SWAN
Brain Imaging

See brain vasculature in exquisite detail in one quick, easy scan.

With the GE-exclusive SWAN (T2 Star Weighted ANgiography) technique, you can visualize and clearly delineate small vessels and microbleeds, as well as large vascular structures, and iron or calcium deposits in the brain.

The SWAN technique combines a unique 3D T2*-based multi-echo acquisition with a special reconstruction algorithm. Several echoes are read out at different TE times and then combined as a weighted average, compiling magnetic signature of a whole range of tissues with varying degrees of T2* contrast. SWAN's multi-TE approach is inherently less affected by the chemical shift, virtually eliminating image blurring typical in single-TE T2* acquisitions.

The end result is a clear, sub-millimeter-resolution 3D with significantly enhanced susceptibility information and greatly increased signal-to-noise ratio (SNR) on both 1.5T and 3.0T field strength systems.

### More tissue contrast and tissue bandwidth[1]

SWAN captures a broad spectrum of contrast characteristics specific to a wide range of tissue components.

More signal

SWAN generates as much as 2-4 times more SNR than a single-echo T2* acquisition – a GE MR exclusive.

Less scan time

Simple to use, robust and time-efficient, the SWAN sequence can be further accelerated by GE ASSET parallel imaging. High-resolution 3D acquisition of the whole brain typically takes as little as 3-4 minutes, considerably less time than most other T2*-based techniques.
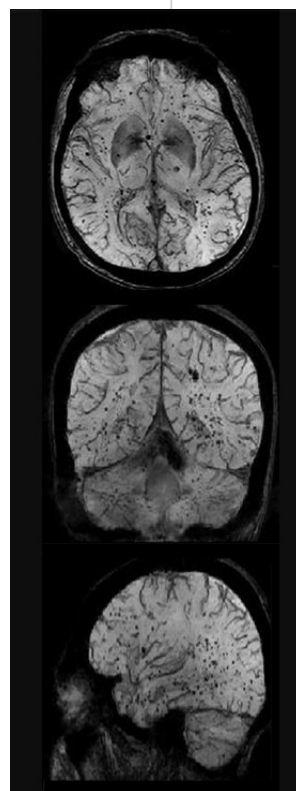

Courtesy of Beneficencia Portuguesa, Brazil

3D SWAN acquired axially on Signa* HDxt 3.0T system with coronal and sagittal reformats.

With SWAN, you can:
- Visualize major vessels and large vascular structures
- Reproducibly image and accurately delineate small vessels and microbleeds
- Assess iron and calcium deposits in tissue
- Consistently generate exquisite images with this push-button, robust acquisition and automatic reconstruction algorithm
- Image the whole brain in 3D high resolution in as little as 3-4 minutes
- Make more accurate, more confident differential diagnoses in patients with hemorrhages, cerebrovascular and ischemic brain diseases, traumatic brain injuries, arteriovenous malformations, neurodegenerative diseases and a variety of other lesions

[1] Compared to conventional single-TE readout techniques.
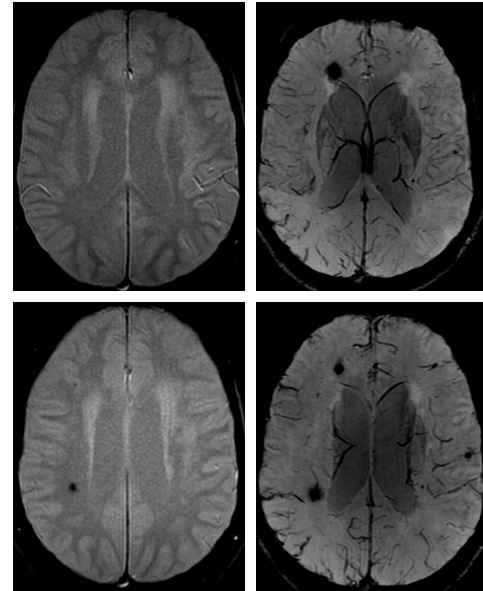
SWAN Brain Imaging

3.0T

GRE / **SWAN**
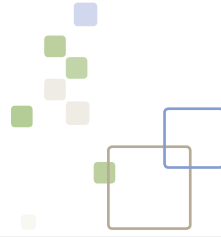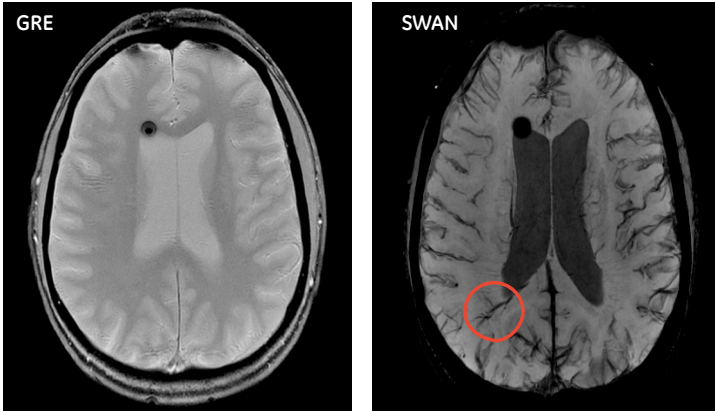
Courtesy of LMU Muenchen, Germany

This developmental venous anomaly is clearly seen on the SWAN image on the right, but undetectable on the GRE image on the left. (Note: Black spot is an air bubble remaining from surgery.) Acquired on Discovery* MR750 3.0T.
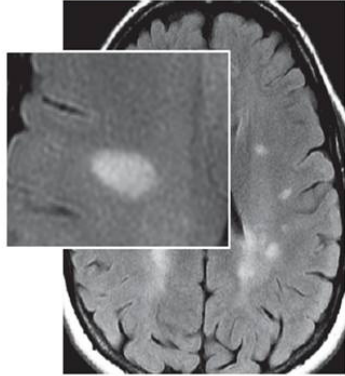

T2 FLAIR / SWAN

Courtesy of LMU Muenchen, Germany

Venous vessel is crossing MS plague as seen on SWAN (right), but not on T2 FLAIR (left). This parapial lesion has been also demonstrated on 7.0T. Acquired on Discovery MR750 3.0T.
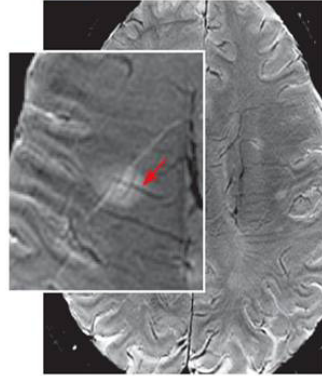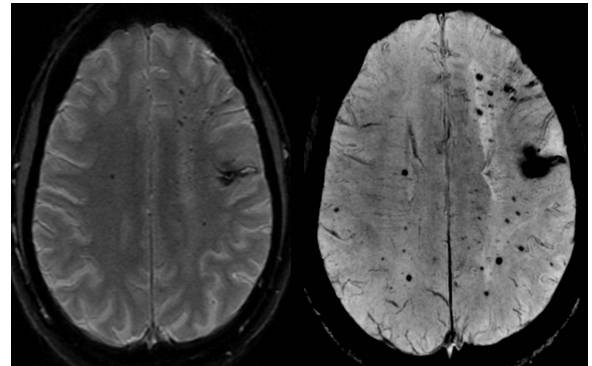
1.5T

Courtesy of Prof. Oppenheim, Hospital Sainte-Anne in Paris, France

Cavernoma is clearly delineated on SWAN images (right) but only partially visible on the T2* images on the left. Acquired on Signa* HDxt 1.5T.

Courtesy of Prof. Oppenheim, Hospital Sainte-Anne in Paris, France

This patient's microbleeds are well depicted on the 1.5T SWAN image on the right, but are only partially revealed on the T2* image on the left. Acquired on Signa HDxt 1.5T.

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imagination at work