

Supplemental data for
Diagnostic Accuracy of Quantitative Multicontrast 5-Minute Knee MRI Using
Prospective Artificial Intelligence Image Quality Enhancement

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The authors have supplied these materials to give readers additional information about the work.

The publication of these supplemental data is intended to satisfy ethical requirements of completeness. The authors are solely accountable for the accuracy of the supplemental data. Although the data will be reviewed to ensure compliance with specific journal requirements, it will not undergo further copyediting, verification, or layout. The reader is cautioned to consult the definitive version of record and to direct any inquiries about the contents of these supplemental data directly to the authors.

Supplemental Data:

Table S1: Comparison of the diagnostic image quality scores for conventional MRI and the quantitative double-echo steady-state (qDESS) sequence. Diagnostic image quality: (1=very poor, 2=poor, 3=acceptable, 4=good, 5=very good). All qDESS ratings were significantly lower ($p<0.001$) than the conventional MRI ratings.

	Conventional MRI	qDESS
Meniscus	4.6 ± 0.5	3.1 ± 0.5
Cruciate Ligaments	4.6 ± 0.5	3.0 ± 0.5
Collateral Ligaments	4.6 ± 0.6	2.7 ± 0.5
Cartilage	4.6 ± 0.6	3.5 ± 0.6
Extensor Mechanism	4.6 ± 0.8	3.1 ± 0.8
Bone Marrow	4.7 ± 0.6	3.2 ± 0.5

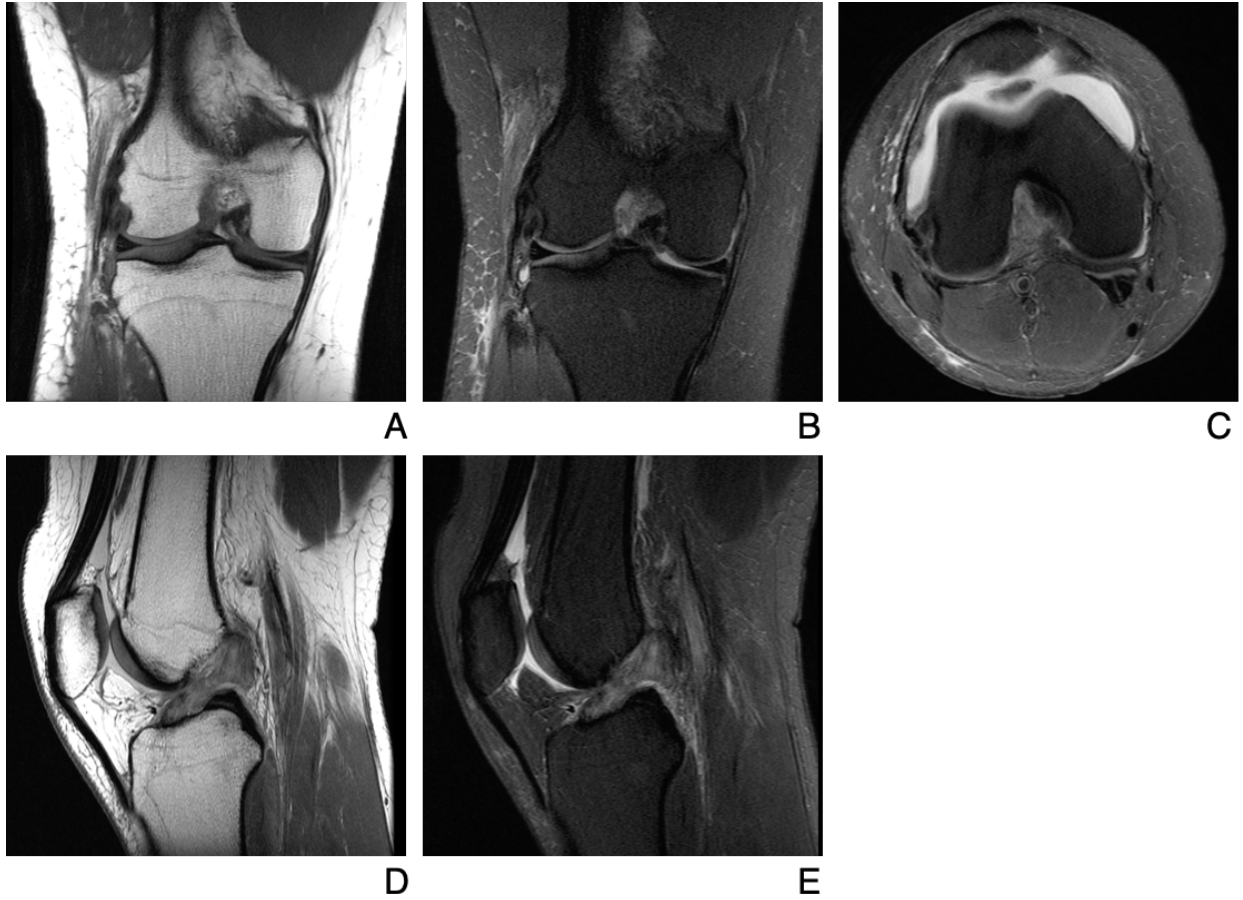


Figure S1: An 18-year old woman with a full thickness tear of the anterior cruciate ligament.

A-E, The conventional knee MRI protocol at our institution consists of a coronal T1-weighted scan (**A**), a coronal proton-density-weighted fat suppressed scan (**B**), an axial proton-density-weighted fat suppressed scan (**C**), a sagittal proton-density-weighted scan (**D**), and a sagittal T2-weighted fat suppressed scan (**E**).

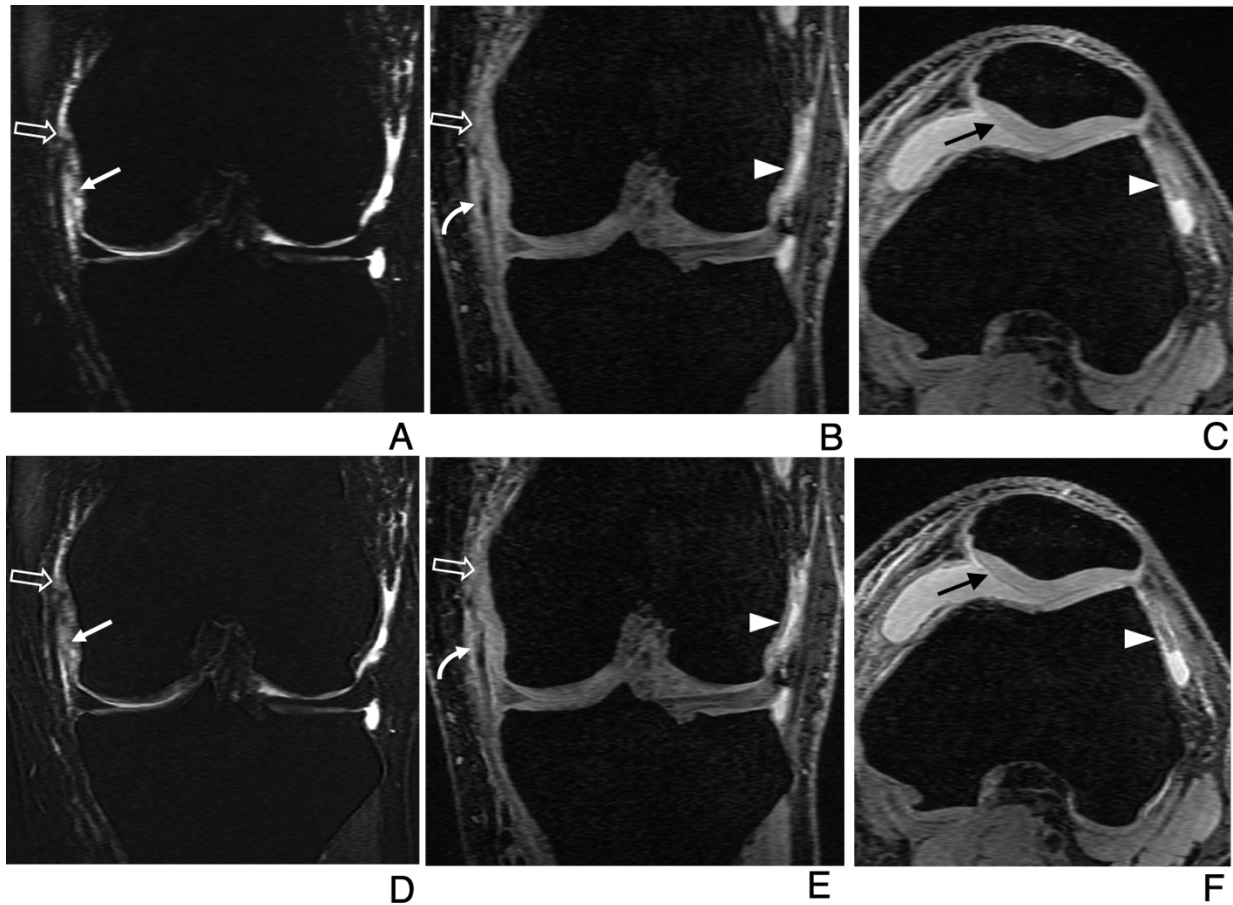


Figure S2: A 19-year-old woman with a high grade tear of the superficial (open arrow in A, B, D, E) and deep fibers (arrow in A, D) of the proximal medial collateral ligament (MCL).

A-C, Unenhanced Fourier interpolated images for a qDESS S- coronal reformat (**A**), qDESS S+ coronal reformat (**B**), and qDESS S+ axial reformat (**C**). Superficial fibers (open arrows) and deep fibers (arrow) appear blurry on (**A,B**), while the MCL is blurry on (**B**) and the cartilage-fluid interface (arrowhead) is blurry on (**C**).

D-F, Deep learning super-resolution (DLSR) enhanced qDESS S- coronal reformat (**D**), qDESS S+ coronal reformat (**E**), and qDESS S+ axial reformat (**F**) improves the depiction of the MCL fibers and the cartilage-fluid interface compared to (**A-C**).

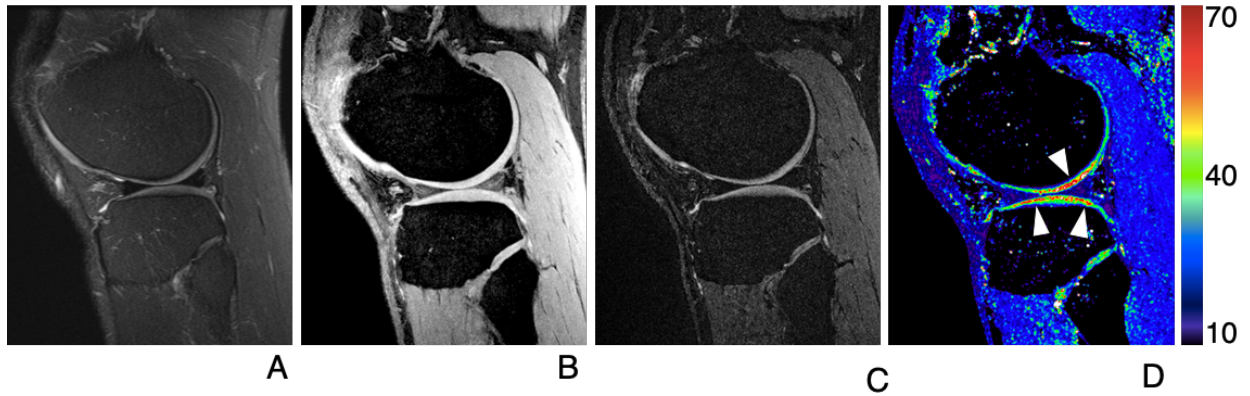


Figure S3: 41-year-old man with an oblique tear in the posterior horn of the medial meniscus (same patient as in Figure 2). Images show the lateral tibiofemoral compartment.

A-C, Sagittal T2-weighted (**A**), qDESS S+ (**B**), qDESS S- (**C**) images demonstrates morphologically normal articular cartilage.

D, qDESS T2 map (in ms) indicates hyperintense T2 values in the posterior femoral condyle and the tibial plateau (arrowheads).

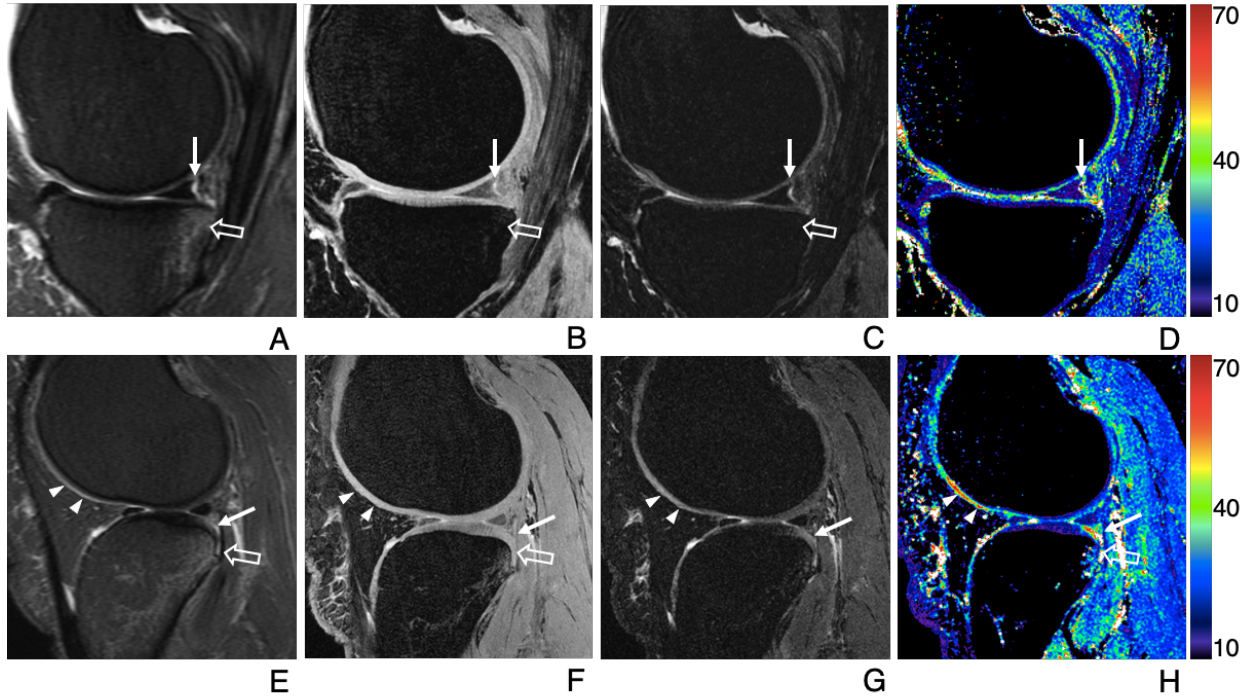


Figure S4: 27-year-old man with a complete ACL tear.

A-H, Sagittal T2-weighted (**A,E**), qDESS S+ (**B,F**), qDESS S- (**C,G**), and qDESS T2 map (in ms) images (**D,H**) depict multiple abnormalities. A vertical peripheral tear is seen in the posterior horn of the medial meniscus (solid arrow) (**A-D**). Subtle increased signal with abnormal corresponding T2 relaxation times is seen in cartilage over the lateral tibial plateau posteriorly (arrow) (**D**). Cartilage along the lateral trochlea (arrowhead) appeared intact on (**E**) but has subtle increased signal abnormality on qDESS S- (**G**). Bone marrow edema along the posterior aspect of the medial (open arrow) and lateral tibial plateaus (open arrow) is well seen on (**A,E**), but less well seen with qDESS. (**B,C,F,G**).

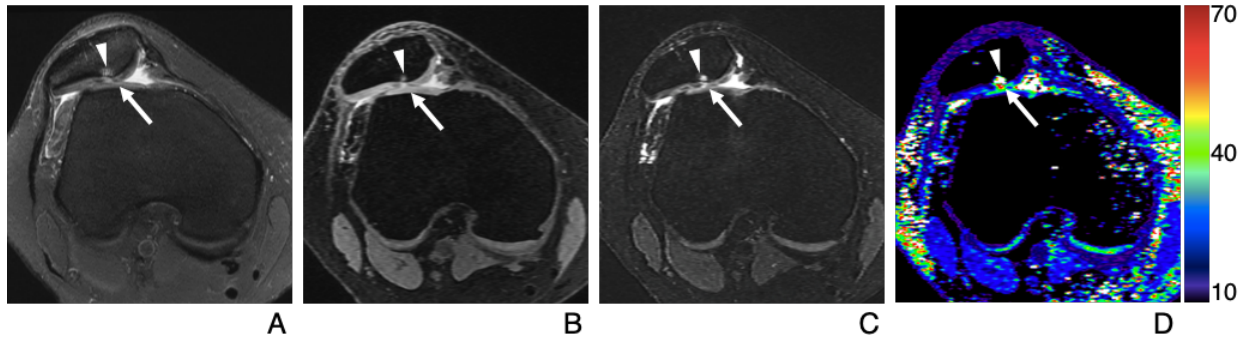


Figure S5: 24-year-old woman with patellar maltracking.

A-C, Axial proton-density fat-saturated (**A**), qDESS S+ (**B**), qDESS S- (**C**) images demonstrates hypoplastic femoral trochlea and lateral tilt and subluxation of the patella. There is focal increased chondral signal and delamination along the patella at the junction of the median ridge and lateral patellar facet (arrow) with underlying subchondral cystic change (arrowhead) (**A-C**).

D, qDESS T2 map (in ms) indicates hyperintense T2 values in the patellar cartilage (arrow).