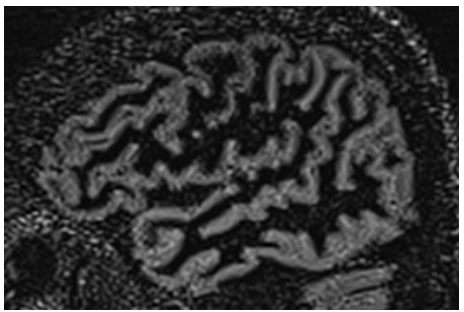
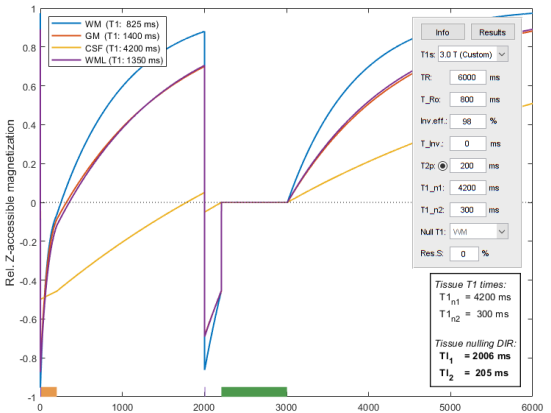
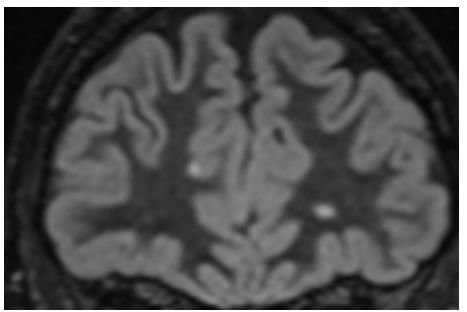
MR Inversion Recovery Simulation

and Scanning of Subjects with Focus on White Matter Lesion Contrast Optimization







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ISMRM 2021 (MS: White Matter & Other Structures), #2807

Oslo University Hospital

ISMRM & SMRT Annual Meeting & Exhibition
An Online Experience
15-20 May 2021

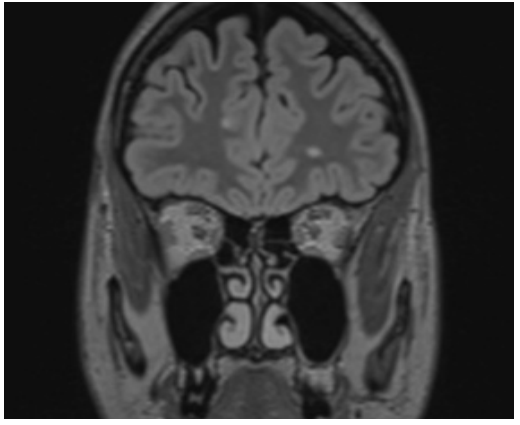
Declaration of Financial Interests or Relationships

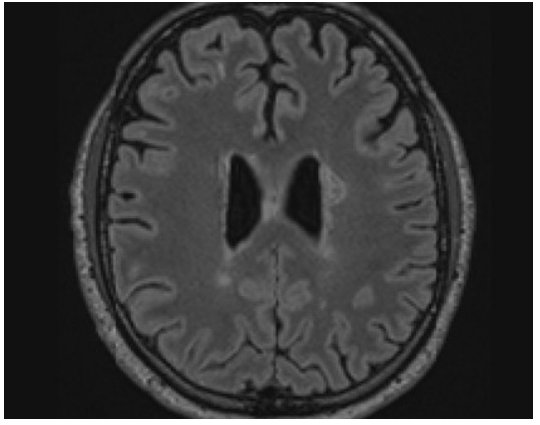
Speaker Name: Øystein Bech Gadmar

I have no financial interests or relationships to disclose with regard to the subject matter of this presentation.

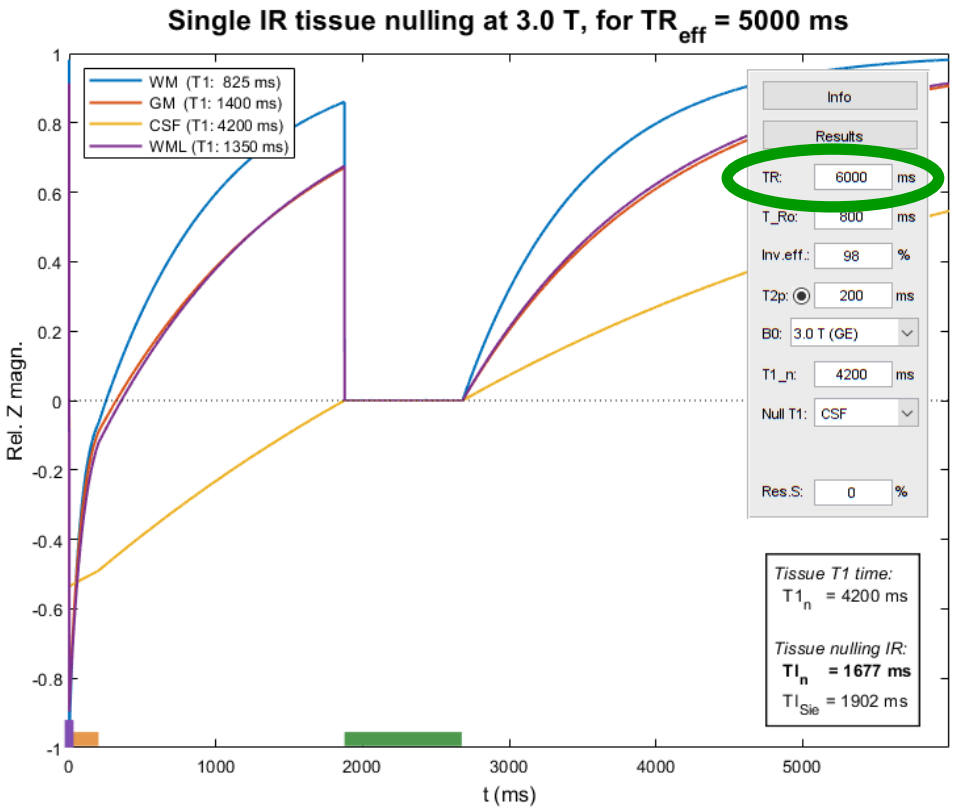
3D Fluid Attenuated Inversion Recovery

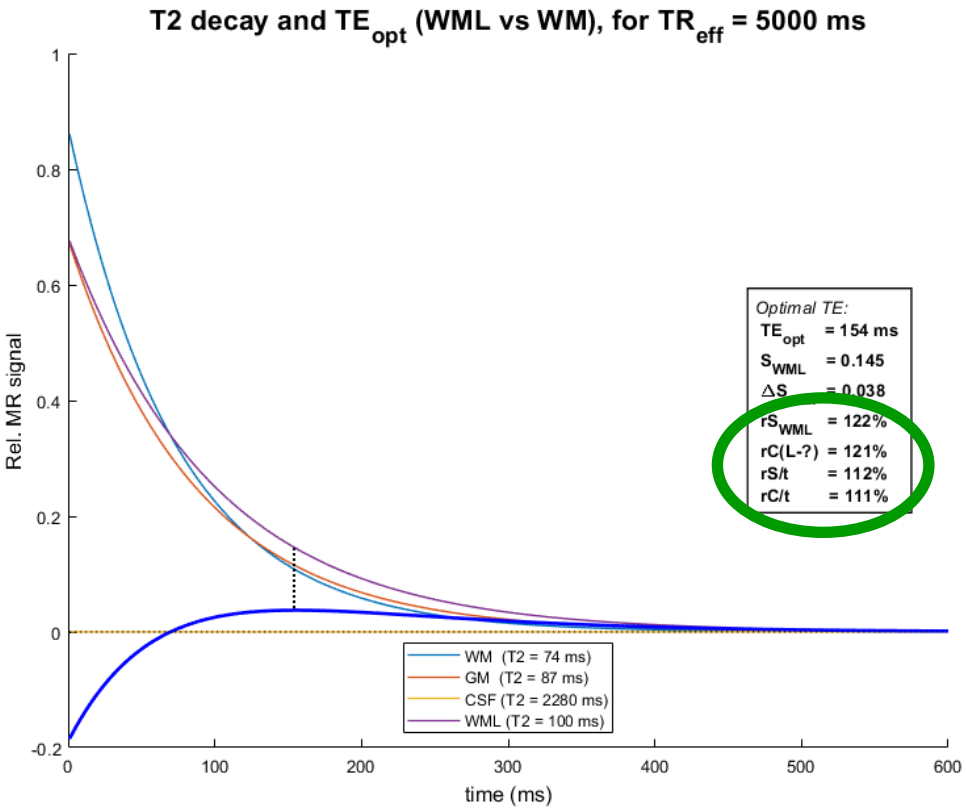
- 3D T2-weighted readout (SPACE/CUBE/VIEW)
- T1 weighting from IR counteracts desired T2 contrast
- $C = S_{WML} - S_{WM}$ primarily. End point: $CNR/t \propto C/\sqrt{TR}$.



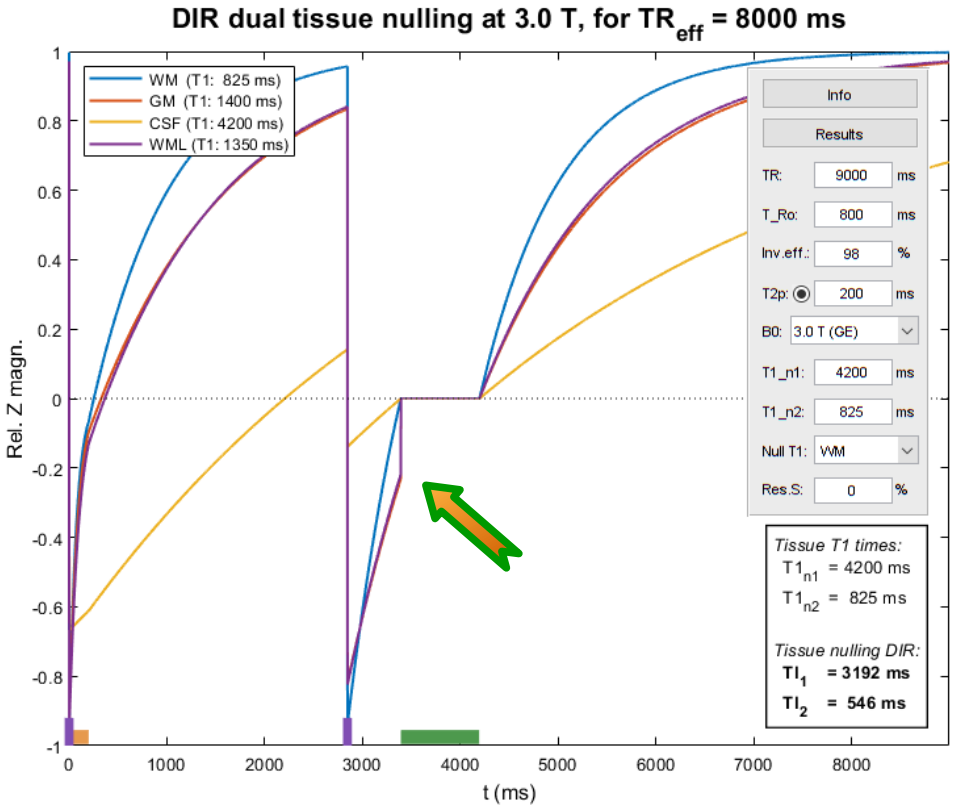


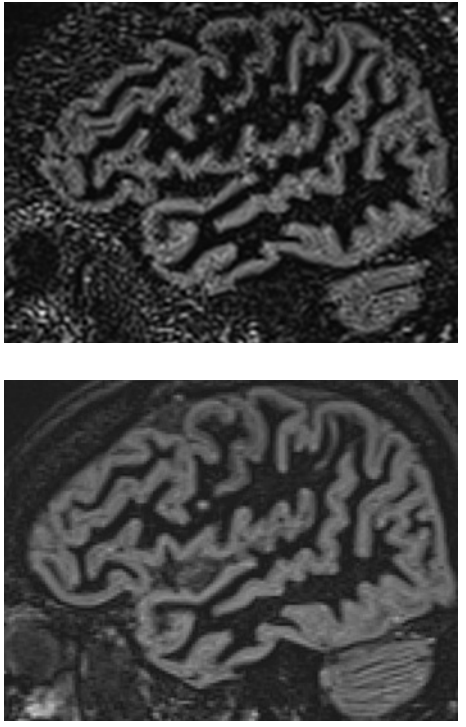
Optimized 3D FLAIR – vendor TR +1 s





Standard DIR: Nulling S_{WM} – at a price!



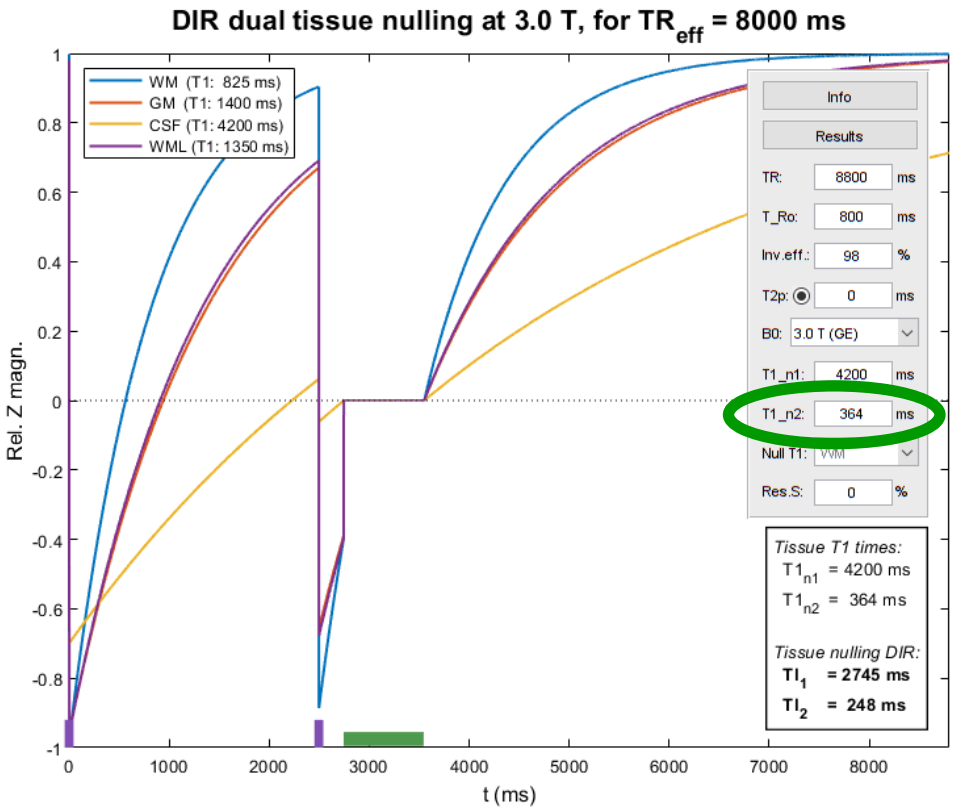


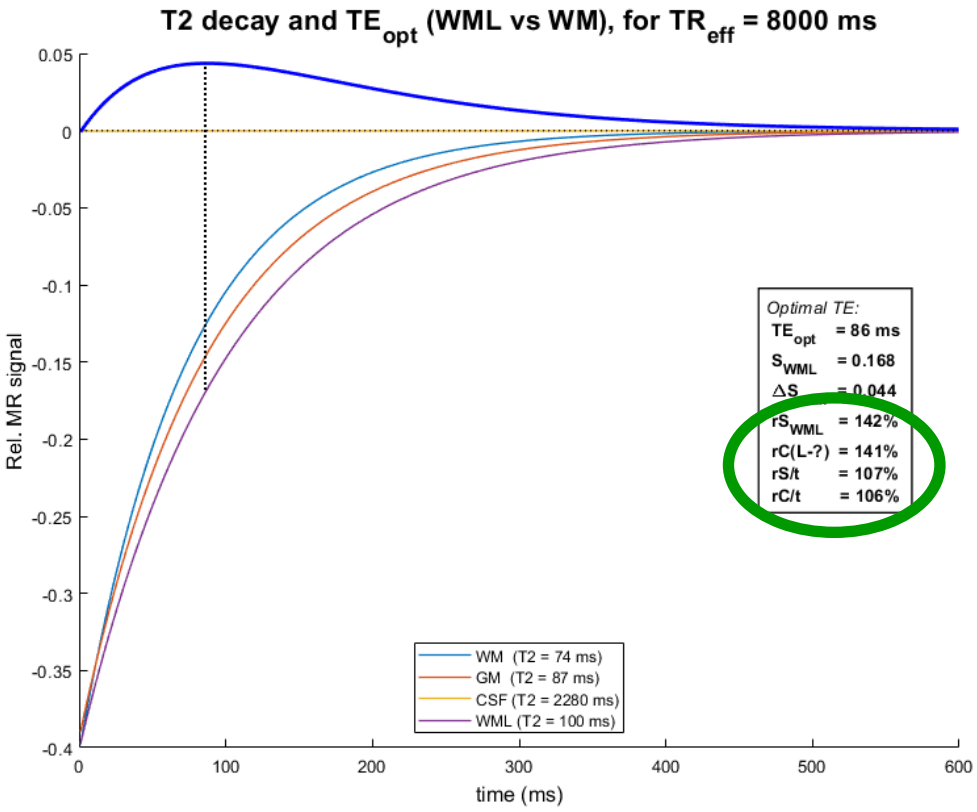
1.5 T DIR, diff. TE

- Poor SNR!
- T2Prep? (Ineffective) (Availability?)
- Longer TR (Inefficient)
- Shorter TE (Contrast loss)
- Longer readout (Blurring/res.)

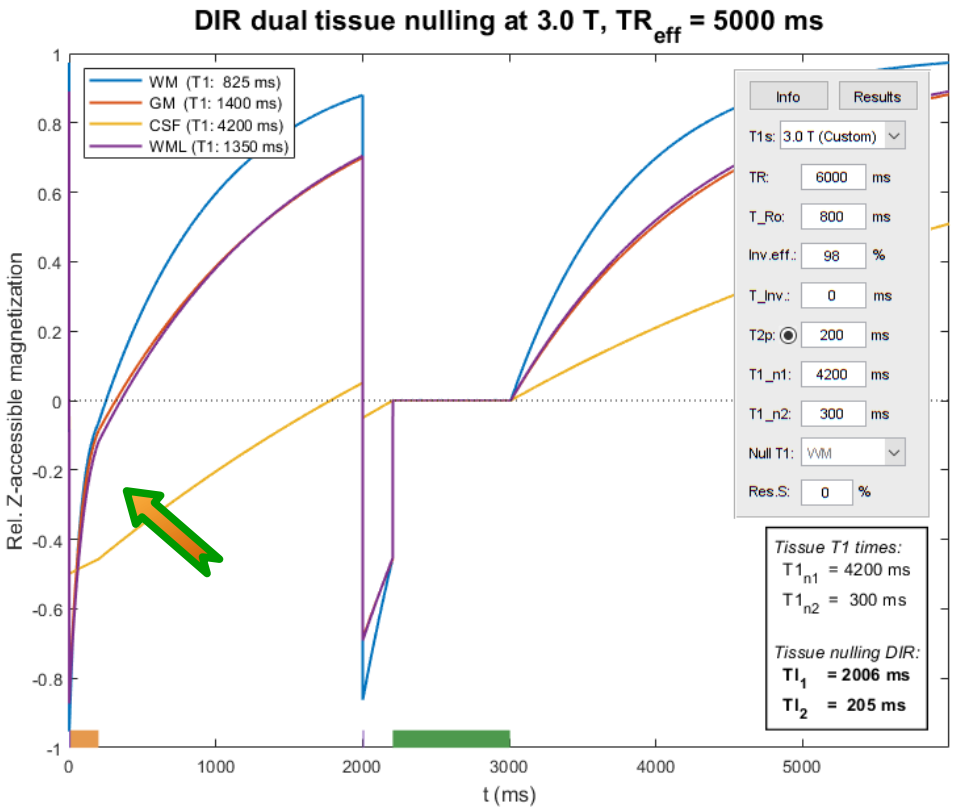
TrueT2-DIR – T1 contrast nulled

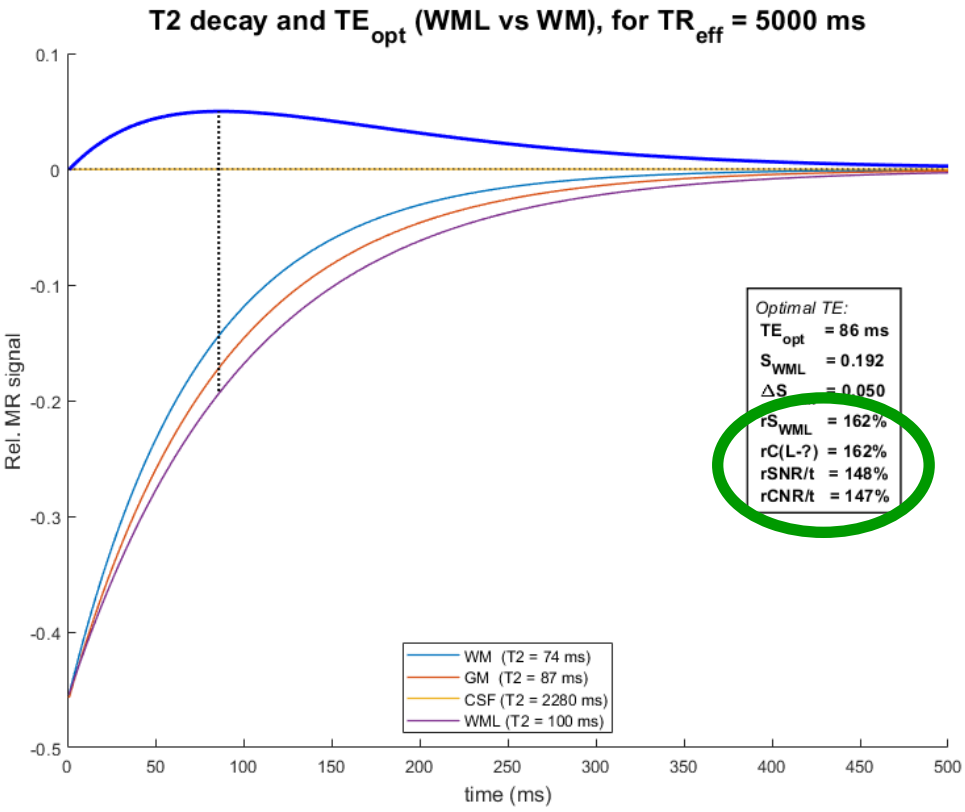
[Madhuranthakam *et al*, Mag Res Med 2012 67(1):81-88]





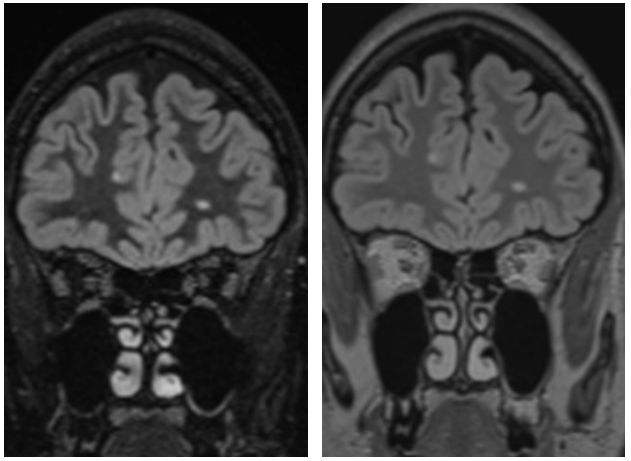
TrueT2-DIR w/ T2Prep & TR 6 s



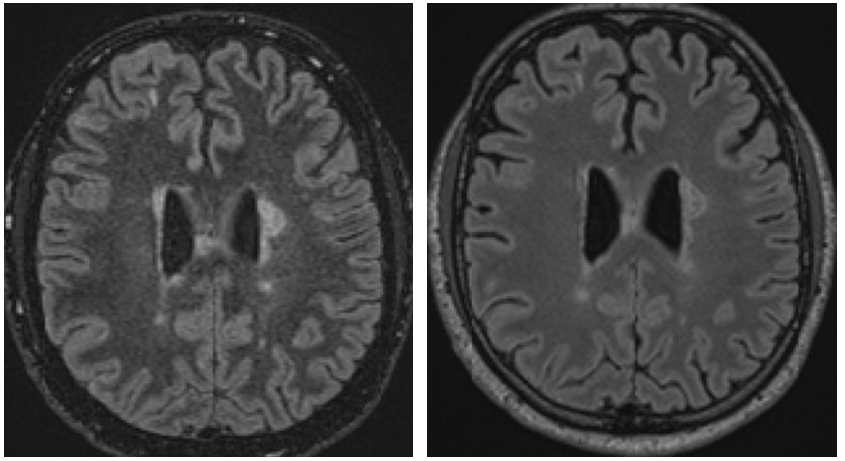


TrueT2-DIR vs FLAIR (1.5 T, 6:30 scan time)

TrueT2 FLAIR



Volunteer (age 50+)



MS patient

- CNR/t at least as good as optimized FLAIR.
- Better WML–GM CNR?! Preliminary analysis suggests so.
- Acceleration more robust than for FLAIR.
- Vendor specific DIR T2Prep availability. We hope this will be remedied!