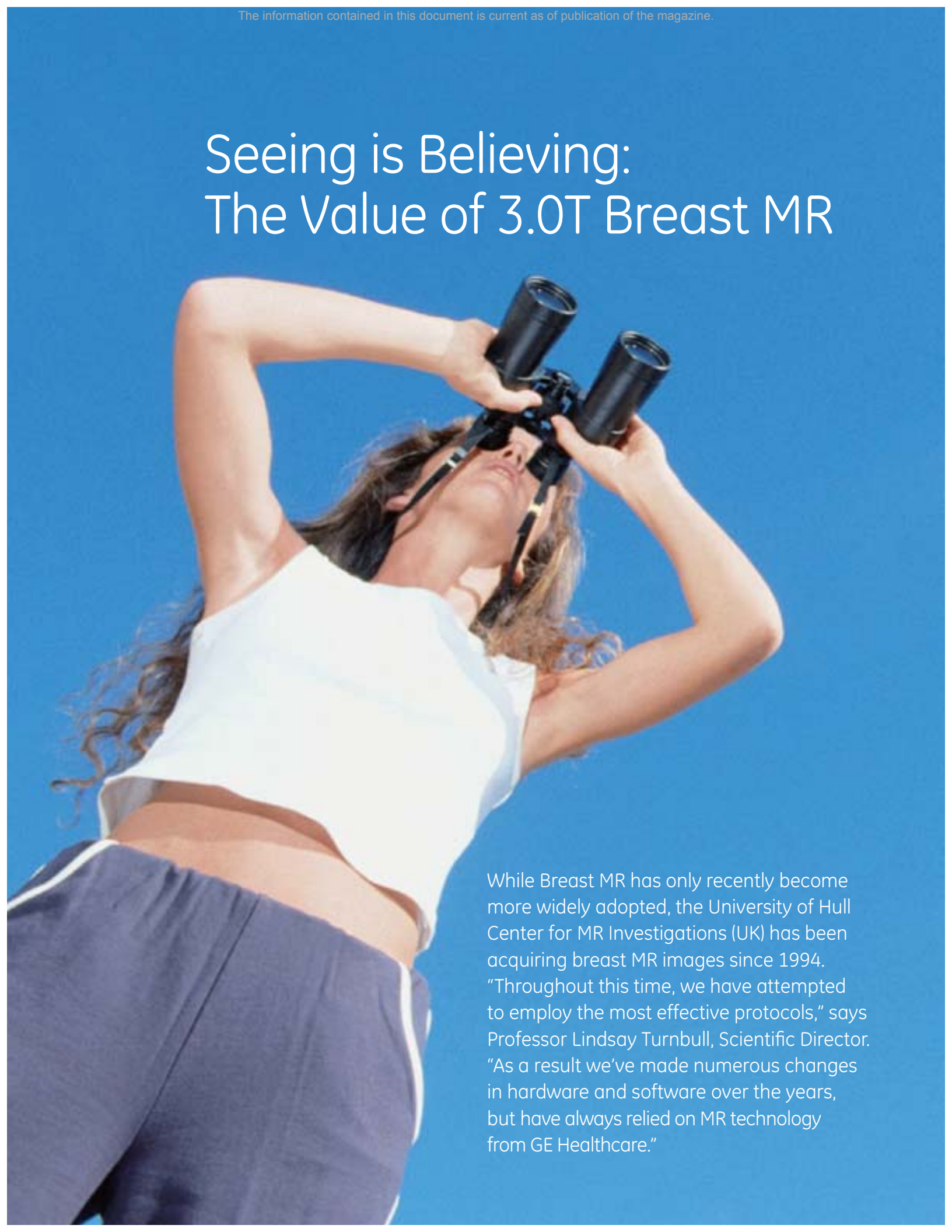


Seeing is Believing: The Value of 3.0T Breast MR



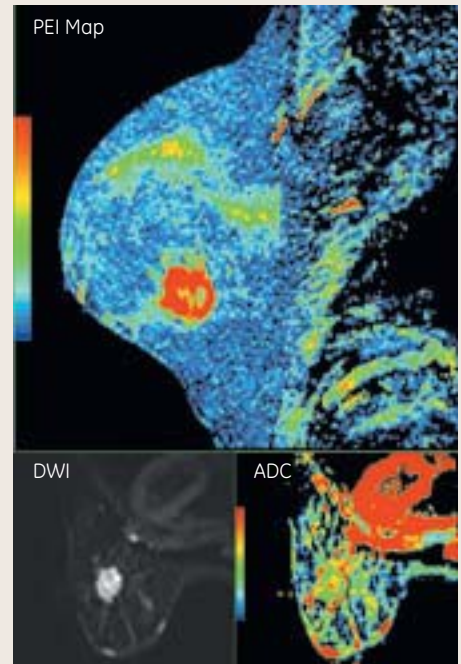
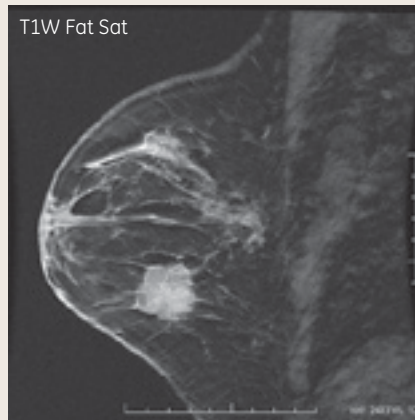
While Breast MR has only recently become more widely adopted, the University of Hull Center for MR Investigations (UK) has been acquiring breast MR images since 1994. “Throughout this time, we have attempted to employ the most effective protocols,” says Professor Lindsay Turnbull, Scientific Director. “As a result we’ve made numerous changes in hardware and software over the years, but have always relied on MR technology from GE Healthcare.”

Case 1

Lesion Characterization

Patient with a self-diagnosed lump. Mammography and ultrasound identified a single lesion. Core biopsy confirmed malignant nature (NST, Grade III, ER and PR positive). MRI requested to stage disease prior to neoadjuvant chemotherapy.

MRI helped identify a relatively well-defined lobulated 3 cm diameter mass lesion demonstrating a Type III uptake curve. A further 9 mm satellite lesion was also noted.



Protocols:

Dynamic VIBRANT: VIBRANT, 10° flip, TR4.1 TE1.6/Fr, TI 6.0, 41.7 kHz, 22x22cm FOV, 220x160 matrix, 4/-2 mm, 1NEX, SPECIAL, NPW, ZIP2, ASSET multiphase (2 pre 10 post)

T1W High Resolution: VIBRANT, 10° flip, TR7.5, TE2.9/Fr, TI 5.0, 41.7 kHz, 20x20 cm FOV, 512x512, 3.6/-1.8 mm, 1NEX, SPECIAL, ZIP2

Prof. Turnbull and Martin Pickles, PhD, research radiographer, currently use VIBRANT™ on a Signa® HDx 3.0T system. “The current protocol uses high temporal and spatial resolution sequences, incorporating multiple parameters that are analyzed by various techniques,” Prof. Turnbull explains, “for a robust and effective clinical assessment.”

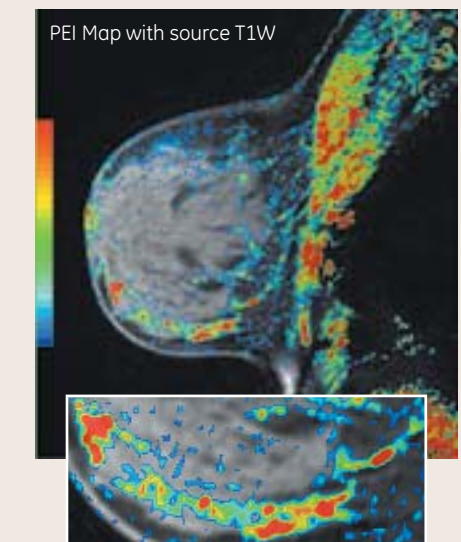
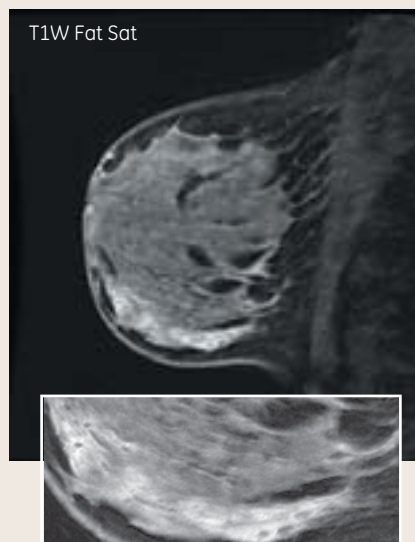
In 2008, Hull University expects to examine nearly 650 cases with breast MR. Of those, Dr. Pickles estimates 200 will be screening exams of high-risk patients with family history, while the remaining 450 will be a mix of problem-solving cases. “This includes staging of invasive disease, neoadjuvant chemotherapy treatment follow-up, breast implants and to a small degree, MR-guided biopsy,” he adds.

Case 2

Ductal Carcinoma In Situ (DCIS)

Patient has a high-risk family history. Mammogram was normal but MRI requested due to dense nature of the breast tissue.

The MRI images depict a prominent ductal type enhancement in the inferior aspect of the breast in keeping with the appearance of DCIS.



Protocol:

T1W High Resolution: VIBRANT, 10° flip, TR7.5, TE2.9/Fr, TI 5.0, 41.7 kHz, 20x20 cm FOV, 512x512, 3.6/-1.8 mm, 1NEX, SPECIAL, ZIP2

Case 3

High-Risk Family History

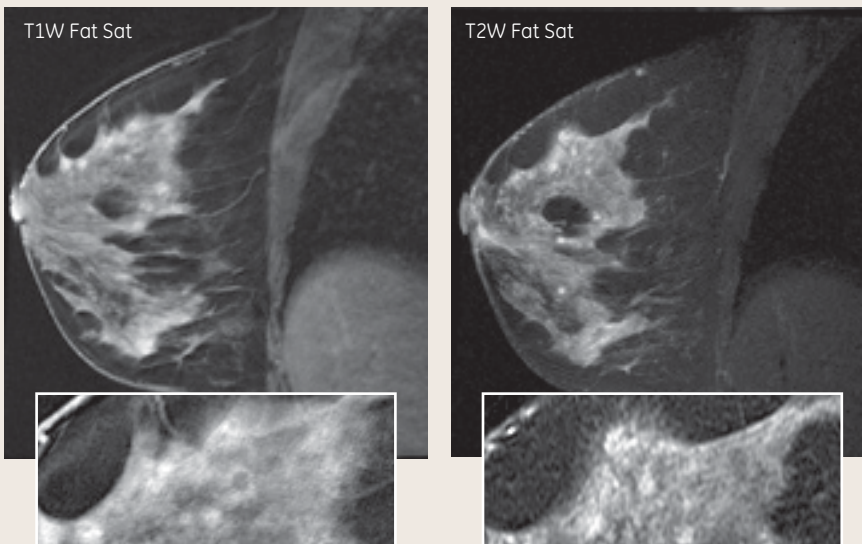
Woman with high-risk family history referred for MRI. The exam uncovered extensive punctuate areas of contrast uptake (Type 1) seen throughout both breasts. Post-contrast T1W images reveal multiple tiny ring enhancing structures corresponding with high signal intensity areas on T2W images. As a result of the MRI, patient was diagnosed with fibrocystic disease.

Protocols:

Dynamic VIBRANT: VIBRANT, 10° flip, TR4.1 TE1.6/Fr, TI 6.0, 41.7 kHz, 22x22cm FOV, 220x160 matrix, 4/-2 mm, 1NEX, SPECIAL, NPW, ZIP2, ASSET multiphase (2 pre 10 post)

T1W High Resolution: VIBRANT, 10° flip, TR7.5, TE2.9/Fr, TI 5.0, 41.7 kHz, 20x20 cm FOV, 512x512, 3.6/-1.8 mm, 1NEX, SPECIAL, ZIP2

T2W High Spatial Resolution: FSE-XL, TR5780, TE80.6, 41.7 kHz, 20x20 cm FOV, 512x320, 3.6/0 mm, 2NEX, fat sat, NPW, TRF, ED, ZIP512



According to Dr. Pickles, "VIBRANT™ allows us to acquire functional data with a 35 sec temporal resolution and 1.00x1.37x2 mm spatial resolution. Additionally, we use VIBRANT to acquire post-contrast, high spatial resolution (0.4x 0.4x1.8 mm) images that further improve our specificity."

The value of VIBRANT is quite clear to the clinicians at Hull University. Prof. Turnbull says. "With the elevated signal-to-noise ratio of the Signa® HDx 3.0T, coupled with the ASSET™ parallel imaging method, we obtain a high level of diagnostic accuracy with the superior temporal and spatial resolution of the VIBRANT sequence." ■

Case 4

Breast Augmentation

Patient underwent breast augmentation in 2003. Recent RTA breasts are described as lumpy and tender. Due to possible silicone rupture, patient referred for breast MRI. MRI found evidence of extracapsular silicone posteriorly but no evidence of an intracapsular rupture.

Protocols:

Dynamic VIBRANT: VIBRANT, 10° flip, TR4.1 TE1.6/Fr, TI 6.0, 41.7 kHz, 22x22cm FOV, 220x160 matrix, 4/-2 mm, 1NEX, SPECIAL, NPW, ZIP2, ASSET multiphase (2 pre 10 post)

T1W High Resolution: VIBRANT, 10° flip, TR7.5, TE2.9/Fr, TI 5.0, 41.7 kHz, 20x20 cm FOV, 512x512, 3.6/-1.8 mm, 1NEX, SPECIAL, ZIP2

Silicone only: FSEIR, TR4920, TE13.0, T1200, 15.6 kHz, 30x30 cm FOV, 256x256, 4/1 mm, 1NEX, water sat

