syngo.via VB10 for MR
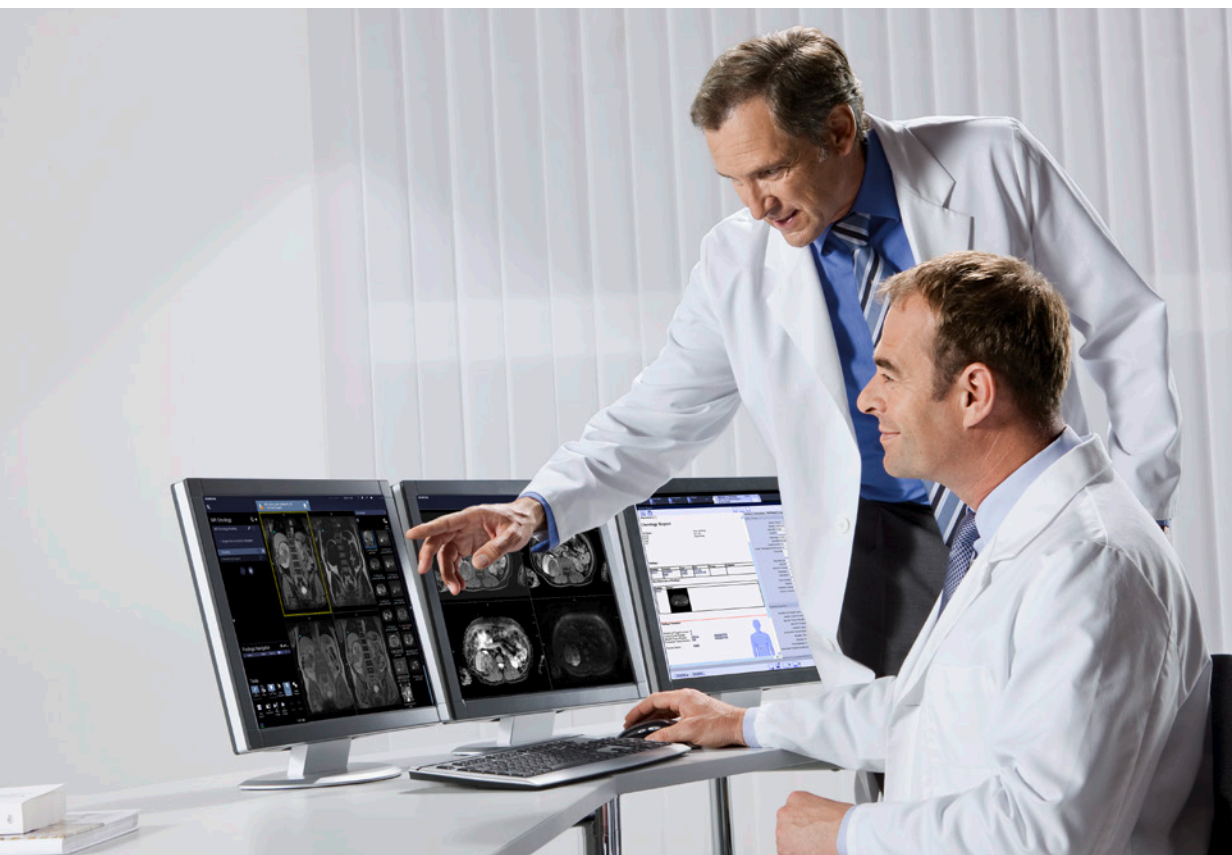
A new generation is coming

siemens.com/*syngo*via-mr

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.

Answers for life.

Note: The MR General Engine license is a pre-requisite for all MR applications and improvements mentioned in this document.

Dear *syngo*.via user,

Your post-processing solution benefits from the continuous development of the modality applications. It is our goal to keep you on top of the latest technology.

Since the first versions of *syngo*.via, we have come a long way with important evolutions every year.

This year is a special year for *syngo*.via: Going from the VA-line to the VB-line, we change generation and introduce *syngo*.via VB10.

A change in generation always means profound changes.

The new *syngo*.via focuses on ease-of-use, advanced oncology, and key improvements of your current clinical applications.

Indeed, the new *syngo*.via brings a major change in your daily routine with a new user interface and a thumbnails view for efficient and more intuitive reading in MRI. The new application *syngo*.MR OncoCare offers a quantitative evaluation of functional response to treatment, paving the way to an earlier assessment of therapy response. And the computed b-values functionality aims at saving MR scan time while improving image quality in diffusion-weighted imaging.

With the following information, we would like to describe the key elements of *syngo*.via VB10 and present some highlights. If you are reading the electronic version of this document, click on the short movie snippets and enlarge them in order to experience *syngo*.via VB10.

Your Application Specialist will introduce you to the new software in more detail.

Sincerely,

Your Siemens Team

Content ⌃

A major change in your daily routine

- New user interface
- New patient browser
- New thumbnails view in all MR workflows

Advanced functionalities in oncology

- One MR Oncology workflow with Easy Reading Mode
- *syngo*.MR OncoCare – quantitative evaluation of functional tumor response (optional license, pre-requisite MR Onco)
- Computed b-values – save scan time and improve diffusion image quality

Take your existing applications to the next level

- Improved mean curve
- Improved registration functionality
- MR Cardiac reading evolves
- *syngo*.MR Tissue 4D
- *syngo*.MR Spectro
- *syngo*.MR Vascular Analysis
- *syngo*.mMR General
- *syngo*.MR Neuro Tumor becomes *syngo*.MR Neuro Dynamics

New MR workflow manager

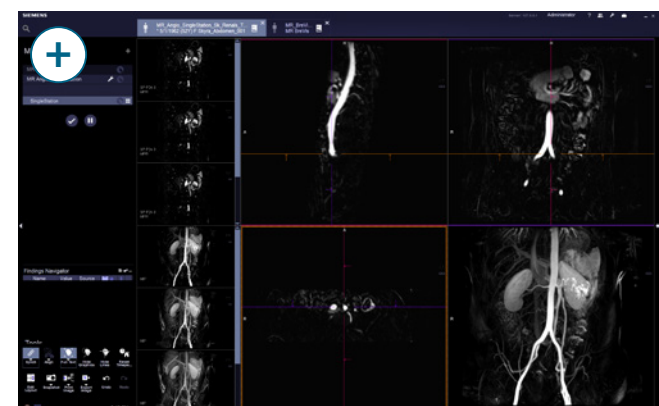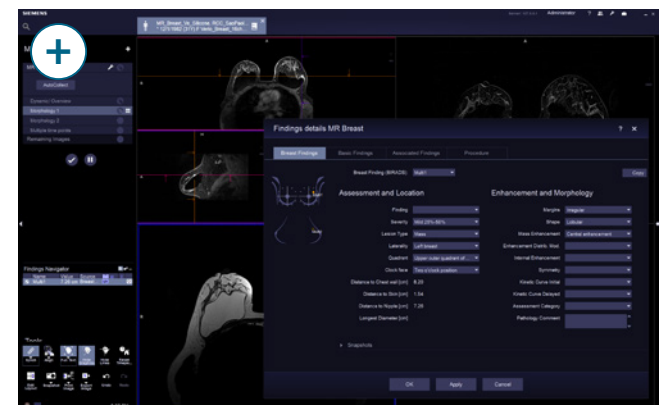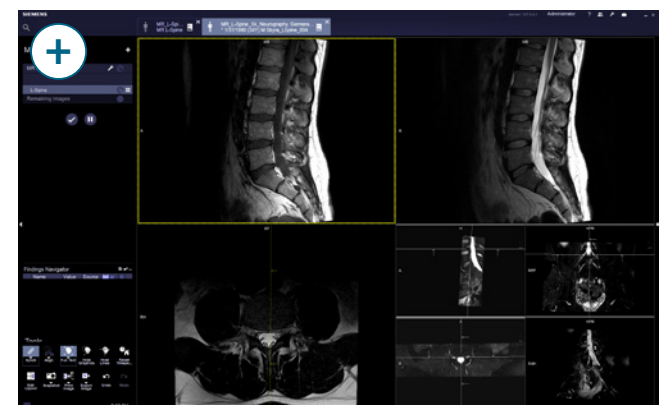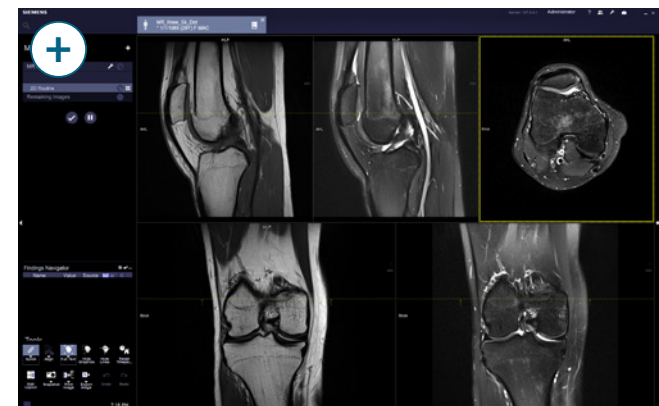## Summary of all improvements and new features

A major change in your daily routine

The new *syngo*.via looks different. It feels different. For good reasons.

New user interface

Following real benefits are intended:

• Clearer, calmer, and darker interface

• Labeled icons

• Enhanced Online Help

New user interface in *syngo*.via applications

A major change in your daily routine

New patient browser

The patient browser is where everything starts: Locating the right patient must be as intuitive and efficient as searching over the internet with your preferred web browser.

The new patient browser of *syngo*.via VB10 offers three major functionalities going in this very direction:

- **Web browser-like search capability**
  Similar to what we do on the internet, typing "Andreas, MR" in the search area will return all "MR" exams for the patients with the name "Andreas".

- **Preview of the images with scrolling functionality**
  Before opening the case, you can quickly identify the study you want to open based on the images that have been acquired.

- **Dockable and floating patient browser**
  You can freely dock and undock the patient browser and move it around on your monitor(s) as a floating window, for more convenient access to your database.
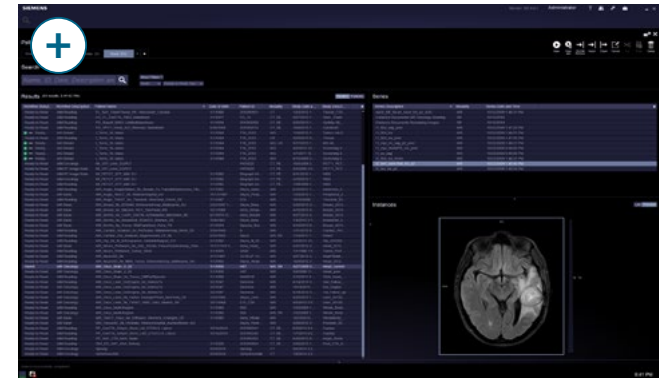
New patient browser
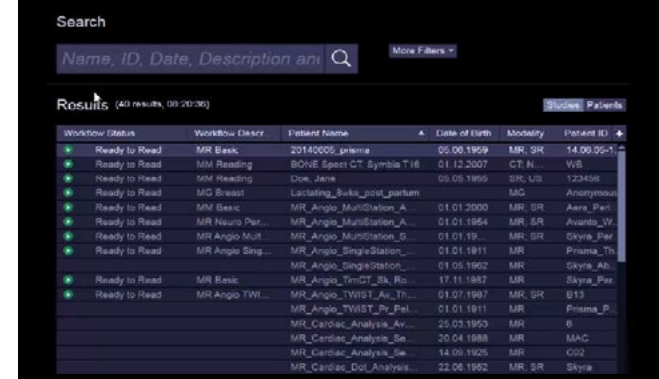
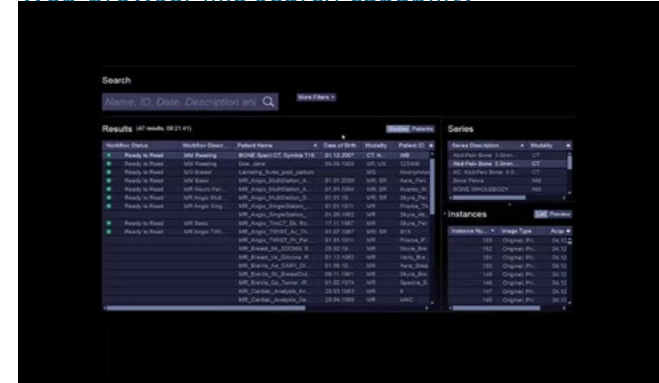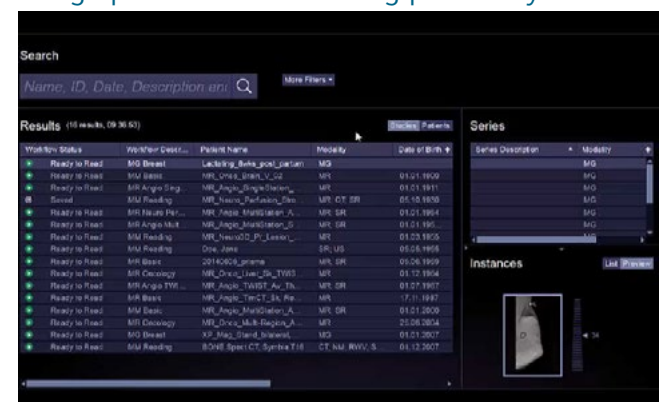
Web-browser like search capability

Image preview with scrolling possibility

Full flexibility

A major change in your daily routine

New thumbnails view in all MR workflows

When reading a case, it is often useful to have a place where you can find a summary of all the series you have acquired. For this purpose, the series navigator exists since the beginning of *syngo*.via and displays the different series names.

With the high amount of series acquired in MR, a visual identification of the different series based on the contrast is sometimes easier and faster.

With the new *syngo*.via for MR, **the series navigator now offers the possibility to visualize all available MR sequences as thumbnails**, allowing for a preview of the MR sequences done during the exam. With this, you are now able to visually quickly identify the information you are looking for.
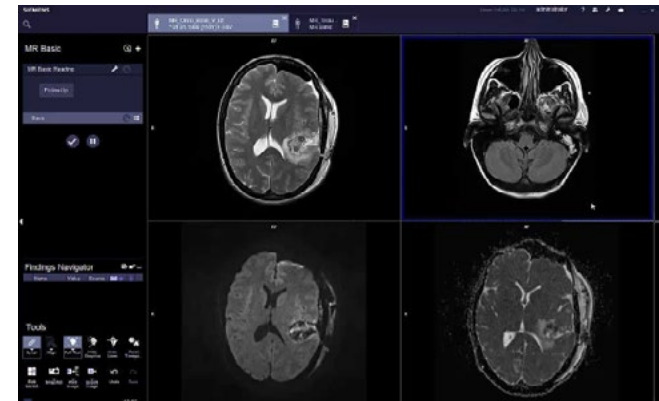
The already existing display mode remains available.

Thumbnails view

Thumbnails view


Activation of thumbnails view
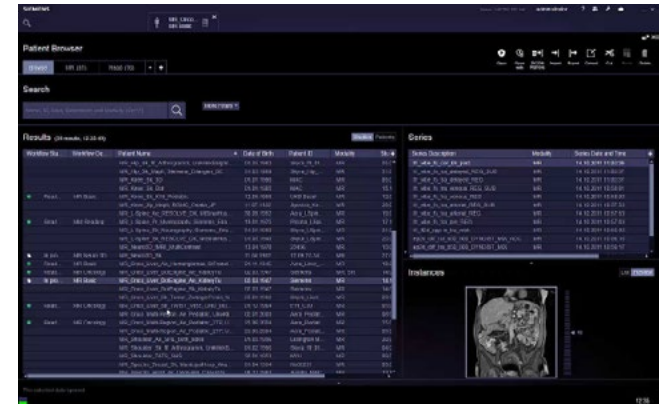
Advanced functionalities in oncology

One MR Oncology workflow with Easy Reading Mode – one tool for fast and easy multi-parametric reading

The new *syngo*.via offers **one consolidated MR Oncology workflow**. The previous four oncology (Onco Brain, Onco Liver, Onco Multi Region, Onco TimCT) and the dedicated mMR General (for MR/PET) workflows are now fused into one single MR Oncology workflow where the PET tools are activated as soon as PET data are detected and the corresponding license available.

Your benefit? You can now find all functionalities embedded into one workflow for efficient evaluation of multiple tumor types or lesions.
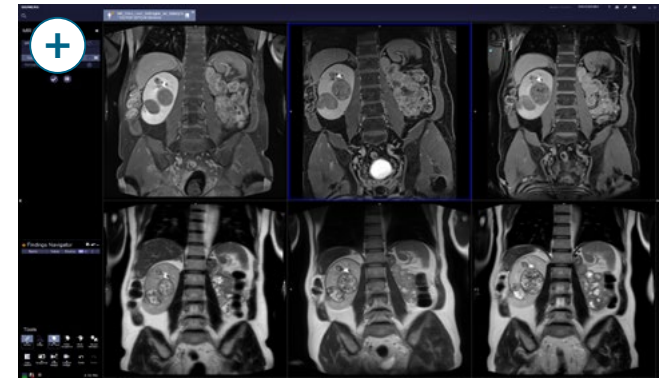
MR Oncology workflow


Now one MR Oncology workflow

Advanced functionalities in oncology

And there is more.

The many sequences acquired during oncology studies require a fast and intuitive way to deal with all the images. Therefore, we implemented the **Easy Reading Mode in MR Oncology**:

- With just one click, you can choose the series you want to evaluate.

- With one drag & drop interaction, you can automatically adapt the layout to the amount of series you want to compare. The series are automatically synchronized.

- With one mouse gesture, you can quickly fuse two different contrasts to highlight the location of the pathology to the referring physician.

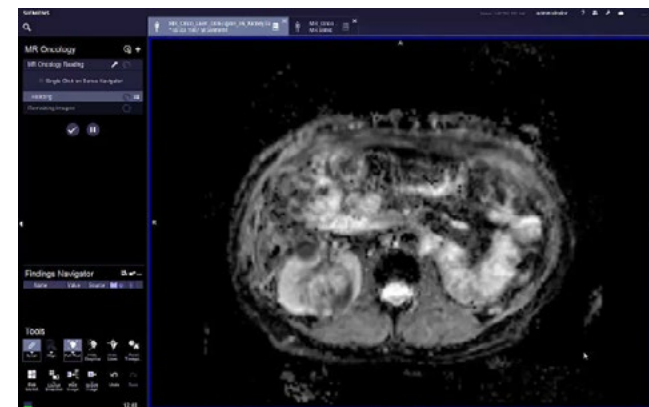**Note:** If you had the MR Onco license, when migrating from *syngo*.via VA30 to the new *syngo*.via, your existing MR Oncology workflows will be migrated (copied) so that you can still use them. In addition, you will receive the new consolidated MR Oncology workflow.
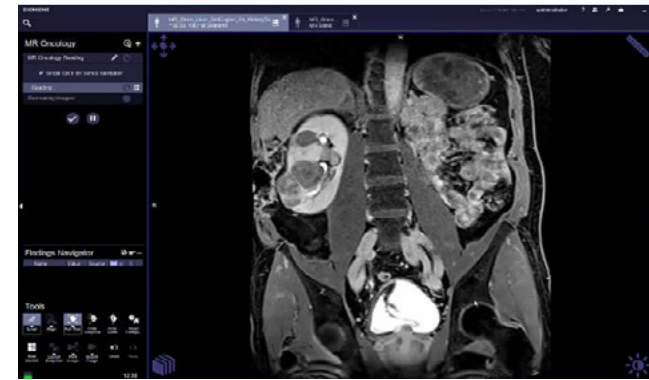
Easy Reading Mode: Single-click interaction
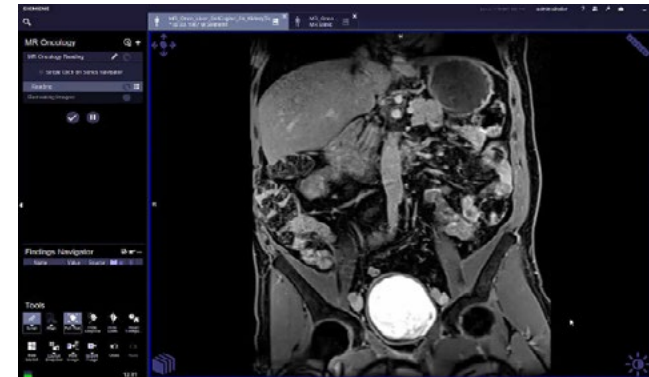
Easy Reading Mode: Drag & drop and automatic layout adaptation

Easy Reading Mode: Single-click fusion
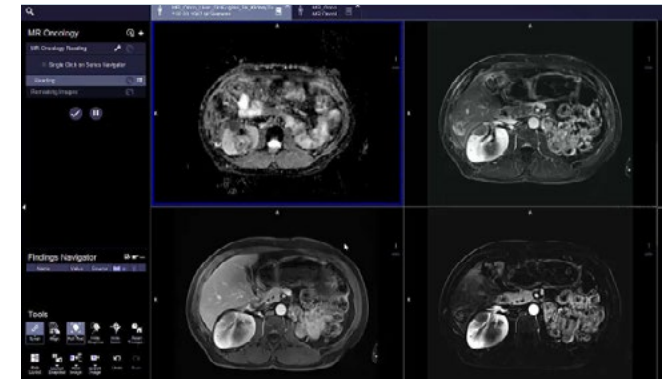
Advanced functionalities in oncology

syngo.MR OncoCare – quantitative evaluation of functional tumor response (optional license, pre-requisite MR Onco)

syngo.MR OncoCare is your new tool for advanced oncology reading, designed to positively address therapy benefit.

syngo.MR OncoCare offers a solution for quantitative evaluation of functional lesion response to treatment. It has the potential to allow **earlier assessment of treatment response**, leading to **treatment path optimization** and **savings of unnecessary treatment costs**.

As extension of the MR Oncology workflow, *syngo*.MR OncoCare provides rich feature sets for histogram analysis and trending over multiple time points:

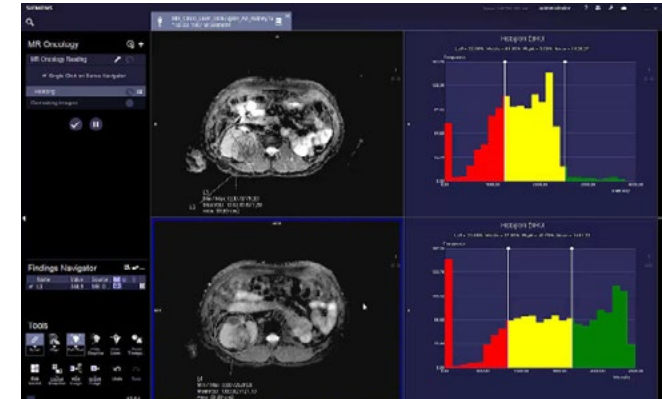- VOI- and ROI-based histogram analysis

- Intuitive color definition for three histogram domains

- Savable presets for histogram analysis

- Back-mapping of histogram colors on the image of reference

- Export in .CSV format of pixel intensity values

- Trending plot

syngo.MR OncoCare: Histogram creation
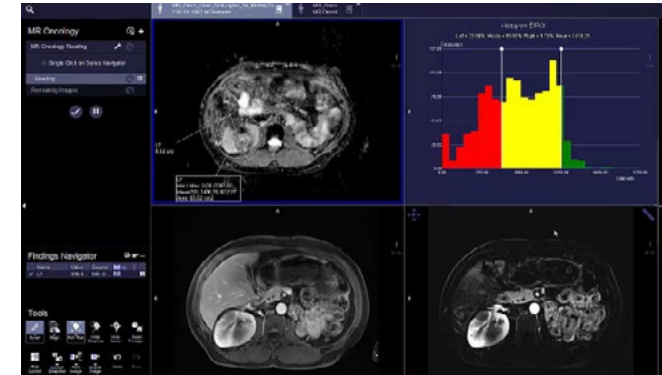
syngo.MR OncoCare: Back-mapping

syngo.MR OncoCare: Trending of histogram metrics

Advanced functionalities in oncology

Benefits:

• Quantitative assessment of the functional behavior of lesions for earlier assessment of therapy benefit

• Improved communication towards referrers and oncologists with the back-mapping functionality

• Additional research possibilities with the export functionality
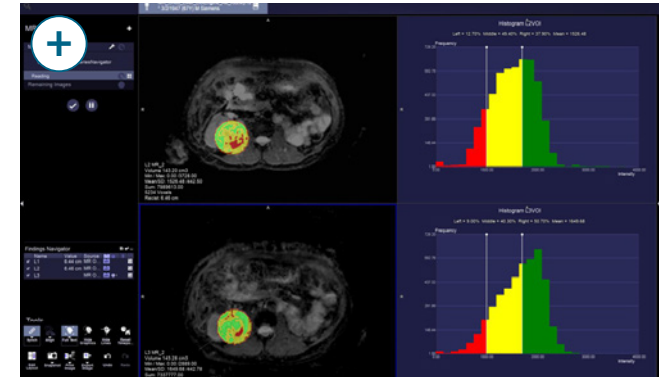
*syngo.*MR OncoCare: Comparison in a follow-up case
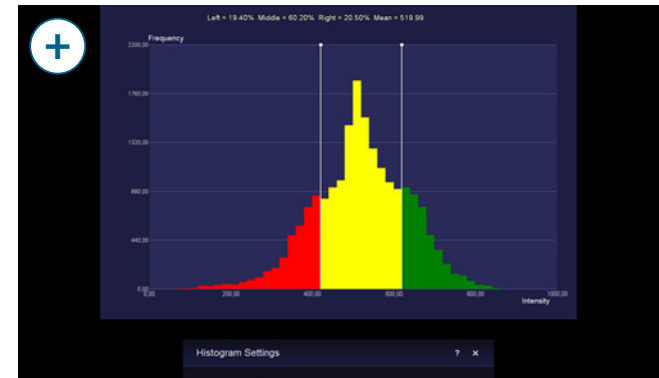
*syngo.*MR OncoCare: User-defined histogram settings

*syngo.*MR OncoCare: Trending of histogram metrics

Advanced functionalities in oncology

Further Readings

Monitoring bone marrow metastases treatment

Histogram analysis of whole-body diffusion-weighted images and ADC maps has been documented to be a powerful tool to monitor response to treatment in skeletal therapy.

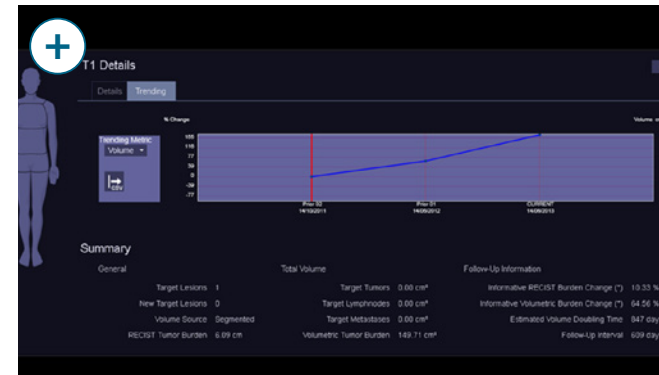„Monitoring Bone Marrow Metastases Treatment with Whole-Body Diffusion MRI" – Anwar R. Padhani, MAGNETOM Flash Issue 59 (04/2014), pages 26-29

Earlier assessment of response to TACE therapy

Volumetric functional MR assessment is documented to help predict TACE therapy response after one month, where the currently available imaging criteria (morphology-based) assess therapy response after six months, earliest[1].

1 Hepatocellular Carcinoma: Response to TACE Assessed with Semi automated Volumetric and Functional Analysis of Diffuson-weighted and Contrast-enhanced MR Imaging Data; Radiology: 2011;260:752-761
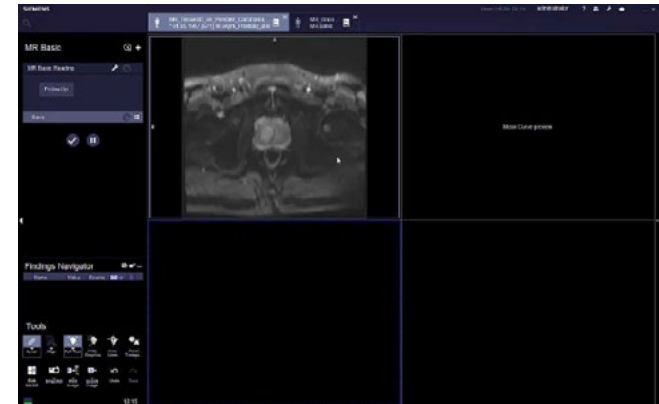
Advanced functionalities in oncology

Computed b-values – save scan time and improve diffusion image quality

Diffusion-weighted imaging has grown to become the key sequence in oncology imaging.

High b-value images deliver the most valuable clinical information, but they require acquisition time and are often prone to distortion and ghosting artifacts.

syngo.via VB10 allows generating computed high b-value images from acquired ones. This type of algorithm has been documented to **save valuable scan time** while providing images of overall better accuracy.[2]

ADC computation
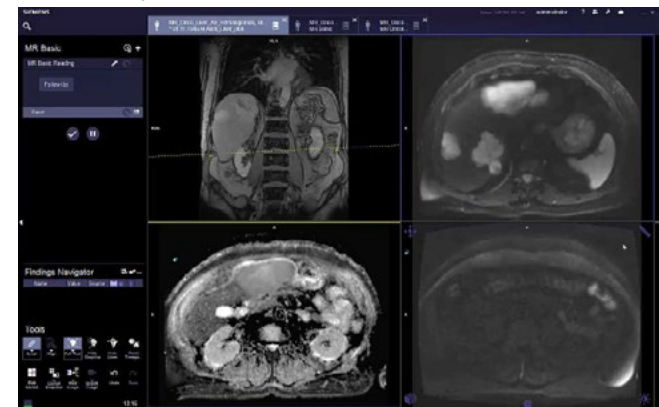
ADC and b-value tool with interactive preview

2 Feasibility study of computed vs measured high b-value (1400 s/mm²) diffusion-weighted MR images of the prostate, World J Radiol 2014 June 28; 6(6): 374-380

Advanced functionalities in oncology

Additionally, **the computed images can be interactively adapted** to better fit the pathology, the body area, and the patient you are looking at.

We believe this functionality can have a huge impact in reducing your examination time and improving your diagnostic power. Therefore, this powerful feature comes standard with a *syngo*.via VB10 upgrade, as long as you have the MR General Engine license.

Note: This feature is integrated in a tool called "ADC and b-value", where the offline computation of ADC maps is also available.
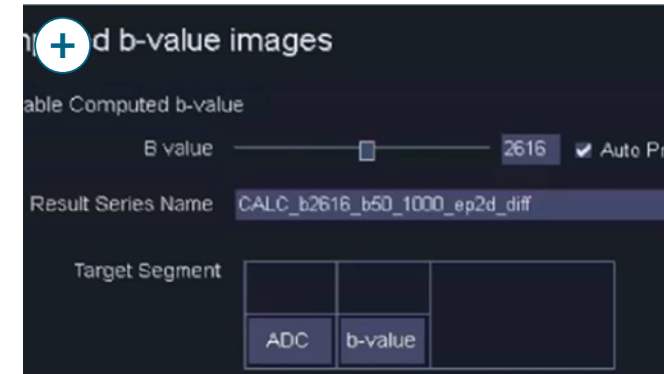
Computed b-value tool with interactive slider
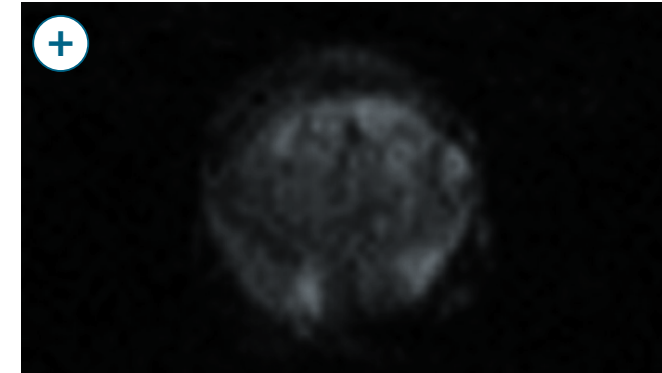
b 2000 (measured)

b 2616 (computed)

Take your existing applications to the next level

Improved mean curve with new checkboxes

Based on your valuable feedback, we implemented numerous improvements in *syngo*.via VB10 for the existing applications. This paragraph describes these improvements.

Improved mean curve

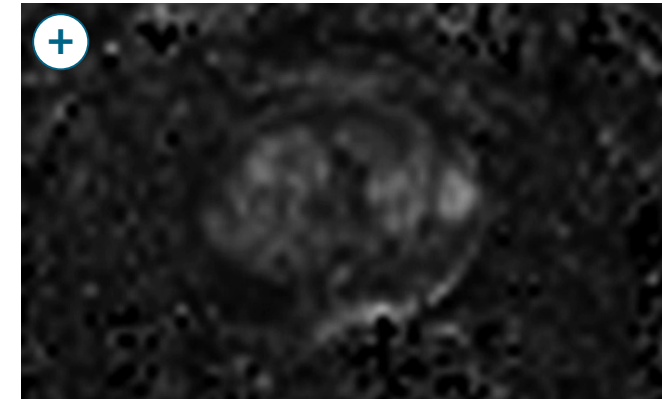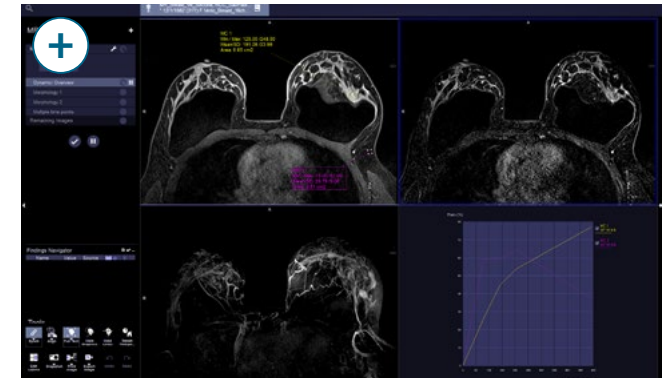The mean curve is an important tool for evaluation of dynamic images. This tool is available in the different workflows of the MR General Engine application.

The new *syngo*.via makes this tool more intuitive and interactive:

• **Display of curve on / off**
  When you have multiple ROIs for mean curve evaluation, you can chose which curves you want to display by using the new checkboxes.

Display of curve on / off

• **Interactive mean curve segment**
  By using the mouse or the keyboard arrows, you can visualize the relevant slice and phase in the corresponding image segment. In other words, you can now use the mean curve segment to scroll through your dynamics and display on demand the curve information.

• **Export functionality**
  The mean curve values can be exported as .CSV file in order to use them e.g. for research purposes.

Interactive mean curve segment

Display of mean curve information

Take your existing applications to the next level

Improved registration functionality

The automatic registration functionality offers a fast and easy way to compare current and prior data. This registration is based on sequence parameters and can be manually fine-tuned for more precise analysis.

With the new *syngo*.via, the "Hot Iron" LUT is automatically selected in the floating alignment tool in order to allow for better visual alignment when fine-tuning is needed.

Take your existing applications to the next level

MR Cardiac reading evolves

For cardiac reading, the new *syngo*.via will give you:

- **More flexibility in the reading of cine images**
  For the reading of cine images in the cine step, you can now change phase and slice position with keyboard shortcuts.

- **New user guidance**
  In some cardiac cases, the automatic contouring proposed by the software needs to be fine-tuned or corrected. This is especially true for abnormal anatomies. The new step-by-step user guidance in the Cardiac Function step will show you the best and fastest way to do it, as if your application specialist were next to you explaining how to do it.

- **New drop tool "add slices"**
  The new drop tool in MR Cardiac Function allows adding slices to an existing analysis. This is particularly important if post-processing is performed simultaneously with scanning in order to increase your productivity.
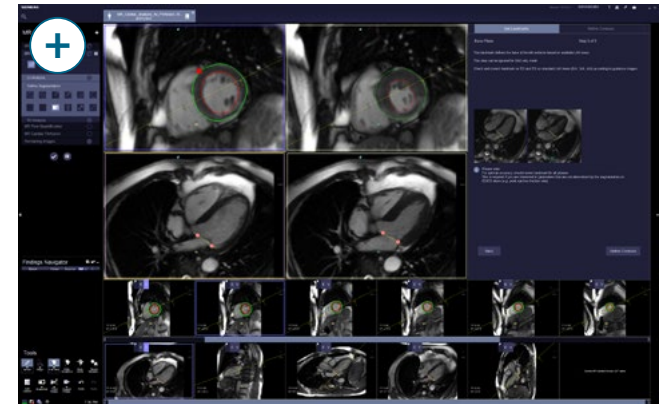
New user guidance for cardiac reading
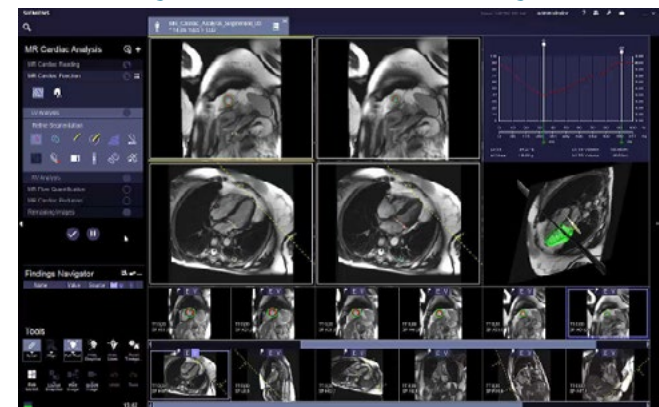
New user guidance for cardiac reading
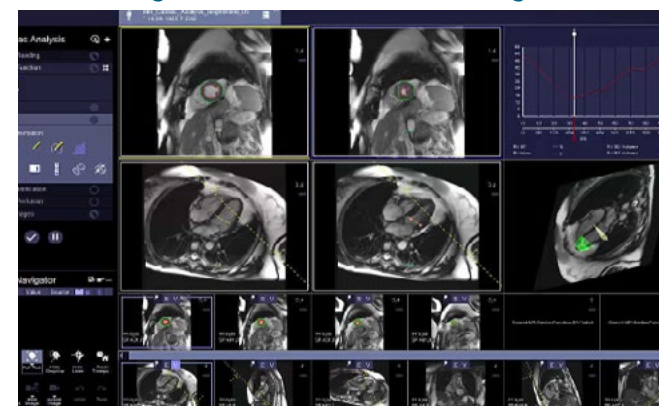
New drop tool „add slices"

Take your existing applications to the next level

- **"Mirroring of flow curve"**
  In the Flow Quantification step, it is now possible to invert the polarity of the flow encoding direction in order to match the display of the curve to the Ultrasound visualization.
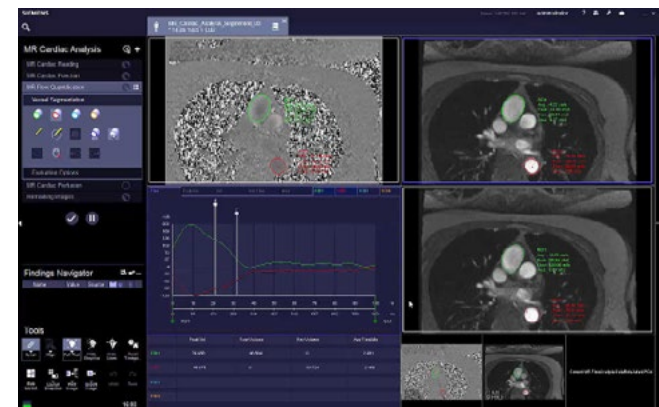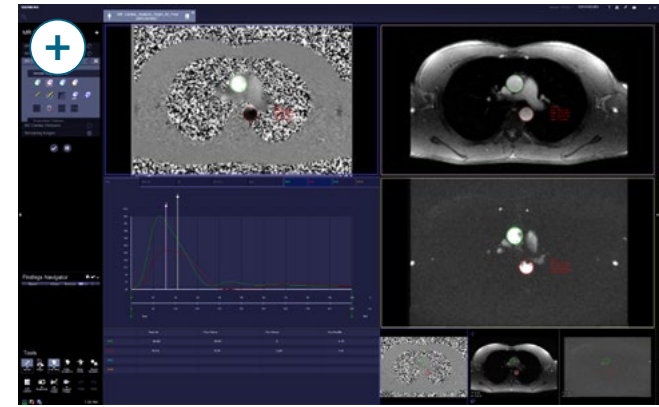
"Mirroring of flow curve"

Take your existing applications to the next level

syngo.MR Tissue 4D

syngo.MR Tissue 4D is intended to support your diagnostic with advanced tools for T1 perfusion evaluation (qualitative and quantitative Tofts-based analysis). One of the key benefits of this application is the high level of standardization of your results thanks to advanced pre-processing functionalities.

With the new *syngo*.via, we intend to make this functionality more flexible:

- **New volume type for pre-processing**
  In addition to the already available ellipsoid, you can now also select a cuboid and configure its size and its position within the imaging volume. This can be particularly useful if you want to apply the application in some specific areas (e.g. spine) or if you want to calculate the parametric maps for the complete image, just by setting the dimension values to 100%.

- **New handling of additional data incoming during reading the case**
  If additional data are coming, you are now advised to restart the processing.

Take your existing applications to the next level

Layout snapshot with result table

syngo.MR Spectro

For reading of spectroscopy cases, the following functionalities are now available:

- **More flexibility in the handling of user-defined post-processing protocols**
  The protocols can be saved either on user level (so that only the specific user can see them) or now on site level by the clinical administrator (so that every user of that site can see them).

- **Additional options for the findings**
  A layout snapshot finding now contains the result table. It makes life easier when the goal is to save the result table with the different localization slices.

Take your existing applications to the next level

syngo.MR Vascular Analysis

syngo.MR Vascular Analysis gives you the tools for quantitative assessment of vascular lesions such as stenosis degree.

With the new *syngo*.via, this application offers the following improvements:

- **Enhanced algorithm for QISS data**
  With the *syngo* MR E11 software version on the MR scanner, Siemens introduced QISS, a software package for non-contrast enhanced peripheral MR angiography based on quiescent interval single-shot imaging. The new *syngo*.via improves the algorithm used in *syngo*.MR Vascular Analysis for QISS datasets.

- **Enhanced usability in centerline editing**

Take your existing applications to the next level

MR/PET reading in MR Oncology

syngo.mMR General

As previously described, the mMR tools for reading and post-processing of MR/PET exams are now integrated in the MR Oncology workflow. The PET tools are automatically activated as soon as PET data are detected.

Note: When migrating from *syngo*.via VA30 to the new *syngo*.via, your existing mMR workflow will be migrated so that you can still use it in addition to the new MR Oncology with PET tools.
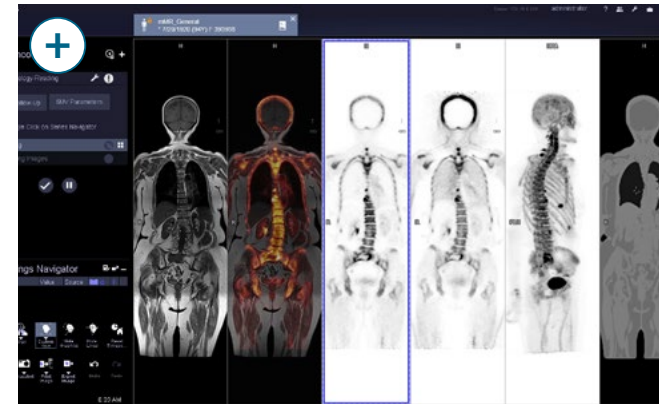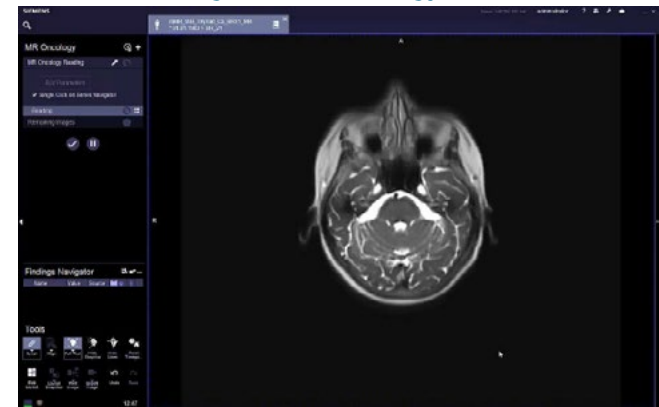
MR/PET reading in MR Oncology

Take your existing applications to the next level

syngo.MR Neuro Tumor becomes _syngo_.MR Neuro Dynamics

Introduced with _syngo_.via VA30, _syngo_.MR Neuro Tumor offers dedicated tools for brain tumor perfusion evaluation.

For regulatory reasons, the name of the workflow is evolving from "_syngo_.MR Neuro Tumor" to "_syngo_.MR Neuro Dynamics".

All functionalities remain the same.

New MR workflow manager

In MR, one of *syngo*.via's main functionalities is the highly structured reading of the cases, enabling faster access to the diagnostic information as well as better standardization of the reading throughout the institution.

In addition, the ad-hoc functionality makes it possible to call up, within a workflow, another workflow in order to interactively adapt to a specific case.

The new workflow manager makes it now possible for the clinical administrator to permanently save one ad-hoc task in order to generate advanced customized workflows. These customized workflows can then be freely imported and exported from a *syngo*.via VB10 server to another.

Summary of all improvements and new features

	Feature / application	Description	Your benefits	How you can receive it
A major change in your daily routine with MR	New user interface	Darker, cleaner, calmer	Reduced eye strain	Included in your *syngo*.via VB10 upgrade
		Labeled icons	More intuitive reading	
		Enhanced online help	Increased knowledge of *syngo*.via	
	Patient browser	Browser-like search area	Faster access to the patient exam	
		Series preview	Easier identification of your case	
		Dockable functionality	More freedom in the display of the patient browser	
	Thumbnails view in all MR workflows	Thumbnails view in series navigator	More intuitive reading with faster identification of the contrasts	
		Existing mode remains available		

Summary of all improvements and new features

	Feature / application	Description	Your benefits	How you can receive it

Advanced functionalities in oncology now available	One MR Oncology with Easy Reading Mode	• Consolidation of the previous 4 oncology (Onco Brain, Onco Liver, Onco Multi Region, Onco TimCT) and the mMR General (for MR/PET) workflows into one single MR Oncology workflow
		• Easy Reading Mode:
		  - Single click interaction
		  - Intelligent layout adaptation
		  - One click fusion
			• One workflow for efficient evaluation of multiple tumor types or lesions
			• Fast and easy way to deal with the high amount of images in MR oncology cases
				Included in the *syngo*.via VB10 upgrade if you had *syngo*.MR Onco on *syngo*.via VA30. Otherwise optional.

	syngo.MR OncoCare	• Histogram analysis • Backmapping • Trending	• Earlier assessment of therapy benefit • Savings of unnecessary treatment costs • Better communication to the referring physician	Optional (pre-requisite *syngo*.MR Onco)
	Computed b-values	• Generation of computed high b-value images from acquired ones • Interactive preview • Generation of ADC maps	Save scan time and improve diffusion image quality	Included in your *syngo*.via VB10 upgrade

Your existing applications taken to the next level	Feature / application	Description	Your benefits	How you can receive it
	Improved mean curve	• Display of curve on / off • Interactive mean curve segment • Export values as .CSV	More intuitive and interactive reading of dynamic series	Included in your *syngo*.via VB10 upgrade if the corresponding license is available on *syngo*.via VA30. Ask your Siemens representative for more details.
	Improved registration functionality	The "Hot Iron" LUT is automatically selected in the floating alignment tool	Easier visual alignment	
	MR Cardiac reading evolves	Cine reading through keyboard shortcuts	Faster reading of cine images	
		New user guidance for myocardium contouring	Efficient and faster contouring for complex cases	
		New drop tool "add slices"	You can perform the post-processing in parallel to scanning	
		"Mirroring of flow curve" functionality	The display of your curve matches the visualization in Ultrasound	
	syngo.MR Tissue 4D	New cuboid volume type for pre-processing	More flexibility for use in specific body regions	
		New handling of additional data incoming during reading the case	Better usability for reading parallel to scanning as you are now advised to restart the processing	
	syngo.MR Spectro	Layout snapshot finding with result table	Save the result table with the reference images	
		User-defined post-processing protocols can be saved on admin level	Better standardization of the spectroscopy post-processing	
	syngo.MR Vascular Analysis	• Improved algorithm for QISS data • Improved usability in centerline editing	Optimal non-contrast angiography workflow from scanning to quantitative reading	
	syngo.mMR General	MR/PET specific tools are integrated in the MR Oncology workflow	One workflow for efficient multi-parametric reading	
	syngo.MR Neuro Tumor	*syngo*.MR Neuro Tumor is renamed to *syngo*.MR Neuro Dynamics	All functionalities remain the same	

	Feature / application	Description	Your benefits	How you can receive it
New MR workflow manager	Advanced customization of your MR workflows	• Ad-hoc tasks can be persistently saved by the clinical admin • Possibility to import / export customized workflows	Better standardization of post-processing throughout your institution	Included in your *syngo*.via VB10 upgrade