

# FieldStrength

Publication for the Philips MRI Community

Issue 38 – Summer 2009

## DWI of the breast at 3.0T

By Thomas Chenevert, PhD, Mark Helvie, MD, Caroline Daly, MD, (University of Michigan, Ann Arbor, MI, USA) and Marko Ivancevic, PhD (Philips Healthcare)



This article is part of  
Field Strength issue 38,  
Summer 2009

# PHILIPS

# DWI of the breast at 3.0T

By Thomas Chenevert, PhD, Mark Helvie, MD, Caroline Daly, MD, (University of Michigan, Ann Arbor, MI, USA) and Marko Ivancevic, PhD (Philips Healthcare)

### Introduction

In diffusion-weighted MR images tissue contrast is based on water mobility properties. It is particularly used for visualization of lesions that alter water mobility relative to surrounding tissues.

At the University of Michigan we recently introduced diffusion-weighted imaging (DWI) to our 3.0T breast MR examination protocol consisting of T1- and T2-weighted sequences and a dynamic 3D T1 gradient echo sequence.

### The diffusion-weighted sequence

The diffusion sequence is evaluated as an efficient way to localize the area of suspicion by way of reduced water mobility secondary to increased cellular density, thereby appearing hyperintense on DWI. The sequence used is an axial 2D single-shot EPI with b factors 0 and 800, 2.5 mm isotropic voxel size, SENSE factor 3, SPAIR fat suppression, 4 averages and a total scan time of 5:23 min. Scanning is currently performed using the 7-channel SENSE Breast coil. Higher channel coils, such as 16-channel SENSE Breast coil, would allow higher SENSE factor for reduced distortion. The isotropic voxels allow for reformatting and MIP display in arbitrary planes.

### Results

The figure shows a 47-year old patient with a malignant lesion in the right breast visible on T1- and T2-weighted images. The lesion is also well depicted on the high b-value DWI axial image and the sagittal reformat of the low b-value.

DWI of the breast at 3.0T has clinical potential in the applications of lesion visualization in high-risk patient imaging, diagnostic follow-up and problem solving, as well as assessment of response in women undergoing neoadjuvant treatment.

