware and Software[1]

The client application software is delivered and downloadable from the *syngo*.via Server. The Client SW needs to be installed on each client computer. The client installation is in the responsibility of the IT Administrator and requires administrative rights on the client computer.

The client software can be installed and updated using the standard Microsoft Windows installer.

The tools check for updated software versions on the *syngo*.via Server and can download and install updates. Client Virtualization supported based on the following:

- VMWare Horizon (with View) 5.5, and higher
- Citrix XenDesktop 7 or higher

Component	Minimum	Recommended
Processor	Minimum Intel Core i5 with 2.5 GHz or higher	Intel Core i5 with 3.4 GHz or higher
RAM	8 GB	16 GB
Hard disk drive (free space for client software)	≥ 1.5 GB	≥ 3 GB
Graphic card	OpenGL 2.1 or higher with dedicated graphics card (e.g., NVIDIA T400 4 GB)	OpenGL 2.1 or higher with dedicated graphics card (e.g., NVIDIA T400 4 GB)
Pixel depth graphic cards	Standard Client (non-Mammography Client): 24 bit (= 8 bit per RGB) Mammography Client: 30 bit (= 10 bit per RGB)[4] GPU and Monitor need to support this.	Standard Client (non-Mammography Client): 24 bit (= 8 bit per RGB) or 32 bit (= 8 bit per RGBA) Mammography Client: 30 bit (= 10 bit per RGB)[4] GPU and Monitor need to support this.

Note: If other software is running on the client, performance may be affected.

For MAMMOVISTA B.smart related additional requirements, refer to page 37.

Software Requirements

- Microsoft Windows 11[2] and Windows 10 – Home, Pro, Education, Enterprise or higher[2]
- Microsoft Visual C++ Redistributable VC12, and VC14 Runtime

- Microsoft .NET framework 4.8 or higher
- Windows Media Player 9 or higher
- Microsoft Edge Browser, Internet Explorer 11[3]
- Siemens Healthineers TeamViewer Connector Repack
- Siemens Healthineers TeamViewer Repack
- TeamViewer ModeratorGateway (Siemens Healthineers Repack)
- Siemens Healthineers VNC Repack

- Apple OS X (Emulating Microsoft Windows Operating Systems as listed above – using software like Parallels Desktop for Mac)

The VC Runtime, the Siemens Healthineers Repacks for TeamViewer, VNC, and the .NET framework are installed automatically if they are not available on a client. The Media Player must be installed manually by the user if screen captures and videos need to be replayed on the client. Administrative rights are required for all these installations.

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[1] The used hardware must follow IEC 60950-1/EN 60950-1.

[2] Only AMD64 architecture is supported.

[3] Internet Explorer 11 is only supported on Windows 10 LTSB/C, server 2016, 2019, 2022 but is not longer recommended.

[4] Only applicable for Mammography monitors

syngo.via Clients

Note: The IT administrator should ensure that all *syngo*.via client hardware drivers, especially the GPU driver, are up to date.

The following security settings must be enabled in Internet Explorer:

- File download
- Active scripting (JavaScript)
- Submit non-encrypted form data
- ActiveX controls and plug-ins

The required hardware for *syngo*.via clients and servers may vary based on specific needs and performance expectations.

Monitors

The quality of displayed images is highly dependent on the quality and settings of the monitors, graphics cards, and graphics drivers that are used. In the United States, monitors (displays) should not be used for diagnosis, unless the monitor (display) has specifically received 510(k) clearance for this purpose. It is the customer's responsibility to ensure that client monitors are compatible with graphic cards and graphic drivers.

It is also his/her responsibility to use suitable monitors for diagnostic purposes[1].

We recommend a single monitor of at least 2 MP[2,3] or two monitors of at least 2 MP.

syngo.via supports the following monitors.

- Equal orientation landscape, portrait, and wide screen monitors, color, or grayscale[4] up to 6 MP monitors for diagnostic reading
- 8 MP, 10 MP, and 12 MP[5] monitors which are treated as 2 × 4 / 2 × 5 / 2 × 6 MP monitors
- Two office size landscape monitors for demonstrating images using projectors
- Two 5 MP portrait grayscale monitors in addition to 1 or 2 office size color monitors for reading of MG images (5 MP, grayscale) and MR and US images (office size color monitors) for multi-modal breast reading Layouts of at least 8 × 8 segments per monitor are supported
- Barco UNITI 12 MP (2 × 6 MP) monitor with Barco controller for *syngo*.via client systems only[6]

Other Hardware

Printers and cameras used for diagnostic purposes must also fulfill minimum requirements. Siemens Healthineers provides optional validation of the suitability of specific printers and cameras to be used for the diagnosis of radiological images.

In the United States, paper printouts should not be used for diagnosis, unless the PostScript printer has specifically received 510(k) clearance for this purpose.

Client Access Licenses

The *syngo*.via server is delivered with one instance of Microsoft Windows Server 2022 Standard Edition. With each installation of the *syngo*.via client software, the client computer or user has access to services of the Windows Server 2022 Standard Edition running on the *syngo*.via server.

To legally access this Windows Server 2022 Standard Edition software, a Client Access License (CAL) is required. A CAL is not a software product; rather, it is a license that gives users the right to access the services of the server.

It is the customer's responsibility to ensure that each client computer or user, that accesses the *syngo*.via server or *syngo*.via Workstation through the *syngo*.via client software, is equipped with an appropriate Windows Server device or user CAL.

For more information about Microsoft CAL please refer to **microsoft.com/en-us/licensing/ product-licensing/client-access-license**

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[1] *Country-specific regulations/laws may apply.*

[2] *For MI Cardiology and MI Neurology on server-based workstation only, the minimum monitor resolution is 1600 × 1200.*

[3] *For syngo.SPECT Processing: minimum monitor resolution is 1920 × 1080.*

[4] *Not released for CT CaScoring. Not released for CT Colon. For Cardiac Function: Polar maps shall be used only on color monitors.*

[5] *Restrictions for Mammo Tomosynthesis apply. Please contact your local sales representative for more information.*

[6] *Appropriate graphic card needed. Contact our local Siemens Healthineers organization for further details.*
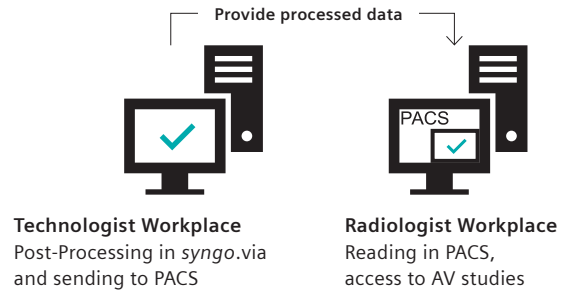
Implementation Packages

Clinical IT Infrastructures are diverse, which is why flexible software integration is key to an efficient reading workflow. *syngo*.via can be implemented in various levels, depending on existing, surrounding software solutions, desired data flow, and diagnostic processes.

Basic Implementation Package

This includes connection to a validated Siemens Healthineers DICOM modality and image archiving to PACS.

As an example, the following reading scenario can be realized:

Provide processed data

Technologist Workplace
Post-Processing in *syngo*.via and sending to PACS

Radiologist Workplace
Reading in PACS, access to AV studies

PACS-driven Implementation Package

This includes connection to DICOM modalities with image archiving to PACS and image call-up[1] directly out of PACS[2]. *syngo*.via clients can be installed both outside and within the same department as the *syngo*.via server.

The following reading scenario, for example, is possible:

Radiologist Workplace
Reading in PACS and *syngo*.via
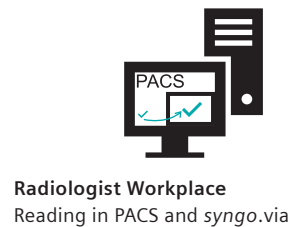
- PACS is the leading reading system. Access to quantitative information, and prior study data in *syngo*.via
- Study call-up[1] from PACS[3]

RIS-driven Implementation Package

Loading of studies into *syngo*.via can also be orchestrated by the RIS.

syngo.via supports DICOM Modality Worklists (DMWL) and automatic loading of studies from different customer sites with different Medical Record Numbers but the same Enterprise Master Patient Index (EMPI).[4]

Radiologist Workplace
Reading in PACS and *syngo*.via
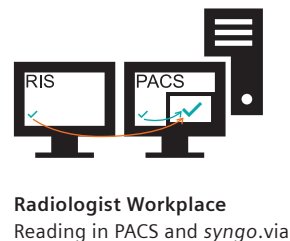
- RIS is the leading system to control prefetching in *syngo*.via. Access to quantitative information, and prior study data in *syngo*.via
- Study Call-up[1] from PACS[3]
- Study Call-up[4] from RIS Worklist/DMWL Study Prefetching[3]

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[1] *PACS Vendor support required. The PACS has to support starting an executable with the appropriate parameters. If this is not available, it may be required to use the optional Desktop Connector to achieve this integration.*

[2] *As long as this is supported by the existing PACS.*

[3] *Please contact your local sales representative for further information on availability in your region, technical requirements, and limitations.*

[4] *RIS Vendor Support required. The RIS has to support starting an executable with the appropriate parameters. If this is not available, it may be required to use the optional Desktop Connector to achieve this integration.*

Implementation Packages

The following reading scenario, for example, is possible:

Technical view of the *syngo*.via integration:
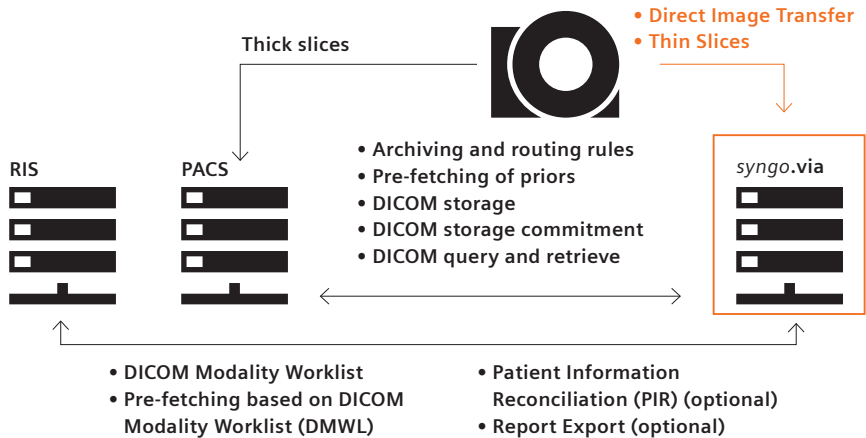
- Smart Remote Services connection
- Integration into clinical network
- Active Directory integration
- Basic installation and configuration
  (Archiving, Pre-fetching, Workflow
  mapping, and so on.)
- Integration of up to 5 DICOM nodes
- DICOM routing
- One client installation
- Study Call-up[1] from PACS[2]
- Study Call-up[1] from RIS Worklist[2]
- DICOM Modality Worklist Integration

Thick slices

- **Direct Image Transfer**
- **Thin Slices**

RIS   **PACS**

- **Archiving and routing rules**
- **Pre-fetching of priors**
- **DICOM storage**
- **DICOM storage commitment**
- **DICOM query and retrieve**

syngo.**via**

- **DICOM Modality Worklist**
- **Pre-fetching based on DICOM Modality Worklist (DMWL)**

- **Patient Information Reconciliation (PIR) (optional)**
- **Report Export (optional)**

[1] *The PACS has to support starting an executable with the appropriate parameters. If this is not available, it may be required to use the optional Desktop Connector to achieve this integration.*
[2] *Please contact your local sales representative for further information on availability in your region, technical requirements, and limitations.*

High-level content of the implementation packages

	Siemens Healthineers Professional Services	Basic	PACS Driven	RIS Driven	Customer Responsibilities
Planning & Pre-Staging	• Project coordination • Shipment of hardware to customer site • Integration into the customer's Local Area Network and to Smart Remote Services[1,2] • Clarification of customer's workflow and on-site requirements for *syngo*.via implementation • Request validation for DICOM/HL7 (optional)	X	X	X	• Coordination and support for hardware and software installation by the IT Administrators[3] • Provide electrical power and LAN access[3] • Ensure broadband Internet access for Smart Remote Services • Have monitor(s) at the site of operation, including appropriate cables[3]
Installation	• Basic hardware installation and connection to power supply or uninterruptible power supply (optional)[3] • Connection of one or two monitors[4] • Installation of the *syngo*.via server software • Import of all *syngo*.via server license files • Installation of client on server and basic test • Integration of Active Directory (AD) in *syngo*.via	X	X	X	• Support rack mount installation[3] • Ensure access to the location and space for server operation[3] • Availability of IT administrator for routing/ports and integration of *syngo*.via in the customer's Active Directory
Integration & Configuration	• Integration of up to 5 DICOM nodes in *syngo*.via • Server configuration and basic technical customization (for deleting, archiving, and routing studies) • Basic clinical configuration **Clients** • Installation of client software for one[5] user on one computer	X	X	X	• Support the configuration of additional DICOM nodes • Install *syngo*.via client software on additional computers
	On-site briefing • Optional support for definition of advanced rules for deleting, archiving, routing, pre-fetching of priors • IT Administrator briefing session	X	X	X	• Ensure attendance of IT administrators
	Image Call-Up PACS or RIS • Assistance in setting up front-end integration of *syngo*.via with one PACS or RIS workplace for image call-up directly out of the PACS or RIS application user interface **Clients** • Assistance in setting up image call-up of *syngo*.via from the RIS user interface[6]		X	X	• Contact PACS or RIS vendor for study call-up implementation, configuration, and licenses. **This may require the purchase of additionalsoftware and services from the PACS or RIS vendor.[7]** • Distribute the front-end integration to additional PACS or RIS clients within the institution

[1] *If the customer does not provide SRS connectivity, additional professional services for implementation without SRS support are offered.*

[2] *Server system must be installed with all connected DICOM nodes & clients inside the same LAN segment/subnet. Deployment across different LAN segments is not covered.*

[3] *Please refer to the syngo.via Pre-installation Manual for virtual server installations.*

[4] *Depending on local legal regulations, the monitor setup may allow viewing only (monitor calibration not included).*

[5] *Each package covers a dedicated number of DICOM nodes & clients that will be connected. Please consider ordering additional services if further connections are required.*

[6] *Purchase of software and services from the RIS vendor might be required.*

[7] *The PACS or RIS has to support starting an executable with the appropriate parameters. If this is not available, it may be required to use the optional Desktop Connector to achieve this integration.*

Implementation Packages

High-level content of the implementation packages				
Siemens Healthineers Professional Services	Basic	PACS Driven	RIS Driven	**Customer Responsibilities**
Integration & Configuration — **Multi-server features (opt[1])** Multi-server License Sharing (MSL), Access (MSA), Configuration (MSC)		X	X	Support installation and configuration of the servers in clinical network
DICOM Modality Worklist Integration Configuration of the DICOM Modality Worklist interface from RIS to *syngo*.via[2]			X	Ensure that the DMWL-source can provide the DMWL to *syngo*.via
Patient Information Reconciliation/PIR (opt[1]) Patient Data on RIS and *syngo*.via are automatically synchronized by PIR			X	Configure the sending application to send PIR messages to *syngo*.via[2]
Report Export (opt[1]) • Enable context-specific reports created in *syngo*.via for export and sign-off in RIS • Nuance PowerScribe 360 and PowerScribe One (brand name of latest version; the old interfaces still are supported) interfacing			X	The receiving application might require additional licenses for this connectivity to the *syngo*.via server. The customer is responsible to clarify and order licenses if needed
Project approval — Implementation handover of the system to Siemens Healthineers Service and customer	X	X	X	Acceptance tests with IT administrator and responsible radiologist

[1] *Optional implementation package. Needs to be ordered separately.*
[2] *Purchase of software and services from the RIS vendor might be required.*

Roles and Responsibilities

syngo.via is based on a client-server architecture. Therefore, the integration into an existing IT architecture requires IT administration. It is also necessary for the IT administrator to assist the implementation and maintenance of *syngo*.via. Additionally, a customer clinical administrator (key user) is strongly recommended. The customer IT administrator as well as the customer clinical administrator are appointed by the customer.

IT Administrator

Administration tasks (recurring)	Occurrence
Check *syngo*.via server systems for working properly (by Status Monitoring and e-mail notifications)	Daily
Backup management (perform a secondary backup[1])	Weekly
Archiving of audit trail logs using optical media or network shares (HIPAA Audit Controls, USA only)	Weekly
Check the *syngo*.via server for available updates from the Software Catalog	Every three months
Installation of client software and prerequisites per client machine	Once and on demand
Data security and data protection (install, configure, and update firewalls, virus protection software, and Microsoft operating system hotfixes on clients and servers)	Once and on demand
Network Management (allow remote access for Siemens Healthineers Customer Care, configure to send important messages to the IT Administrator by e-mail or SMS)	Once

Support tasks (on demand)

Update of *syngo*.via client prerequisites and application
Update of *syngo*.via server with Siemens Healthineers hotfixes and service packs from the Software Catalog
Update of *syngo*.via client BIOS, firmware, and drivers based on HW vendor instructions
Configuration of DICOM nodes (for example, printers, PACS, modalities)
License Management (import, check availability of *syngo*.via application licenses, assign to dedicated users or clients)
User Account and Role Management (manage domain and local user accounts using Active Directory and/or .NET SQL Authorization Manager, assign roles to users and user groups using Windows Authorization Manager)
Provide help to clinical users regarding IT topics (use troubleshooting tools, escalate issues to the Siemens Healthineers Customer Care, if required)
Assist the Siemens Healthineers Customer Care in troubleshooting software issues (provide access and configuration data)
Assist the hardware vendor during troubleshooting of hardware issues (provide access to server hardware and diagnostic tool results)
Solve *syngo*.via server issues (*syngo*.via application server, operating system, and network)
Solve *syngo*.via client issues (user management, network, hardware, and operating system issues)

[1] *A secondary backup is a copy of the primary backup.*

Roles and Responsibilities

Clinical Administrator

Administration tasks (recurring)	Occurrence
Configuration of application settings (for example, configuration of Display Layouts, Report Templates)	Once
Configuration of data-related settings (auto data deletion, auto routing, exclude from archiving rules)	Once
Configuration of workflow-related settings (workflow assignment rules, auto pre-fetching rules)	On demand
Customize client software options (for example, Patient Browser)	On demand

Support tasks (recurring)	Occurrence
Provide help to clinical users regarding application topics (use troubleshooting tools, escalate issues to the Siemens Healthineers Customer Care)	If required
Train clinical users in handling the *syngo*.via client (knowledge transfer on *syngo*.via applications to clinical users)	On demand
Assist Siemens Healthineers application specialists during troubleshooting of software issues (for example, provide anonymous patient examination for reproducing a software issue)	On demand
Solve *syngo*.via application-related issues (for example, delete or restore examination data, layouts, or worklists)	On demand

Connectivity and Standards Compliance

Connectivity

Efficiency depends on how workplaces are networked. *syngo*.via integrates imaging modalities and IT, making it possible to access and share information with clinical partners:

- Front-end integration: *syngo*.via provides a standard interface for image call-up from third-party RIS/PACS or HIS applications. This interface can be used to configure a third-party application to launch *syngo*.via with selected images

- Data exchange: *syngo*.via uses industry standards (DICOM and HL7) meaning it can connect to HIS/RIS, PACS, printers/cameras, and modalities, regardless of the vendor

- Siemens Healthineers integration solutions: Further synergies can be achieved by using RIS/PACS and modalities from Siemens Healthineers

Hospital IT Infrastructure

syngo.via can be connected to the hospital's IT infrastructure, such as the hospital's Active Directory, DNS, and mail server.

IHE Profiles

syngo.via is designed for back-end and front-end integration with Siemens Healthineers *syngo* applications, and with systems from different vendors. Communication is based on the internationally recognized workflow-supported profiles defined by the IHE Framework (Integrating the Healthcare Enterprise).

For the IHE profiles, see: **siemens-healthineers.com/services/it-standards/ihe-integrating-the-healthcare-enterprise**

Import and Export of DICOM Data

syngo.via provides functionality for importing/exporting DICOM data from/to CD/DVD, from/to local and network drives, and from/to configured DICOM nodes.

Image Archiving

- *syngo*.via stores images and changes in short-term storage (STS). *syngo*.via can be configured to send images to the archive immediately or based on specific rules. In *syngo*.via, archiving means sending DICOM objects to a DICOM node which has been configured for archiving. DICOM objects comprise received DICOM objects and internally created DICOM objects. *syngo*.via itself does not provide equipment for archiving.

- To fit the capabilities of the existing archiving environment, *syngo*.via can be configured to wrap its DICOM result objects into basic objects. Furthermore, *syngo*.via supports multiple archives such as thin- and thick-slice archives and allows it to send results to different archives based on DICOM attributes such as Referring Physician.

DICOM Standard

DICOM is used for exchanging image data between *syngo*.via and modalities (Siemens Healthineers and third-party), DICOM nodes, and the PACS.

For the DICOM conformance statements, see: **siemens-healthineers.com/services/it-standards/dicom**

HL7 Messages

HL7 messages are used to communicate between *syngo*.via, the RIS, and/or HIS (in case of no RIS) to correct patient data and achieve a synchronized patient data set in these systems.

syngo.via supports the following incoming HL7 messages:

- ADT A08 (patient record update
- ADT A40 (patient record merge)
- ADT A34 (patient record merge – Patient ID only)

All other not supported HL7 messages are silently discarded by *syngo*.via.

ORU R01 messages are used to export structured results to a connected information system. *syngo*.via supports three formats: ASCII Text, CDA Level 3, and PDF.

- FHIRcast interface for bi-directional findings exchange with third-party reporting solutions

For the HL7 conformance statement, see **siemens-healthineers.com/services/it-standards/hl7**

Nuance PowerScribe

The *syngo*.via report can be integrated into Nuance PowerScribe using the web service provided by PowerScribe 360 and Nuance PowerScribe One

File Drop Integration

The *syngo*.via report can be exported to a fileshare as a .docx or PDF file for the exchange with information systems.

System Security and Data Protection

Offering a secure solution is one of our major goals. That is why we continue to improve the security for *syngo*.via in every version. To prevent data theft and keep up with changing security guidelines of the authorities, we have increased the system protection measures with VB80.

Data Protection
Legal Requirements

- Authorization required to access functions and data
- Audit trails to record user and system activities
- Automatic termination of user sessions after specific time-out
- Archiving of images using interface to existing PACS
- Secure data storage using RAID short-term storage for images
- Protection against malicious software attacks
- Encryption of Client-Server communication
- Encryption of DICOM node communication

Virus Protection
The endpoint virus scanners from the following manufacturers are approved for *syngo*.via:

- Kaspersky
- McAfee
- Microsoft
- Sophos
- Symantec
- Trend Micro

Siemens Healthineers provides information on recommended virus protection software, and general instructions on configuration in the *syngo*.via Administrator Manual.

The customer is responsible for regularly updating virus patterns/definitions.

System Hardening
The medical industry is nowadays one of the most attacked industries worldwide. System hardening is to minimize a system's vulnerability by reducing its attack surface.

The hardening is based on the Secure Technical Implementation Guides (STIG) which are developed and maintained by Defense Information System Agency of the U.S.

For further details, please refer to the *syngo*.via Security White Paper and Manufacturer Disclosure Statement (MDS[2]) form.

We offer RAID solutions which have the possibility to protect against the most common attacks, such as cold boot attacks, malicious code, and brute force attack. Hardware encryption uses dedicated physical processors located in the RAID controller device to encrypt and decrypt the data in real time.

Please contact your sales representative for further information.

Backup / Restore
syngo.via backup policy uses an incremental backup scheme (daily). The backup includes system, application (including *syngo*.via configuration), and database (patient and workflow) data. *syngo*.via acts as short-term storage, therefore, it does not back up the image data itself. Restore operations can be performed by the IT administrator, for example recovery of corrupted files, recovery of a corrupted operating system, or recovery of applications. Restore operations after database failures must be performed by Siemens Healthineers Service.

IT Care Plan

Acquiring best-in-class medical equipment is just the first step to remaining competitive in a constantly changing healthcare environment. The management of healthcare IT solutions, including their associated resources, can be both time-consuming and costly.

To address these challenges, the IT Care Plan from Siemens Healthineers enables you to:

Increase your system availability

by minimizing IT-related downtime over the entire serviceable lifetime through continuous remote support and with the benefits of proactive system monitoring. Regular remote software updates and upgrades keep your IT solutions reliable and secure, protecting your investment.

Increase your staff competency, efficiency, and productivity

with a personalized education and performance experience, designed for healthcare professionals.

With an IT Care Plan, you can increase your return on invest knowing that you have a reliable partner who helps you improve your efficiency and productivity throughout the entire serviceable lifetime of your healthcare IT solutions.

■ Empowered Users

■ Personalized Experiences

IT Care Plan

- ■ PEPconnections*
- ■ Equipment & Clinical Education
- ■ Application Support
- ■ Technical Support
- ■ Software Upgrades
- ■ Software Updates

■ System Availability

* Our optional premium service offering for the virtual education services to manage the healthcare institution's performance growth with integrated group management and administration features.

	Includes ...	Consisting of ...
Options	■ Remote Admin Plus	Remote administration of *syngo*.via, e.g., remote installation of hotfixes, workflow configuration and user management[1].
Education Elements	■ PEPconnections	Personalized learning experience to increase workforce productivity, deliver high-quality results, and increase performance.
	■ Equipment & Clinical Education	Tailored training to improve workflow productivity and diagnostic accuracy, adapted to the learning styles and needs of clinical staff.
Core Elements	■ Remote Application Support	Immediate remote support and guidance for application-related requests, to empower users and improve daily operations.
	■ Remote Technical Support	Immediate remote technical and phone support for technical requests, to optimize system availability and daily operations[2].
	■ Software Upgrades	Regular distribution of new versions for increased productivity with enhanced software features to improve application functionality.
	■ Software Updates	Regular distribution of software updates for higher system performance and reliability

[1] Connection to Smart Remote Services is mandatory.
[2] Optimized system availability and daily operations are supported by Event Monitoring (Guardian PRO).

IT Care Plan

Points of Contact

- Siemens Healthineers is the single point of contact for the customer (except for some OpenApps). Siemens Healthineers provides support for the software as committed in the IT Care Plan. Hardware-related service requests will be routed to the responsible hardware provider.
- The customer administrator is the first contact person for internal users and the single point of contact to Siemens Healthineers.

Therefore, the administrator is an essential part of the service process. For more details regarding administrator tasks, please refer to the current version of the respective Administrator Manual.

Customer Benefits

System IT availability with fast and professional service provision:

- Ensure a high quality of reports, readings, and results when they are needed by keeping the system up to date, high performing, and available
- Rely on our team of specialists who provide fast and comprehensive remote support up to 24/7 using the SRS infrastructure and features
- Protect your budget and system investment: Keep your software up to date and operational over the entire product life cycle
- Get the most out of your assets with optimized system usage

Remote Service Software

All IT Care Plans require a connection to Smart Remote Services (SRS) through VPN connection.

Pre-Condition

Specification of minimum broadband Internet connection in detail:

- Downstream: 2000 kBit/s for Software update, IT and Application support
- Upstream: 512 kBit/s for Application support
- Upstream: 256 kBit/s for Software update and IT support

In case these minimum requirements are not fulfilled, certain services may not be provided (like Remote Application Support) and the agreed remote response time cannot be guaranteed. It is necessary to calculate additional costs to ensure a proper onsite support. These costs can be calculated by your local Service Organization or your regional sales support team.

Depending on customer infrastructure, Siemens Healthineers can provide a router to establish the connection between customer's internal network and the Smart Remote Services infrastructure.

Administration Workplace

The Administration Portal is part of the *syngo*.via server software and enables the following administrative functions:

- Status control of server and components
- Access to detailed status checks, down to subprocesses and subcomponents
- Color-coded overall system status
- Statistical reports for continuous monitoring of key performance parameters
- Overview of active users
- Evaluation of centrally stored system messages
- Configuration of system, workplaces, and DICOM nodes
- License management
- Detailed information about installed hardware and software
- Access control for Smart Remote Services and remote administration
- In case of errors, suggestions for further analyses and corrective actions

The Administration Portal can be accessed by IT Administrators from workplaces inside a local network and by Siemens Healthineers Service Engineers using a Service Key for special access authorization.

Education Plans

To empower your staff with expertise and increase workforce productivity, Siemens Healthineers offers continuous tailored education based on a blended learning approach.

After installation of your *syngo*.via software, an initial training is provided to guarantee a seamless onboarding for your *syngo*.via end users. This hand-over training is delivered by the Clinical Education Specialist and includes:
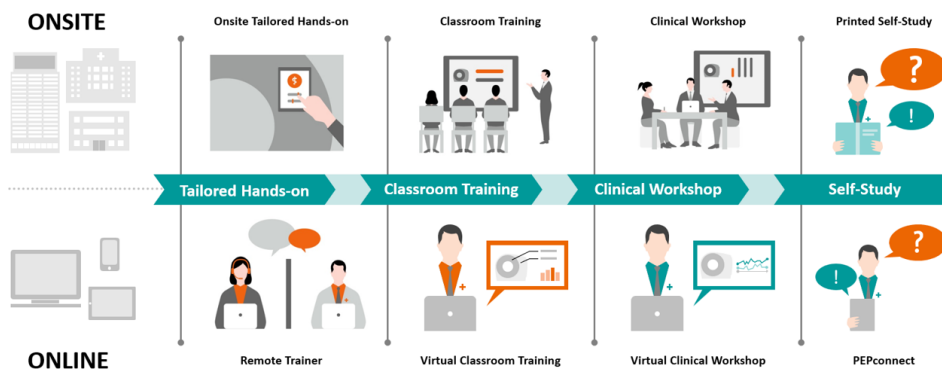
• Pre-training clarification
• Pre-training online learning activities prior to the hand-over training event for more efficiency
• Clinical integration of the main modality (remote or onsite)
• Dedicated number of *syngo*.via training hours/days, depending on the specific applications and users for your institution.

We offer 3 Education Plans that are flexible, and are customized to meet the needs of your institutions:

• **Education Plan GAIN** (always part of any *syngo*.via delivery)
• **Education Plan GROW**
• **Education Plan LEAD**.

All Education Plans contain onsite as well as online training variants:

We care for your knowledge and develop your skills along the equipment lifecycle, not only onsite but also online

SIEMENS Healthineers

ONSITE	Onsite Tailored Hands-on	Classroom Training	Clinical Workshop	Printed Self-Study
	Tailored Hands-on	Classroom Training	Clinical Workshop	Self-Study
ONLINE	Remote Trainer	Virtual Classroom Training	Virtual Clinical Workshop	PEPconnect

To give you the possibility to increase your knowledge at your pace anytime and anywhere, you will have access to our Siemens Healthineers learning platform – PEPconnect. PEPconnect is a platform available from the *syngo*.via User Interface[1], where you can benefit from online trainings and educational videos,

focused on the utilization of your *syngo*.via clinical applications.

Optional Education Plan elements such as the Optimized Structured Reporting, a consulting offering to optimally support the usage of *syngo*.via Structured Reporting, complement the portfolio.

With PEPconnections – our premium subscription for workforce education management – you can assign and manage the education of your staff, ensuring all your employees have a continuous education path.

[1] *Direct connection to the PEPconnect platform is available from the syngo.via UI when an internet connection is available from the syngo.via client.*

Siemens Healthineers Integration with Solutions

syngo.via Research Applications[1]

With *syngo*.via, you can explore the potential of advanced post-processing research applications that are seamlessly integrated with your routine *syngo*.via system. *syngo*.via Frontier enables you to easily implement your own algorithms to create your own research applications and connects you directly with other key opinion leaders and the Siemens Healthineers development teams.

syngo.via Frontier gives you direct access to multi-modality research applications in the fields of Cardio-Vascular imaging, Neurology, Oncology, physics or general availability (e.g., from Siemens Healthineers). The Digital Marketplace provides access to the *syngo*.via Frontier research applications. Further details are described in the *syngo*.via Frontier Datasheet.

With *syngo*.via Frontier, you open up your *syngo*.via to a world of research.

syngo.via OpenApps

Siemens Healthineers introduces the Digital Marketplace as the new web store for *syngo*.via OpenApps. This integrated web store provides an easy way to browse and download apps. It offers apps with a commitment-free full featured 90 days trial phase for exploration and optional subscription later on. Clinical users can easily download and install additional apps from any *syngo*.via client workplace by utilizing the Digital Marketplace. Apps from other vendors have been scanned for security vulnerabilities and integrated into the safe environment of *syngo*.via by Siemens Healthineers.

Remote Collaboration

syngo.via enables collaboration between two clients through desktop sharing. This mode can be used between physicians (asking for a second opinion) and between users and service technicians (for troubleshooting).

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[1] *Disclaimer: Please note that the syngo.via Frontier research applications are not intended for clinical or diagnostic use.*

Mapping Table

Medical Devices to Applications

D&A Medical Devices[1]	Clinical Application
syngo.via (Basic) is a software solution intended to be used for viewing, manipulation, communication, and storage of medical images. It can be used as a stand-alone device or together with a variety of cleared and unmodified *syngo* based software options. *syngo*.via supports interpretation and evaluation of examinations within healthcare institutions, e.g., in Radiology, Nuclear Medicine and Cardiology environments. The system is not intended for the displaying of digital mammography images for diagnosis in the U.S.	*syngo*.via MM Reading

Syngo Carbon Clinicals

Syngo Carbon Clinicals
is intended to provide advanced visualization tools to prepare and process the medical image for evaluation, manipulation and communication of clinical data that was acquired by the medical imaging modalities (e.g., CT, MR, etc.).

syngo.CT Lung CAD – an accessory of syngo.MM Oncology and Syngo Carbon Clinicals
The device is a Computer Aided Detection (CAD) tool designed to assist radiologists in the detection of solid pulmonary nodules, part solid nodules and ground glass nodules during review of multi-detector computed tomographic (MDCT) examinations of the chest. The software is an adjunctive tool that alerts the radiologist to regions of interest (ROI) that may be initially overlooked. The *syngo*.CT Lung CAD device may be used as a concurrent first reader followed by a full review of the case by the radiologist or as second reader after the radiologist has completed his/her initial read.

[1] *See manufacturer address on p. 73.*

Mapping Table
Medical Devices to Applications

CT Medical Devices[1]	Clinical Application
***syngo*.CT Applications** is a set of software applications for advanced visualization, measurement, and evaluation for specific body regions. This software package is designed to support the radiologists and physicians in emergency medicine, specialty care, urgent care, and general practice, e.g., in the following cases: • Evaluation of perfusion of organs and tumors and myocardial tissue perfusion • Evaluation of bone structures and detection of bone lesions • Evaluation of CT images of the heart • Evaluation of the coronary lesions • Evaluation of the mandible and maxilla • Evaluation of dynamic vessels and extended phase handling • Evaluation of the liver and its intrahepatic vessel structures to identify the vascular territories of sub-vessel systems in the liver • Evaluation of neurovascular structures • Evaluation of the lung parenchyma • Evaluation of non-enhanced head CT images • Evaluation of vascular lesions	*syngo*.CT Neuro DSA *syngo*.CT Neuro Perfusion *syngo*.CT Dynamic Angio *syngo*.CT Vascular Analysis *syngo*.CT Coronary Analysis *syngo*.CT Cardiac Function *syngo*.CT Liver Analysis *syngo*.CT Bone Reading *syngo*.CT Myocardial Perfusion *syngo*.CT Pulmo 3D *syngo*.CT Body Perfusion *syngo*.CT Dental *syngo*.CT CaScoring *syngo*.CT Skull Unfolding

[1] *See manufacturer address on p. 73.*

Mapping Table
Medical Devices to Applications

CT Medical Devices[1]	Clinical Application

syngo.CT Colonography

is used for easy-to-perform and efficient inspection of the colonic surface. It facilitates the search and diagnosis of colon lesions. The workflow management ensures that the required data and tools are offered to you according to your role and task. *syngo*.CT Colonography is a clinical post-processing workflow for basic virtual colonoscopy.

It is designed to support the following image reconstruction techniques:

- Multiplanar Reconstruction (MPR)
- Volume Rendering Technique (VRT)
- Perspective surface shaded display (pSSD)

The following evaluation tools are provided with this workflow:

- Virtual Flight
- Panoramic View
- Polyp Lens
- Stool Tagging
- Stool Subtraction
- Polyp Enhanced Viewing (PEV)
- Movie

syngo.CT Colonography supports reporting with appropriate reporting tools such as lesion location, lesion characterization, and key image creation. Combining enhanced commercially available digital image processing tools with an optimized workflow and reporting tools, the software is designed to support the physician on confirming the presence or absence of physician identified colon lesions (e.g., polyps) in addition to evaluation, documentation, and follow-up of any such lesions using standard or low-dose spiral CT scanning.

syngo.CT ASPECTS[2]

is designed to evaluate the brain in case of ischemic stroke. The software is designed to process volumes without contrast. *syngo*.CT ASPECTS provides a reproducible quantitative grading system on CT images of the head that may help in finding visible ischemic changes in patients suspected of having stroke related circulation occlusion.

syngo.CT ASPECTS[2]

[1] *See manufacturer address on p. 73.*
[2] *syngo.CT ASPECTS can either be purchased as standalone application or as part of syngo.CT Neuro Perfusion.*
 syngo.CT ASPECTS is not available in the U.S. Future availability cannot be guaranteed.

Mapping Table

Medical Devices to Applications

CT Medical Devices[1]	Clinical Application
***syngo*.CT Dual Energy** is designed to operate with CT images based on two different X-ray spectra. The various materials of an anatomical region of interest have different attenuation coefficients, which depend on the used energy. These differences provide information on the chemical composition of the scanned body materials. *syngo*.CT Dual Energy combines images acquired with low and high energy spectra to visualize this information. Depending on the region of interest, contrast agents may be used. The general functionality of the *syngo*.CT Dual Energy applications is as follows: • Monoenergetic • Brain Hemorrhage[1] • Gout Evaluation • Lung Vessels[2] • Heart PBV[1] • Bone Removal[1] • Liver VNC[3] • Monoenergetic Plus • Virtual Unenhanced • Bone Marrow[2] • Hard Plaques[1] • Rho/Z[1] • Kidney Stones • SPR (Stopping Power Ratio)[1] • SPP (Spectral Post-Processing Format) The availability of each feature is depending on the Dual Energy scan mode. Kidney Stones is designed to support the visualization of the chemical composition of kidney stones and especially the differentiation between uric acid and non-uric acid stones.For full identification of the kidney stone additional clinical information should be considered, such as patient history and urine testing. Only a well-trained radiologist can make the final diagnosis under consideration of all available information. The accuracy of identification is decreased in obese patients.	*syngo*.CT Dual Energy *syngo*.CT DE Gout *syngo*.CT DE Calculi Characterization *syngo*.CT DE Brain Hemorrhage[1] *syngo*.CT DE Heart PBV[1] *syngo*.CT DE Direct Angio[1] *syngo*.CT DE Lung Analysis[2] *syngo*.CT DE Bone Marrow[2] *syngo*.CT DE Virtual Unenhanced[3] *syngo*.CT DE Monoenergetic Plus *syngo*.CT DE Hardplaque Display[1] Rapid Results Technology

[1] *Currently not available for NAEOTOM Alpha. Future availability cannot be guaranteed.*
[2] *Not available for NAEOTOM Alpha in the U.S. Future availability cannot be guaranteed.*
[3] *Liver ECV and Liver Fat Maps are not available for NAEOTOM Alpha. Future availability cannot be guaranteed.*

Mapping Table

Medical Devices to Applications

CT Medical Devices[1]	Clinical Application

syngo.via RT Image Suite
is a 3D and 4D image visualization, multimodality manipulation, and contouring tool that helps the preparation of treatments such as, but not limited to those performed with radiation (for example, Brachytherapy, Particle Therapy, External Beam Radiation Therapy).

It provides tools to view existing contours, create, edit, modify, copy contours of regions of the body, such as but not limited to, skin outline, targets, and organs-at-risk. It also provide functionalities to create simple geometric treatment plans. Contours, images and treatment plans can subsequently be exported to a Treatment Planning System.

The software combines the following digital image processing and visualization tools:

- Multimodality viewing and contouring of anatomical, functional, and multi-parametric images, such as but not limited to, CT, PET, PET/CT, MRI, Linac CBCT images
- Multiplanar reconstruction (MPR) thin/thick, minimum intensity projection (MIP), volume rendering technique (VRT)
- Freehand and semi-automatic contouring of regions-of-interest on any orientation including oblique
- Automated Contouring on CT images
- Creation of contours on images supported by the application without prior assignment of a planning CT
- Manual and semi-automatic registration using rigid and deformable registration
- Supports the user in comparing, contouring, and adapting contours based on datasets acquired with different imaging modalities and at different time points
- Supports multimodality image fusion
- Visualization and contouring of moving tumors and organs
- Management of points of interest including but not limited to the isocenter
- Creation of simple geometric treatment plans
- Generation of a synthetic CT based on multiple pre-define MR acquisitions

syngo.CT Extended Functionality is intended to provide advanced visualization tools to prepare and process medical images for diagnostic purpose. The software package is designed to support technicians and physicians in qualitative and quantitative measurements and in the analysis of clinical data that was acquired and reconstructed by Computed Tomography (CT) scanners, and possibly other medical imaging modalities (e.g., MR scanners). An interface shall enable the connection between the *syngo*.CT Extended Functionality software package and the interconnected CT Scanner system. Resulting images created with the *syngo*.CT Extended Functionality software package can be used to assist trained technicians or physicians in diagnosis.	*syngo*.CT Extended Functionality

[1] *See manufacturer address on p. 73.*

Mapping Table
Medical Devices to Applications

CT Medical Devices[1]	Clinical Application
syngo.CT Brain Hemorrhage[2] is designed to assist the radiologist in prioritizing cases of suspected intracranial hemorrhage, also in the subarachnoid space, on non-contrast CT examinations of the head. It makes case-level output available to a CT scanner or other PACS system for worklist prioritization. The output is intended for informational purposes only and is not intended for diagnostic use. The device does not alter the original medical image and is not intended to be used as a standalone diagnostic device.	*syngo*.CT Brain Hemorrhage[2]
syngo.CT Brain Quantification[2] is a radiological post-processing application for the analysis of non-contrast head CT images. The device is intended for automatic labeling, visualization, and quantification of intracranial structures. The software is indicated for use in the analysis of: • Intracranial hyperdensities • Midline shift.	*syngo*.CT Brain Quantification[2]
syngo.CT LVO Detection[2] is a radiological post-processing application for the analysis of CT angiography (CTA) head images. It provides computer-aided triage. The pathology which is addressed by *syngo*.CT LVO Detection is large vessel occlusion. The output for triage is intended for informational purposes only. It is not intended for diagnostic use and does not alter the original medical image.	*syngo*.CT LVO Detection[2]
syngo.CT Cardiac Planning is an image analysis software package for evaluating contrast enhanced CT images. The software package is designed to support the physician in the qualitative and quantitative analysis of morphology and pathology of vascular and cardiac structures, with the overarching purpose of serving as input for planning of cardiovascular procedures.	*syngo*.CT Cardiac Planning – Valve Pilot

[1] *Available with optional license only*
[2] *Not available for the U.S. Future availability cannot be guaranteed.*

Mapping Table

Medical Devices to Applications

MR Medical Devices[1]	Clinical Application
syngo.MR Applications is a *syngo* based post-acquisition image processing software for viewing, manipulating, evaluating, and analyzing MR, MR-PET, CT, PET, CT-PET images, and MR spectra.	*syngo*.MR General Clinical Package
	syngo.MR Composing
	syngo.MR Neuro Perfusion
	syngo.MR Neuro Perfusion Mismatch
	syngo.MR Neuro fMRI
	Brain MR Morphometry[1]
	syngo.MR Tractography
	syngo.MR Cardiac 4D Ventricular Function
	syngo.MR Cardiac Flow
	syngo.MR Cardiac Perfusion[2]
	syngo.MR Vascular Analysis
	syngo.MR Onco
	syngo.MR OncoTrend
	syngo.MR 3D Lesion Segmentation
	syngo.MR Tissue4D
	syngo.MR Prostate[3,4]
	syngo.MR Spectro SVS
	syngo.MR Spectro CSI
	syngo.MR Spectro Extension
	syngo.MR Spectro Research
	syngo.mMR General
	syngo.MR BreVis

[1] *Available with optional license only*

[2] *This feature is not commercially available in the U.S.*

[3] *Prostate MR is not commercially available in some countries. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.*

[4] *Some features are available with optional license only.*

Mapping Table

Medical Devices to Applications

MI Medical Devices[1]	Clinical Application
syngo.**MM Oncology** The device is comprised of individual software program or group of programs, routines or algorithms that add specific image processing and/or analysis capabilities to a Positron Emission Tomography (PET) or Single Photon Emission Computed Tomography (SPECT) imaging system configuration. A basic set of application programs and routines is included with such computer-controlled imaging systems, and they can be upgraded to correct programming errors or to add new system capabilities. Some applications software routines or groups of routines (packages) must be combined with specific hardware or firmware accessories or configurations in order to function as intended. Applications program packages are typically identified by a proprietary name and "version" or "upgrade" number. GMDN code: 40870 (PET) and 40869 (SPECT). The software components may provide functions for performing operations related to image manipulation, enhancement, compression, or quantification.	*syngo*.MM Multi-Timepoint Eval *syngo*.MI Segmentation *syngo*.CT Segmentation *syngo*.PET Dynamic Analysis *syngo*.MM Therapy Interface *syngo*.CT Onco Function – Hepatic AEF *syngo*.MI Anatomy Insights *syngo*.PET Auto ID
Scenium The Scenium display and analysis software has been developed to aid the Clinician in the assessment and quantification of pathologies taken from PET and SPECT scans. The software is deployed through medical imaging workplaces and is organized as a series of workflows which are specific to use with particular drug and disease combinations. The software aids in the assessment of human brain scan, enabling automated analysis through quantification of mean pixel values located within standard regions of interest. It facilitates comparison with existing databases of normal patients and normal parameters derived from these databases, derived from FDG-PET, amyloid-PET, and SPECT studies, calculation of uptake ratios between regions of interest, and subtraction between two functional scans.	*syngo*.PET DB Comparison *syngo*.SPECT DB Comparison *syngo*.PET Cortical Analysis *syngo*.PET Striatal Analysis *syngo*.SPECT Striatal Analysis *syngo*.MI Neuro Subtraction
syngo.**Myocardial Blood Flow** This is a software product intended for visualization, assessment and quantification of PET images. The application performs quantitative measurements of tracer uptake over time to aid in the interpretation of myocardial perfusion PET images. This application supports scans acquired with either 82Rb, or 13NH3 tracers.	*syngo*.PET Myocardial Blood Flow
syngo.**CT Lung CAD – an accessory of** *syngo*.**MM Oncology and Syngo Carbon Clinicals** The device is a Computer Aided Detection (CAD) tool designed to assist radiologists in the detection of solid pulmonary nodules, part solid nodules and ground glass nodules during review of multi-detector computed tomographic (MDCT) examinations of the chest. The software is an adjunctive tool that alerts the radiologist to regions of interest (ROI) that may be initially overlooked. The *syngo*.CT Lung CAD device may be used as a concurrent first reader followed by a full review of the case by the radiologist or as second reader after the radiologist has completed his/her initial read.	*syngo*.CT Lung CAD

[1] *Available with optional license only*

Mapping Table

Medical Devices to Applications

MI Medical Devices[1]	Clinical Application
syngo.MI General The device is comprised of individual software program or group of programs, routines or algorithms that add specific image processing and/or analysis capabilities to a Positron Emission Tomography (PET) or Single Photon Emission Computed Tomography (SPECT) imaging system configuration. A basic set of application programs and routines is included with such computer-controlled imaging systems, and they can be upgraded to correct programming errors or to add new system capabilities. Some applications software routines or groups of routines (packages) must be combined with specific hardware or firmware accessories or configurations in order to function as intended. Applications program packages are typically identified by a proprietary name and "version" or "upgrade" number. GMDN code: 40870 (PET) and 40869 (SPECT). The software components may provide functions for performing operations related to image manipulation, enhancement, compression or quantification.	*syngo*.MI General *syngo*.NM Organ Processing *syngo*.MI Neurology *syngo*.MI Cardiology 4DM *syngo*.CT Extension Corridor 4DM *syngo*.PET Cardiology Cedars *syngo*.SPECT Cardiology Cedars *syngo*.MI Cardiology Cedars *syngo*.CT Extension Cedars *syngo*.MI Cedars Reporting

[1] *Available with optional license only*

Mapping Table

Medical Devices to Applications

Mammography Medical Devices[1]	Clinical Application
syngo.Breast Care is a dedicated softcopy review environment for both screening and diagnostic mammography as well as digital breast tomosynthesis.	*syngo*.Breast Care Reading *syngo*.Breast Care Tomo *syngo*.Breast Care CAD Display *syngo*.Breast Care Link-it *syngo*.Breast Care One-Click
MAMMOVISTA B.smart is a dedicated softcopy review environment for both screening and diagnostic mammography as well as digital breast tomosynthesis. Its user interface and workflow have been optimized to support experienced mammography and tomosynthesis reviewers in both screening and diagnostic reading. Efficiency and reading quality are supported by various specialized features.MAMMOVISTA B.smart provides visualization and image enhancement tools to aid aqualified radiologist in the review of digital mammography and digital breast tomosynthesis datasets, as well as other modalities of breast images.	MAMMOVISTA B.smart Reading MAMMOVISTA B.smart Advanced[2] MAMMOVISTA B.smart One-click[2] MAMMOVISTA B.smart MR Advanced MAMMOVSITA B.smart Double Blind

[1] See manufacturer address on p. 73.
[2] Available as option

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Caution: U.S. federal law restricts the herein described devices to sale by or on the order of a physician.

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