SIEMENS

CT Clinical Engines 2014 Edition

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Get further. With the CT Neuro Engine.

Driving progress to reduce door-to-needle time in stroke

Answers for life.

What is a CT Clinical Engine?

- A powerful combination of software applications and scanner features – tailored to meet your clinical challenges
- A solution that helps you get the most from your CT scanner

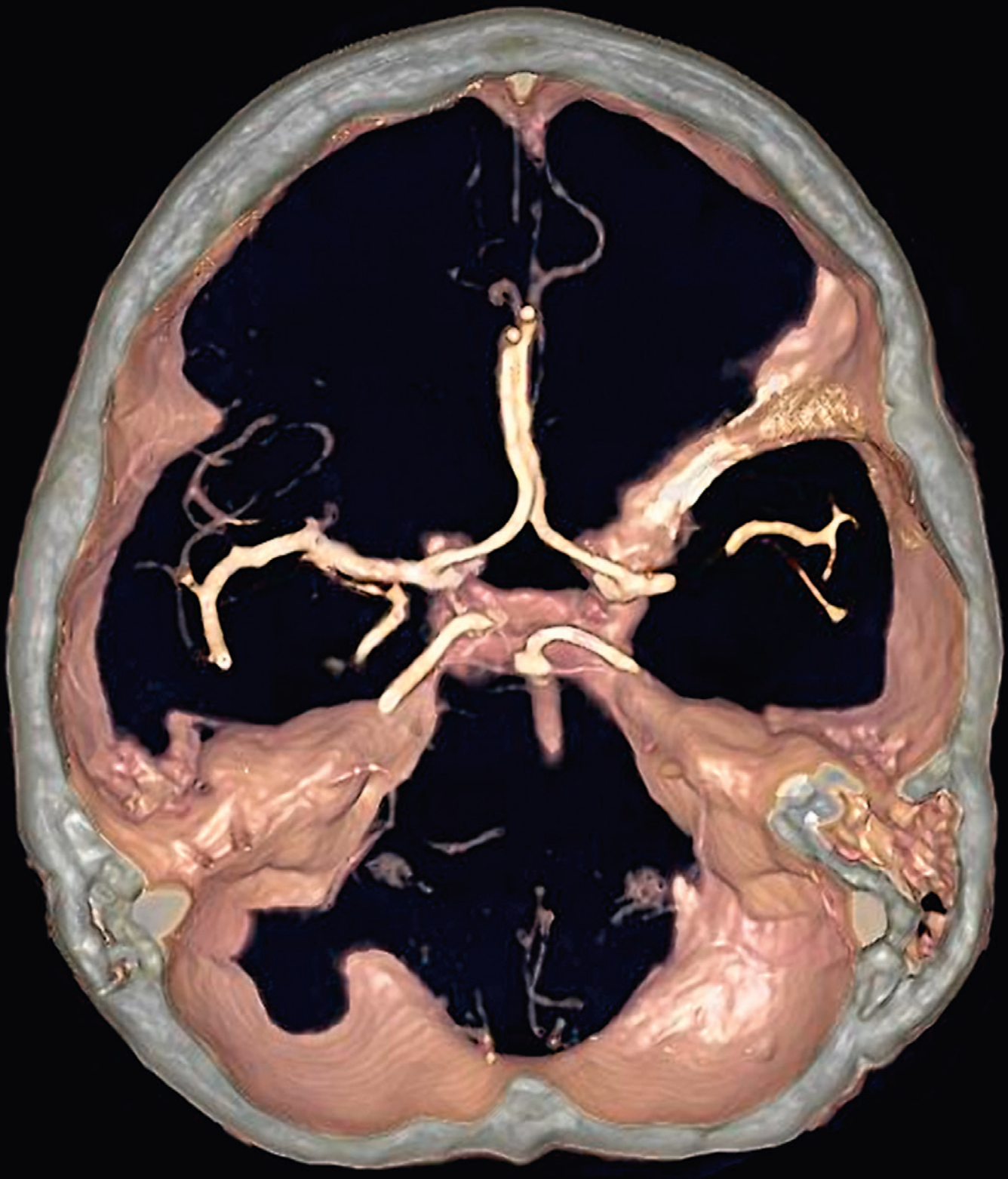
With a CT Clinical Engine, you can continuously enhance speed, workflow efficiency, and diagnostic information.

How far can you get with your CT?

Year after year, the CT Clinical Engines advance your diagnostic possibilities, supporting you in better understanding diseases and in making the right treatment decisions faster. Now experience the next step with the 2014 Edition.

The 2014 Edition focuses on stroke. The CT Neuro Engine offers a complete diagnostic stroke solution on *syngo*.via. Read on to find out why clinicians with the world's leading door-to-needle times utilize the CT Neuro Engine.

Driving progress to reduce door-to-needle time in stroke.



Visualize collateral status and measure occlusion length.[1]

[1] Froelich AM *et al.* AJNR Am J Neuroradiol. Published online before print April 25, 2013.

Reduce door-to-needle times in stroke

The world's leading door-to-needle times of 20–25 minutes are claimed by Markku Kaste, MD, PhD at the University of Helsinki, Finland and Stephan Kloska, MD at the University Hospital Erlangen, Germany.[1–2]

Why do they use the winning combination of CT Neuro Engine and SOMATOM Definition AS+?

Because it answers the key diagnostic questions fast. Exclude bleeding, evaluate the size and location of the occlusion, and assess core infarct and penumbra – with high precision and speed.

Is the stroke caused by bleeding?
Neuro BestContrast

Knowing if the stroke is caused by hemorrhage or ischemia is key to determining the potential benefit or harm of thrombolytic drugs. This is quickly and easily detected using a non-contrast CT. Subtle nuances indicative of early signs of ischemia are visualized with Neuro BestContrast. This increases diagnostic confidence by enhancing the contrast-to-noise ratio.

What is the size and location of the clot?
***syngo*.CT Dynamic Angio**

Detecting the occlusion is essential to planning interventional clot retrieval. This is because a larger clot burden is associated with a more challenging intervention and poorer patient outcome.[3] The size of the clot may be overestimated on axial CTA source images. *syngo*.CT Dynamic Angio can help you better characterize the clot using temporal maximum-intensity projection (tMIP) images.

> You will only achieve satisfactory door-to-needle times when imaging is available directly in the emergency unit.

Prof. Markku Kaste, MD, PhD,
Head Clinical Research Group,
Helsinki University Central Hospital,
University of Helsinki, Finland

Dr. Froelich *et al.* recently demonstrated that this application allows for the more precise measurement of the occlusion length vs. single-phase CTA.[4] Videos showing the flow of contrast from the arteries to the veins enable a dynamic evaluation so you can see antegrade and delayed collateral blood flow.[5–7]

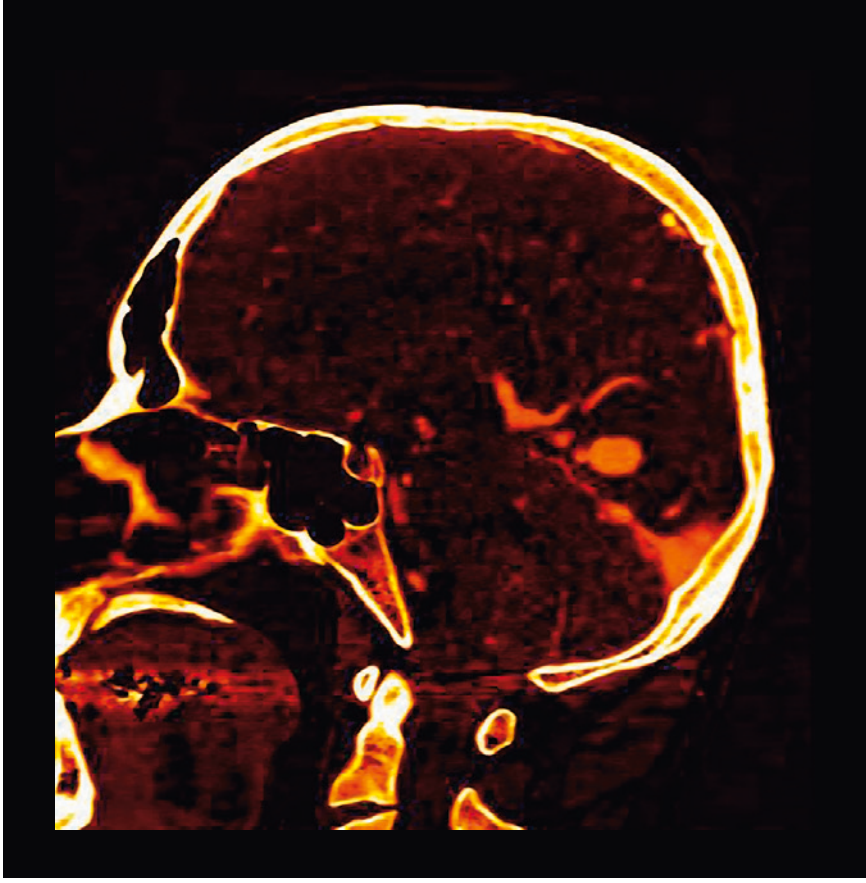
How big is the infarct?
syngo.CT Neuro Perfusion

In order to reliably determine the size of the infarct, you need to assess the entire area affected by the stroke. Siemens' SOMATOM Definition AS+ 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. Tissue at risk can easily be visualized in 3D color maps, based on the mismatch between blood volume (CBV) and flow (CBF).

Or feel free to define a custom mismatch based on parameters you select. For example, Siemens' Time To Drain (TTD) shows potential for detecting early ischemia. Refined algorithms offer automated grey matter segmentation so you can immediately focus on this task.

[1] Meretoja A *et al.* Neurology. 2012, 79:306-13.
[2] Köhrmann M *et al.* Int J Stroke. 2011, 6:493-7.
[3] Riedel CH *et al.* Stroke. 2011, 42:1775-7.
[4] Froelich AM *et al.* AJNR Am J Neuroradiol. Published online before print April 25, 2013.
[5] Smit EJ *et al.* Radiology. 2012, 263:216-25.
[6] Froelich AM *et al.* Stroke. 2012, 43:97-102.
[7] Froelich AM *et al.* Stroke. 2012 Nov, 43(11):2974-9.

Reliable bone removal with *syngo*.CT DE Direct Angio



Differentiate post-interventional bleeding from transient iodine uptake with *syngo*.CT DE Brain Hemorrhage

Dual Energy CT in neuroradiology

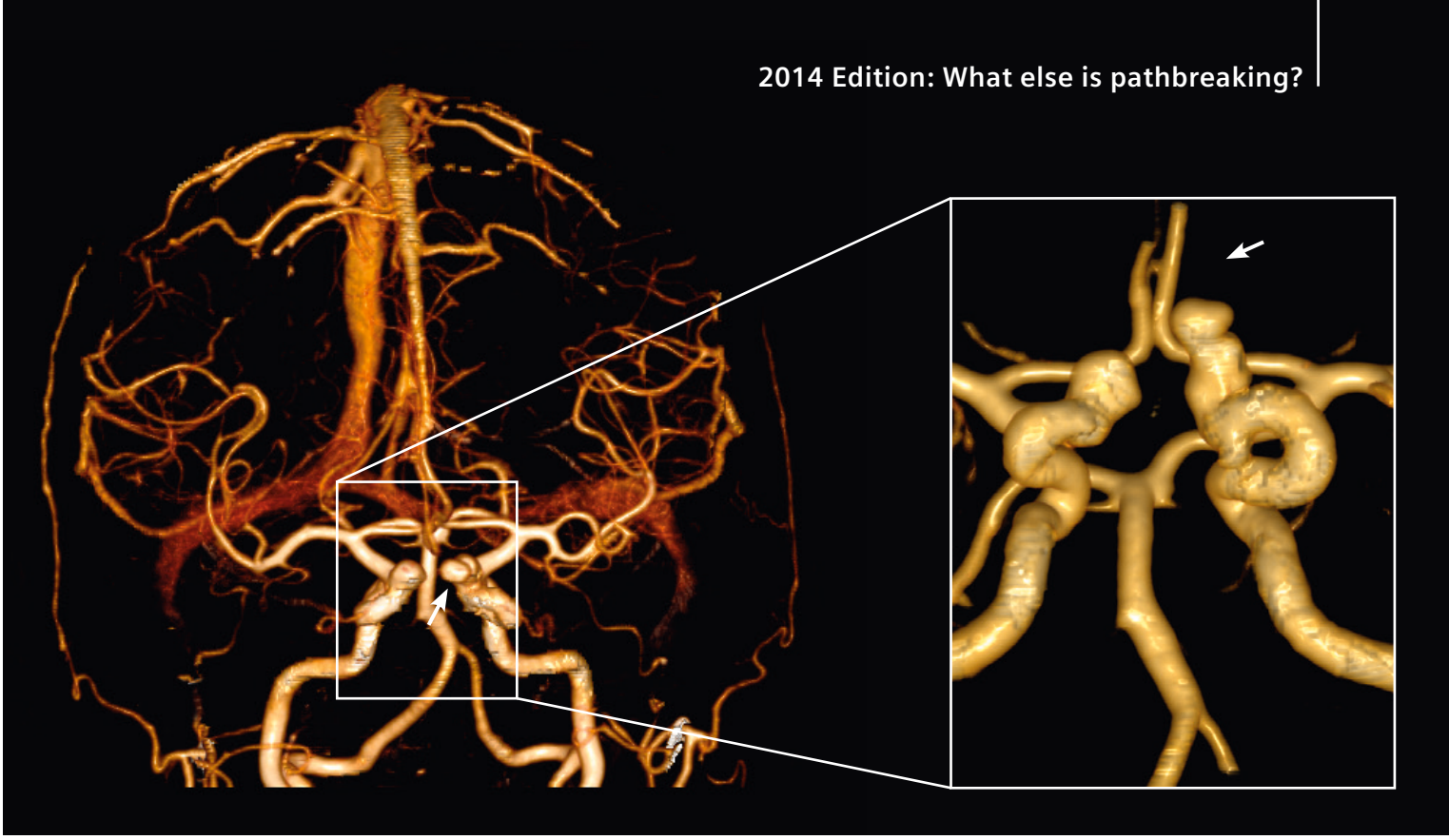
Bone removal – fewer motion artifacts – lower dose
syngo.CT DE Direct Angio

syngo.CT DE Direct Angio performs reliable bone removal because it suffers less from the motion artifacts sometimes seen with DSA-based algorithms. It also does this at lower dose, because a non-contrast CT is not required.

Post-interventional bleeding – easily discriminated from transient iodine uptake
syngo.CT DE Brain Hemorrhage

Neurointerventional procedures like clot retrieval in stroke are increasingly being employed. Occasionally, serious complications such as post-interventional bleeding can occur. On single-energy CT, this can appear similar to transient iodine uptake: in other words, with no clinical symptoms. This is where Dual Energy CT can be very helpful, because it helps discriminate between the two.*

syngo.CT DE Brain Hemorrhage is now also available on our single- source CT scanners SOMATOM Definition AS+ and SOMATOM Definition Edge.



Easy bone removal and one-click aneurysm evaluation with *syngo*.CT Neuro DSA

No bones – fast evaluation
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.

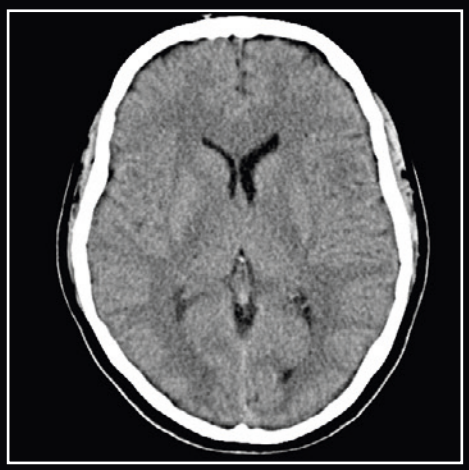
Thanks to fully automated bone removal, you'll find your images ready for reading when you open a case. You can also toggle between bone and vessel views. The new CT Neurovascular workflow also permits a comprehensive vessel analysis of head and neck – including curved planar reformations (CPR) for stenosis measurement and automated vessel tracking.

Your benefits at a glance

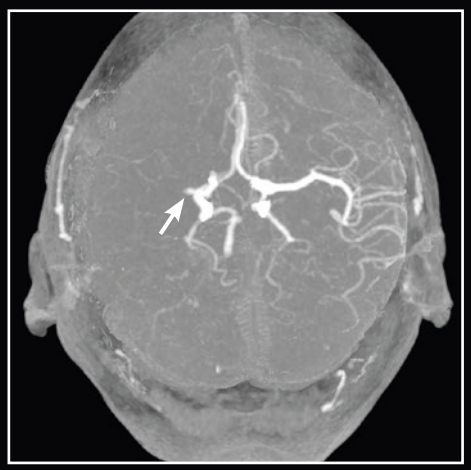
- Fast – evaluate neurovascular disease without wasting time on bone removal
- Precise – use dynamic blood flow to better define the clot size and collateral flow in stroke
- Easy – see infarct core and penumbra using our tissue-at-risk model

* Phan CM *et al.* AJNR Am J Neuroradiol. 2012 Jun, 33(6):1088-94.

Get further – with our CT Neuro Engine and optional



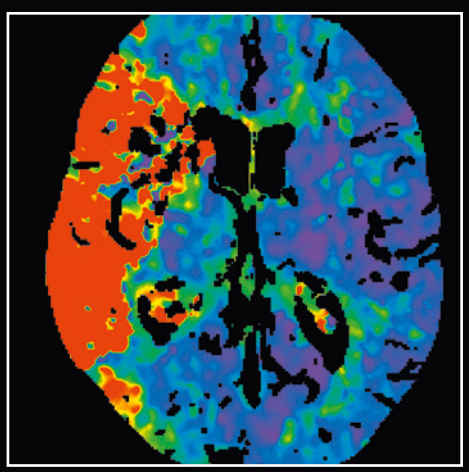
Non-contrast CT scan with Neuro BestContrast to improve contrast-to-noise ratio



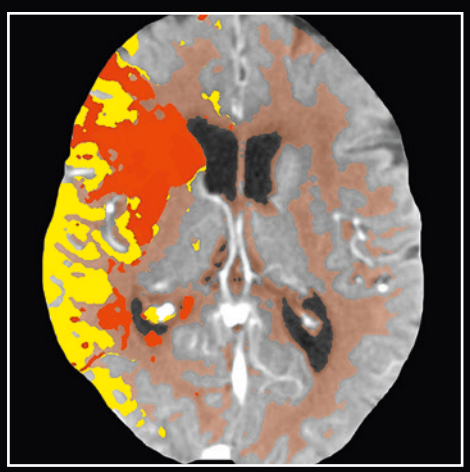
Single time-point CTA image (MIP): MCA occlusion with few apparent collaterals and poorly-defined clot size (arrow)

Multiple time-point tMIP showing better-defined clot size (arrows)
syngo.CT Dynamic Angio

MIP image at later time-point showing delayed collateral blood flow (oval) missed at earlier time point
syngo.CT Dynamic Angio

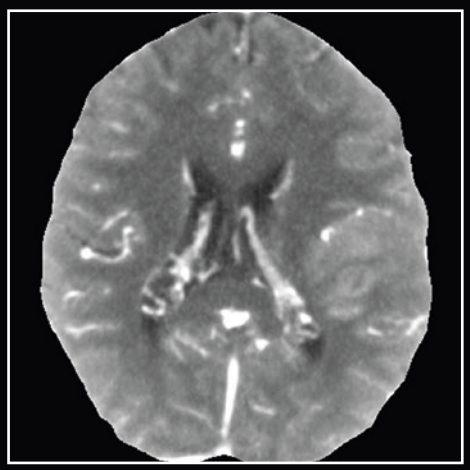


Siemens unique Time To Drain (TTD) as potential metric for early ischemia
syngo.CT Neuro Perfusion

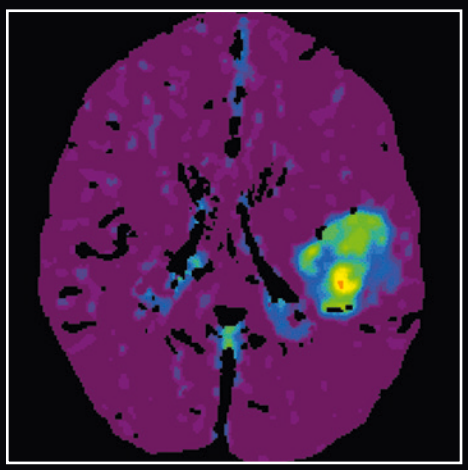


Easily see core infarct and penumbra with the tissue-at-risk model
syngo.CT Neuro Perfusion

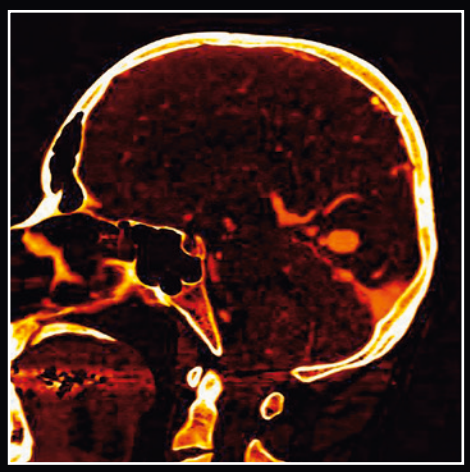
applications



MIP image of a brain tumor
syngo.CT Neuro Perfusion



Corresponding permeability map (flow extraction product)
syngo.CT Neuro Perfusion



Differentiate post-interventional hemorrhage from transient iodine uptake with Dual Energy
syngo.CT DE Brain Hemorrhage*

Fast and accurate bone removal with Dual Energy
syngo.CT DE Direct Angio*

*** Optional**

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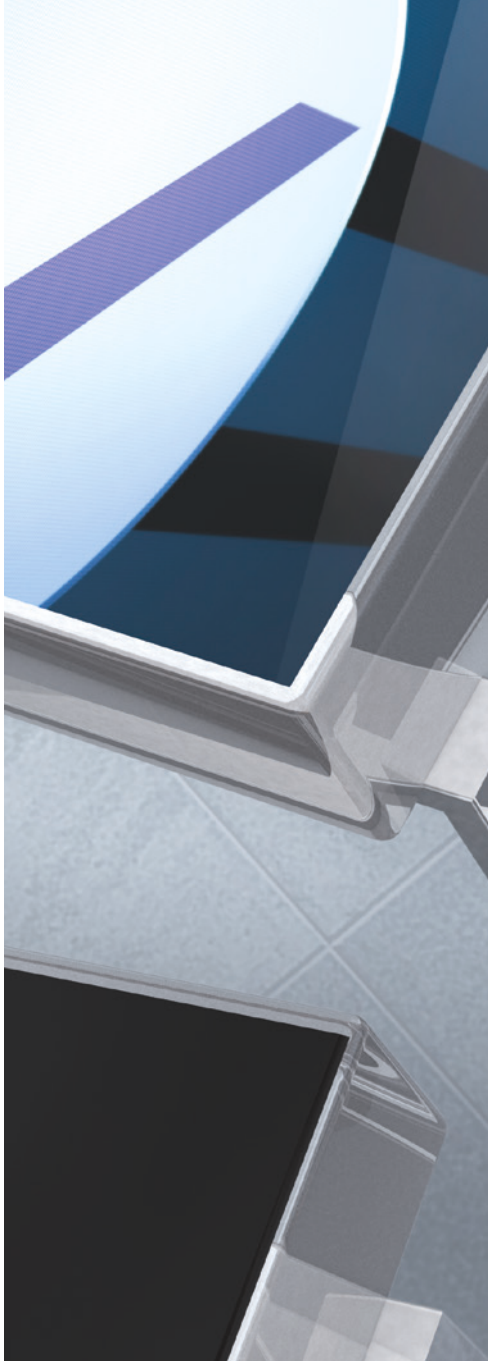

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