Iran J Radiol. 2017 May; Special issue(5):e48373. doi: 10.5812/iranjradiol.48373.

Published online 2017 April 13.

**Abstract**

# Basic and New Techniques for MRI of the Breast

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**Received** 2016 December 21; **Accepted** 2017 February 08.

**Abstract**

MRI of the breast has evolved as a non-invasive imaging modality and is ideally suited for several indications e.g. pre-operative staging and screening in women at increased risk for breast cancer. The widespread use opens also the discussion on over-diagnosis if only 20 - 30 out of 100 MRI - guided breast biopsies lead to the diagnosis of breast cancer. Thus MRI based strategies are needed to significantly reduce the number of unnecessary biopsies by decreasing over-diagnosis. In their development cancer have acquired several functional capabilities, which are defined as the hallmarks of cancer. For a deeper understanding of the hallmarks of cancer, and, consequently, improved personalized patient care, diagnostic tests must be multilayered and complex to identify the relevant underlying processes of cancer development and progression. Contrast-enhanced MRI (CE-MRI) is the most sensitive test for breast cancer detection, with a good specificity. Recently, several functional parameters on MRI have been assessed for breast imaging and this combined application is defined as multiparametric imaging. Multiparametric imaging with different functional MRI parameters (mpMRI) visualizes and quantifies the functional processes of cancer development and progression at multiple levels, and provides specific information about the hallmarks of cancer. MpMRI of the breast improves diagnostic accuracy in breast cancer, obviates unnecessary breast biopsies, and enables an improved assessment and prediction of response to neoadjuvant therapy. This lecture will provide a comprehensive overview of the current strategies and emerging techniques for mpMRI of the breast.

This is an abstract presented in the 33rd Iranian congress of radiology (ICR) and the 15th congress of Iranian radiographic science association (IRSA).