



Datasheet

syngo.via Software Version VB40A

siemens-healthineers.com/syngo.via

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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”.

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.

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.

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 workflow, and nuclear medicine, and enables fast and efficient diagnostics.

syngo.via client can access multiple servers¹.

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 AI technology, 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 provides immediate and open access to an ever-growing variety of clinical applications. With OpenApps, syngo.via connects to the Siemens Healthineers Digital Ecosystem.

The integrated store provides an easy way to browse and download apps. It offers trial apps and request for quotations in-line with a flexible subscription concept. Apps from other vendors have been scanned for security vulnerabilities and integrated into the safe environment of syngo.via by Siemens Healthineers.

OpenApps integration in MM Reading

Siemens Healthineers introduces the Digital Marketplace as the new web store for syngo.via OpenApps, medical post-processing apps created by us or our partners. You are able to launch and use syngo.via OpenApps directly out of the MM Reading workflow. This allows you to focus on your case and exchange results.

Findings Reporting

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 PDF² 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. And the report can be integrated into Nuance PowerScribe 360.

Multi-Server Access

Allows for easy access from one client to up to six syngo.via servers. syngo.via also supports automatic loading of studies from different customer sites with different Medical Record Numbers but same EMPI (Electronic Master Patient Index).³

Every syngo.via comes with the following multi-modality reading functionality and applications, suitable for many needs in the clinical routine.

Multi-modality 2D/3D/4D Reading

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

¹ The 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.

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

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.via MM Reading includes¹:

- 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 navigation tool, Time Curve tool for 4D analysis, CT Lung Change tool for quick review and assess changes in the lung

MM Vessel tool (incl. Automatic Heart and Coronary Tree Isolation), Quantification of PET and SPECT data using standardized methods e.g., SUV, Bq/ml, %.

MR Generic tools (incl. Calculation, Motion Correction, Image Filter, 2D/3D Distortion Correction, ADC & b-value calculation, and Composing)

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 (VNC). This allows easy comparison between multiple Dual Energy studies from different timepoints in *syngo.via* MM Reading.

Findings Reporting

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

syngo.via common features

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

¹ Some features are available with optional license only.

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 needs¹. 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 access². For dedicated clinical use cases individual applications can be obtained.

	CT	MR	PET	SPECT	Others	
Acute Care	Acute Care CT					
Neurology	Neurology CT	Neurology MR	Neurology PET	Neurology SPECT		
Oncology	Oncology CT	Oncology MR	Oncology MI		Breast Care	RT Image Suite
Cardiology	Cardiology CT	Cardiology MR	Cardiology MI			
Routine	Routine CT	Routine MR	Routine SPECT			
Multi-modality	Automate and Routine	Reporting	Mobile Viewing		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, 3rd party contents are not included in the subscription packages. Exception: Breast Care contains MeVis license.

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 General Routine Packages

Automate & Routine	Reporting	Mobile Viewing	Connect
<p><i>syngo.via</i> multi-modality software foundation</p> <p>Dedicated workflows for multi-modality, CT Cardiac, CT Vascular, CT Dual Energy¹, PET&CT Oncology, MR Reading</p> <p>Tools and technologies:</p> <ul style="list-style-type: none"> • <i>syngo.via</i> Cinematic VRT • <i>syngo.via</i> OpenApps² • Interactive Spectral Imaging³ • <i>syngo.via</i> Time Curve Tool • <i>syngo.via</i> CT Lung Change • <i>syngo.via</i> Basic Onco Tool • <i>syngo.MR</i> Composer • ALPHA Technology⁴ • Rapid Results Technology for ALPHA 	<ul style="list-style-type: none"> • Report templates and editor • Findings infrastructure • Report customization and advanced report template management • HL7 based report export • Integrated diagnostic guidelines for TNM staging, Lung RADS, CAD RADS, LI RADS 	<ul style="list-style-type: none"> • Easy access to 2D and rendered image data through web browsers and mobile devices 	<ul style="list-style-type: none"> • HL7 Patient Information Reconciliation (PIR) for data consistency with e.g., RIS, HIS. • HL7 based Report export to connected information system

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 Interactive Spectral Imaging allows change of Monoenergetic Plus keV levels right within *syngo* MM Reading as well as visualizing non-editable iodine maps, Mixed and Virtual Unenhanced images (VNC).

⁴ 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, cardio-vascular, body regions, organs)

Multi-modality Routine Packages

In addition to the separate packages, an all-inclusive package option combining all functionalities 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.

syngo.via OpenApps

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

Interactive Spectral Imaging

Interactive Spectral Imaging allows change of Monoenergetic Plus keV levels right within *syngo* MM Reading as well as visualizing non-editable iodine maps, Mixed and Virtual Unenhanced images (VNC).

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, cardio-vascular, body regions, organs).

Rapid Results Technology for ALPHA

Rapid Results Technology for standardized and automated anatomical ranges creation and archiving, triggered from the CT scanner¹.

• 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.

• Dedicated workflows optimize reading for multi-modality, CT Cardiac, CT Vascular, CT Dual Energy², PET&CT Oncology, 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.

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

syngo.CT Dual Energy³ includes preparing and viewing of Dual Energy data, mixed image calculation, monoenergetic, optimum contrast⁴, Rho/Z (electron density/effective atomic number), direct SPR (Stopping Power Ratio).

syngo.MI Reading 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, manual RECIST/WHO 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.

¹ Only available for CT data, for the whole SOMATOM Family.

² *syngo*.CT Dual Energy includes Monoenergetic, Optimum Contrast and *syngo*.CT DE Rho/Z

³ Works with Dual Energy images from the whole SOMATOM Family (Single Source and Dual Source Dual Energy).

⁴ Optimum Contrast is only available for Dual Source and Twin Beam Dual Energy. This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

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
- Cross workflow reporting to combine results in one document

Mobile Viewing

syngo.via* WebViewer¹ is the mobile extension of *syngo.via

syngo.via WebViewer is a client server product that provides access to rendered medical image data through web browsers and mobile devices.

It provides fast and easy image access in time-critical situations or on-call for physicians outside the radiology department (e.g., for surgeons in trauma cases or neurosurgeon in stroke cases).

The flexible image access through mobile devices also makes it possible to illustrate and discuss results directly with the patient.

syngo.via WebViewer supports the following image and file formats (2D images as well as volumetric data): Computed Tomography (CT), Magnetic Resonance (MR), Positron Emission Tomography (PET, PET/CT), Computed Radiography/Digital Radiography (CR/DR), Secondary Capture Images (SC), Encapsulated PDF Configuration

syngo.via WebViewer is available for *syngo.via* Workstation and *syngo.via* Departmental (L-and XL) in two different deployments: integrated and/or dedicated server. The integrated deployment supports a maximum of 3 concurrent WebViewer users.

The dedicated server deployment supports up to 19 concurrent WebViewer users. Please contact your sales representative for further information.

Connect

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 functionalities are supported:

HL7 Patient Information Reconciliation (PIR) messages A08, A34, and A40 (receiving patient update information from, e.g., RIS, HIS).

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

¹ The application *syngo.via* WebViewer is not for diagnostic viewing/reading on mobile devices in the US. Please refer to your sales representative whether the product is available for your country. Diagnostic reading of images with a web browser requires a medical grade monitor. For iPhone and iPad country-specific laws may apply. Please refer to these laws before using for diagnostic reading/viewing. For Japan: Applications on iPhone/iPad/iPod are not a medical device in Japan. Use at your own risk. They are not intended to be used for diagnosis.

Computed Tomography

The CT Clinical Packages

Better understand diseases and make the right treatment decisions – with disease-specific software applications complementary to your CT. Continuously enhance your clinical capabilities by providing better diagnostic confidence. Improve process efficiency by saving working steps and make your entire patient pathway even faster.

Routine CT Package	Acute Care CT Package	Cardiovascular CT Package	Neurology CT Package	Oncology CT Package
<i>syngo</i> .CT CaScoring	<i>syngo</i> .CT ASPECTS ¹	<i>syngo</i> .CT Cardiac Function	<i>syngo</i> .CT ASPECTS ¹	<i>syngo</i> .CT Body Perfusion
<i>syngo</i> .CT Colonography	<i>syngo</i> .CT Bone Reading	<i>syngo</i> .CT Cardiac Function-Enhancement	<i>syngo</i> .CT DE Bone Marrow	<i>syngo</i> .CT Bone Reading
<i>syngo</i> .CT DE Calculi Characterization	<i>syngo</i> .CT Coronary Analysis	<i>syngo</i> .CT Cardiac Function-Right Ventricle	<i>syngo</i> .CT DE Brain Hemorrhage ³	<i>syngo</i> .CT Colonography
<i>syngo</i> .CT DE Gout	<i>syngo</i> .CT DE Bone Marrow	<i>syngo</i> .CT Cardiac Function-Right Ventricle	<i>syngo</i> .CT DE Direct Angio	<i>syngo</i> .CT Colonography-Advanced
<i>syngo</i> .CT DE Monoenergetic Plus	<i>syngo</i> .CT DE Brain Hemorrhage ³	<i>syngo</i> .CT CaScoring	<i>syngo</i> .CT DE Hardplaque Display	<i>syngo</i> .CT Colonography-PEV
<i>syngo</i> .CT Dental	<i>syngo</i> .CT DE Direct Angio	<i>syngo</i> .CT Coronary Analysis	<i>syngo</i> .CT DE Monoenergetic Plus	<i>syngo</i> .CT DE Monoenergetic Plus
<i>syngo</i> .CT Neuro DSA	<i>syngo</i> .CT DE Lung Analysis	<i>syngo</i> .CT DE Direct Angio	<i>syngo</i> .CT Dynamic Angio	<i>syngo</i> .CT DE Bone Marrow
<i>syngo</i> .CT Vascular Analysis	<i>syngo</i> .CT DE Monoenergetic Plus	<i>syngo</i> .CT DE Hardplaque Display	<i>syngo</i> .CT Neuro DSA	<i>syngo</i> .CT DE Virtual Unenhanced
	<i>syngo</i> .CT DE Virtual Unenhanced	<i>syngo</i> .CT DE Heart PBV	<i>syngo</i> .CT Neuro Perfusion	<i>syngo</i> .CT Lung CAD
	<i>syngo</i> .CT Dynamic Angio	<i>syngo</i> .CT DE Monoenergetic Plus		<i>syngo</i> .CT Onco Function-Hepatic AEF
	<i>syngo</i> .CT Neuro DSA	<i>syngo</i> .CT Myocardial Perfusion		<i>syngo</i> .CT Pulmo 3D
	<i>syngo</i> .CT Neuro Perfusion	<i>syngo</i> .CT PE CAD ²		<i>syngo</i> .CT Segmentation
	<i>syngo</i> .CT PE CAD ²	<i>syngo</i> .CT TAVI Valve Pilot		<i>syngo</i> .MM Onco Multi-Timepoint Evaluation and <i>syngo</i> .MM Onco Cross-Time Evaluation
	<i>syngo</i> .CT Vascular Analysis	<i>syngo</i> .CT Cardiac Planning		
	<i>syngo</i> .CT Vascular Analysis-Autotracer	<i>syngo</i> .CT Vascular Analysis		
		<i>syngo</i> .CT Vascular Analysis-Autotracer		

¹ Included in *syngo*.CT Neuro Perfusion

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

³ Not yet approved for USA.

Routine CT Package

syngo.CT CaScoring

- Total & standard calcium scoring and Coronary Age calculation based, for example, on MESA Trial data and more
- Preferred loading of Agatston-equivalent low kV series
- Rapid Result Technology for standardized and automated total CaScore result.

syngo.CT Colonography¹

- 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 composition of kidney stones
- Seamless navigation through the visualized stones

syngo.CT DE Gout

- Color-coded visualization of deposited uric acid crystals in peripheral extremities

syngo.CT DE Monoenergetic Plus

- Improved algorithm for enhanced image quality and iodine contrast
- Evaluation of multiple ROI

syngo.CT Dental

- Prepare dental images with CT for implant planning
- Create panoramic and paraxial images based on a defined reference plane and centerline in real-time

syngo.CT Neuro DSA

- Bone removal
- Follow-up workflow
- Findings Navigator & Reporting
- Workflow CT Neurovascular

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 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

Acute Care CT Package

syngo.CT ASPECTS³

- Dedicated PACS-ready application automated through Rapid Results Technology
- Shows information about Alberta stroke program early CT score (ASPECTS) in a score from 0 (most severe) to 10 (least severe)
- Support of the assessment and severity of ischemic changes on noncontrast CT head scans
- Highlights stroke affected brain regions

syngo.CT Bone Reading

- Rib unfolding – bone reading adopted visualization of all ribs in one plane
- Spine reading optimized reading functionality
- Computer Aided Detection (CAD) for spine lesions²
- Automated rib and spine labeling and numbering
- Rapid Results Technology for standardized and automated Bone Reading results creation and archiving

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

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

³ Included in syngo.CT Neuro Perfusion.

Computed Tomography

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 Bone Marrow

- Color-coding of bone marrow
- Evaluation of diffuse tumor infiltrations

syngo.CT DE Brain Hemorrhage¹

- Iodine uptake quantification
- Differentiate hemorrhage from contrast agent

syngo.CT DE Direct Angio

- Highlighting of bone structures
- Subtract bones by a single click

syngo.CT DE Lung Analysis

- Combination of syngo Lung PBV and syngo Lung Vessels
- Lung isolation
- Color-coding of affected vessels
- Iodine uptake quantification

¹ Not yet approved for USA.



syngo.CT Vascular Analysis

syngo.CT DE Monoenergetic Plus

- Improved algorithm for enhanced image quality and iodine contrast
- Evaluation of multiple ROI

syngo.CT DE Virtual Unenhanced

- Iodine uptake quantification
- Calculation of virtual unenhanced image
- Calculation of fat map in the liver

syngo.CT Dynamic Angio

- Time resolved CT images reconstructed from dynamic CT data
- Visualization of the vessel enhancement over time
- Visual inspection of time attenuation curves

syngo.CT Neuro DSA

- Bone Removal
- Follow-up Workflow
- Findings Navigator & Reporting
- Workflow CT Neurovascular

syngo.CT Neuro Perfusion

- Tissue-at-risk model with user-defined perfusion parameters (e.g., CBF, SBV, TTD, TTS, TTP, MTT, Tmax, rCBF)
- Calculation of perfusion parameters based on two different perfusion models
- Rapid Results Technology for standardized and automated perfusion results creation and archiving
- Multi-parameter view
- Allows time point and volume navigation
- Dedicated Motion Correction
- 4D noise reduction
- Bone removal
- Statistical ROI analysis
- Data Export
- Reporting and Findings Handling
- Motion correction
- 4-step workflow available both as guided or automated – Auto Stroke

syngo.CT PE CAD¹

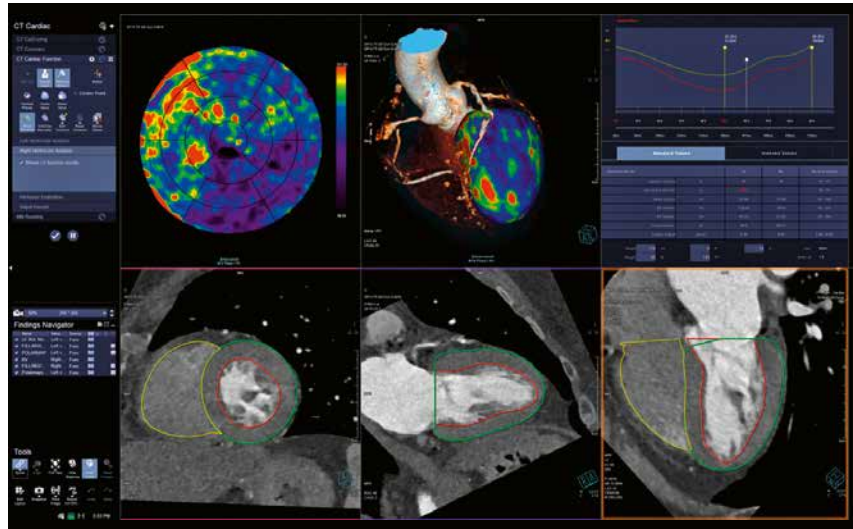
- Automated detection of filling defects
- Overview layout
- Automatic lesion zoom view

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)



syngo.CT Cardiac Function

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

- Total & standard Calcium Scoring and Coronary Age calculation based, for example, on MESA Trial data and more
- Preferred loading of Agatston-equivalent low kV series
- Rapid Result Technology for standardized and automated total CaScore result.

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

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

Computed Tomography

- 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 Angio

- Highlighting of bone structures
- Subtract bones by a single click

syngo.CT DE Hardplaque Display

- Differentiation of calcified plaque and iodine contrast media with color-coding

syngo.CT DE Heart PBV

- Heart isolation
- Iodine uptake quantification
- Virtual noncontrast display

syngo.CT DE Monoenergetic Plus

- Improved algorithm for enhanced image quality and iodine contrast
- Evaluation of multiple ROI

syngo.CT Myocardial Perfusion

- Intuitive visualization of time-variant multislice or volumetric data
- Advanced motion correction for improved anatomical alignment
- Fast simultaneous 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
- Optimized color display of perfusion parameter
- Assessment and quantification of the perfusion of the myocardium

syngo.CT PE CAD²

- Automated detection of filling defects
- Overview layout
- Automatic lesion zoom view

syngo.CT Rapid Stent Planning

- Automatic completion of manufacturer-specific graft order forms

syngo.CT TAVI Valve Pilot

- Zero-click 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

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 ASPECTS¹

- Dedicated PACS-ready application automated through Rapid Results Technology

syngo.CT DE Bone Marrow

- Color-coding of bone marrow
- Evaluation of diffuse tumor infiltrations

syngo.CT DE Brain Hemorrhage³

- Iodine uptake quantification
- Differentiate hemorrhage from contrast agent

syngo.CT DE Direct Angio

- Highlights of bone structures
- Subtract bones by a single click

¹ Included in syngo.CT Neuro Perfusion

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

³ Not yet approved for USA.

syngo.CT DE Hardplaque Display

- Differentiation of calcified plaque and iodine contrast media with color-coding

syngo.CT DE Monoenergetic Plus

- Improved algorithm for enhanced image quality and iodine contrast
- Evaluation of multiple ROI

syngo.CT Dynamic Angio

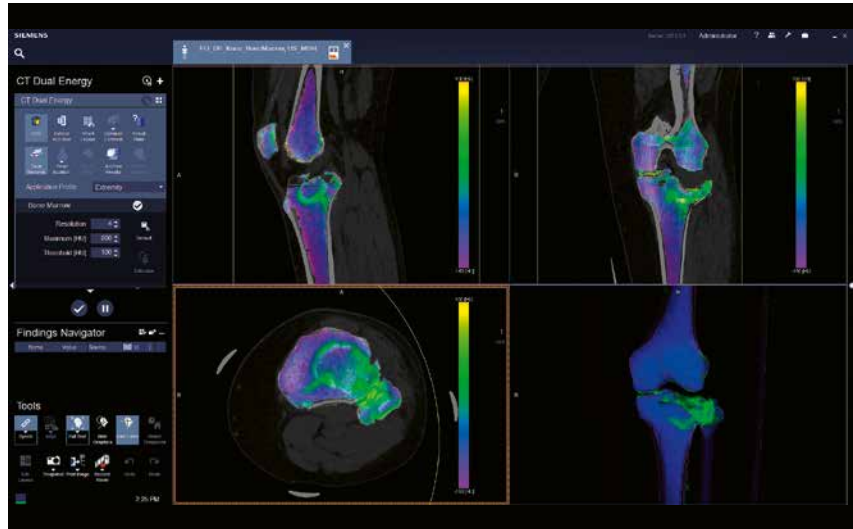
- Time resolved CT images reconstructed from dynamic CT data
- Visualization of the vessel enhancement over time
- Visual inspection of time attenuation curves

syngo.CT Neuro DSA

- Bone Removal
- Follow-up Workflow
- Findings Navigator & Reporting
- Workflow CT Neurovascular

syngo.CT Neuro Perfusion

- Tissue-at-risk model with user-defined perfusion parameters (e.g., CBF, SBV, TTD, TTS, TTP, MTT, Tmax, rCBF)
- Calculation of perfusion parameters based on two different perfusion models
- Rapid Results Technology for standardized and automated perfusion results creation and archiving
- Multi-parameter view
- Allows time point and volume navigation
- Dedicated Motion Correction
- 4D Noise Reduction
- Bone removal



syngo.CT DE Bone Marrow

- Statistical ROI analysis
- Data Export
- Reporting and Findings Handling
- Motion correction
- 4-step workflow available both as guided or automated – Auto Stroke
- Shows Information about Alberta stroke program early CT score (ASPECTS)² in a score from 0 (most severe) to 10 (least severe)
- Support of the assessment and severity of ischemic changes on noncontrast CT head scans
- Highlighting of the stroke affected brain regions
- Calculation of the average HU value in each of the 10 regions

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

- Rib unfolding – bone reading adopted visualization of all ribs in one plane
- Spine reading optimized reading functionality
- Computer Aided Detection (CAD)¹ for spine lesions
- Automated rib and spine labeling and numbering
- Rapid Results Technology for standardized and automated Bone Reading results creation and archiving

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

² Included in syngo.CT Neuro Perfusion.

Computed Tomography

- 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 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

- Color-coding of bone marrow
- Evaluation of diffuse tumor infiltrations

syngo.CT DE Virtual Unenhanced

- Iodine uptake quantification
- Calculation of virtual unenhanced image
- Calculation of fat map in the liver

syngo.CT DE Monoenergetic Plus

- Improved algorithm for enhanced image quality and iodine contrast
- Evaluation of multiple ROI

syngo.CT Lung CAD

- Adjunct 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
- Automatic completion of manufacturer-specific graft order forms

syngo.CT Onco Function – Hepatic AEF

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

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 lunglobes and evaluation of airways (trachea and bronchi) with color-coded display

syngo.CT Segmentation

- Volume rendering of segmentation
- Automated RECIST 1.0 or 1.1 calculation
- 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 Onco Multi-Timepoint Evaluation and syngo.MM Onco Cross-Timepoint Evaluation

- Quantify tumor growth rates between time points
- Dual-time point comparison
- 8-time point visualization
- Trending workflow step for fast assessment response to therapy

Dual Energy Applications

- ✓ Available
- Available, but usage not recommended or meaningful

Scanner Software Version		VB10	VB10	VB10	VB10	VA20
syngo.via VB40	syngo.CT DE Advanced Package	syngo.CT DE Gout	✓	✓	✓	✓
		syngo.CT DE Calculi Characterization	✓	✓	✓	✓
		syngo.CT DE Direct Angio	✓	✓	✓	✓
		syngo.CT DE Lung Analysis (contains Lung PBV)	✓	✓	✓	✓
		syngo.CT DE Virtual Unenhanced	✓	✓	✓	✓
		syngo.CT DE Virtual Unenhanced – Liver VNC	✓	✓	✓	✓ ²
		syngo.CT DE Brain Hemorrhage ¹	✓	✓	○ ¹	✓ ³
		syngo.CT DE Monoenergetic Plus	✓	✓	✓ ⁵	✓ ⁴
		syngo.CT DE Hardplaque Display	✓	✓	✓	✓ ⁵
		syngo.CT DE Heart PBV	✓	✓		
		syngo.CT DE Bone Marrow	✓	✓		✓
	Basic	syngo.CT DE Rho/Z ⁶	✓	✓	✓	✓
		Optimum Contrast	✓	✓	○	○
Monoenergetic		✓	✓	○	○	
	Interactive Spectral Imaging	✓	✓	✓	✓ ¹²	
	Rapid Results Technology	✓	✓	✓	✓	
GO technologies	Recon & Go	Mixed				✓
		Direct Angio				✓
		Virtual Unenhanced ¹⁰				✓
		Monoenergetic Plus				✓
FAST DE Results ⁸	Mixed		✓	✓		
	Monoenergetic Plus (fixed keV levels)		✓	✓	✓	
	Optimum Contrast	✓	✓	○		
	Lung PBV	✓	✓			
	Virtual Unenhanced	✓	✓	✓		
	Rho/Z ⁶	✓	✓	✓	✓	
Virtual Unenhanced – Liver VNC ¹¹	✓	✓	✓			
FAST DE ⁹		✓	✓	C-image ⁷	C-image ⁷	

¹ Not yet approved for USA

² With mandatory scan delay after injection of >75 s (no arterial phase, liver only)

³ Only for visualization of static iodine enhancement after interventional procedures (not for CTA)

⁴ Not for visualization of iodine, only for metal artifact reduction

⁵ Mainly for visualization of iodine, basic metal artifact reduction

⁶ Not cleared for use as a basis for radiation therapy planning, but for visualization only

⁷ C-type reconstruction is similar to FAST DE in terms of usage possibilities

⁸ FAST DE Results automatically generates Dual Energy datasets at the AWP

⁹ FAST DE allows choosing the mixing ratio between low and high kV at the scanner for reconstructed mixed images that are directly send to PACS

¹⁰ Including Liver VNC

¹¹ Requires scanner version VB20. This software version is 510(k) pending

¹² VNC not available for Dual Spiral Dual Energy

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
<i>syngo.MR</i> General	<i>syngo.MR</i> 3D Lesion Segmentation	<i>syngo.MR</i> Brain Morphometry ¹	<i>syngo.MR</i> Cardiac 4D Ventricular Function
<i>syngo.MR</i> Composing	<i>syngo.MR</i> BreVis	<i>syngo.MR</i> Neuro fMRI	<i>syngo.MR</i> Cardiac Flow
	<i>syngo.MR</i> Oncology	<i>syngo.MR</i> Neuro Perfusion	<i>syngo.MR</i> Cardiac Perfusion ²
	<i>syngo.MR</i> OncoTrend ¹	<i>syngo.MR</i> Neuro Perfusion Mismatch	<i>syngo.MR</i> Vascular Analysis
	<i>syngo.MR</i> Spectro CSI	<i>syngo.MR</i> Spectro CSI	
	<i>syngo.MR</i> Spectro SVS	<i>syngo.MR</i> Spectro SVS	
	<i>syngo.MR</i> Spectro Extension	<i>syngo.MR</i> Spectro Extension	
	<i>syngo.MR</i> Spectro Research	<i>syngo.MR</i> Spectro Research	
	<i>syngo.MR</i> Tissue 4D	<i>syngo.MR</i> Tractography	

¹ This feature is still under development, and is not yet commercially available in the United States.

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

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 Maps¹, specific Mean Curve¹, Mismatch²) and semi-automated lesion segmentation³ 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)⁴.
- 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

¹ Requires syngo.MR Neuro Perfusion.

² Requires syngo.MR Neuro Perfusion Mismatch.

³ Requires syngo.MR 3D Lesion Segmentation.

⁴ This feature is still under development, and is not yet commercially available in the United States.

Magnetic Resonance

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

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



syngo.MR OncoTrend¹

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

syngo.MR OncoTrend¹

- 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
- 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

¹ This feature is still under development, and is not yet commercially available in the United States.

syngo.MR Spectro SVS

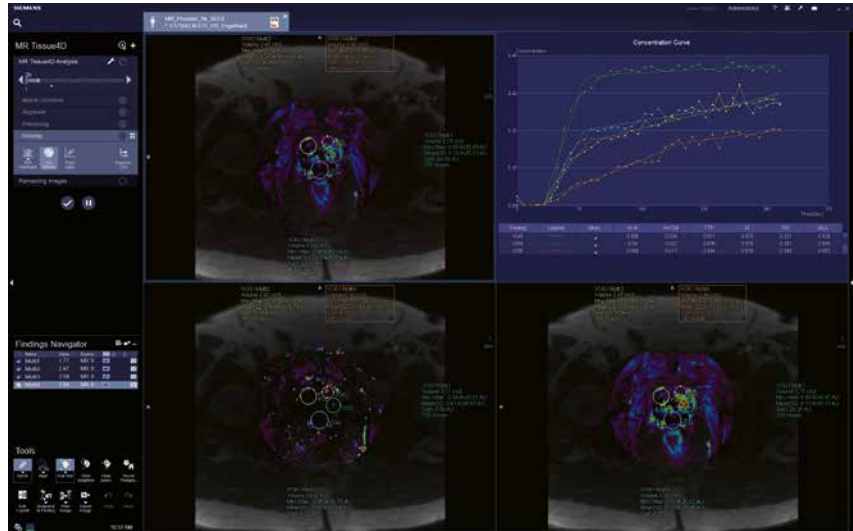
- Integrated quality check
- Automatic post-processing of the spectrum (including baseline and phase adjustment)
- Improved algorithm based on extended prior knowledge modeling
- Ad hoc possibility

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

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

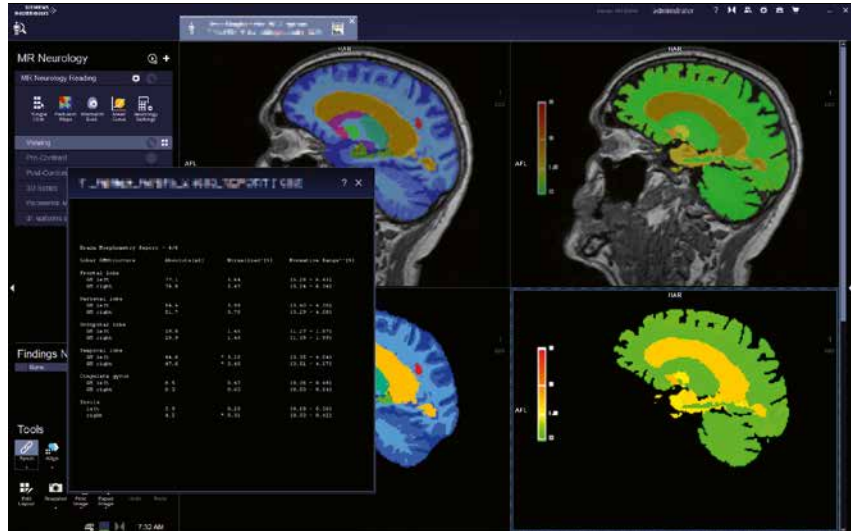
Magnetic Resonance

MR Neurology Package

syngo.MR Brain Morphometry¹

syngo.MR Brain Morphometry¹ extends the MR Neurology workflow, contained in the syngo.MR General Engine by 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



syngo.MR Brain Morphometry¹

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

¹ This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

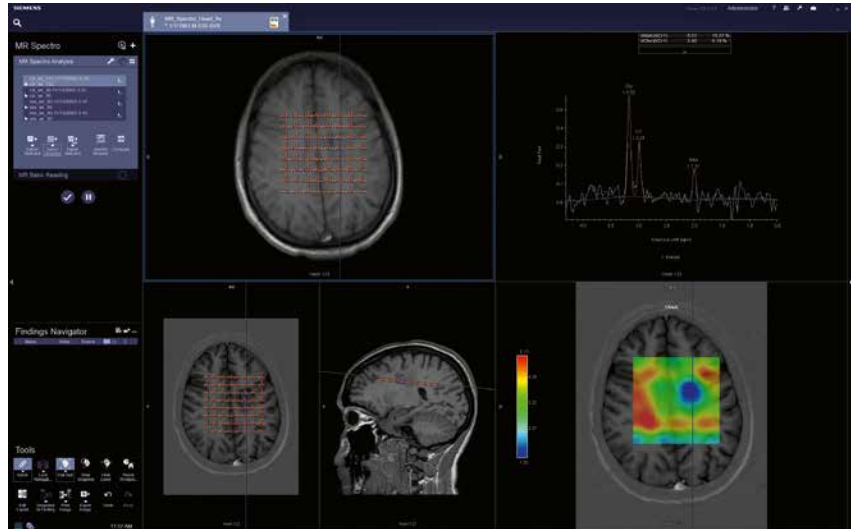
syngo.MR Neuro Perfusion

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), 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

Magnetic Resonance

syngo.MR Spectro Extension

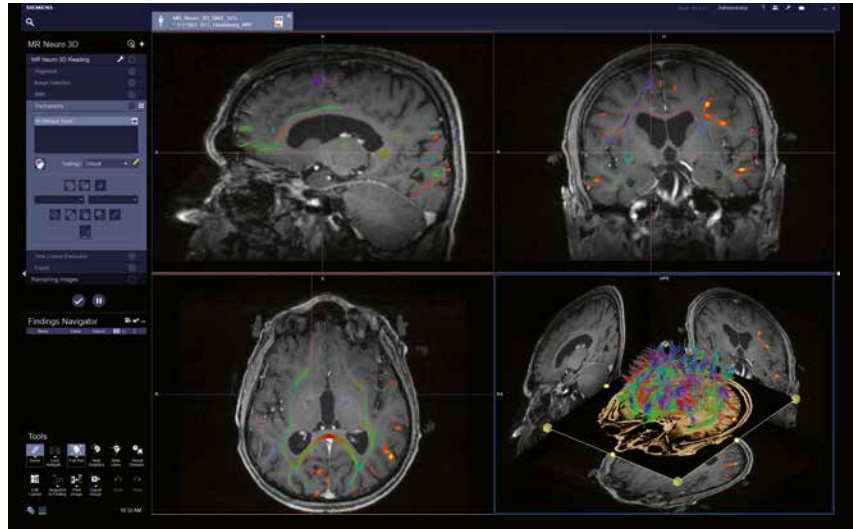
- Quality check criteria can be defined by the user
- More display possibilities (e.g., real/imaginary parts)
- Creation of new metabolite templates

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
- 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

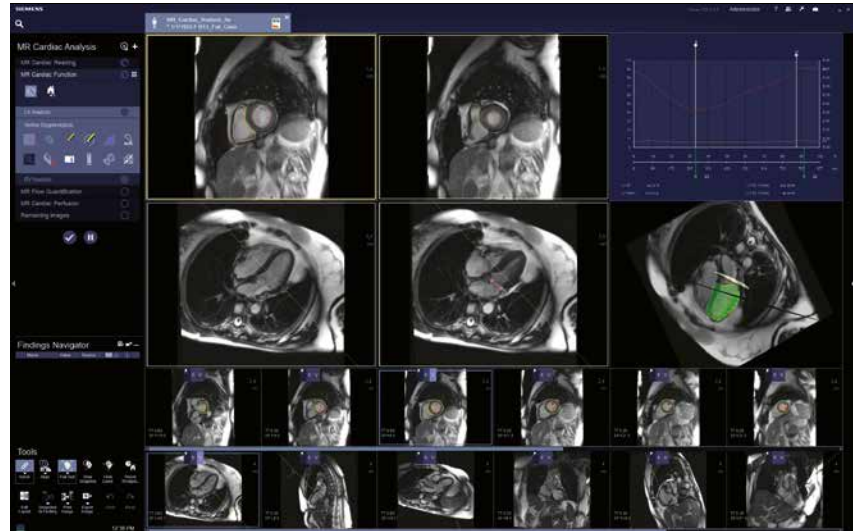


syngo.MR Tractography

MR Cardiovascular Package

syngo.MR Cardiac 4D Ventricular Function

- Fully automatic left ventricle and semi-automatic right ventricle segmentation
- Volume-time curves
- 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 Perfusion¹

- 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

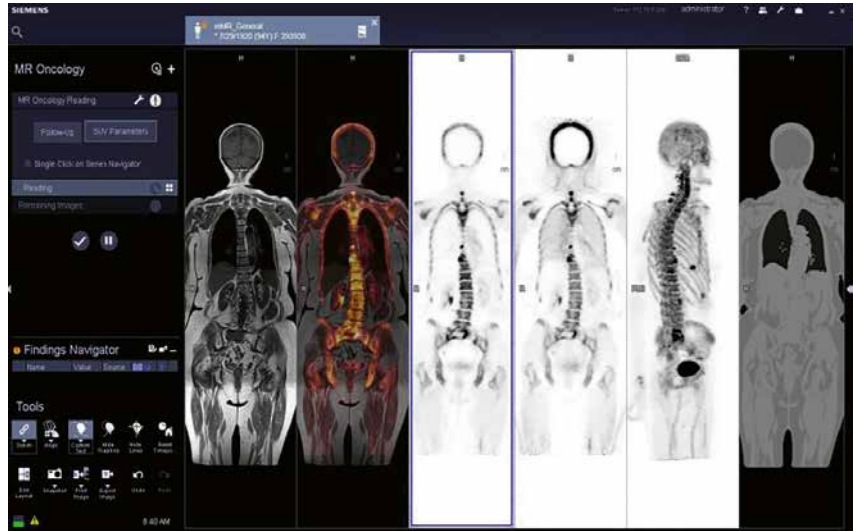
Magnetic Resonance

Single Applications

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

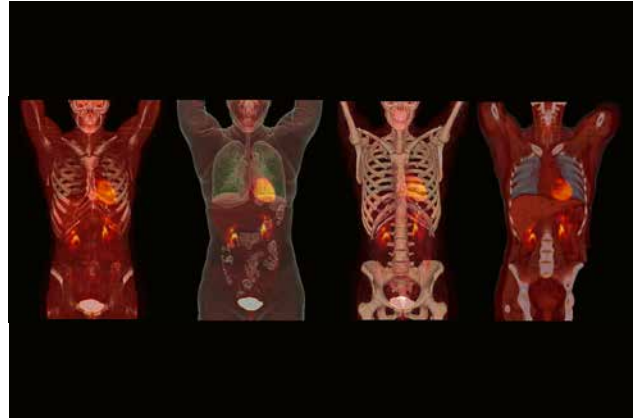


syngo.mMR General

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.



syngo.MI Oncology

syngo.MI Oncology	syngo.PET Neurology	syngo.SPECT Neurology	syngo.MI Neurology	syngo.NM Organ Processing
<ul style="list-style-type: none"> • syngo.MM Multi-Timepoint Eval • syngo.MI Segmentation • syngo.CT Segmentation • syngo.PET Dynamic Analysis • syngo.MM Therapy Interface • syngo.MI Offline OncoBoard 	<ul style="list-style-type: none"> • syngo.PET DB Comparison • syngo.MI Neuro DB Creation • syngo.PET Striatal Analysis¹ • syngo.PET Amyloid Plaque • syngo.CT Neuro DSA 	<ul style="list-style-type: none"> • syngo.SPECT DB Comparison • syngo.MI Neuro DB Creation • syngo.SPECT Striatal Analysis¹ • syngo.MI Neuro Subtraction 	<ul style="list-style-type: none"> • syngo.PET DB Comparison • syngo.SPECT DB Comparison • syngo.MI Neuro DB Creation • syngo.MI Neuro Subtraction • syngo.PET Striatal Analysis¹ • syngo.SPECT Striatal Analysis • syngo.PET Amyloid Plaque • syngo.CT Neuro DSA 	<ul style="list-style-type: none"> • MI Reading • NM Organ Processing

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

Molecular Imaging

<i>syngo.MI</i> Cardiology 4DM	<i>syngo.PET</i> Cardiology Cedars	<i>syngo.SPECT</i> Cardiology Cedars	<i>syngo.MI</i> Cardiology Cedars	Options
<ul style="list-style-type: none"> • <i>syngo.PET</i> Corridor4DM • <i>syngo.SPECT</i> Corridor4DM • <i>syngo.PET</i> Myocardial Blood Flow 	<ul style="list-style-type: none"> • <i>syngo.PET</i> Cedars Suite • <i>syngo.PET</i> Myocardial Blood Flow 	<ul style="list-style-type: none"> • <i>syngo.SPECT</i> Cedars Suite 	<ul style="list-style-type: none"> • <i>syngo.PET</i> Cedars Suite • <i>syngo.SPECT</i> Cedars Suite • <i>syngo.PET</i> Myocardial Blood Flow 	<ul style="list-style-type: none"> • <i>syngo.CT</i> Extension Corridor4DM • <i>syngo.CT</i> Extension Cedars • <i>syngo.PET</i> Extension Corridor4DM CFR • <i>syngo.MI</i> Hybrid Coronary View

In addition to the clinical packages, it is possible to get access to all modality-specific applications in one comprehensive modality all-in package, or as part of an enterprise all-inclusive package¹.

¹ All-in modality and all-in enterprise packages are exclusively available as subscription offering. In general, 3rd party contents are not included in the subscription packages. Exception: Breast Care contains MeVis license.

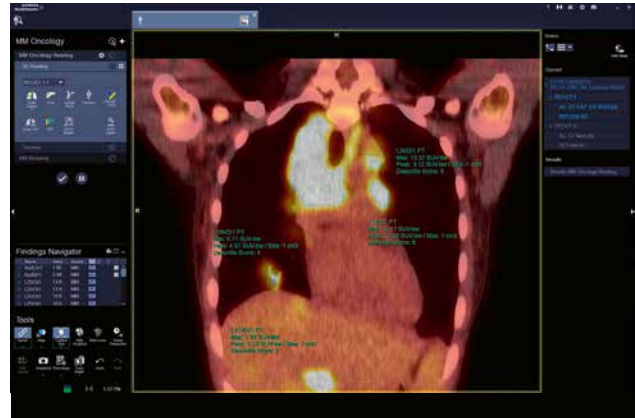
syngo.MI Oncology

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 through automated segmentation of single or multiple foci and calculation of whole body or region-specific functional tumor burden (MTV and TLG/Total Activity)
- 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



syngo.MI Oncology

syngo.CT Segmentation

- Volume rendering of segmentation
- Automated RECIST 1.0 or 1.1 calculation
- 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 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

syngo.MI Offline OncoBoard

- Present MI cases at tumor board, multi-disciplinary team meeting or conference with evidence from syngo.via even when not connected to the syngo.via system or clinical network

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.

Molecular Imaging

syngo.PET Neurology

syngo.PET DB Comparison

- Display and quantification of PET brain scans
- FDG 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 Analysis¹

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

syngo.PET Amyloid Plaque

- SUV quantification of amyloid plaque scans
- Florbetapir, Flutemetamol, and Florbetaben quantification
- Florbetapir and Florbetaben normals databases

syngo.CT Neuro DSA

- Facilitates the diagnosis of the cerebral vasculature by removing interfering bone structures from CTA data

syngo.SPECT Neurology

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.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

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

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

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Molecular Imaging

syngo.NM Organ Processing

MI Reading

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

NM Organ Processing

- Enables reading, measurement and reporting of SPECT and SPECT/CT by visualizing and quantifying physiology characteristics
- Provides quality control and organ-based processing activities

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 and right 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
 - Itoh ERPF
 - Gates GFR
 - Oberhausen
 - Oriuchi
 - Bubeck
 - Captopril Comparison
- Available dose calibrator or syringe methods
- Yields detailed curve analysis and results summary

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.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)
- 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 TI 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

Molecular Imaging

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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syngo.SPECT

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- 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.MI**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 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

syngo.SPECT Cedars Suite

- Cedars Cardiac Suite 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 TI 201
- Normals database comparison
- Generation of stress, rest, and reversibility surfaces and 2D polarmaps
- 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

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 Hybrid Coronary View

- Fused 3D display combining CT Coronary Angiography with PET and SPECT

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 mammography 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 BD² information
- Dedicated layouts for Contrast Enhanced Mammography and Insight CEM² images
- Dedicated layouts for mammograms (DICOM MG) 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

syngo.Breast Care One-Click¹

- 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

¹ Optional

² Available with MAMMOMAT Revelation only.

syngo.Breast Care Tomo¹

- 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-it¹

- 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 Tomo²

syngo.Breast Care CAD Display¹

- 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 SecondLook® Digital
- iCAD PowerLook® with SecondLook Premier
- iCAD PowerLook® ProFound AI
- VuComp M-Vu
- R2 CAD
- ScreenPoint Medical Transpara™ (2D and DBT)

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 x 5 mega pixels, plus up to 2 additional monitors of up to 1536 x 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

Multi-modality for Radiation Oncology

syngo.via RT Image Suite

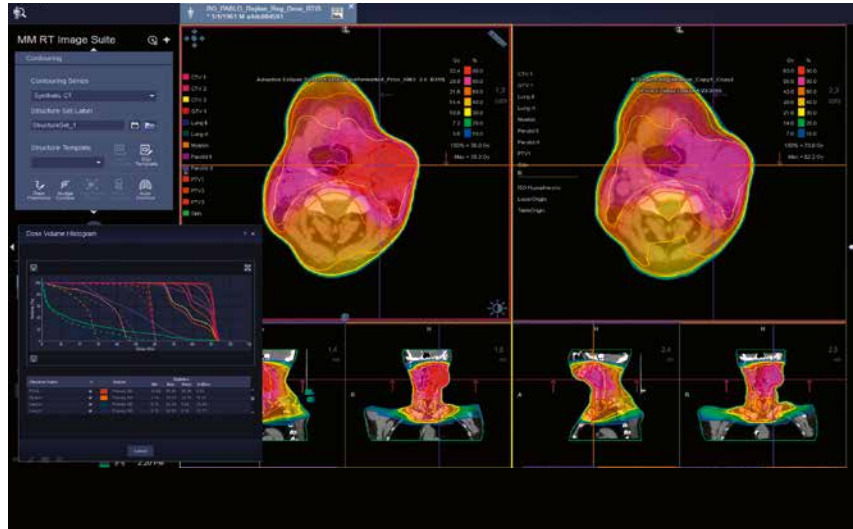
syngo.via RT Image Suite is a dedicated RT software that is designed to make simulation, image assessment, and contouring easier and better integrated – while also offering capabilities that go beyond the current standard.

Multi-modality support

- 3D CT, PET, PET/CT, MRI, and Linac CBCT
- 4D CT, PET/CT, MRI
- Time resolved CT and MR images
- Calculate SUV for PET images
- Concurrent display of up to a total of 8 image series (4 single or 4 fused series) over 4 image panels¹

4D features

- 4D data management with phase splitting, tMinIP, tMIP, AverageCT generation, cine-loop visualization of 4D CT dataset and contours, semiautomatic contour propagation over 4D CT breathing phases¹ and ITV generation
- Quantitative assessment of 3D tumor trajectory and amplitude and semi-automatic calculation of the mid-ventilation phase



syngo.via RT Image Suite

¹ Optional

Contouring features

- Zero clicks RT Auto-contouring Deep Learning, Hybrid Atlas, Model based with Rapid Results Technology as parameter of the CT acquisition protocol on selected scanners
- User configurable Organ Templates based on a subset of the FMA (Foundation Model of Anatomy) for interoperability between IT systems
- “CT-free” contouring: native PET or MR contouring
- Parallel contouring: contouring performed on any image is reflected on all other images
- Contour copy and warping¹ between image series

Image Registration features

- Rigid and Deformable¹ 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
- Registration Quality Check¹ with spyglass, deformation vector map, deformation magnitude color map

MR only simulation features

- SyntheticCT¹ provides density information for dose calculation in photon therapy. It supports using MR as primary imaging modality for RT treatment preparation of brain and pelvic cancer patients



SyntheticCT (left) with other MR series (middle, right)

RT Dose¹ features

- Diagnostic follow up tool as additional information
- Display dose volumes overlaid on any supported image type and side-by-side
- Display related dose volume histograms
- Use deformable registration between current and prior dose volumes and images for dose accumulation

Simulation features¹

- Reference point / isocenter management
- Direct Laser Steering for LAP lasers²
- 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)
- Beam Placement including DRR, Source to Distance and beam templates
- Automated isocentering for breast optimizes clinical operations by removing manual computation of the middle slice based on auto-contouring

¹ Optional.

² Requires compatible laser systems.

Licensing and Server Grades

Licensing

Multi-modality routine reading functionality comes with every syngo.via system and is available to all users (i.e., 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 L Server
(Recommended for departmental scenarios limited to 15 kppy¹, ideal for 1–7 concurrent users)
- syngo.via XL/XL+ Server
(Recommended for Enterprise scenarios limited to 25 kppy¹, ideal for 1–15 concurrent users)
- syngo.via Workstation
(Recommended for Multi-modality Standalone scenarios, limited to 7 kppy¹, ideal for 1–2 concurrent users)
- syngo.via Workplace for CT, MI, BreastCare, and RT
(Recommended for Single-modality standalone scenarios, limited to 7 kppy¹, 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 server sizing 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)

Hardware Specifications & Virtual Deployments

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

The Hewlett Packard 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 amount of slices stored in syngo.via short-term storage.

HP based Hardware	Workstation/Workplace CPU: Intel® Xeon® Gold RAM: 96 GB GPU: P2000 Storage: 1.3 TB	L Server CPU: Intel®Xeon® Gold RAM: 96 GB GPU: P2000 Storage: 3.7 TB	XL Server CPU: Intel® Xeon® Gold RAM: 192 GB GPU: P2000 Storage: 5 TB	XL+ Server CPU: Intel® Xeon® Gold RAM: 192 GB GPU: P2000 Storage: 15 TB
Max. number of concurrent slices ¹	16.000	24.000	46.000	46.000
Max. number of slices in short term storage uncompressed	~ 540.000	~ 1,200.000	~ 4,500.00	~ 9,100.000

Server Virtualization

This option allows you to utilize own virtualized infrastructures, and this smoothly integrate syngo.via in the existing IT Infrastructure². For sizing orientation, find the below details oriented on the above load profiles.

Minimal vCPU Cores	8	14	20	20
Recommended vCPU Cores	16	32	48	48
Minimal Memory	32 GB	48 GB	96 GB	96 GB
Recommended Memory	64 GB	96 GB	192 GB	192 GB
Data store disc size (recommended)	2.3 TB	5.1 TB	8.4 TB	18.5 TB

It is recommended to enable GPU support, if latest NVIDIA vGPU technology OpenGL support and GRID cards are available. nVidia vGPU support VMware features vMotion and snapshot with the new GPU-GRID card technology. For more information, please contact your local sales representative on availability in your region, technical requirements, and limitations.

Note:

- It is the operator’s responsibility to ensure that the license for the Microsoft Operating System (Windows Server) running in the syngo.via virtual container complies with the Microsoft terms and conditions for operations in a virtualized environment.
- Listed resource requirements are valid for virtualized environments. Installations on non-virtualized environments are typically not supported. For more information please contact your local sales representative on availability in your region.

¹ Concurrent rendering of slices is based on 512 x 512-bit image matrix.

² 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 should be enabled for the following applications: syngo.CT Colon, syngo.CT Liver Analysis, syngo.MR Neuro fMRI, syngo.MR Neuro Tractography, syngo.MR Neuro 3D Engine, and syngo.MI Neuro Hybrid 3D.

Network Requirements

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

Ports used by the system are listed in Product & Solution Security White Paper and MDS2 syngo.via.

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.

	Minimum	Recommended
Hospital internal Network Connection	100 Mbit/s	1 Gbit/s
Remote Client Connection ¹	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)
	Software Updates	Regular distribution of software updates for higher system performance and reliability

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.

¹ 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 Software¹

The client 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 is also possible based on the following:

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

Component	Minimum	Recommended
Processor	Minimum Intel Core i3 with 2.5 GHz or higher	Intel Core i5-7500 3.4 GHz or higher
RAM	6 GB	8 GB
Hard disk drive (free space for client software)	≥ 1.5 GB	≥ 3 GB
Graphic card	OpenGL 1.1 (min. 1024 x 768)	OpenGL2.0 or higher with NVIDIA graphic cards (e.g., NVIDIA Quadro K620)
Pixel depth graphic cards	16–32 bits	16–32 bits

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

Software Requirements²

- Microsoft Windows 7 SP1 (Home Premium, Professional, Ultimate, Enterprise), Microsoft Windows 8.1 (Pro, Enterprise), Microsoft Windows 10 (Home, Pro, Education, Enterprise)
- Microsoft VC8, VC10, VC12, and VC14 Runtime
- Microsoft .NET framework 4.7.2 or higher
- Windows Media Player 9 or higher
- Internet Explorer 11³
- Siemens Healthineers TeamViewer Connector Repack
- Siemens Healthineers VNC Repack

- Siemens Healthineers TeamViewer 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 has to 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.

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.

The minimum recommended hardware for syngo.MI Offline OncoBoard client:

- IBM/PC compatible running Windows10 Pro 64-bit OS MUI
- Intel Core i3 and 2.5 GHz clock
- Minimum of 6 GB of RAM
- Minimum of 1 GB of free disk space
- Minimum screen resolution of 1366 x 768
- If using USB drives, minimum of USB 3.0

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

² 64-bit operating systems are recommended.

³ Newer versions like Microsoft Edge can be used.

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 purposes¹.

We recommend a single monitor of at least 2 MP^{2,4} or two monitors of at least 2 MP.

syngo.via supports the following monitors.

- Equal orientation landscape, portrait, and wide screen monitors, color, or grayscale³ up to 6 MP monitors for diagnostic reading
- 8 MP, 10 MP, and 12 MP⁵ monitors which are treated as 2x4/2x5/2x6 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 x 8 segments per monitor are supported
- Barco UNITI 12 MP (2 x 6 MP) monitor with Barco controller for syngo.via client systems only⁶

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 Post Script 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 2016 Standard Edition. With each installation of the syngo.via client software, the client computer or user has access to services of the Windows Server 2016 Standard Edition running on the syngo.via server.

To legally access this Windows Server 2016 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 2012/2016 device or user CAL.

For more information about Microsoft CAL please refer to <https://www.microsoft.com/en-us/licensing/product-licensing/client-access-license.aspx>

Hint: The syngo.via server factory delivery consists of 5 Microsoft Windows Server 2016 device CALs.

¹ Country-specific regulations/laws may apply.

² For MI Cardiology and MI Neurology on server-based workstation only: Minimum monitor resolution is 1600 x 1200.

³ Not released for CT CaScoring. Not released for CT Colon. For Cardiac Function: Polarmaps shall be used only on color monitors.

⁴ For syngo.SPECT Processing: minimum monitor resolution is 1920 x 1080.

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.

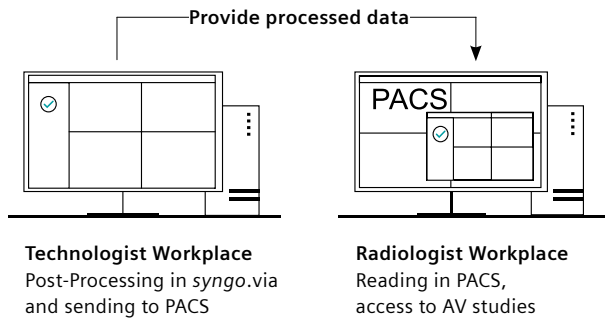
Implementation Packages

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.

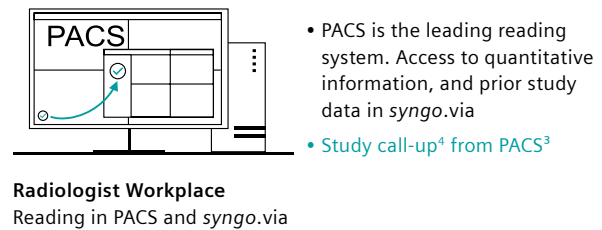
As an example, the following reading scenario can be realized:



PACS-driven Implementation Package

This includes connection to DICOM modalities with image archiving to PACS and image call-up⁴ directly out of PACS.¹ *syngo.via* clients can be installed both outside and within the same department as the *syngo.via* server.

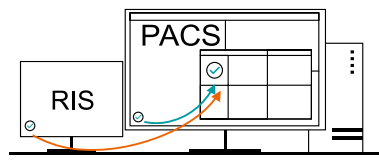
The following reading scenario, for example, is possible:



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).²

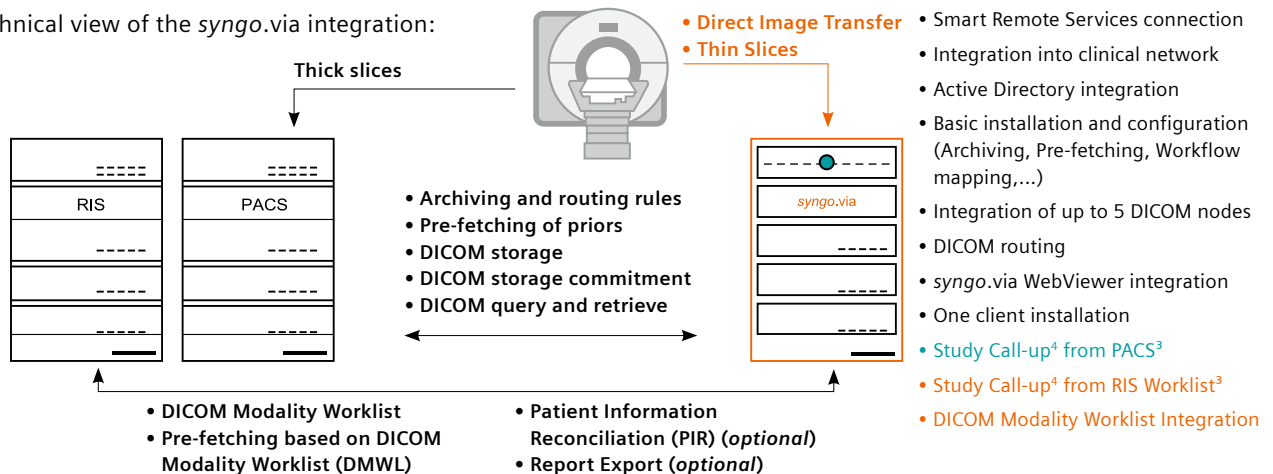


- RIS is the leading system to control prefetching in *syngo.via*. Access to quantitative information, and prior study data in *syngo.via*
- Study Call-up⁴ from PACS³
- Study Call-up⁴ from RIS Worklist/DMWL Study Prefetching³

The following reading scenario, for example, is possible:

Radiologist Workplace
Reading in PACS and *syngo.via*

Technical view of the *syngo.via* integration:



¹ As long as this is supported by the existing PACS.

² Please contact your local sales representative for further information on availability in your region, technical requirements, and limitations.

³ PACS/RIS Vendor Support required. 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.

⁴ 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

High-level content of the implementation packages

Siemens Healthineers Professional Services		Basic	PACS Driven	RIS Driven	Customer Responsibilities
Planning & Pre-Staging	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Coordination and support for hardware and software installation by the IT Administrators³ Provide electrical power and LAN access³ Ensure broadband Internet access for Smart Remote Services Have monitor(s) at the site of operation, including appropriate cables³
	<ul style="list-style-type: none"> Basic hardware installation and connection to power supply or uninterruptible power supply (optional)³ Connection of one or two monitors⁴. 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 <p>WebViewer</p> <ul style="list-style-type: none"> Installation of WebViewer integrated license⁴ Installation of one syngo.via WebViewer client Verification of the syngo.via WebViewer basic functionality 	X	X	X	<ul style="list-style-type: none"> Support rack mount installation³ Ensure access to the location and space for server operation³ Availability of IT administrator for routing/ports and integration of syngo.via in the customer's Active Directory Ensure that Web Clients & Mobile Devices fulfill the minimum requirements according to the syngo.via WebViewer Datasheet
Integration & Configuration	<ul style="list-style-type: none"> 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 <p>Clients</p> <ul style="list-style-type: none"> Installation of client software for one⁵ user on one computer 	X	X	X	<ul style="list-style-type: none"> Support the configuration of additional DICOM nodes Install syngo.via client software on additional computers
	<p>On-site briefing</p> <ul style="list-style-type: none"> Optional support for definition of advanced rules for deleting, archiving, routing, pre-fetching of priors IT Administrator briefing session 	X	X	X	<ul style="list-style-type: none"> Ensure attendance of IT administrators
	<p>Image Call-Up PACS or RIS</p> <ul style="list-style-type: none"> 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 <p>Clients</p> <ul style="list-style-type: none"> Assistance in setting up image call-up of syngo.via from the RIS user interface⁶ 		X	X	<ul style="list-style-type: none"> Contact PACS or RIS vendor for study call-up implementation, configuration, and licenses This may require the purchase of additional software and services from the PACS or RIS vendor⁸ Distribute the front-end integration to additional PACS or RIS clients within the institution
	<p>Multi-server features (opt⁷)</p> <ul style="list-style-type: none"> Multi-server License Sharing (MSL), Access (MSA), Configuration (MSC) 		X	X	<ul style="list-style-type: none"> Support installation and configuration of the servers in clinical network
	<p>DICOM Modality Worklist Integration</p> <ul style="list-style-type: none"> Configuration of the DICOM Modality Worklist interface from RIS to syngo.via⁶ 			X	<ul style="list-style-type: none"> Ensure that the DMWL-source can provide the DMWL to syngo.via
	<p>Patient Information Reconciliation/PIR (opt⁷)</p> <ul style="list-style-type: none"> Patient Data on RIS and syngo.via are automatically synchronized by PIR 			X	<ul style="list-style-type: none"> Configure the sending application to send PIR messages to syngo.via⁶
	<p>Report Export (opt⁷)</p> <ul style="list-style-type: none"> Enable context-specific reports created in syngo.via for export and sign-off in RIS Nuance PowerScribe 360 interfacing 			X	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Implementation handover of the system to Siemens Healthineers Service and customer 	X	X	X	<ul style="list-style-type: none"> Acceptance tests with IT administrator and responsible radiologist

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 Optional implementation package. Need to be ordered separately.
⁸ 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.

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 and have to be trained by Siemens Healthineers.

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 month
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 OS with Microsoft hotfixes and service packs
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 (e.g., 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)

¹ A secondary backup is a copy of the primary backup.

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)

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:
<https://www.healthcare.siemens.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:
<https://www.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.

For the HL7 conformance statement, see <http://www.siemens.com/HL7>.

Nuance PowerScribe 360

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

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 VB40A.

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

Virus Protection

Virus protection software from the following manufacturers is approved for syngo.via:

- Trend Micro OfficeScan
- McAfee VirusScan Enterprise
- Symantec Endpoint Protection
- Sophos Endpoint Security and Control

Siemens Healthineers provides information on recommended virus protection software, and general instructions on configuration.

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 one of the security measures to minimize the vulnerabilities of the system.

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

For further details, please refer to the syngo.via Security White Paper.

Please contact your sales representative for further information.

We offer RAID solutions 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.

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 backup 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

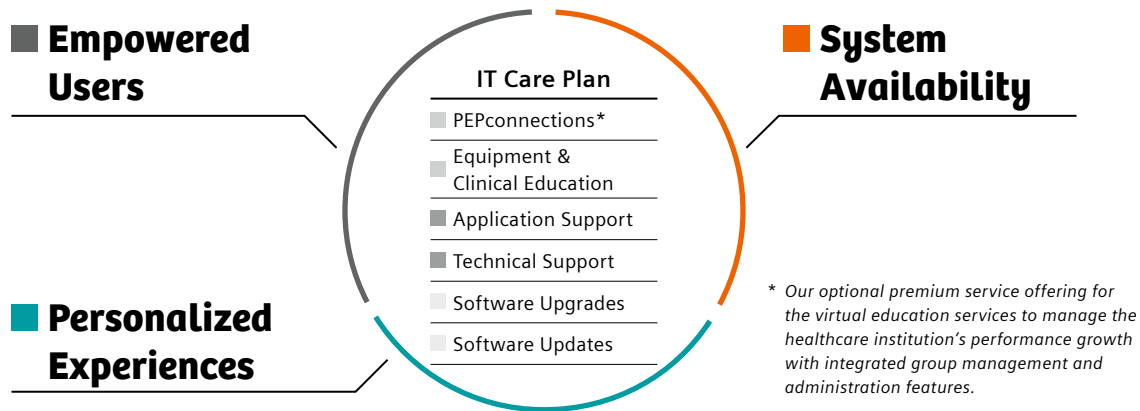
Investment in IT services' development and staff's knowledge is key to long-lasting business success.

The trend towards evidence-based medicine also requires the decision-support features healthcare providers demand from their healthcare IT systems. Whatever your applications, workflow, or IT

requirements are, the IT Care Plan is at hand. The comprehensive service contract, customized for Healthcare IT systems, is offered to institutions who choose syngo.via, the leading Healthcare 3D post-processing suite.

The contracts are customized to the level of service that is appropriate to your specific system and organization.

The core elements of the IT Care Plan are Remote Technical Support, Remote Application Support, Software Updates, and Software Upgrades. To help customers taking the most out of the new software functionalities, the IT Care Plan can be extended with Equipment & Clinical Education and PEPconnections.



	Includes...	Consisting of...
	■ Remote Admin Plus	Remote administration of syngo.via, e.g., remote installation of hotfixes, workflow configuration and user management ² .
Options	■ syngo.via Evolve	One Hardware replacement and one Software upgrade during the 5-year period of the Evolve contract.
	■ PEPconnections	Personalized learning experience to increase workforce productivity, deliver high-quality results, and increase performance.
Education Elements	■ Equipment & Clinical Education	Tailored training to improve workflow productivity and diagnostic accuracy, adapted to the learning styles and needs of clinical staff.
	■ 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. ¹
	■ Software Upgrades	Regular distribution of new versions for increased productivity with enhanced software features to improve application functionality.
Core Elements	■ Software Updates	Regular distribution of software updates for higher system performance and reliability

¹ Optimized system availability and daily operations are supported by Event Monitoring (Guardian PRO)

² Connection to Smart Remote Services is mandatory.

Points of Contact

- Siemens Healthineers is the single point of contact for the customer. 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 lifecycle
- 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, Siemens Healthineers offers continuous education tailored to your institutions needs based on a blended learning approach.

At the time, your syngo.via is installed, an initial training is provided to guarantee a seamless start with your syngo.via software. The Handover training is delivered by the Clinical Education Specialist and includes

- clinical integration of the main modality

- pre-training clarification (remote or onsite)
- dedicated number of syngo.via training hours/days, depending on the specific applications and users for your institution.

To give you the possibility to increase your knowledge at your pace, you will have access to Siemens Healthineers learning platform – PEPconnect –, where you can benefit from online trainings and educational videos, focused on the utilization of your syngo.via clinical applications.

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

We offer 3 different Education Plans: **Education Plan GAIN, Education Plan GROW and Education Plan LEAD**. Our solutions to customers who would like to GAIN confidence, GROW capabilities and LEAD with expertise.

Education Plans GAIN Confidence. GROW Capabilities. LEAD with Expertise.

Annual Review and Customization ¹			Individual Support
Education and Skills Assessment ²			
PEPconnections	PEPconnections	PEPconnections	Options
Optimize Program	Optimize Program	Optimize Program	
Remote Assist	Remote Assist	Remote Assist	
		Clinical Workshop	Customizable
		Classroom Training	
	Tailored Hands-on	Tailored Hands-on	Core plan
PEPconnect	PEPconnect	PEPconnect	
Hand-over Training	Hand-over Training	Hand-over Training	
Gain	Grow	Lead	

Education Plan GAIN is always part of any syngo.via delivery. You do not have to do any additional investment on your side. You can upgrade to Education Plan GROW or LEAD to include additional education activities and formats, all customizable to best meet your institution’s needs.

¹ In case of a multi-year contract

² Availability of the assessment depends on country

Siemens Healthineers Integration Solutions

syngo Multi-modality Workplace (MMWP) Integration

syngo MMWP versions VE60A, VE61A, VE61B, VE40D, VE40E and VE40F support syngo.via client integration and remote desktop access using syngo Expert-i.

The syngo.via client can be integrated on the syngo MMWP allowing user access both to syngo.via and syngo MMWP applications at one workplace.

syngo.via client workplaces can include the syngo MMWP Expert-i remote desktop application to allow single-monitor access to one or more syngo MMWP workplaces from any location in the hospital¹.

Direct Image Transfer

Using direct image transfer (available for current Siemens Healthineers CT scanners):

- The image transfer rate can be increased considerably compared to the standard DICOM protocol

Desktop Sharing

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).

¹ Prerequisites include: Network connection to clinical network, DICOM compliance, meeting of minimum hardware requirements, and adherence to local data security regulations.

Mapping Table

Medical Devices to Applications

SY Medical Devices ¹	Clinical Application
<p>syngo.via 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 <i>syngo</i> based software options. <i>syngo.via</i> supports interpretation and evaluation of examinations within healthcare institutions, for example, 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.</p>	<i>syngo.via</i> MM Reading
<p>syngo.via WebViewer² (not applicable for US) is intended to be a software-only solution for reviewing medical images from <i>syngo.via</i> for diagnostic use, i.e., on the iPad. This device is not intended to replace full workstations and should be used only when there is no access to a workstation. The system cannot be used as stand-alone device. It is intended to be an option for <i>syngo.via</i> system only. <i>syngo.via</i> WebViewer is not intended for storage or distribution of medical images from one medical device to another. <i>syngo.via</i> WebViewer is a client-server architecture and the client is intended to run on web and mobile clients, which are connected to the healthcare institution IT infrastructure where the customer has to ensure HIPAA compliance. <i>syngo.via</i> WebViewer supports interpretation and evaluation of examinations within healthcare institutions, for example, in Radiology, Nuclear Medicine and Cardiology environments. The communication of <i>syngo.via</i> WebViewer with connected medical IT systems will be done through standard interfaces such as, but not limited to, DICOM. The system is not intended for the displaying of digital mammography images for diagnosis.</p>	<i>syngo.via</i> WebViewer
<p>syngo.via WebViewer² (for US only) is a software-only device indicated for reviewing medical images from <i>syngo.via</i>. It supports interpretation and evaluation of examinations within healthcare institutions, for example, in Radiology, Nuclear Medicine and Cardiology environments (supported image types: CT, MR, CR, DR, DX, PET). It is not intended for storage or distribution of medical images. <i>syngo.via</i> WebViewer is an option for the <i>syngo.via</i> system and cannot be run without it. It is client-server architecture, and the client is intended to run on web clients connected to the healthcare institution IT infrastructure where the customer must ensure HIPAA compliance. The communication of <i>syngo.via</i> WebViewer with connected medical IT systems will be done through standard interfaces such as, but not limited to, DICOM. The system is not intended for the display of digital mammography images for diagnosis.</p>	<i>syngo.via</i> WebViewer

Note: WebViewer is not connected to medical IT systems and does not use DICOM as a communication protocol. The communication to *syngo.via* is done through proprietary interfaces. It can process DICOM objects stored on the *syngo.via* server only.

¹ See German legal manufacturer address on p. 69.

² The application *syngo.via* WebViewer is not for diagnostic viewing/reading on mobile devices in the US. Please refer to your sales representative whether the product is available for your country. Diagnostic reading of images with a web browser requires a medical grade monitor. For iPhone and iPad country-specific laws may apply. Please refer to these laws before using for diagnostic reading/viewing. For Japan: Applications on iPhone/iPad/iPod are not a medical device in Japan. Use at your own risk. They are not intended to be used for diagnosis.

Mapping Table

Medical Devices to Applications

CT Medical Devices ¹	Clinical Application
<p>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 <i>syngo.CT Extended Functionality</i> software package and the interconnected CT Scanner system. Result images created with the <i>syngo.CT Extended Functionality</i> software package can be used to assist trained technicians or physicians in diagnosis.</p>	<p><i>syngo.CT Extended Functionality</i></p>
<p>syngo.CT Neuro DSA is a dedicated post-processing application which allows removing of bone structures from CT Angiography (CTA) data sets of the cerebral vasculature. Bone removal is based on a bone mask created from an additional non-enhanced CT (NECT) scan that was three-dimensionally registered to the CTA data set. <i>syngo.CT Neuro DSA</i> facilitates the diagnosis of the cerebral vasculature by removing interfering bone structures from CTA data. This particularly helps to delineate aneurysms and other vascular diseases in the area of the skull base.</p>	<p><i>syngo.CT Neuro DSA</i></p>
<p>syngo.CT Neuro Perfusion The <i>syngo.CT Neuro Perfusion</i> software allows for the investigation of dynamic processes, for example brain tissue perfusion, by means of a rapid sequence of CT scans (multi-scan at the same table position or adaptive 4D spirals).</p>	<p><i>syngo.CT Neuro Perfusion</i></p>
<p>syngo.CT ASPECTS² <i>syngo.CT ASPECTS</i> provides a reproducible quantitative grading system on CT examinations of the head for detection of visible ischemic changes in patients suspected of having stroke-related circulation occlusion.</p>	<p><i>syngo.CT ASPECTS²</i></p>
<p>syngo.CT Dynamic Angio The <i>syngo.CT Dynamic Angio</i> software package has been designed to evaluate CT data which has been continuously acquired with computed tomography (CT) imaging systems. Contrast enhanced CT images are used to visualize the flow of contrast from the arteries to the veins. <i>syngo.CT Dynamic Angio</i> can be used to assist the physician in the diagnosis of blood vessels and it supports in the evaluation of regions of interest, the visual inspection of time attenuation curves, and the creation of specific CT volumes, for example, arterial or venous phase. It will aid in the inspection of diseases which affect the vessel system, for example, vessel stenosis, collateral or late filling of vessels, vascular malformations, control of stent graft extravasation, or in the evaluation of tumor vascularization.</p>	<p><i>syngo.CT Dynamic Angio</i></p>

¹ See German legal manufacturer address on p. 69.

² Included in *syngo.CT Neuro Perfusion*

CT Medical Devices ¹	Clinical Application
<p>syngo.CT Vascular Analysis</p> <p>is an image analysis software package for evaluating enhanced CT images. Combining digital image processing and visualization tools (Multiplanar reconstruction (MPR) thin/thick, maximum intensity projection (MIP) thin/thick, inverted MIP thin/thick, volume rendering technique (VRT), Curved Planar Reformation (CPR), processing tools (bone removal (based both on Single Energy and Dual Energy), table removal) and evaluation tools (vessel centerline calculation, lumen calculation, stenosis calculation) and reporting tools (lesion location, lesion characteristics, and key images), the software package is designed to support the physician in confirming the presence or absence of physician-identified lesions in blood vessels and evaluation, documentation and follow-up of any such lesion.</p> <p>These visualization/processing/evaluation tools allow for characterization of vascular lesions and lesion size over time, helping the physician to assess the changes in their growth. It is also designed to help the physician to classify conspicuous regions of tissue.</p>	<p>syngo.CT Vascular Analysis</p> <p>syngo.CT Vascular Analysis – Autotracer</p> <p>Rapid Results Technology</p> <p>Rapid Stent Planning</p>
<p>syngo.CT Coronary Analysis</p> <p>is an image analysis software package for evaluating cardiac CT angiography (CTA) volume data sets. Combining digital image processing and visualization tools (Multiplanar reconstruction (MPR) thin/thick, maximum intensity projection (MIP) thin/thick, inverted MIP thin/thick, volume rendering technique (VRT), curved planar reformation (CPR)), evaluation tools (coronary vessel centerline calculation, stenosis calculation and plaque analysis) and reporting tools (lesion location, lesion characteristics and key images), the software package is designed to support the physician in confirming the presence or absence of physician-identified coronary lesions and evaluation, documentation and follow-up of any such lesion. These visualization/evaluation tools allow for characterization of coronary lesions and lesion size over time, helping the physician to assess the changes in their growth. It is also designed to help the physician to classify conspicuous regions of tissue.</p>	<p>syngo.CT Coronary Analysis</p> <p>Rapid Results Technology</p> <p>Rapid Stent Planning</p>
<p>syngo.CT Cardiac Function</p> <p>is an image analysis software package for evaluating CT images of the heart. Combining digital image processing and visualization tools (2D, 3D, and 4D display of dynamic data), evaluation tools (structural and functional analysis of heart chambers and valves, and analysis of myocardial tissue), and reporting tools, the software package is designed to support the physician in determining the functional and morphological parameters of the heart chambers, heart valves and confirming the presence or absence of physician-identified myocardial disease and evaluation, documentation and follow-up of any such finding.</p>	<p>syngo.CT Cardiac Function</p> <p>syngo.CT Cardiac Function – RVA</p> <p>syngo.CT Cardiac Function – Enhancement</p> <p>Rapid Results Technology</p> <p>Rapid Stent Planning</p>

¹ See German legal manufacturer address on p. 69.

Mapping Table

Medical Devices to Applications

CT Medical Devices ¹	Clinical Application
<p>syngo.CT CaScoring is an image analysis software package for evaluating CT data sets. The software is designed to support the physician in evaluating and documenting calcified coronary lesions, using standard or low-dose spiral or sequential CT scanning data sets. After loading noncontrast cardiac CT images, <i>syngo.CT CaScoring</i> can be used to interactively mark calcified coronary lesions and to allocate each lesion to one of several coronary arteries, that is, the right coronary artery (RCA), the left main coronary artery (LM), the left anterior descending artery (LAD), and the left circumflex artery (CX). <i>syngo.CT CaScoring</i> calculates the Agatston equivalent score, the mass score and the volume score of each coronary artery as well as the corresponding total scores across all coronary arteries. <i>syngo.CT CaScoring</i> allows the user to create a paper report including the calcium scoring data, any user-documented images, cited literature and additional relevant information.</p>	<i>syngo.CT CaScoring</i>
<p>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. <i>syngo.CT Colonography</i> is a clinical post-processing workflow for basic virtual colonoscopy. It is designed to support the following image reconstruction techniques:</p> <ul style="list-style-type: none"> • Multiplanar Reconstruction (MPR) • Volume Rendering Technique (VRT) • Perspective surface shaded display (pSSD) <p>The following evaluation tools are provided with this workflow:</p> <ul style="list-style-type: none"> • Virtual Flight • Panoramic view • Polyp Lens • Stool Tagging • Stool Subtraction • Polyp Enhanced Viewing (PEV) • Movie <p><i>syngo.CT Colonography</i> 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 (for example, polyps) in addition to evaluation, documentation, and follow-up of any such lesions using standard or low-dose spiral CT scanning.</p>	<p><i>syngo.CT Colonography</i> <i>syngo.CT Colonography Advanced</i> <i>syngo.CT Colonography – PEV</i></p>

¹ See German legal manufacturer address on p. 69.

CT Medical Devices¹

Clinical Application

syngo.CT Dual Source Dual Energy

is designed to operate with CT images which have been acquired with Siemens Healthineers Dual Source scanners. The various materials of an anatomical region of interest have different attenuation coefficients, which depend on the used energy. Depending on the region of interest, contrast agents may be used. 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. The functionality of the *syngo.CT Dual Energy* application is as follows:

- Monoenergetic
- Brain Hemorrhage
- Gout Evaluation
- Lung Analysis
- Heart PBV
- Bone Removal
- Liver VNC
- Monoenergetic Plus
- Virtual Unenhanced
- Bone Marrow
- Hard Plaques
- Rho/Z
- Kidney Stones²

syngo.CT Dual Energy

syngo.CT DE Gout

syngo.CT DE Calculi Characterization

syngo.CT DE Brain Hemorrhage³

syngo.CT DE Heart PBV

syngo.CT DE Direct Angio

syngo.CT DE Lung Analysis

syngo.CT DE Bone Marrow

syngo.CT DE Virtual Unenhanced

syngo.CT DE Monoenergetic Plus

syngo.CT DE Hardplaque Display

Rapid Results Technology

¹ See German legal manufacturer address on p. 69.

² 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.

³ Not yet approved for USA.

Mapping Table

Medical Devices to Applications

CT Medical Devices ¹	Clinical Application
<p>syngo.CT Single Source Dual Energy is designed to operate with CT images which have been acquired with Siemens Healthineers Dual Spiral Single Source scanners. 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. <i>syngo.CT Single Source Dual Energy</i> combines images acquired with low and high energy spectra to visualize this information.</p> <p>Depending on the region of interest, contrast agents may be used. The functionality of the <i>syngo.CT Single Source Dual Energy</i> applications are as follows:</p> <ul style="list-style-type: none"> • Monoenergetic • Monoenergetic Plus • Brain Hemorrhage • Liver VNC • Gout Evaluation • Bone Marrow • Rho/Z • Kidney Stones³ 	<p><i>syngo.CT Dual Energy</i></p> <p><i>syngo.CT DE Gout</i></p> <p><i>syngo.CT DE Calculi Characterization</i></p> <p><i>syngo.CT DE Brain Hemorrhage⁴</i></p> <p><i>syngo.CT DE Bone Marrow</i></p> <p><i>syngo.CT DE Virtual Unenhanced</i></p> <p><i>syngo.CT DE Monoenergetic Plus</i></p> <p>Rapid Results Technology</p>
<p>syngo.CT TwinBeam Dual Energy² <i>syngo.CT Single Source Dual Energy</i> is designed to operate with CT images which have been acquired with Siemens Healthineers TwinBeam Single Source scanners. 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.</p> <p><i>syngo.CT Single Source Dual Energy</i> 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 functionality of the <i>syngo.CT Single Source Dual Energy</i> applications are as follows:</p> <ul style="list-style-type: none"> • Monoenergetic • Bone Removal • Brain Hemorrhage • Liver VNC • Lung Analysis • Gout Evaluation • Monoenergetic Plus • Virtual Unenhanced • Rho/Z • Hard Plaques • Kidney Stones³ 	<p><i>syngo.CT Dual Energy</i></p> <p><i>syngo.CT DE Gout</i></p> <p><i>syngo.CT DE Calculi Characterization</i></p> <p><i>syngo.CT DE Virtual Unenhanced</i></p> <p><i>syngo.CT DE Monoenergetic Plus</i></p> <p><i>syngo.CT DE Direct Angio</i></p> <p><i>syngo.CT DE Lung Analysis</i></p> <p><i>syngo.CT DE Hardplaque Display</i></p> <p>Rapid Results Technology</p>

¹ See German legal manufacturer address on p. 69.

² This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

³ 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.

⁴ Not yet approved for USA.

CT Medical Devices¹**Clinical Application****syngo.CT PE CAD²**syngo.CT PE CAD²

device is a Computer Aided Detection (CAD) tool designed to assist radiologists in the detection of filling defects during review of CT pulmonary angiograms (CTPA). The software is an adjunctive tool to alert the radiologist to regions of interest (ROI) that may have been initially overlooked. The syngo.CT PE CAD device is intended to be used as a second reader tool after the radiologist has completed his or her initial diagnosis. The syngo.CT PE CAD device includes a syngo.CT PE CAD Reading function that displays the CAD findings and also provides navigation and review of CAD findings.

syngo.CT Liver Analysis

syngo.CT Liver Analysis

is an image analysis software for CT volume data sets. It analyses the liver and its intrahepatic vessel structures to identify the vascular territories of sub-vessel systems in the liver. These regions can be evaluated by exploring the volume of the liver and its vascular territories. Using syngo.CT Liver Analysis, you can evaluate the liver volume and examine the vessels of the liver.

The following evaluation tools are provided:

- Computation and manual correction of liver volumes
- Computation and manual correction of tumor volumes and extent
- Computation and manual correction of liver vessel tree structure
- Computation of territories based on vessel branches
- Tumor position in relation to vessels (i.e., 3D visualization of liver, tumor, and vessels)
- Manual definition of separation plane proposals
- Computation of volume of liver parts
- Combination of information from different CT and MR phase volumes

syngo.CT Liver Analysis facilitates reporting by using of appropriate reporting tools, for example, volume statistics and key image creation.

You can use syngo.CT Liver Analysis to create a DICOM Structured Report.

syngo.CT Bone Reading

syngo.CT Bone Reading

Rapid Results Technology

is an image analysis software for CT volume data sets which has been continuously acquired with computed tomography (CT) imaging systems. The software combines following digital image processing and visualization tools:

- Multiplanar reconstruction (MPR) thin/thick, maximum intensity projection (MIP) thin/ thick, inverted MIP thin/thick, volume rendering technique (VRT)
- Geometric measurement tools (distance line, polyline, marker, arrow, angle)
- HU measurement tools (Pixel lens, ROI circle, ROI polygonal, ROI freehand, VOI sphere)
- Curved MPR visualization (unfolded ribs and spine views), cross-section MPRs
- Tools for creation and editing of anatomical centerline paths
- Tools for creation and editing of anatomical labels

The specific visualizations of spine and rib structures allow for easy manual identification and marking of pathologies such as bone lesions or fractures.

Reporting and documentation of results is facilitated by using of appropriate reporting tool, statistics and creation of ranges and snapshots.

¹ See German legal manufacturer address on p. 69.

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

Mapping Table

Medical Devices to Applications

CT Medical Devices ¹	Clinical Application
<p>syngo.CT Myocardial Perfusion allows assessment of parameters related to myocardial tissue perfusion by means of a rapid sequence of CT scans (typically prospective triggered cardiac sequence or shuttle mode scans).</p>	syngo.CT Myocardial Perfusion
<p>syngo.CT Pulmo 3D is intended to assist the physician in evaluating the lung parenchyma and the airways.</p>	syngo.CT Pulmo 3D
<p>syngo.CT Body Perfusion is a post-processing software package, designed to post-process images acquired with SOMATOM CT scanners. The syngo.CT Body Perfusion software package has been designed to evaluate perfusion of organs and tumors. The software can calculate blood flow, blood volume, and permeability from sets of images reconstructed from dynamic CT data acquired after the injection of contrast media. The package also allows the separate calculation of the arterial and portal venous component of hepatic perfusion. It supports evaluation of regions of interest and the visual inspection of time density curves. A potential application is the characterization of tumors by analyzing the differences of perfusion parameters to normal tissue. Determination of the change of perfusion parameters during the course of treatment may be helpful in therapy monitoring.</p>	syngo.CT Body Perfusion
<p>syngo.CT Dental is used for diagnostic imaging of the mandible and maxilla for 3D evaluation of dental anatomy, such as the planning of dental (implant) surgery.</p>	syngo.CT Dental
<p>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.</p>	syngo.CT Cardiac Planning – Valve Pilot
<p>syngo.via RT Image Suite is intended to be used by trained medical professionals including, but not limited to physicians, radiologists, nuclear medicine physicians, and radiation oncologists. syngo.via RT Image Suite is a medical application for viewing, manipulation, 3D and 4D visualization, and comparison of medical images from multiple imaging modalities. The application enables the registration of images and provides tools to help the user to identify volumes, regions, and points of interest inside the patient anatomy. These objects may assist in the preparation of further radiation therapy treatment planning. The application supports functional data, such as PET as well as anatomical datasets, such as CT or MR.</p>	syngo.via RT Image Suite

¹ See German legal manufacturer address on p. 69.

MR Medical Devices¹

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.

Clinical Application

syngo.MR General Clinical Package
 syngo.MR Composing
 syngo.MR Neuro Perfusion
 syngo.MR Neuro Perfusion Mismatch
 syngo.MR Neuro fMRI
 syngo.MR Brain Morphometry²
 syngo.MR Tractography
 syngo.MR Cardiac 4D Ventricular Function
 syngo.MR Cardiac Flow
 syngo.MR Cardiac Perfusion³
 syngo.MR Vascular Analysis
 syngo.MR Onco
 syngo.MR OncoTrend²
 syngo.MR 3D Lesion Segmentation
 syngo.MR Tissue4D
 syngo.MR Spectro SVS
 syngo.MR Spectro CSI
 syngo.MR Spectro Extension
 syngo.MR Spectro Research
 syngo.mMR General
 syngo.MR BreVis

¹ See German legal manufacturer address on p. 69.

² This feature is still under development, and is not yet commercially available in the United States.

³ This feature is not commercially available in the U.S.

Mapping Table

Medical Devices to Applications

MI Medical Devices ¹	Clinical Application
<p>syngo.MM Oncology</p> <p>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).</p> <p>The software components may provide functions for performing operations related to image manipulation, enhancement, compression, or quantification.</p>	<p><i>syngo.MM</i> Multi-Timepoint Eval</p> <p><i>syngo.MI</i> Segmentation</p> <p><i>syngo.CT</i> Segmentation</p> <p><i>syngo.PET</i> Dynamic Analysis</p> <p><i>syngo.MM</i> Therapy Interface</p> <p><i>syngo.CT</i> Onco Function – Hepatic AEF</p> <p><i>syngo.MI</i> Offline OncoBoard</p>
<p>syngo.MI Neurology²</p> <p>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.</p>	<p><i>syngo.MI</i> Neurology</p>
<p>Scenium – a component of syngo.MI Neurology²</p> <p>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 scans 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.</p>	<p><i>syngo.PET</i> DB Comparison</p> <p><i>syngo.SPECT</i> DB Comparison</p> <p><i>syngo.PET</i> Amyloid Plaque</p> <p><i>syngo.MI</i> Neuro DB Creation</p> <p><i>syngo.PET</i> Striatal Analysis³</p> <p><i>syngo.MI</i> Neuro Subtraction</p>

¹ See US legal manufacturer address on p. 69.

² This feature is pending 510(k) clearance, and is not yet commercially available in the United States.

³ This feature is not commercially available in the U.S.

MI Medical Devices¹**Clinical Application****syngo.MI Cardiology**

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 Cardiology
 syngo.SPECT Cardiology 4DM
 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.PET Myocardial Blood Flow

syngo.CT Lung CAD – an accessory of syngo.MM Oncology

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 is intended to be used as a second reader after the radiologist has completed his/her initial read

syngo.CT Lung CAD

syngo.NM Organ Processing

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 Reading
 syngo.NM Organ Processing

¹ See US legal manufacturer address on p. 69.

Mapping Table

Medical Devices to Applications

Mammography Medical Devices ¹	Clinical Application
<p><i>syngo.Breast Care</i> is a dedicated softcopy review environment for both screening and diagnostic mammography as well as digital breast tomosynthesis.</p>	<p><i>syngo.Breast Care Reading</i> <i>syngo.Breast Care Tomo</i> <i>syngo.Breast Care CAD Display</i> <i>syngo.Breast Care Link-it</i> <i>syngo.Breast Care One-Click</i></p>
AT Medical Devices ¹	Clinical Application
<p><i>syngo.Interventional</i> is a medical diagnostic system for viewing, manipulation, communication, and storage of medical images and data on exchange media. The <i>syngo.Interventional</i> can be configured as a stand-alone diagnostic post-processing and reporting system. The <i>syngo.Interventional</i> can be configured with a variety of software options, which are intended to assist the physician in diagnosis or treatment planning. This includes commercially available postprocessing techniques and OEM options.</p>	<p><i>syngo.Interventional Viewer</i> <i>syngo.Interventional QCA</i> <i>syngo.Interventional QCA Bifurcation</i> <i>syngo.Interventional IZ3D</i> <i>syngo.Interventional LVA</i> <i>syngo.Interventional QVA</i> <i>syngo.Interventional iFlow</i></p>

¹ See US legal manufacturer address on p. 69.

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