

Techniques et séquences avancées IRM pour les applications neurologiques

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SFNR
31 Mars 2016

Signal sur bruit

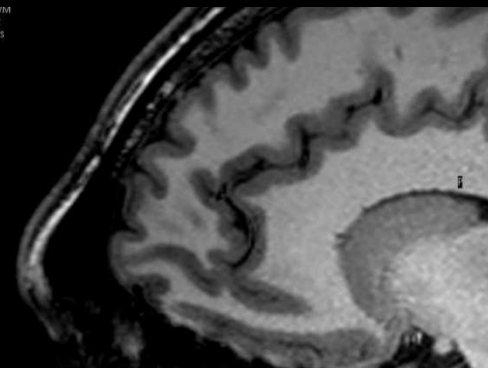
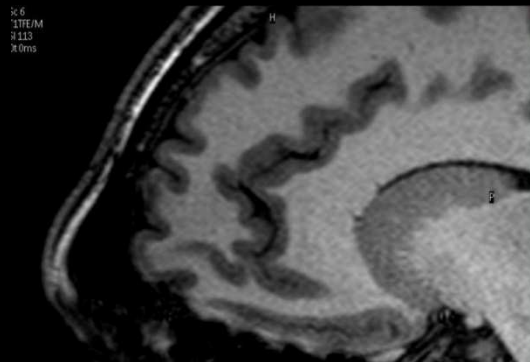
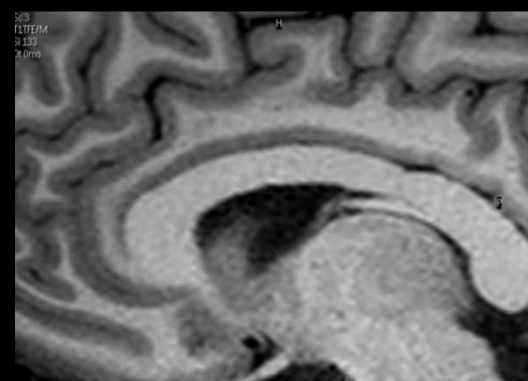
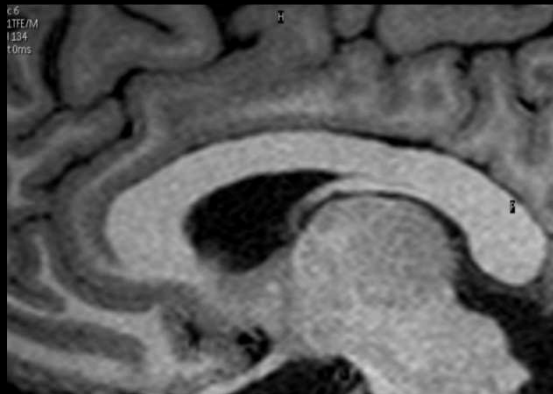
Jusqu'à 40% d'augmentation avec le dStream



Achieva 3.0T



Ingenia 3.0T with
dStream



Propriété de Philips

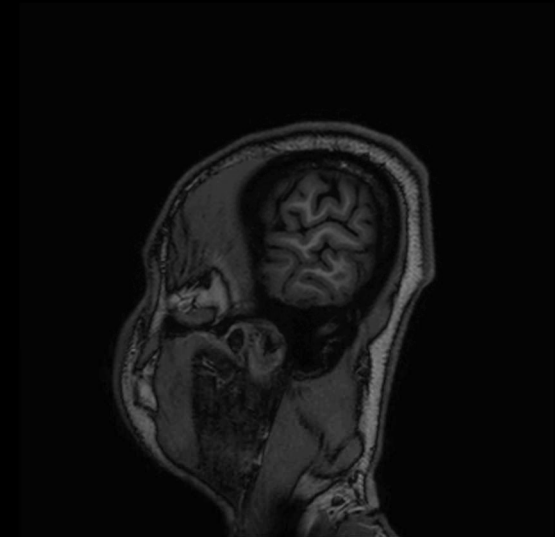
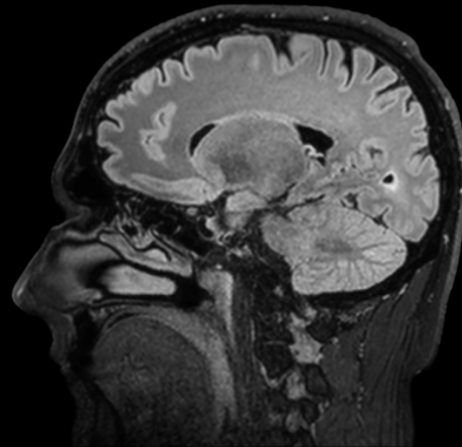
PHILIPS

dS SENSE

Haut facteur d'accélération

3D Brain

Ingenia 3.0T, dS Head 32
3D FLAIR and T1-TFE
1.0 x 1.0 x 1.0 mm
<4 min



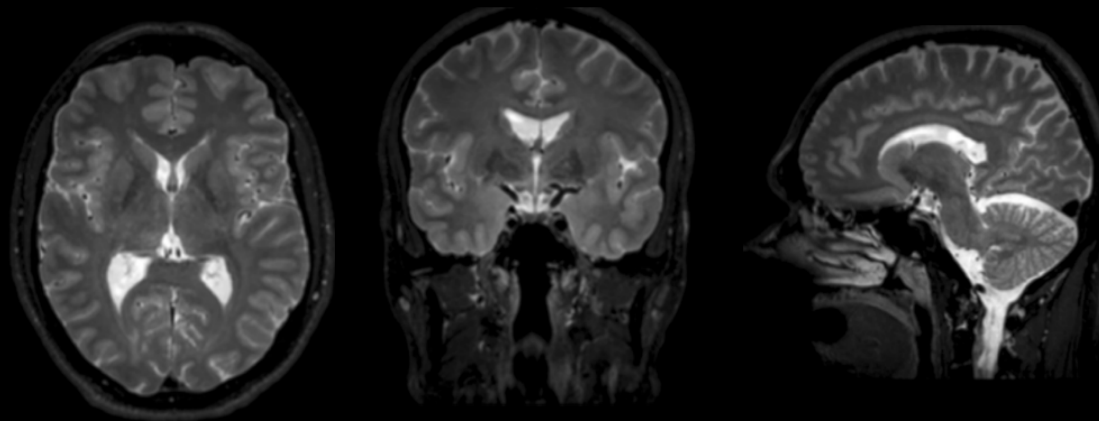
dS SENSE = 9

dS SENSE

Nouvelle génération de l'imagerie parallèle

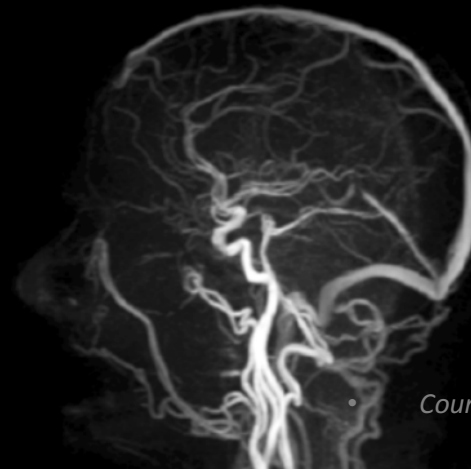
Brain View

- dS SENSE x9
- Ingenia 3.0T
- dS Head 32
- Isotropique 1.0mm
- 5:27min



Contraste de phase

- dS SENSE x9
- Ingenia 3.0T
- Isotropique 0.9mm
- 4:42min



Courtesy: Barmherzigen Brueder, Trier, Germany

Echo de gradient 3D

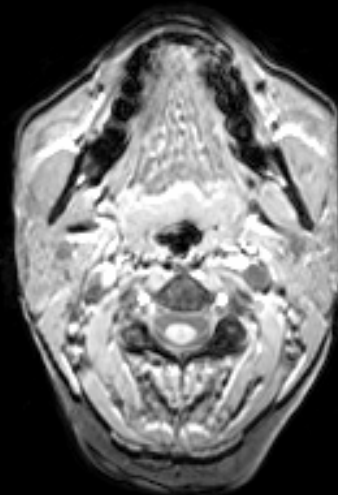
Echo de gradient

3D T1 FFE – steady state

3D T1 FFE

Achieva 3.0T, Sense Head 8

1.0 x 1.0 x 3.0 mm



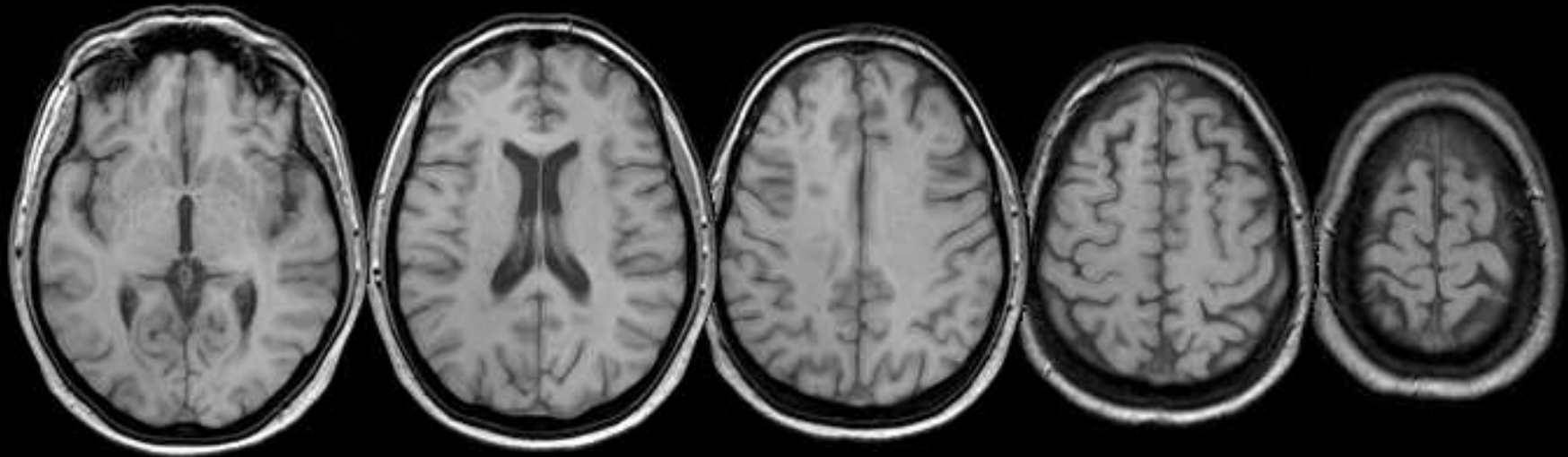
Echo de gradient

3D T1 FFE – steady state

3D T1 FFE

Achieva 3.0T, Sense Head 8

1.0 x 1.0 x 3.0 mm



Echo de gradient

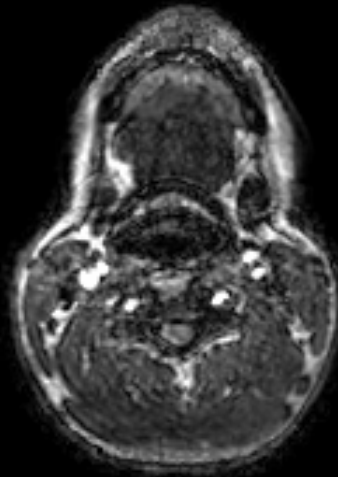
3D T1 TFE

3D T1 TFE

Achieva 3.0T, Sense Head 8

1.0 x 1.0 x 1.0 mm

9 mn 42 s

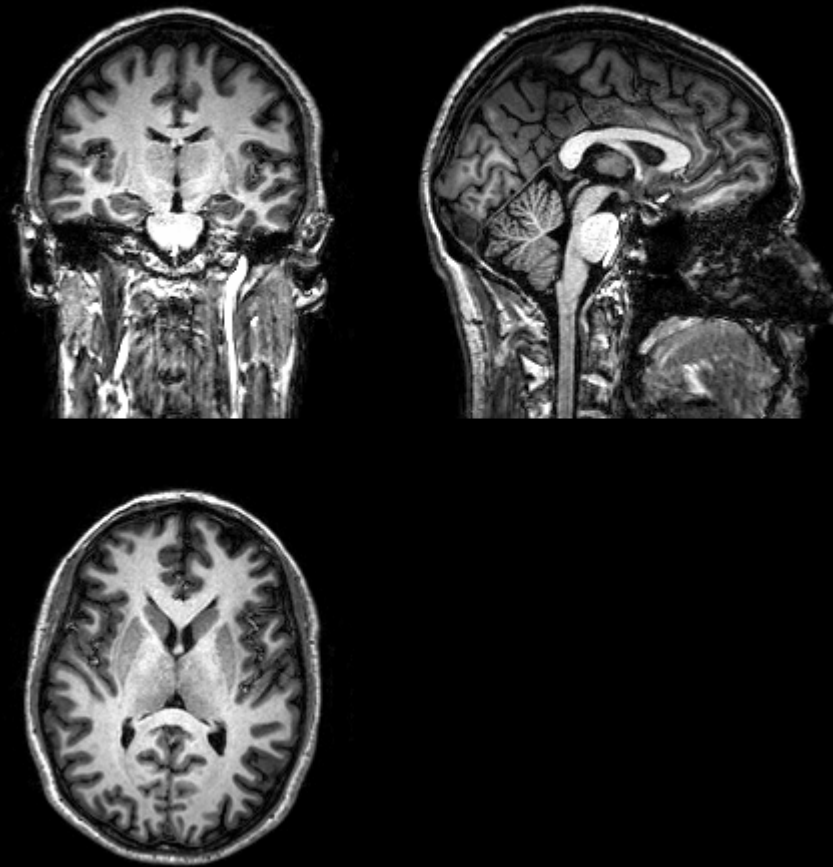


Echo de gradient

3D T1 TFE

3D T1 TFE

Achieva 3.0T, Sense Head 8
1.0 x 1.0 x 1.0 mm



Propriété de Philips

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Echo de gradient

dS SENSE - haut facteur d'accélération

3D Brain

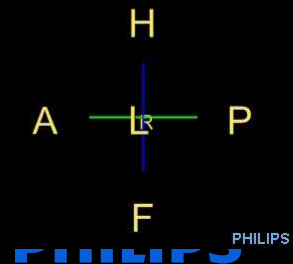
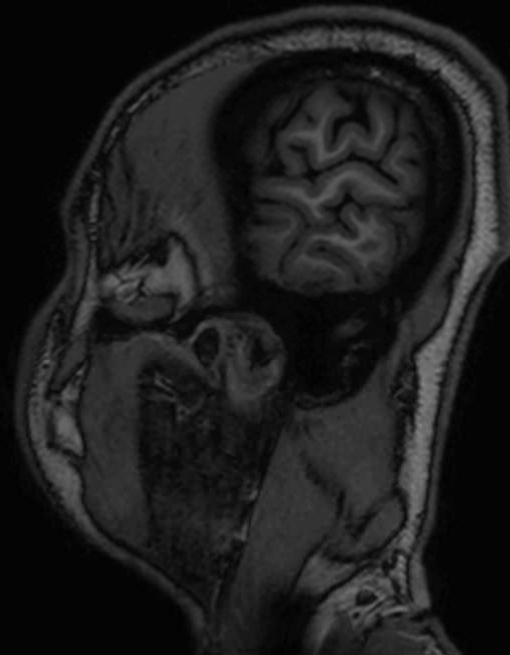
Ingenia 3.0T, dS Head 32

T1-TFE

1.0 x 1.0 x 1.0 mm

<4 min

dS SENSE = 9



Propriété de Philips

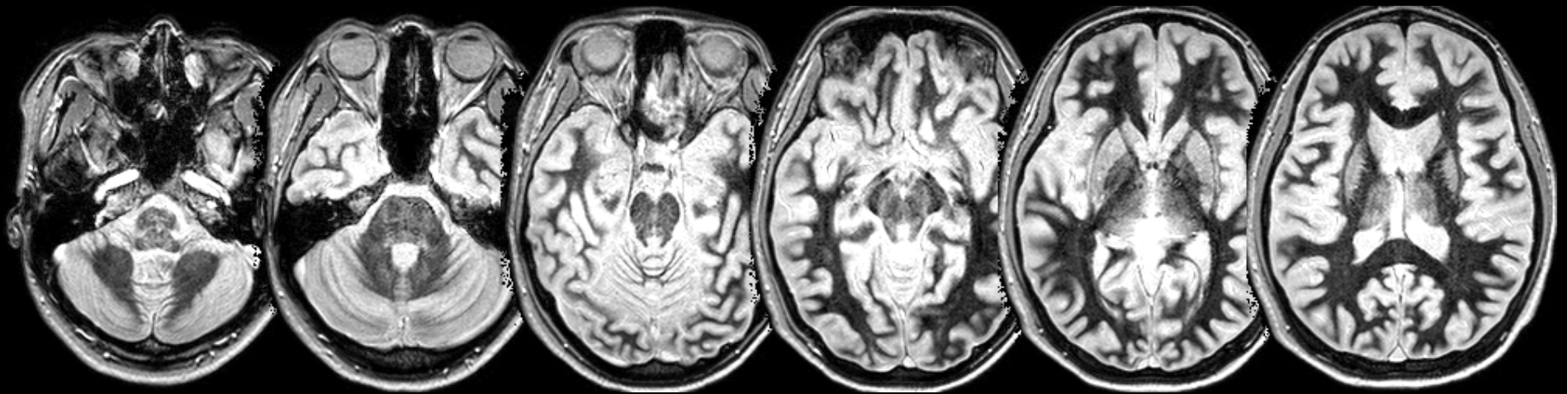
Echo de gradient

fGATIR

3D T1 TFE

Achieva 3.0T, Sense Head 32

0.75x0.75x 1 mm



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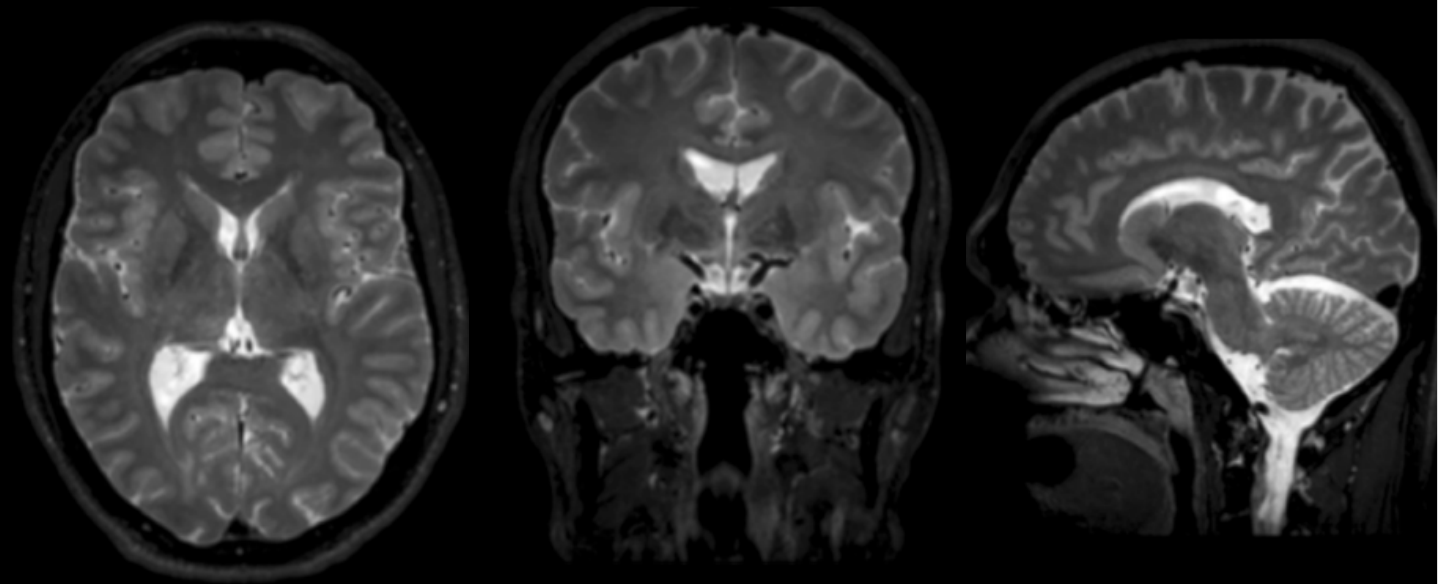
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Brain VIEW echo de spin 3D

3D TSE - long train d'échos

Volumetric Imaging by Echo Weighting

dS SENSE x9
Ingenia 3.0T
dS Head 32
Isotropie 1.0mm
5:27min



Résolution isotropique 1mm dans temps d'acquisition court

Courtesy: Barmherzigen Brueder, Trier, Germany

Propriété de Philips

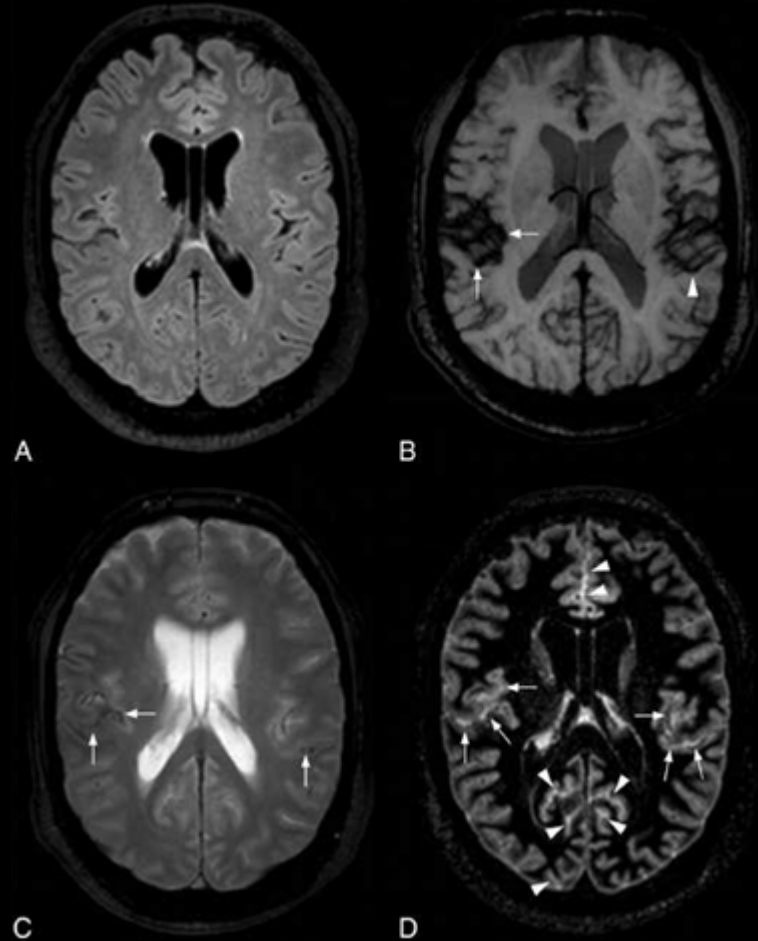
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3D TSE

Brain VIEW DIR

Evaluation hémorragie sous-arachnoïdienne

Parameters	3D DIR
Acquisition plane	Sagittal
TR/TE (ms)	5500/255
TI (ms)	2600/625
Acquired voxel size (mm)	1.2 X 1.2 X 1.2
Echo-train length	173
No. of sections	280



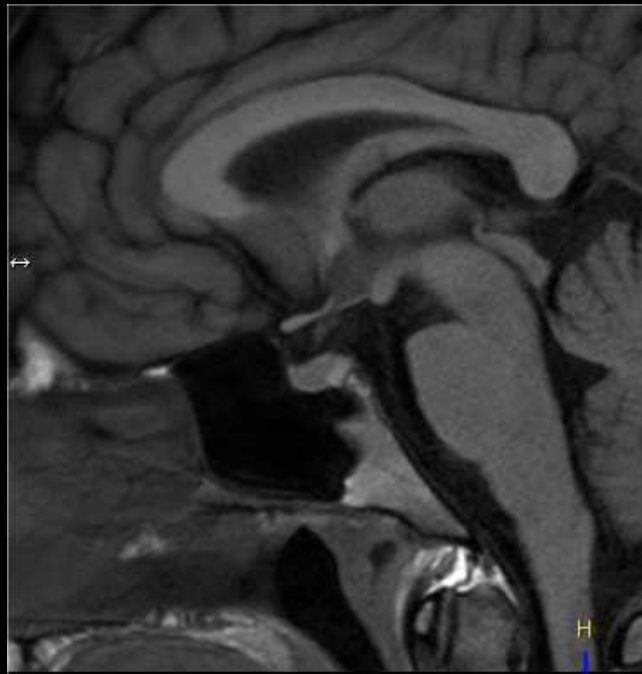
Double Inversion Recovery MR Sequence for the Detection of Subacute Subarachnoid Hemorrhage
Hodel, J. and al.
AJNR, 2014

3D TSE

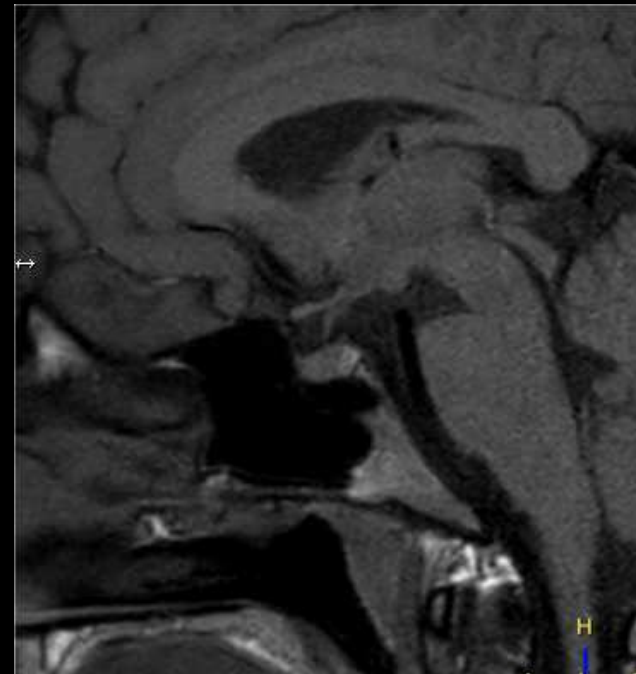
Brain VIEW T1 - Non Isotropique

- Gain SNR compare à une acquisition to multi-coupes

1.5T Ingenia



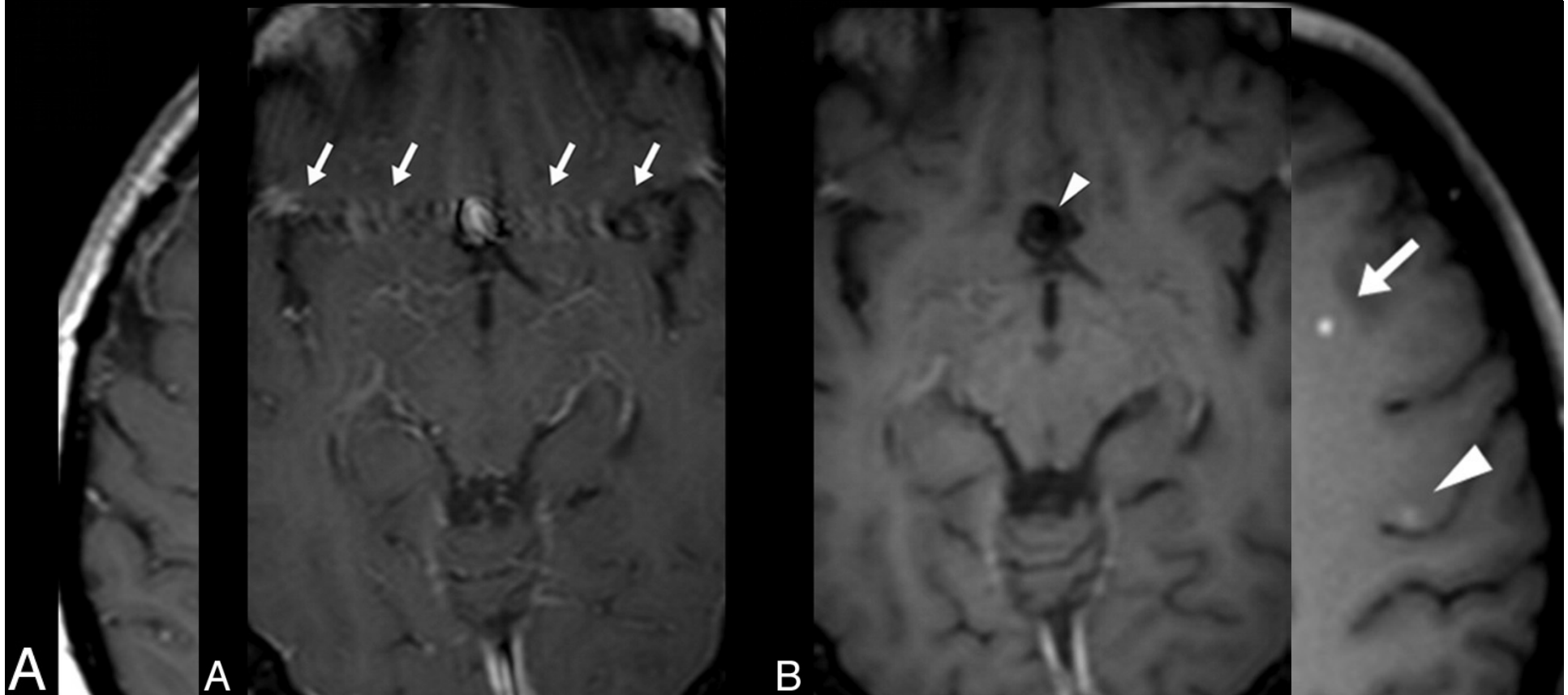
3D BrainVIEW (4:30 min.)
2.5x0.6x0.6 mm



MS TSE (4:28 min.)
2.5x0.6x0.75 mm

3D TSE

Brain VIEW T1



Lésions identifiées chez patients comparées à une séquence spin-écho conventionnelle

Hodel, J. and al. European radiology, 24(12), 3069-3075, 2014

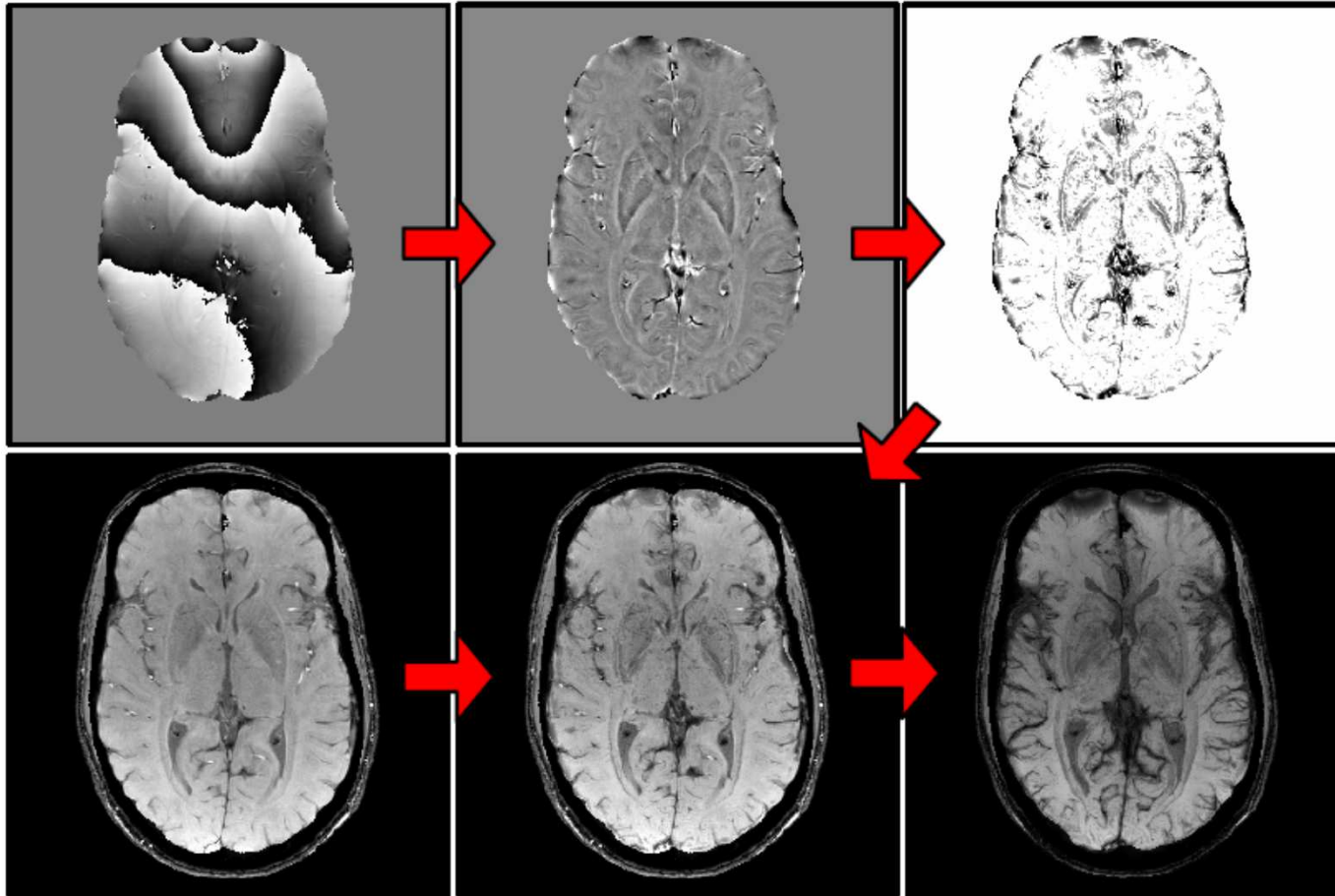
Propriété de Philips

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Séquence de susceptibilité

Echo de gradient 3D multi-échos

Imagerie de susceptibilité magnétique



Propriété de Philips

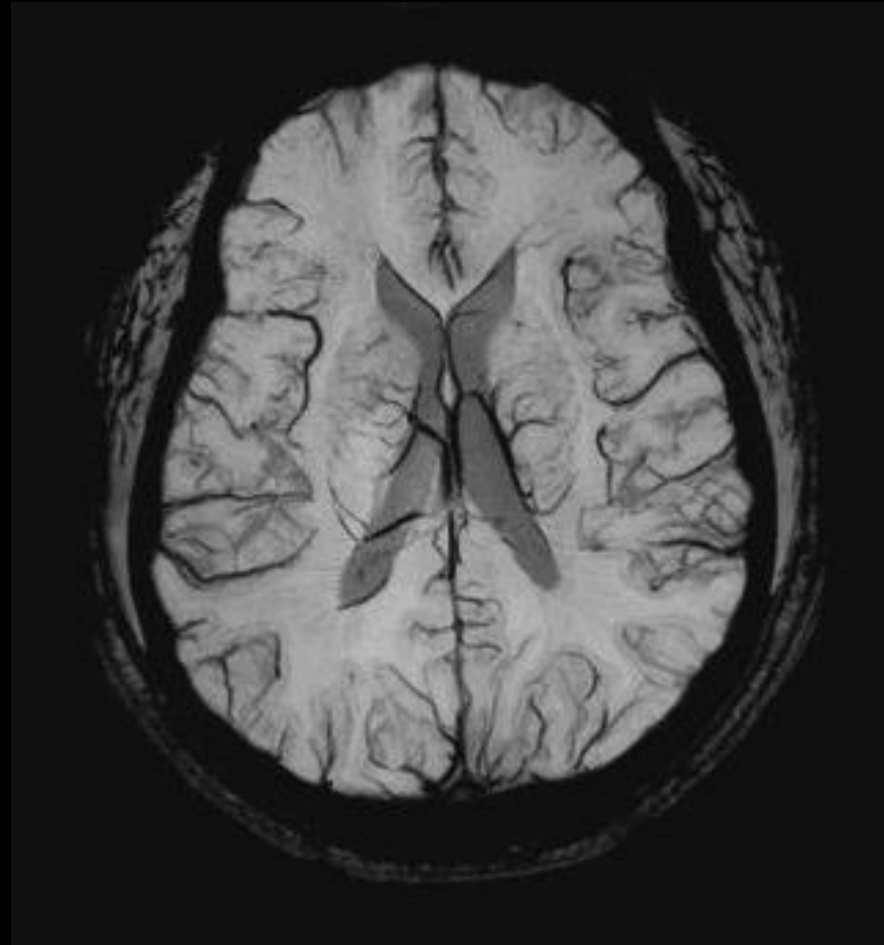
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Echo de gradient 3D multi-échos

SWIp

Ingenia 3.0T

dS-Head 32
0.6 x 0.6 x 1.0 mm
2:30min
(dS-SENSE 4.5)



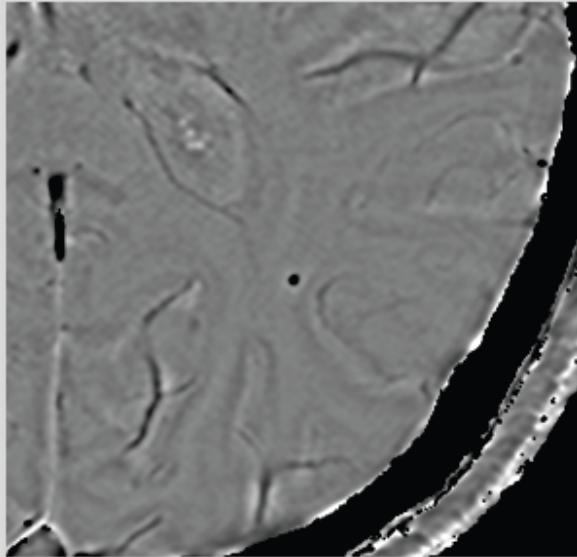
Propriété de Philips

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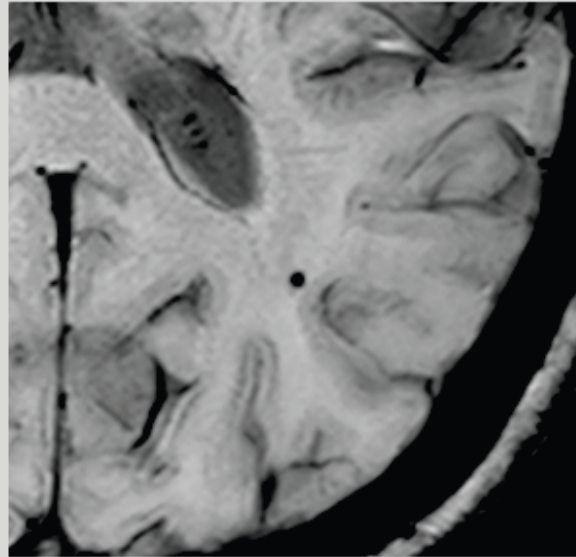
SWIp

Types d'images

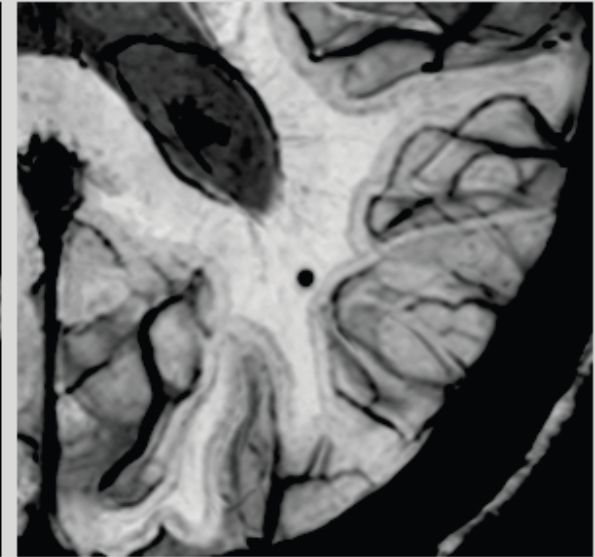
SW-P



SW-M



MinIP

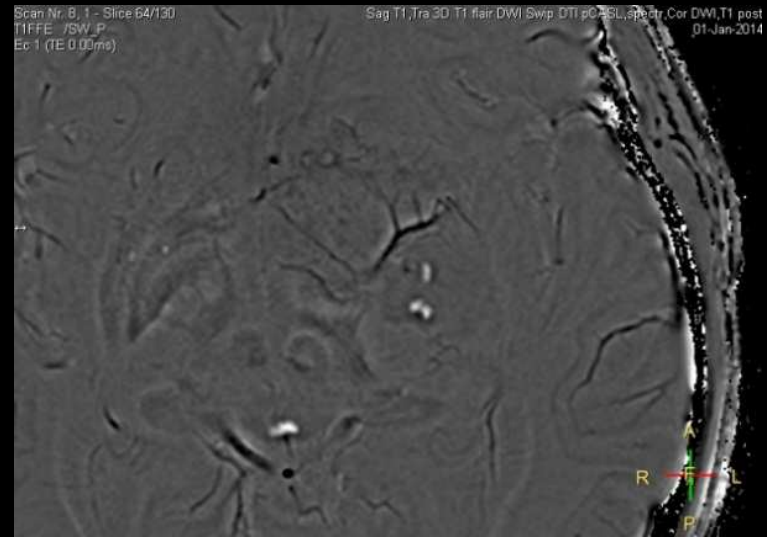


SWIp

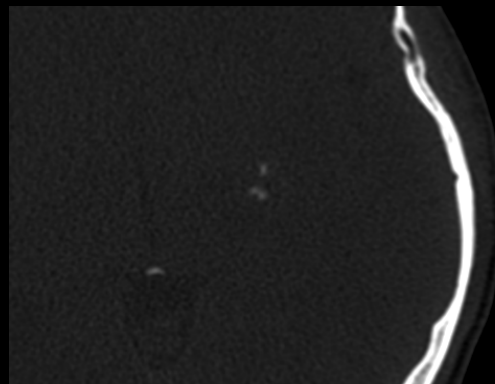
Types d'images



SW-M



SW-P



CT scan
Confidentiel

Synthetic MR

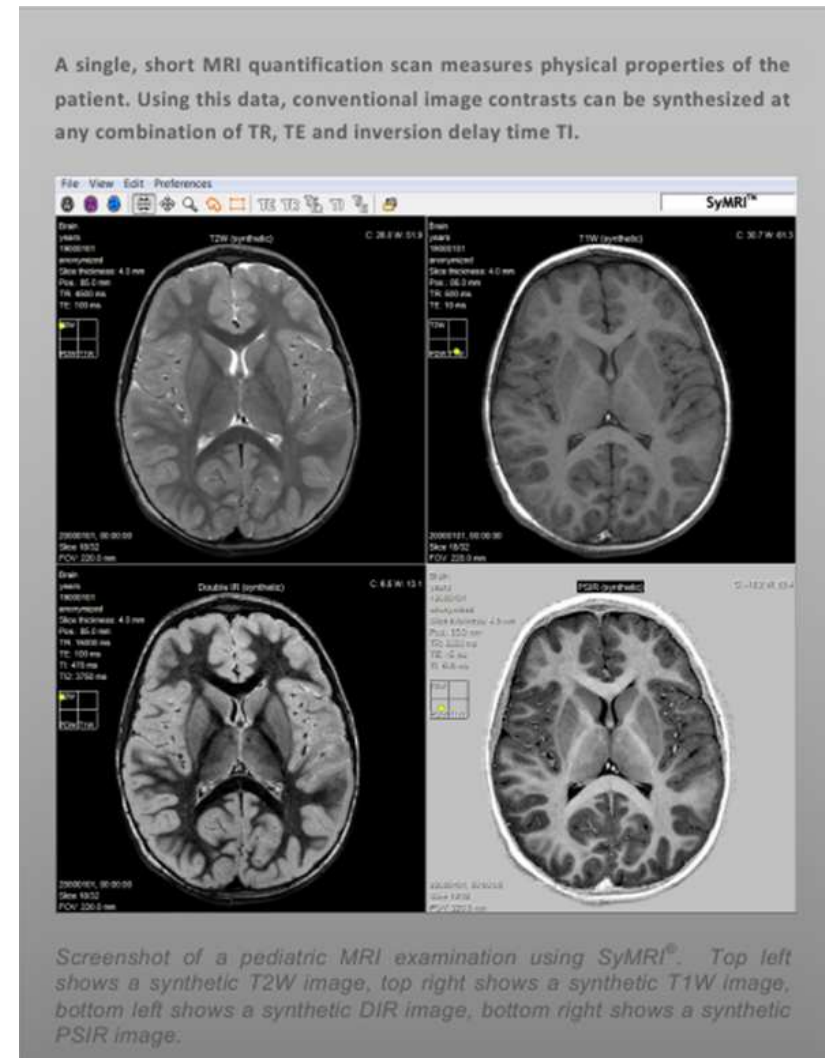
Propriété de Philips

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SyntheticMR

SyMRI® & SyntAc

SyntheticMR has developed **SyMRI®**, software that provides fast MRI workflows, and objective decision support through quantitative data based on synthetic MRI. **SyMRI** is available on **Philips MRI** systems together with the **SyntAc** sequence from Philips



SyntAc

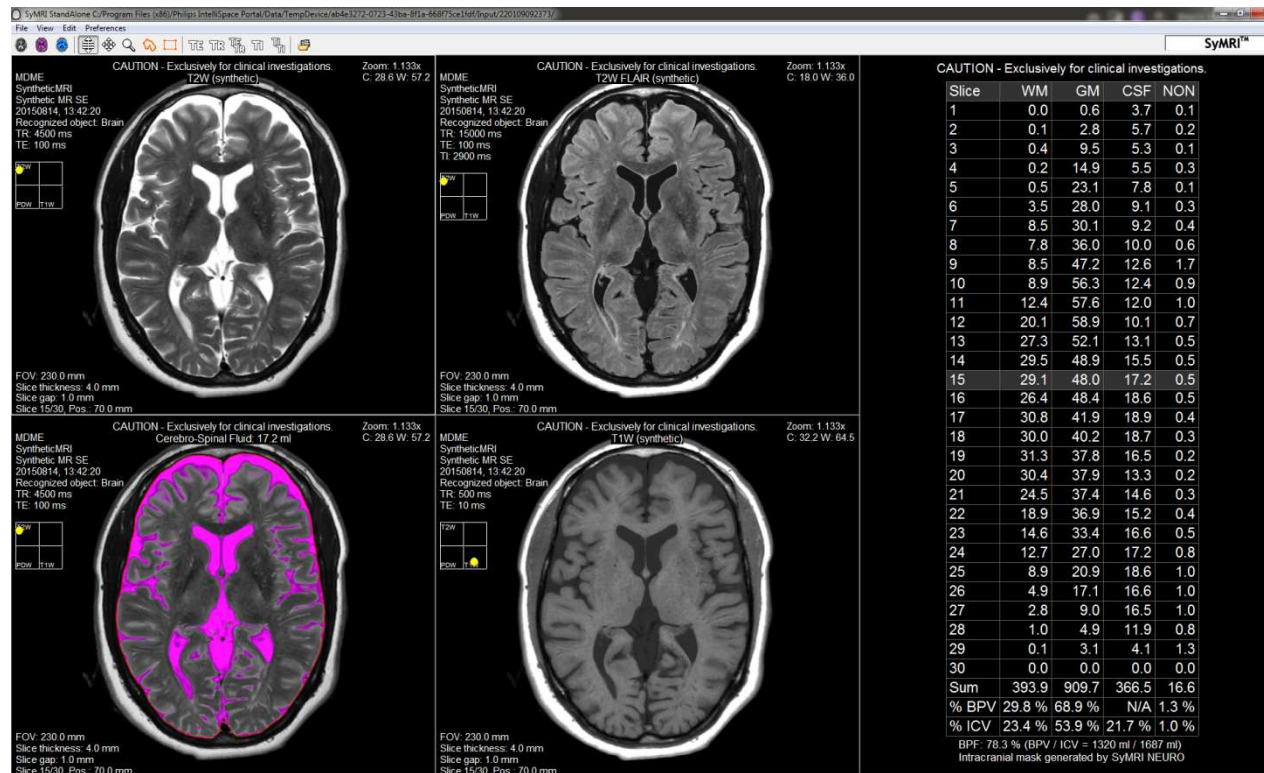
Qu'est-ce que c'est ?

- Séquence multi-dynamique multiple échos (MDME)
 - A la sources des données permettant de générer le images via SyMRI.
 - Mesure du T1 et T2
- Implémentation de Synthetic MRI
 - La méthode d'acquisition MDME dite SyntAc
 - Outil SyMRI traitant ces données
 - Permet la génération des différents contrastes IRM

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SyMRI Disposition

- Images synthétisées :
 - T2W, FLAIR, T1W images

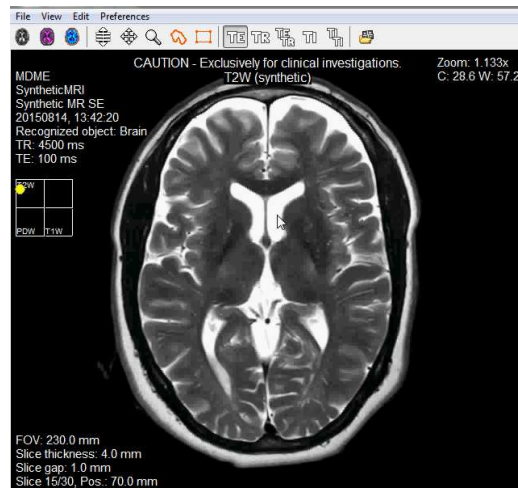


SyMRI

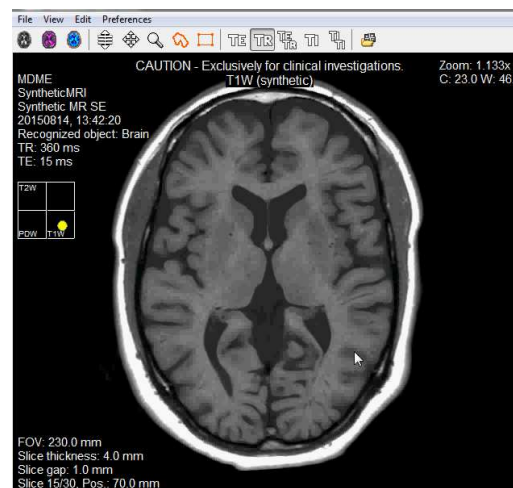
Disposition

- Ajustements des TE, TR et TI

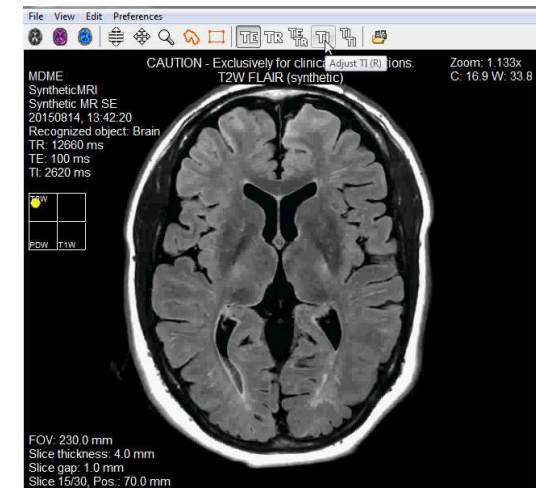
TE adjustment



TR adjustment



TI adjustment



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SyMRI

Segmentation

- Segmentation LCR, SB, SG. Information sur les volumes.

