

# SyMRI® NEURO

The next level of quantitative MRI



*With SyMRI the radiologist can re-adjust the TR, TE and TI to generate contrasts specific to the patient rather than use the fixed values acquired during scanning. This is truly a game changer!"*

**Dr. Suraj Serai, Assistant Professor of Radiology, Cincinnati Children's Hospital Medical Center,**

Fig 1: Get up to 8 contrast weighted images and tissue volumes in a single 6 minute scan.

# 6

minutes

in the scanner



## Contrasts:

T1W	PDW
T2W	STIR
T1W FLAIR	DIR
T2W FLAIR	PSIR

## Segmentations:

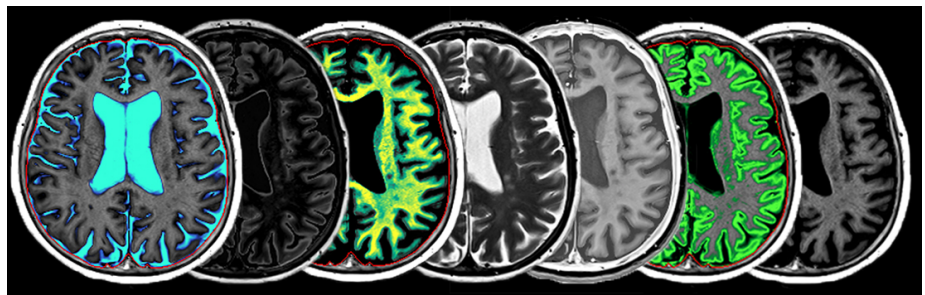
Myelin  
White matter  
Gray matter  
Cerebrospinal fluid

Fig 2: Myelin development in children. A T1W image was synthesized (top row). Based on the same data a myelin volume map was created (bottom row). The red line indicates the intracranial volume. It is clear that the total myelin increases both in density and volume during these years (Cincinnati Children's Hospital Medical Center).

The SyMRI NEURO package is the next level of quantitative MRI. With a single 6-minute scan, you have access to up to eight different contrast-weighted images, tissue volumes and quantitative data.

## Speed up your workflow

SyMRI NEURO is designed to optimize the MRI workflow and shorten scan times. The single quantification scan takes approximately 6 minutes and brings synthesized contrast images such as T1W, T2W, FLAIR. The product also includes Double Inversion Recovery (DIR), Phase Sensitive Inversion Recovery (PSIR) at no additional scan time.

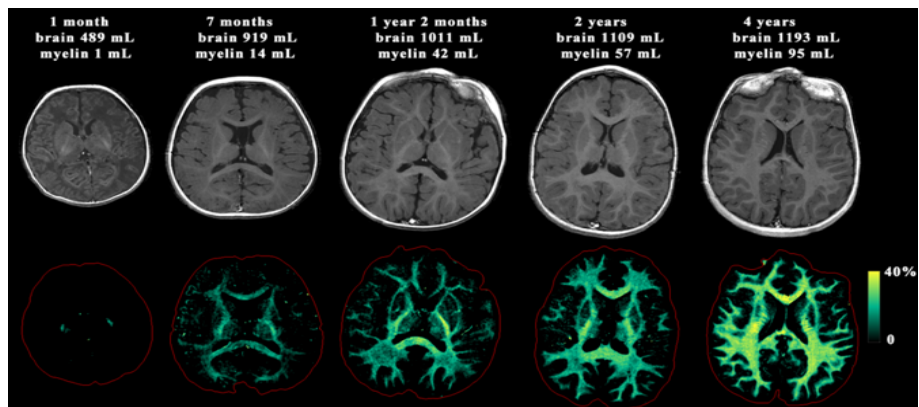


## Myelin correlated volumes

SyMRI NEURO is industry first to provide myelin correlated segmentation and volumes available for clinical use. The correlation to actual myelin volumes has been validated by histopathological examination.<sup>3</sup>

Myelination is the last stage of white matter development, and the development process is believed to be associated with normal function and behavior in children. Myelin is therefore a clinically important tool within pediatrics.<sup>4</sup>

Myelin volumes could be a straightforward biomarker for multiple sclerosis since this neurodegenerative disease involves myelin loss, however finding reliable measurements has been challenging. A recent study has also shown that the myelin correlated volumes in SyMRI may be a potential new biomarker for early detection of cognitive dysfunction.<sup>5</sup>



“With SyMRI, we get new opportunities to monitor and measure disease progression using quantifiable data. This allows better follow-up of our MS patients.”

Sven Ekholm, Professor and Senior Advisor to the Gothenburg University / BOIC, Sweden.

## Quantitative data

SyMRI NEURO includes tools to measure tissue volumes in a region of interest (ROI) defined by the user. Now you may easily calculate, for example, MS lesion load, tumor volume or ventricle volumes for improved diagnostic efficiency and precision.

The Brain Parenchymal Fraction (BPF) is a ratio based on the intracranial volume, ICV, brain tissue, and CSF. Studies show it provides a valuable measurement for brain atrophy in patients with neurodegenerative disorders such as MS and dementia. BPF is measured automatically in SyMRI NEURO.

## User Case

Karolinska University Hospital in Stockholm, Sweden, utilizes SyMRI to obtain simultaneous T1- and T2-relaxometry, multiple weighted images, volumetric maps and myelin quantification in a single MR scan, which can lead to more efficient monitoring of patients with neurodegenerative and neuroinflammatory disorders.

Dr Tobias Granberg, MD, PhD, at the Neuroradiology Department at Karolinska University Hospital, saw the potential with SyMRI at an early stage.

“With the SyMRI technology we are now able to see and measure myelin with a technique that has been approved for clinical use. The improved tissue-specificity opens avenues for more targeted evaluations of treatment effects, especially for promising new drugs that may enhance remyelination in MS.”

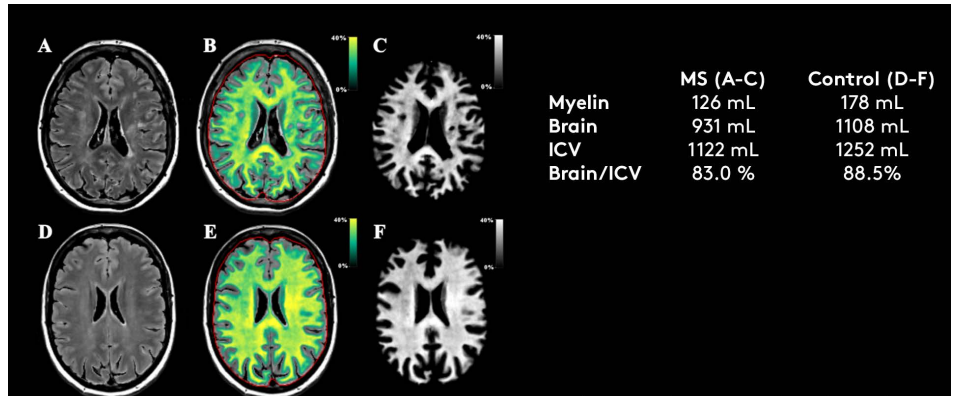


Fig 3: Lower myelin volumes in a patient with MS compare to a healthy control

## Objective decision support

The quantitative MRI in SyMRI NEURO delivers unparalleled robustness and precision to every scan.

Conventional gray-scale contrast-weighted images depend heavily on the applied scanner and the subjective view of the radiologist.

Unlike the arbitrary scale of conventional imaging, SyMRI NEURO is based on the quantitative multi-parametric maps. These maps provide the absolute values of physical properties of the patient, comparable to the Hounsfield units in CT imaging.

SyMRI NEURO enables accurate, reliable and repeatable results. The values have shown high intrascanner and inter-scanner stability, even when comparing different vendors.<sup>2</sup>

<sup>2</sup> Hagiwara A, Hori M, et al. Linearity, Bias, Intrascanner Repeatability, and Interscanner Reproducibility of Quantitative Multidynamic Multiecho Sequence for Rapid Simultaneous Relaxometry at 3 T. 2019 Jan;54(1):39-47.

<sup>3</sup> Wamtnjes JB, Persson A, Berge J, Zech W, Myelin Detection Using Rapid Quantitative MR Imaging Correlated to Macroscopically Registered Luxol Fast Blue–Stained Brain Specimens. AJNR Am J Neuroradiol. 2017;38(6)

<sup>4</sup> McAllister A, Leach J, West H, Jones B, Zhang B, Serai S. Quantitative Synthetic MRI in Children: Normative Intra cranial Tissue Segmentation Values during Development. AJNR Am J Neuroradiol. 2017 Dec;38(12):2364-2372

Contact us for more information

info.us@syntheticmr.com

+ 1 800 560 8371

syntheticmr.com