

AbstractID: 9447 Title: Abdominal Fat Quantification Accuracy Using Water Saturated b-SSFP MRI Sequences: A Verification Study

**Purpose:** To verify the fat quantification accuracy of abdominal fat quantification results on images acquired with a Water Saturated b-SSFP (WS b-SSFP) MRI Sequence.

**Methods and Materials:** 10 healthy (5 female and 5 male) volunteers underwent both WS T1W TSE and WS b-SSFP scans with breath hold on a 1.5 T clinical MR scanner. For the WS T1W TSE sequence, the parameters were as follows: TR/TE/flip angle = 500 ms/5 ms/90°, turbo factor = 7 and readout bandwidth = 128 KHz. For the WS 3D b-SSFP sequences, the imaging parameters were as follows: TR/TE/flip angle = 2.9 ms/1.2 ms/55°, ETL = 128 with 12 dummy echoes, and readout bandwidth = 200 KHz. For WS T1W TSE sequence, 6 axial slices centered at L2-L3 level were acquired in two consecutive expired breath-holds, with 14 seconds each. Since WS b-SSFP is a much faster scan, 8 slices (with slice 2-7 imaged at the same positions of the 6 TSE slices) were obtained in 11 seconds in one breath-hold. For each subject, fat volumes from six common slices of WS TSE and WS b-SSFP were measured and summed. Total abdominal fat (TAF), intra-abdominal fat (IAF), and subcutaneous abdominal fat (SAF) volumes from images of both scans were measured and compared.

**Results:** The TAF, IAF, and SAF mean differences of the fat volume measured from images of the two scans are only 0.34%, -0.25%, and 0.91%, respectively. The Bland-Altman plots show that all the measurement differences between WS b-SSFP and WS TSE are within the 95% of difference.

**Conclusion:** The two methods are the same in terms of the measurement accuracy for human abdominal imaging. Therefore, WS b-SSFP MRI can be used for abdominal fat quantification to reduce imaging and post-processing difficulties and ultimately reduce research cost in abdominal fat distribution studies.