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Overview

Routine CT Package

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• syngo.CT DE Calculi Characterization
• syngo.CT DE Gout
• syngo.CT DE Monoenergetic Plus
• syngo.CT Dental
• syngo.CT Neuro DSA
• syngo.CT Vascular Analysis

Acute Care CT Package

• syngo.CT ASPECTS\(^1\) | new
• syngo.CT Bone Reading
• syngo.CT Coronary Analysis
• syngo.CT DE Bone Marrow
• syngo.CT DE Brain Hemorrhage
• syngo.CT DE Direct Angio
• syngo.CT DE Lung Analysis
• syngo.CT DE Monoenergetic Plus
• syngo.CT DE Virtual Unenhanced
• syngo.CT Dynamic Angio
• syngo.CT Neuro DSA
• syngo.CT Neuro Perfusion
• syngo.CT PE CAD
• syngo.CT Vascular Analysis
• syngo.CT Vascular Autotracer

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Not available for sale. Future availability cannot be guaranteed.
Cardiovascular CT Package
- syngo.CT Cardiac Function
- syngo.CT Cardiac Function – Enhancement
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Oncology CT Package
- syngo.CT Body Perfusion
- syngo.CT Bone Reading
- syngo.CT Colonography
- syngo.CT Colonography – Advanced
- syngo.CT Colonography – PEV
- syngo.CT DE Bone Marrow
- syngo.CT DE Monoenergetic Plus
- syngo.CT DE Virtual Unenhanced
- syngo.CT Lung CAD
- syngo.CT Onco Function – Hepatic AEF
- syngo.CT Pulmo 3D
- syngo.CT Segmentation
- syngo.MM Multi-Timepoint Evaluation
- syngo.MM Cross-Timepoint Evaluation

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syngo.CT CaScoring

Assessment of coronary artery calcium burden can be used as a prognostic indicator of the patient’s risk of morbidity/mortality from atherosclerotic coronary heart disease.

The syngo.CT CaScoring package allows accurate visualization and quick quantification of calcified coronary lesions. Scoring is facilitated by automatic selection and region growing tools for defining lesions in the main coronary branches (RCA, LM, LAD, CX). It also provides a one-stop comprehensive analysis of area (in mm²), peak density (in Hounsfield units), volume (in mm³), calcium mass (mg calcium hydroxyapatite), and score (Agatston method).

syngo.CT Colonography

It’s time to perform your entire virtual colonography assessment in 3D. With these two exceptional tools, you can make polyp size measurements in the 3D endoluminal view. Toggle quickly between stool removal and regular display to assess potential polyps that might be hidden in residual stool cavities. In addition, a longer and redesigned Virtual Dissection provides you a planar visualization of the mucosa, enabling you to assess the colon surface across its entire width. Of course, colon reading is a time-intensive job that also requires a lot of attention.

syngo.CT Colonography or its advanced version as part of the oncology package provides you an efficient shortcut. With these tools you need only one navigation instead of the two previous anterograde and retrograde steps. You can see the whole colon surface at a glance, even behind the folds. And while flying through the colon, your display is updated continuously so that the entire length of the colon can be evaluated.

syngo.CT DE Calculi Characterization

syngo.CT DE Calculi Characterization allows identification and characterization of different kinds of kidney stones. The basis for this approach is the utilization of DECT data in order to calculate a visual color-coded material decomposition into uric acid and other stone types.

syngo.CT DE Calculi Characterization also includes the Kidney Stone Navigator for handy review and evaluation of all potential stones that have been identified.
**syngo.CT DE Gout**

syngo.CT DE Gout facilitates the visualization of deposited uric acid crystals in peripheral extremities by automatically color-coding these crystals to visualize those deposits.

Conventional methods of diagnosing gout, for example the aspiration of the joint fluid, are limited in feasibility—especially in acute cases where the joint is inflamed and painful. In these cases an aspiration may not be performable. Furthermore, gout can be difficult to diagnose because there are various forms of arthritis that have similar symptoms.

syngo.CT DE Gout overcomes these limitations by being non-invasive, more specific, and fast. It also provides insight into areas that cannot be reached by conventional aspiration, since uric acid crystals can also be located in periarticular soft tissues, such as tendons and ligaments.

**syngo.CT DE Monoenergetic Plus**

Monoenergetic imaging has become a reliable routine tool for image quality enhancement and metal artifact reduction. The DE application syngo.CT DE Monoenergetic Plus allows users to display monoenergetic images in a range of 40–190 keV. By displaying multiple monoenergetic regions of interest and the associated absorption curves, Monoenergetic Plus lets users easily compare and quantify lesions and tissues.

The ability to export statistical information for further evaluation is very beneficial for various research and diagnostic tasks. In addition, high enhancement is observed even for low iodine concentrations at low energy levels.

**syngo.CT Dental**

syngo.CT Dental supports pre-surgical planning for dental operations by reformatting of curved panoramic and paraxial views along the jaw-bone, as well as, definition of the mandibular canal.

Filming in true anatomical size allows direct measurement based on the x-ray films.
syngo.CT Neuro DSA

In neurovascular disease evaluation and interventional treatment planning, syngo.CT Neuro DSA (digital subtraction angiography) helps you save both time and effort. Thanks to fully automated bone removal, you’ll find your images ready for reading when you open a case. You can also toggle between bone and vessel views.

The CT neurovascular workflow also permits a comprehensive vessel analysis of the head and neck – including curved planar reformations (CPR) for stenosis measurement and automated vessel tracking.

syngo.CT Vascular Analysis

Accurate measurement is key to reliable abdominal aortic aneurysm (AAA) and thoracic aortic aneurysm (TAA) stent planning. Inexact placement of start and end points of a distance measurement compromises the optimal choice of the implant device. Calculating the effective vessel diameter can be cumbersome because vessel cross-sections are usually noncircular. In syngo.CT Vascular Analysis, reference markers are displayed in the VRT, enabling easy placement at the, e.g., ostia or the iliac bifurcation. The exact position can be fine-tuned through direct scrolling in cross-sections along the curved centerline. Also, the system automatically provides effective vessel diameters based on the cross-sectional area and perimeter. syngo.CT Vascular Analysis is available with Rapid Results Technology for automatic generation and archiving of bone and table removed VRT/MIP Radial Ranges and for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) range series of the aorta and runoffs.

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Acute Care
CT Package

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In acute care scenarios, unconscious or severely injured patients must be scanned quickly. Here the “golden hour” to diagnosis mandates precise localization and identification of critical injuries. Multiple trauma cases with suspected injuries to the thorax and spine call for a complete evaluation of the ribs and vertebral bodies to assess possible fractures.

syngo.CT Bone Reading revolutionizes rib and spine assessment. The application identifies and labels the ribs and displays the entire rib cage rolled on a 2D planar format. In addition, the vertebral bodies are tagged and the spine is presented in a stretched view for a straightforward overview of the anatomy. The planar display of the rib cage and spine facilitates the direct detection of lesions. Fractures can now be spotted and assessed immediately, saving precious minutes in situations where time is tight. And to reduce the number of manual steps and clicks in these situations, syngo.CT Bone Reading is available with Rapid Results Technology for standardized and automated spine and rib unfoldings creation and archiving.

syngo.CT Coronary Analysis

For a suspected acute coronary syndrome, it is essential to assess the entire coronary tree. Although severe stenoses may impair a detailed visualization, you may need to make a fast and confident decision. syngo.CT Coronary Analysis features robust segmentation of the coronary vessels and provides comprehensive visualization of the coronary tree, despite high-grade stenoses. You can reliably assess the case and make a sound decision – even when time is tight. syngo.CT Coronary Analysis offers the opportunity for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) range series of LAD, RCA and CX through Rapid Results Technology.

syngo.CT ASPECTS*

syngo.CT ASPECTS automatically calculates the ASPECT score of a non-contrast media enhanced CT head scan and highlights the affected brain regions on the CT image. The images and calculated results are automatically calculated in the background and can be directly sent to the PACS without any needed interaction by the user.

The Alberta stroke program early CT score (ASPECTS) provides a score from 0 (most severe) to 10 (least severe) by evaluating 10 brain regions*. The calculated ASPECT score supports the assessment and severity of ischemic changes of the MCA (middle cerebral artery) regions in axial non-contrast brain CT images.

Within your PACS the ASPECTS overlays can be toggled on/off (depends on the capabilities of the used PACS system). Full window and level capabilities of the non-contrast CT image are maintained. It also provides the average HU value in each of the 10 brain regions. This makes syngo.CT ASPECTS routine ready by providing consistent results independent of the user and always available especially in urgent situations when time is a scarce resource.

*http://www.aspectsinstroke.com

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**syngo.CT DE**

**Bone Marrow**

Bone Marrow can be affected by various pathologies, such as bone bruises after trauma and diffuse tumor infiltrations. Up to now, the major modality for imaging these pathologies has been MRI. With the benefits of Dual Energy, CT imaging can now also aid in the diagnosis.

The DE application syngo.CT DE Bone Marrow allows for the segmentation and visualization (color-coding) of the bone marrow based on a material decomposition into bone marrow and calcium. This application can be used both for Dual Source and Single Source data sets (Dual Spiral Dual Energy).

**Brain Hemorrhage**

The DE application syngo.CT DE Brain Hemorrhage assists you in visualizing iodine concentration and distribution in the brain. Lesions and bleeds may show significant iodine uptake in the image, while inactive hemorrhages are not enhanced.

**syngo.CT DE Direct Angio**

syngo.CT DE Direct Angio accurately highlights vessel structures on CT angiography (CTA) data sets, and suppresses bone structures to provide you with a bonefree view of the vessel system, e.g., to subtract bone in CTAs.

Overcoming limitations of conventional bone removal software, the DE approach reliably isolates even complex vasculature, such as at the base of the skull, where CTAs are difficult to interpret.
Monoenergetic imaging has become a reliable routine tool for image quality enhancement and metal artifact reduction. The DE application syngo.CT DE Monoenergetic Plus allows users to display monoenergetic images in a range of 40–190 keV. By displaying multiple monoenergetic regions of interest and the associated absorption curves, Monoenergetic Plus lets users easily compare and quantify lesions and tissues. The ability to export statistical information for further evaluation is very beneficial for various research and diagnostic tasks. In addition, high enhancement is observed even for low iodine concentrations at low energy levels.

In modern oncology, CT imaging plays a major role in treatment decisions and follow-ups of current therapy. Especially important are the localization and the characterization of lesions in order to rule-out malignancy. With DE, it is possible to perform a contrast scan right away and to view a virtual non-contrast image without the need for a non-contrast scan. Another advantage of DECT is the ability to quantify the iodine uptake [mg/mL] in tissue and lesions. The iodine uptake may correlate with the malignancy of a lesion. This capability also may help in follow-up scenarios where the effectivity of a therapy can be validated by evaluating the development of the iodine uptake of the treated lesion. syngo.CT DE Virtual Unenhanced has been extended by optimized visualization of other organs apart from the liver. Virtual non-contrast (VNC) imaging has been successfully applied for kidney, pancreas, lung, aorta and lymph nodes. For the evaluation of liver lesions, syngo.CT DE Virtual Unenhanced still includes the well-established application Liver VNC with an algorithm optimized for liver tissue.

syngo.CT DE Lung Analysis

syngo.CT DE Lung Analysis allows the color-coding of vessels that are affected, e.g., by pulmonary emboli and therefore show a significantly lower iodine concentration than non-affected vessels. It also enables fast evaluation of the related lung perfusion defects without the use of an additional non-contrast scan. syngo.CT DE Lung Analysis directly visualizes the local iodine concentration in the lung parenchyma, which is a measure of the local blood volume, thus enabling a display of the area of possibly affected tissue. The application provides you with the needed diagnostic information at a glance.

syngo.CT DE Lung Analysis is a combination of syngo Dual Energy Lung Vessels and syngo Dual Energy Lung PBV.

syngo.CT DE Monoenergetic Plus

Monoenergetic imaging has become a reliable routine tool for image quality enhancement and metal artifact reduction. The DE application syngo.CT DE Monoenergetic Plus allows users to display monoenergetic images in a range of 40–190 keV. By displaying multiple monoenergetic regions of interest and the associated absorption curves, Monoenergetic Plus lets users easily compare and quantify lesions and tissues.

The ability to export statistical information for further evaluation is very beneficial for various research and diagnostic tasks. In addition, high enhancement is observed even for low iodine concentrations at low energy levels.
**What is the size and location of the clot?**

**syngo.CT Dynamic Angio**

For evaluating local vessel or tissue enhancement, **syngo.CT Dynamic Angio** displays ROI-specific time attenuation curves, as well as curve and statistical parameters, such as time to peak and peak enhancement. For a phase-specific evaluation, for example of the arterial or venous phase, the Twin Slider can restrict calculation of new CT volumes to any user defined time range within the dynamic scan. This means that the application may also be used for examining the liver, or abdominal aortic stent patency and endovascular leakage.

**syngo.CT Neuro DSA**

In neurovascular disease evaluation and interventional treatment planning, **syngo.CT Neuro DSA** (digital subtraction angiography) helps you save both time and effort.

Thanks to fully automated bone removal, you’ll find your images ready for reading when you open a case. You can also toggle between bone and vessel views.

The CT neurovascular workflow also permits a comprehensive vessel analysis of the head and neck – including curved planar reformations (CPR) for stenosis measurement and automated vessel tracking.

**syngo.CT Neuro Perfusion**

In order to reliably determine the size of the infarct, you need to assess the entire area affected by the stroke. Siemens Healthineers’ CT scanners equipped with its Adaptive 4D spiral offers whole brain coverage for perfusion evaluation.

The guided workflow provided by **syngo.CT Neuro Perfusion** facilitates routine 24/7 operation. It takes just five simple steps to view the core infarct and penumbra. Alternatively Rapid Results Technology allows the results to be transferred directly to PACS without user interaction. Tissue at risk can be visualized easily in 3D color maps, based on the mismatch between blood volume (CBV) and blood flow (CBF). Alternatively, you can define a custom mismatch based on parameters you select (including Tmax and rCBF).

Refined algorithms offer automated gray matter segmentation so you can immediately focus on this task.

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Automatic detection of pulmonary filling defects

Assessment and quantification of general vascular pathologies

Zero-click tracing of the main general vessels

**syngo.CT PE CAD**

When ruling out pulmonary embolism in patients with acute chest pain, for example, the optional syngo.CT PE CAD serves as a second reader to detect segmental and sub-segmental filling defects and also provides an automatic lesion zoom view for easy lesion classification.

**syngo.CT Vascular Analysis**

Accurate measurement is key to reliable abdominal aortic aneurysm (AAA) and thoracic aortic aneurysm (TAA) stent planning. Inexact placement of start and end points of a distance measurement compromises the optimal choice of the implant device.

Calculating the effective vessel diameter can be cumbersome because vessel cross-sections are usually noncircular. In syngo.CT Vascular Analysis, reference markers are displayed in the VRT, enabling easy placement at the, e.g., ostia or the iliac bifurcation. The exact position can be fine-tuned through direct scrolling in cross-sections along the curved centerline. Also, the system automatically provides effective vessel diameters based on the cross-sectional area and perimeter. syngo.CT Vascular Analysis is available with Rapid Results Technology for automatic generation and archiving of bone and table removed VRT/MIP Radial Ranges and for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) range series of the aorta and runoffs.

**syngo.CT Vascular Autotracer**

The Autotracer allows for the automatic identification, anatomical labeling, and centerline extraction of main vessels – even before the case is opened. This applies to vessels such as the internal and external carotid arteries, the aorta, and the renal as well as the iliac arteries.
Cardiovascular CT Package

- syngo.CT Cardiac Function
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- syngo.CT Cardiac Function – Right Ventricle
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- syngo.CT DE Direct Angio
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Comprehensive global and local ventricular analysis

Visualization of ischemia from early or late enhanced images

Right ventricular analysis – even with MinDose data

**syngo.CT Cardiac Function**

syngo.CT Cardiac Function provides fully automatic evaluation of left and right ventricular function. The automatic pre-processing has the data ready for functional evaluation as soon as the case is opened. The ventricles are automatically segmented and the software provides all relevant information for local and global function assessment.

For an in-depth evaluation of the cardiac function, the software automatically calculates the global parameters of ejection fraction, myocardial mass, stroke volume, end-systolic and end-diastolic volumes. The local parameters of wall motion and wall thickness are displayed in 17-segment 2D polar maps in accordance with the American Heart Association (AHA).

The assessment of congestive heart failure is facilitated. The dedicated visualization of first pass enhancement highlights ischemia and yields valuable information on the effects of a stenosis. The late enhancement feature helps to categorize perfusion defects as viable or non-viable.

**syngo.CT Cardiac Function – Enhancement**

A simple first-pass enhancement scan may not yield the decisive information necessary to determine the hemodynamic relevance of an intermediate stenosis: sub-optimal scan timing may decrease the attenuation difference between healthy and diseased myocardium.

A quantitative assessment of a possible perfusion defect is not possible. The Perfusion Evaluation task enables the simultaneous assessment of Dual Energy and quantitative dynamic myocardial perfusion data.

An additional clinical benefit is introduced with the quantification of iodine concentration in the myocardium as well as the inspection of quantitative blood flow and volume data. The visualization in AHA-compliant 17-segment polar maps and the direct overlay in MPR segments help to pinpoint the perfusion defect.

**syngo.CT Cardiac Function – Right Ventricle**

The right ventricle makes an essential contribution to normal cardiac pump function due to the ventricular interdependence. Moreover, its function has been shown to be a major determinant of clinical outcome. Therefore, the reproducible assessment and evaluation of the right ventricular function is evident and should be considered during clinical management and treatment.

**syngo.CT Cardiac Function – Right Ventricle** allows reading and diagnosing CT angiography images of the heart for the evaluation of right ventricular function, even with MinDose data.
Assessment of coronary artery calcium burden can be used as a prognostic indicator of the patient’s risk of morbidity/mortality from atherosclerotic coronary heart disease.

The syngo.CT CaScoring package allows accurate visualization and quick quantification of calcified coronary lesions. Scoring is facilitated by automatic selection and region growing tools for defining lesions in the main coronary branches (RCA, LM, LAD, CX). It also provides a one-stop comprehensive analysis of area (in mm²), peak density (in Hounsfield units), volume (in mm³), calcium mass (mg calcium hydroxyapatite), and score (Agatston method).

For a suspected acute coronary syndrome, it is essential to assess the entire coronary tree. Although severe stenoses may impair a detailed visualization, you may need to make a fast and confident decision. syngo.CT Coronary Analysis features robust segmentation of the coronary vessels and provides comprehensive visualization of the coronary tree, despite high-grade stenoses. You can reliably assess the case and make a sound decision – even when time is tight. syngo.CT Coronary Analysis offers the opportunity for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) range series of LAD, RCA and CX through Rapid Results Technology.

syngo.CT DE Direct Angio accurately highlights vessel structures on CT angiography (CTA) data sets, and suppresses bone structures to provide you with a bonefree view of the vessel system, e.g., to subtract bone in CTAs.

Overcoming limitations of conventional bone removal software, the DE approach reliably isolates even complex vasculature, such as at the base of the skull, where CTAs are difficult to interpret.
**syngo.CT DE Hardplaque Display**

In contrast-enhanced CT scans of the vessel system (CTA), it can be difficult to differentiate between calcified plaques and iodine contrast. Also, the plaque can make it quite challenging to assess the grade of the stenosis.

**syngo.CT DE Harplaque Display** enables the identification (color-coding) and automatic removal of calcifications from a DE CTA image. By differentiating between hard plaques and contrast agent, this DE application helps to display the true vessel lumen without interfering hard plaques.

**syngo.CT DE Heart PBV**

This application uses DE information to visualize and quantify the iodine concentration in the myocardium to reveal perfusional defects. In addition, a virtual non-contrast display can be used to identify myocardial edema. Simultaneous acquisition of the high- and the low-kV datasets diminishes the problem of misregistration due to cardiac motion.

**syngo.CT DE Monoenergetic Plus**

Monoenergetic imaging has become a reliable routine tool for image quality enhancement and metal artifact reduction. The DE application **syngo.CT DE Monoenergetic Plus** allows users to display monoenergetic images in a range of 40–190 keV. By displaying multiple monoenergetic regions of interest and the associated absorption curves, Monoenergetic Plus lets users easily compare and quantify lesions and tissues.

The ability to export statistical information for further evaluation is very beneficial for various research and diagnostic tasks. In addition, high enhancement is observed even for low iodine concentrations at low energy levels.
Automatic detection of pulmonary filling defects

Automatic completion of manufacturer-specific graft order forms

**syngo.CT Myocardial Perfusion**

With coronary CT angiography, the diagnosis of a coronary stenosis is easy in a clinical routine. But what about the functional relevance of an intermediate lesion?

syngo.CT Myocardial Perfusion takes you to a new level in measuring the myocardial blood flow and allows you to use actual quantitative assessment for determining the hemodynamic relevance of intermediate stenoses of the coronaries. This enables you to choose the right diagnostic approach for every patient.

**syngo.CT PE CAD**

When ruling out pulmonary embolism in patients with acute chest pain, for example, the optional syngo.CT PE CAD serves as a second reader to detect segmental and sub-segmental filling defects and also provides an automatic lesion zoom view for easy lesion classification.

**syngo.CT Rapid Stent Planning**

Pre-procedural planning for the treatment of abdominal and thoracic aortic aneurysms (AAA and TAA) requires a precise assessment of several anatomical parameters. Numerous vendors offer various stent grafts, each of which requires its own set of measurements. Manually completing graft order forms can be both tedious and time-consuming.

syngo.CT Rapid Stent Planning introduces the automatic completion of manufacturer-specific stent order forms. This optional extension effectively utilizes our unique Rapid Results Technology. Protocols guide the user through all length and diameter measurements, which are then automatically stored in the corresponding order form. At delivery, syngo.CT Rapid Stent Planning provides three order forms: Gore® Excluder®, Zenith Flex®, and Medtronic Endurant in PDF format. In addition, new order form templates can be generated to match the requirements of other vendors*.

*Adobe Acrobat Professional required.

Dynamic quantitative myocardial perfusion assessment

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**syngo.CT Vascular Analysis**

Accurate measurement is key to reliable abdominal aortic aneurysm (AAA) and thoracic aortic aneurysm (TAA) stent planning. Inexact placement of start and end points of a distance measurement compromises the optimal choice of the implant device.

Calculating the effective vessel diameter can be cumbersome because vessel cross-sections are usually noncircular. In syngo.CT Vascular Analysis, reference markers are displayed in the VRT, enabling easy placement at the, e.g., ostia or the iliac bifurcation. The exact position can be fine-tuned through direct scrolling in cross-sections along the curved centerline. Also, the system automatically provides effective vessel diameters based on the cross-sectional area and perimeter. syngo.CT Vascular Analysis is available with Rapid Results Technology for automatic generation and archiving of bone and table removed VRT/MIP Radial Ranges and for automatic generation and archiving of radial and parallel CPR (Curved Planar Reconstruction) range series of the aorta and runoffs.

**syngo.CT Vascular Autotracer**

The Autotracer allows for the automatic identification, anatomical labeling, and centerline extraction of main vessels – even before the case is opened. This applies to vessels such as the internal and external carotid arteries, the aorta, and the renal as well as the iliac arteries.

**syngo.CT TAVI Valve Pilot**

The optimal selection of a suitable aortic valve implant device relies on the accurate quantitative assessment of the aortic annulus. Crucial for exact measurements is the correct visualization of the annulus plane. syngo.CT Cardiac Planning – Aortic Valve finds the annulus plane and provides minimum, maximum, and effective diameters of the aortic annulus when the case is opened. The two ostia views help you to assess their distance from the annulus plane. That saves time, and your TAVI planning results become more precise and reproducible.

In syngo.via, you also benefit from features like a step-by-step configurable measurement guidance protocol for pre-procedural planning as well as an import and export option for an easy exchange of user-created protocols.
Neurology CT Package

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The DE application syngo.CT DE Brain Hemorrhage assists you in visualizing iodine concentration and distribution in the brain. Lesions and bleeds may show significant iodine uptake in the image, while inactive hemorrhages are not enhanced.

The Alberta stroke program early CT score (ASPECTS) provides a score from 0 (most severe) to 10 (last severe) by evaluating 10 brain regions*. The calculated ASPECT score supports the assessment and severity of ischemic changes of the MCA (middle cerebral artery) regions in axial non-contrast brain CT images.

Within your PACS the ASPECTS overlays can be toggled on/off (depends on the capabilities of the used PACS system). Full window and level capabilities of the non-contrast CT image are maintained. It also provides the average HU value in each of the 10 brain regions. This makes syngo.CT ASPECTS routine ready by providing consistent results independent of the user and always available especially in urgent situations when time is a scarce resource.

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syngo.CT DE Direct Angio

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Overcoming limitations of conventional bone removal software, the DE approach reliably isolates even complex vasculature, such as at the base of the skull, where CTAs are difficult to interpret.

syngo.CT DE Hardplaque Display

In contrast-enhanced CT scans of the vessel system (CTA), it can be difficult to differentiate between calcified plaques and iodine contrast. Also the plaque can make it quite challenging to assess the grade of the stenosis.

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**syngo.CT Dynamic Angio**

For evaluating local vessel or tissue enhancement, syngo.CT Dynamic Angio displays ROI-specific time attenuation curves, as well as curve and statistical parameters, such as time to peak and peak enhancement. For a phase-specific evaluation, for example of the arterial or venous phase, the Twin Slider can restrict calculation of new CT volumes to any user defined time range within the dynamic scan. This means that the application may also be used for examining the liver, or abdominal aortic stent patency and endovascular leakage.

**syngo.CT Neuro DSA**

In neurovascular disease evaluation and interventional treatment planning, syngo.CT Neuro DSA (digital subtraction angiography) helps you save both time and effort. Thanks to fully automated bone removal, you’ll find your images ready for reading when you open a case. You can also toggle between bone and vessel views. The CT neurovascular workflow also permits a comprehensive vessel analysis of the head and neck – including curved planar reformations (CPR) for stenosis measurement and automated vessel tracking.

**syngo.CT Neuro Perfusion**

In order to reliably determine the size of the infarct, you need to assess the entire area affected by the stroke. Siemens Healthineers’ CT scanners equipped with its Adaptive 4D Spiral offers whole-brain perfusion coverage. The guided workflow provided by syngo.CT Neuro Perfusion facilitates routine 24/7 operation. It takes just five simple steps to view the core infarct and penumbra. Alternatively Rapid Results Technology allows the results to be transferred directly to PACS without user interaction. Tissue at risk can be visualized easily in 3D color maps, based on the mismatch between blood volume (CBV) and blood flow (CBF). Alternatively, you can define a custom mismatch based on parameters you select (including Tmax and rCBF). Refined algorithms offer automated gray matter segmentation so you can immediately focus on this task.
Oncology CT Package

- synogo.CT Body Perfusion
- synogo.CT Bone Reading
- synogo.CT Colonography
- synogo.CT Colonography – Advanced
- synogo.CT Colonography – PEV
- synogo.CT DE Bone Marrow
- synogo.CT DE Monoenergetic Plus
- synogo.CT DE Virtual Unenhanced
- synogo.CT Lung CAD
- synogo.CT Onco Function – Hepatic AEF
- synogo.CT Pulmo 3D
- synogo.CT Segmentation
- synogo.MM Multi-Timepoint Evaluation
- synogo.MM Cross-Timepoint Evaluation

synogo.via software version VB40 is under development. Not available for sale. Future availability cannot be guaranteed.
syngo.CT

**Bone Reading**

syngo.CT Bone Reading revolutionizes rib and spine assessment. The application identifies and labels the ribs and displays the entire rib cage rolled on a 2D planar format. In addition, the vertebral bodies are tagged and the spine is presented in a stretched view for a straightforward overview of the anatomy. The planar display of the rib cage and spine facilitates the direct detection of lesions. And to reduce the number of manual steps and clicks, syngo.CT Bone Reading is available with Rapid Results Technology for standardized and automated spine and rib unfoldings creation and archiving. Choose a revolutionary method of reading that is as simple as it is effective. syngo.CT Bone Reading – for increased speed in bone assessment.

**Body Perfusion**

How do you decide whether a patient’s therapy is successful or not? And when? Modern oncological therapies show their potential at an early stage, long before the lesion changes in size. Therefore, the demand for ways to differentiate responders from nonresponders is rising. syngo.CT Body Perfusion offers in-depth assessment of a tumor’s viability by looking into its perfusion and vascularization.

**Colonography**

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It’s time to perform your entire virtual colonography assessment in 3D. With these two exceptional tools, you can make polyp size measurements in the 3D endoluminal view. Toggle quickly between stool removal and regular display to assess potential polyps that might be hidden in residual stool cavities. In addition, a longer and redesigned Virtual Dissection provides you a planar visualization of the mucosa, enabling you to assess the colon surface across its entire width. Of course, colon reading is a time-intensive job that also requires a lot of attention.

syngo.CT Colonography or its advanced version provides you an efficient shortcut. With these tools you need only one navigation instead of the two previous anterograde and retrograde steps. You can see the whole colon surface at a glance, even behind the folds. And while flying through the colon, your display is updated continuously so that the entire length of the colon can be evaluated.
Bone Marrow can be affected by various pathologies, such as bone bruises after trauma and diffuse tumor infiltrations. Up to now, the major modality for imaging these pathologies has been MRI. With the benefits of Dual Energy, CT imaging can now also aid in the diagnosis.

The DE application syngo.CT DE Bone Marrow allows for the segmentation and visualization (color-coding) of the bone marrow based on a material decomposition into bone marrow and calcium. This application can be used both for Dual Source and Single Source data sets (Dual Spiral Dual Energy).
Monoenergetic imaging has become a reliable routine tool for image quality enhancement and metal artifact reduction. The DE application syngo.CT DE Monoenergetic Plus allows users to display monoenergetic images in a range of 40–190 keV. By displaying multiple monoenergetic regions of interest and the associated absorption curves, Monoenergetic Plus lets users easily compare and quantify lesions and tissues.

The ability to export statistical information for further evaluation is very beneficial for various research and diagnostic tasks. In addition, high enhancement is observed even for low iodine concentrations at low energy levels.

**syngo.CT DE Monoenergetic Plus**

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**syngo.CT DE Virtual Unenhanced**

In modern oncology, CT imaging plays a major role in treatment decisions and follow-ups of current therapy. Especially important are the localization and the characterization of lesions in order to rule-out malignancy. With DE, it is possible to perform a contrast scan right away and to view a virtual non-contrast image without the need for a non-contrast scan. Another advantage of DE CT is the ability to quantify the iodine uptake [mg/mL] in tissue and lesions.

The iodine uptake may correlate with the malignancy of a lesion. This capability also may help in follow-up scenarios where the effectiveness of a therapy can be validated by evaluating the development of the iodine uptake of the treated lesion. syngo.CT DE Virtual Unenhanced has been extended by optimized visualization of other organs apart from the liver. Virtual non-contrast (VNC) imaging has been successfully applied for kidney, pancreas, lung, aorta and lymph nodes. For the evaluation of liver lesions, syngo.CT DE Virtual Unenhanced still includes the well-established application Liver VNC with an algorithm optimized for liver tissue.

**syngo.CT DE Lung CAD**

Wouldn’t you profit from Lung CAD (computer-aided detection) technology available directly at your workplace? syngo.via immediately starts working for you when a chest CT arrives on its server. Preprocessing provides you with CAD results as soon as you open the patient’s case. Whether you prefer reviewing potentially suspicious CAD-marked lesions in syngo.via or directly in your PACS reading environment – Rapid Results Technology now offers both.
syngo.CT Onco Function – Hepatic AEF

syngo.CT Onco Function – Hepatic AEF provides a dedicated color-coded visualization of arterial enhancement fraction (AEF) values calculated from routine abdominal multiphase CT. It enables assessment of the hepatic arterial perfusion ratio compared to the total perfusion.

syngo.CT Pulmo 3D

syngo.via application for CT-based clinical assessment of lung diseases like Chronic Obstructive Pulmonary Disease (COPD) and associated lung emphysema. Provides automated evaluation and documentation by 3D quantification of the left and right lung, lung lobes, and automated segmentation and measurements of the trachea and associated bronchi.

syngo.CT Segmentation

syngo.CT Segmentation provides automated segmentation and evaluation of lesions in the lung, liver, lymph nodes and other organs. In addition, further quantifications are provided like Choi criteria and advanced Hounsfield Unit (HU) statistics.
Read your cases over time

**syngo.MM Onco Multi-Timepoint Evaluation and syngo.MM Onco Cross-Timepoint Evaluation**

syngo.MM Onco Multi-Timepoint extension complements syngo.MM Cross-Timepoint Evaluation by enabling physicians to visualize up to eight timepoints concurrently on syngo.via.
CT Options

- syngo.CT Liver Analysis
Utilize the full potential of virtualization and quantification

**syngo.CT Liver Analysis**

How do you satisfy your referrers’ request for virtual planning and quantifying for complex liver surgery? In the operating room, there is usually no time for several approaches – so the right one should be known beforehand. It would be even better if several possibilities could be tried, and resected volumes precisely measured, in advance. **syngo.CT Liver Analysis** provides you with virtual scalpels to plan and measure potential interventions in liver surgery.
syngo.via
Automate & 
Routine Package

- syngo.MM Reading
- syngo.CT Vascular
- syngo.CT Dual Energy
- syngo.CT Cardiac
- syngo.via Cinematic VRT
syno.MM
Reading

Anatomic intelligence
• Automatic spine and rib labeling
• Landmark registration
• Region-growing
• Interactive Spectral Imaging | new

Interactive Spectral Imaging
Interactive Spectral Imaging makes Dual Energy as easy as windowing so you can use additional spectral information at a glance. It enables the loading and use of the most common Dual Energy application classes (Mixed, VNC, Iodine Map, Monoenergetic Plus) directly within syno.via MM Reading by the click of one button.

Interactive Spectral Imaging allows the changing of Monoenergetic Plus keV levels right within syno MM Reading as well as visualizing iodine maps, mixed images and virtual unenhanced images (VNC). Easily compare multiple Dual Energy studies from different timepoints in syno MM Reading.

syno.CT
Vascular

• Bone Removal
• Table Removal
• Review Marker
• Manual Vessel Tracking (> 2-click centerline)
• MPR
• Thin MIP Ranges
• Curved and Cross-Sectional MPR
• Integrated disease-specific reports

syno.CT
Dual Energy

Optimum Contrast for sharper image contrast
Optimum Contrast is an intelligent method that changes the blending ratio of low- and high-energy data on a pixel-by-pixel basis, depending on the corresponding Hounsfield units (CT numbers). For higher CT numbers, which occur in regions of high iodine concentration, larger proportions of the image are taken from low tube-energy data. As a result, areas of contrast enhancement are accentuated.

Monoenergetic imaging for reducing metal artifacts
With monoenergetic imaging, metal artifacts can be reduced in both Single Source and Dual Source Dual Energy data. Select the energy level at which implants, clamps, or screws will have the smallest impact on image quality and get unsurpassed scan results.

Chemical characterization of different materials
The attenuation of X-rays, among others, depends on the electron density and the effective atomic number. Both parameters are characteristic for different materials. With syno.CT DE Rho/Z, you have access to electron density and effective Z maps in one examination.

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**syngo.CT Cardiac**

- Review Marker
- Plaque Visualization
- Heart Isolation
- Movie mode (Beating Heart)
- Manual Coronary Tracking (> 2-click centerline)
- Cardiac Planes
- Curved and Cross-Sectional MPR
- Integrated Reporting

**syngo.via Cinematic VRT**

With a single click, you can generate in a few seconds photorealistic clinical images just like from an anatomy textbook. You can use this material for education, publication, and communication – especially with your referrers and patients. From pure geometric optic to electromagnetic modeling of ambient light: Cinematic VRT is based on a physically accurate simulation of how light interacts with matter. In contrast to the traditional volume rendering technique (VRT), which traces a single straight ray through each pixel into the volume data ("ray casting"), Cinematic VRT traces hundreds or thousands of photon paths per pixel through the captured patient anatomy. This increases the realism of the resulting images tremendously, and allows for artistic techniques to produce descriptive visualizations of the human anatomy. The natural lighting in combination with the accurate simulation of photon scattering and absorption produces photo-realistic images that resemble many shading effects that can be observed in nature, such as soft shadows, ambient occlusion, volumetric scattering and sub-surface photon interaction. Therefore, it provides a realistic rendering of shapes and scattering, subsurface scattering and depth. This promotes easier interpretation by the human brain, a much faster understanding of spatial anatomical structures, and the presentation of a virtual human anatomy that almost explains itself.

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## syngo.via VB40 Applications – CT Dual Energy

### Scanner Software Version

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### GO technologies

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### FAST DE Results²

| Mixed | ✓ | ✓ | ✓ | ✓ |
| Monoenergetic Plus (fixed keV levels) | ✓ | ✓ | ✓ | ✓ |
| Optimum Contrast | ✓ | ✓ | ✓ | ✓ |
| Lung PBV | ✓ | ✓ | ✓ | ✓ |
| Virtual Unenhanced | ✓ | ✓ | ✓ | ✓ |
| Rho/Z² | ✓ | ✓ | ✓ | ✓ |
| Virtual Unenhanced – Liver VNC¹² | ✓ | ✓ | ✓ | ✓ |

### FAST DE¹⁰

| ✓ | ✓ | C-image⁸ | C-image⁸ |

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02.2019 · Clinical Packages for CT
Reading as simple as it should be – Rapid Results Technology

Why waste time in CT postprocessing?

Rapid Results Technology improves your efficiency by reducing your workflow steps:

In trauma cases requiring surgical intervention, the orthopedic surgeon usually requires several standardized views of the affected region to aid in a comprehensive preprocedural workup. While in stroke imaging, standardized perfusion maps are often needed for a quick assessment of possible penumbra areas for intervention planning.

The generation of these different anatomical orientations and perfusion maps can be time-consuming, especially in the emergency setting, and the quality of the results often depends on the expertise of the operator. Now with Rapid Results Technology, you can automatically generate neuro perfusion maps and standard visualizations of general vessels and different anatomies in various types and orientations, for instance an unfolded view of the rib cage and the spine.

Define your workflow once and let Rapid Results Technology produce the decision basis in the acute care scenario, whether in severe trauma cases or stroke, or to rule out aortic dissections. Save time in the “golden hour” by automatically creating just the right amount of information – for standardized and efficient injury assessment and reproducible surgical planning.
Clinical innovations like syngo.CT Bone Reading or syngo.CT Neuro Perfusion for routine exams regardless of expertise level

Standardized and consistent image quality independent of operator

Postprocessing becomes part of the standard reconstruction task

Ready-to-read results wherever you want them
Your gateway to innovation – syngo.via OpenApps

syngo.via OpenApps is your fast and open access to a world of innovation. Get access and run an ever-growing variety of clinical applications from Siemens Healthineers and our partners – directly on your syngo.via. With only one click, apps are installed within minutes after download for all your clients to use, thus fitting seamlessly into your clinical workflow. They have been scanned for security vulnerabilities and integrated into the safe environment of syngo.via by Siemens Healthineers.

• Increase your clinical capabilities
  Access an ever-growing variety of apps from Siemens Healthineers and our partners.

• What you need, when you need it
  Browse, trial, subscribe, and get instant access to the functionality you need in syngo.via.

• Your secure home innovation
  IT-security-scanned and integrated into syngo.via by Siemens Healthineers for you.

syngo.via OpenApps and the Siemens Healthineers Digital Ecosystem

How do you satisfy your referrers’ request for virtual planning and quantifying for complex liver surgery? In the operating room, there is usually no time for several approaches – so the right one should be known beforehand. It would be even better if several possibilities could be tried, and resected volumes precisely measured, in advance. syngo.CT Liver Analysis provides you with virtual scalpels to plan and measure potential interventions in liver surgery.

In short: It’s your invitation to more innovation

Seamless user experience

• Unique user experience through full range of functionality from your syngo.via
• Seamless integration of apps into your existing IT environment
Let’s shape the future of imaging together.
Our partner portfolio on syngo.via OpenApps
Digitalization in healthcare is progressing at an ever faster speed. If you want to stay up to date, rigid imaging IT business models just keep you from staying up to date. You need a solution that fits your budget, your tasks, your clinical focus. **syngo.via Flex Plan** is your flexible licensing model – always adapting to you.

---

**Flexible payment.**
Subscribe from 1 to 7 years and spread your total costs to avoid a high initial investment.

**Rigid Imaging IT** business models just hold you back. Build your solution that fits your budget, your tasks, your clinical focus. **syngo.via Flex plan** is your flexible licensing model – always adapting to you.

---

**Simple packaging.**
Match your package size to your budget from clinically specialized solutions up to all-in packages.

**Individual deployment.**
Whether physical hardware or virtual solutions: Ensure sustainable growth with our scalable deployment from 1 to 30 users that integrates seamlessly into your IT environment.

**Beneficial service package˚.**
Rely on evergreen software, including service and training plans to support optimal operations.

*Value-added services depend on country.

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The information in this document contains general technical descriptions of specifications and options as well as standard and optional features that do not always have to be present in individual cases.

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However, these statements do not suggest or constitute a warranty that all product experiences will yield similar results. Results may vary based on the particular circumstances of individual sites and users.

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 rights.

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.

1 Included in syngo.CT Neuro Perfusion license
2 Not yet approved for USA
3 With mandatory scan delay after injection of >75 s (no arterial phase, liver only)
4 Only for visualization of static iodine enhancement after interventional procedures (not for CTA)
5 Not for visualization of iodine, only for metal artifact reduction
6 Mainly for visualization of iodine, basic metal artifact reduction
7 Not cleared for use as a basis for radiation therapy planning, but for visualization only
8 C-type reconstruction is similar to FAST DE in terms of usage possibilities
9 FAST DE Results automatically generates Dual Energy datasets at the AWP
10 FAST DE allows to choose the mixing ratio between low and high kV at the scanner for reconstructed mixed images that are directly send to PACS
11 Including Liver VNC
12 Requires scanner version VB20. This software version is 510(k) pending
13 VNC not available for Dual Spiral Dual Energy

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