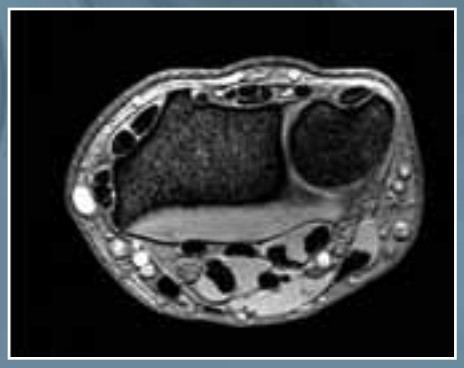
Image is Everything

Hold on to your hats – these clinical images demonstrate how the Discovery™ MR750 is re-shaping the definition of image quality.

In the last issue of *SignaPULSE* we introduced to you the Discovery MR750 – the system that was designed to break traditional boundaries of 3.0T scanning. We provided white papers, system specs, and technical articles so you wouldn't have to take our word for it. And the response has been tremendous. However, as they say, "the proof is in the pudding" so, to demonstrate what your everyday imaging could be like, we've included a taste of the image quality.

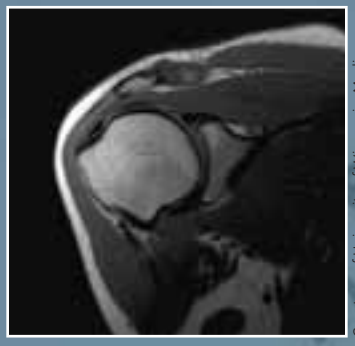
We'll let you see for yourself. ■

Musculoskeletal

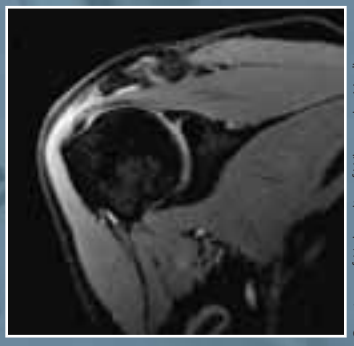


3D MERGE acquisition with 60 slices 2 mm thick scanned through the wrist. Excellent depiction of all tendons with 288 x 288 matrix and 12 cm FOV. Scan time 2:34 min.

Small FOV, high resolution imaging of the wrist trabeculae and carpometacarpal joints. 1 mm acquired slices thickness, 1024 x 1024 matrix.

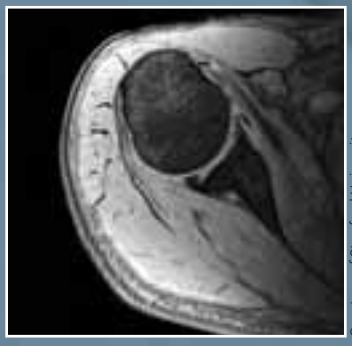


Courtesy of University of Wisconsin, Madison



Courtesy of University of Wisconsin, Madison

High-resolution imaging of the glenoid, articular cartilage, and rotator cuff structures.



Courtesy of Stanford University

3D MERGE acquisition with 72 slices 2 mm thick scanned through the shoulder. The glenoid labra are exquisitely seen due to high SN R provided bythe sequence and 8ch concentric designed shoulder coil. 320 x 320 matrix with 16 cm FOV. Scan time 4:14 min.

Abdominal

All images courtesy of Stanford University

LAVA-Flex study in pelvis displaying 4 unique images acquired at each slice location. A total of 84 images scanned in a 19 s breath hold with a 320 x 256 imaging matrix.

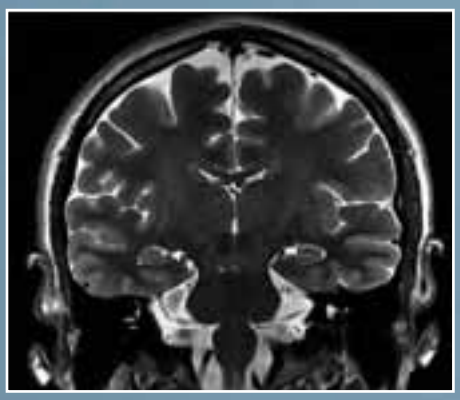
A TR of 4.8 ms allows acquisition of two echoes at 1.1 and 2.2 ms which correspond to the out and in phase images (at 3.0T). The water and fat only images are subsequently reconstructed from the acquired 1.1 and 2.2 ms TE images with perfect separation of the 1H in fat and water. The result is exquisite suppression of fat (or water) which enables excellent visualization of pathology.

Vascular

3D TOF images of the posterior cerebral circulation display a 1.1 mm neck on an aneurysm of the posterior inferior cerebellar artery (PICA). Short TEs and excellent background suppression result in visualization of very small pathologies. 1 mm overlapping slices are employed to ensure excellent reformatted images of the Circle of Willis.

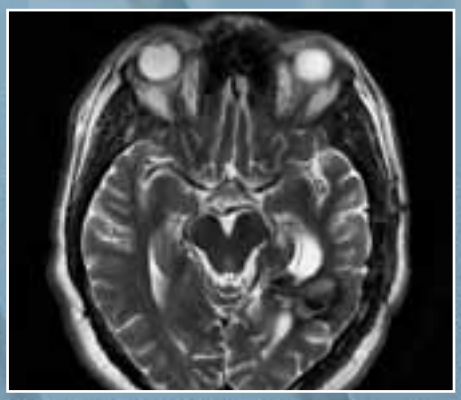
3D TOF using large single slab (113 slices 1 mm thick) with an 864 x 416 matrix displays both excellent blood signal deep into the imaging volume with 230 micron x 480 micron pixel resolution.

Neuro

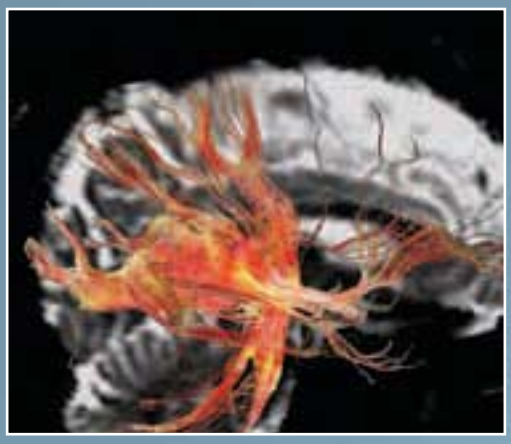


T2 weighted Fast Spin Echo PROPELLER 2.0 in the coronal plane is very useful to visualize the temporal lobes and hippocampus. 3 mm slices imaged with a 22 cm FOV and 512 x 512 matrix results in a pixel size of 430 x 430 microns, 15 slices in Scan Time 2:45 min using 32 ch brain coil.

Sagittal FLAIR PROPELLER 2.0. 3 mm slices with 320 x 320 matrix with an ETL of 40 allows 32 slices in a scan time of 3:11 min.



Axial FSE PROPELLER 2.0 with 512 x 512 matrix displays excellent motion resistance with fast scan time of 2:39 min. Uncooperative patient with hemorrhage in left hemisphere.

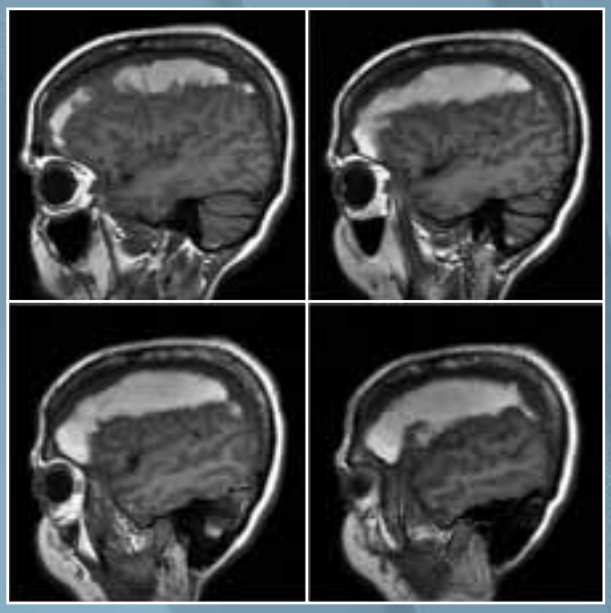


Courtesy of Stanford University

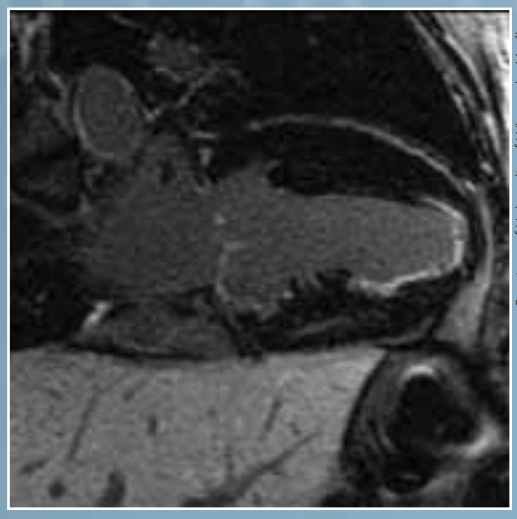
Thin slice diffusion tensor imaging in practical scan times is enabled by the Discovery MR750. This image displays 60 slices scanned with 20 tensor directions with 2 NEX in 5:44 min.

The resulting Tractography image displays excellent white matter fiber delineation.

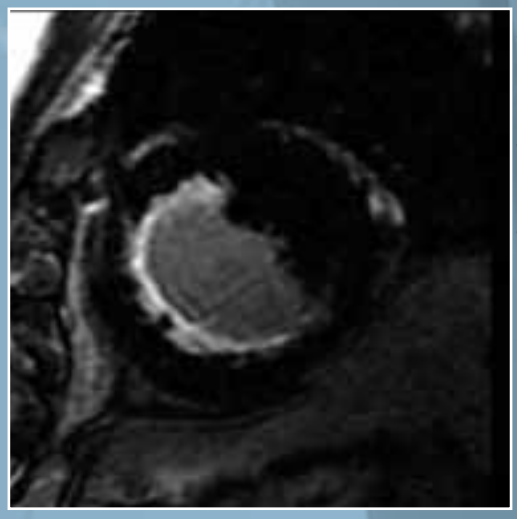
Sub arachnoid hemorrhage imaged with T1 weighted FLAIR. 28 slices in 2:08 min with 320 x 224 matrix.



Cardiac



Courtesy of University of Wisconsin, Madison



Courtesy of University of Wisconsin, Madison

2D myocardial delayed enhancement images in long axis and short axis orientations of the left ventricle.

3.0T increases in SNR allow thinner slices versus 1.5T and adiabatic IR pulses ensure excellent suppression of normal myocardial tissue. Myocardial infarction seen on 6 mm thick slices acquired at 256 x 160 and zipped to 512 x 512.

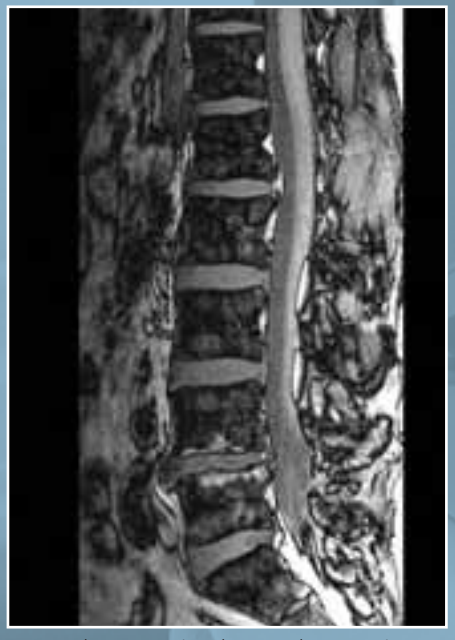
Spine

Courtesy of Stanford University

Courtesy of Stanford University

T2 weighted FRFSE sagittal lumbar spine image in 48 year-old patient with degenerative disc changes at L4/5 and a posterior bulge at L1/2.

15 slices acquired 3 mm thick in 3:05 min with a matrix of 384 x 224.



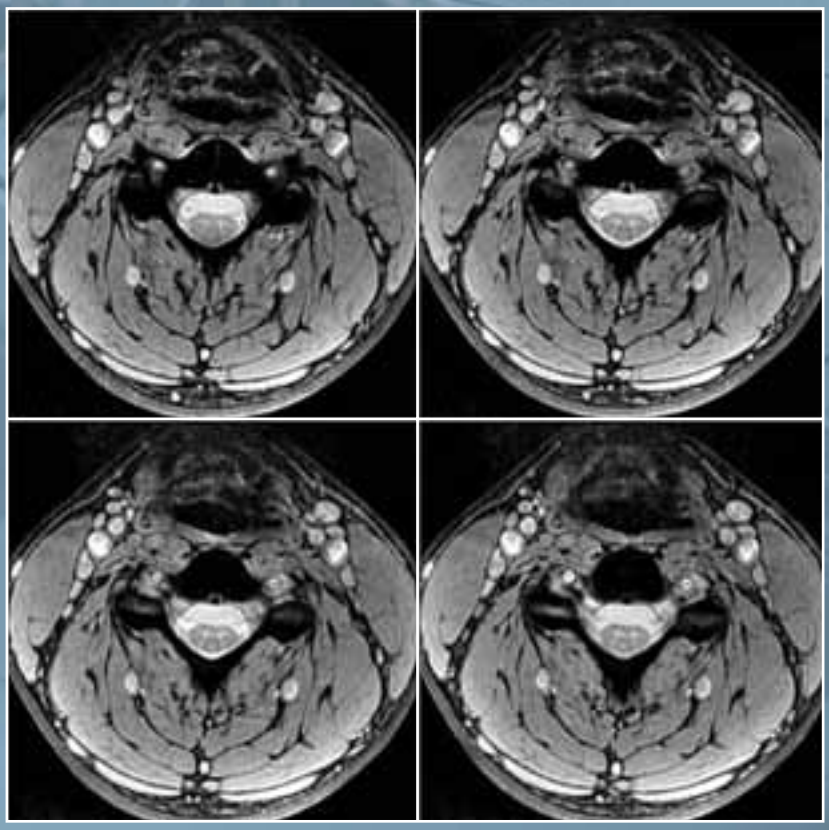
Sagittal T1 weighted IDEAL lumbar spine images post contrast demonstrating the superb separation of the water and fat images, plus the bonus images of in- and out-of-phase.

spine

62 year-old male with previous surgical intervention at mid L4 level. FSE T1 fat suppressed image shows classic metal blooming artifact at L4 level.

Courtesy of Stanford University

Same slice location imaged with IDEAL "fat suppression" and T2 weighting, which displays the remarkable reduction in metal artifact distortion compared to FSE T1.



Courtesy of Stanford University

3D MERGE in the axial cervical spine. 60 slices covering 3 disc spaces in 2:50 min with a 288 x 256 matrix. Excellent depiction of the grey and white matter of the spinal cord.

Multi-station spine scan with IDEAL exhibiting excellent fat exclusion along the entire length of the spine.