

# MR Mammography: How I Do It

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**1** (A) Positioning the patient on the breast coil (phased array breast coil; Siemens, Erlangen) with the integrated compression device, lateromedial. (B) Compression wheels for lateromedial immobilization of the breast.

In recent years, magnetic resonance tomography of the breast (MR Mammography) has become increasingly established as a diagnostic procedure to supplement conventional mammography and sonography.

The indications for MR mammography include:

- Clarification of recurrence of prior breast carcinoma
- Lymph node metastasis in the axilla when the primary tumor is unclear
- Preoperative staging for histologically certain breast carcinoma
- Clinical monitoring of breast carcinoma during neoadjuvant chemotherapy
- Unclear diagnostic findings from mammography and/or sonography

In terms of planning and performance, as well as dealing with the patient, MR mammography represents a particular challenge to the radiologic technologist.

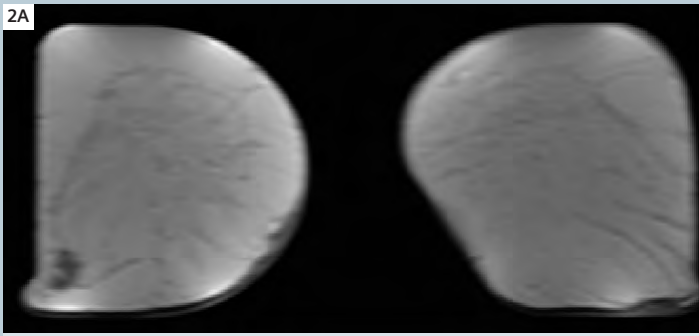
## Examination planning and patient briefing

When setting the appointment for MR mammography, premenopausal patients should be informed that the examination takes place in the 2<sup>nd</sup> or 3<sup>rd</sup> week of her cycle. Examinations in the 1<sup>st</sup> or 4<sup>th</sup> week of the menstrual cycle could result in increased and therefore distorted contrast agent enhancement due to hormones, making it much more difficult to determine the MR mammography diagnostic findings.

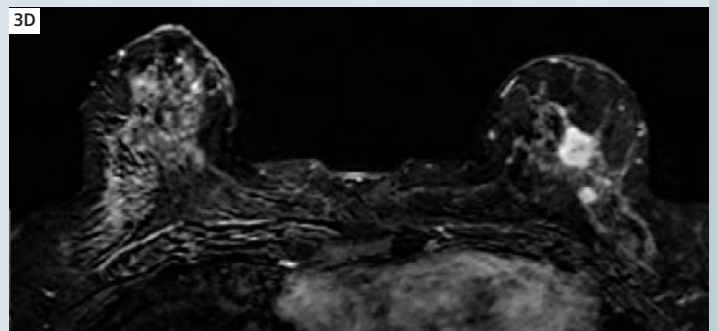
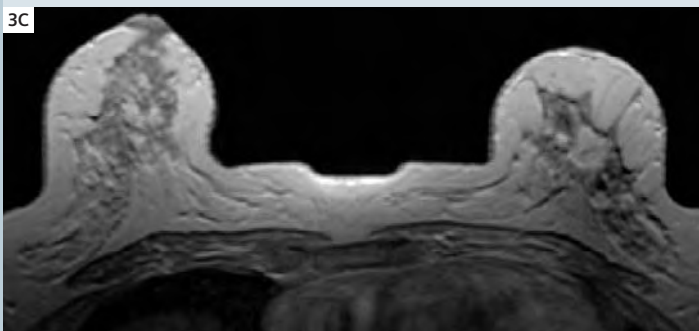
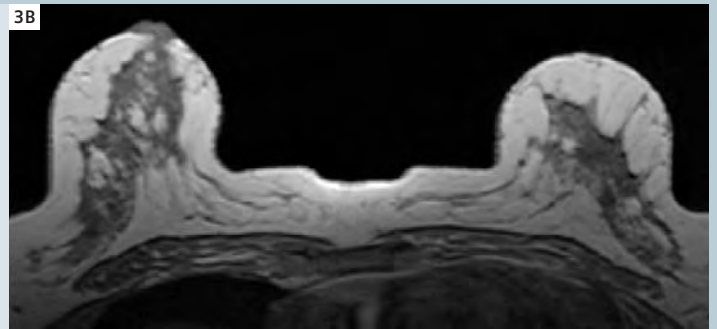
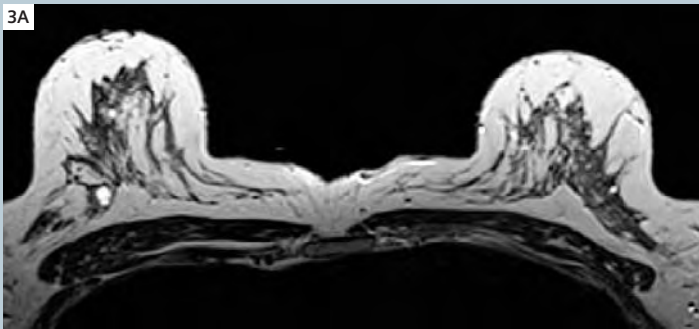
Every patient receives a questionnaire for recording prior breast diseases, genetic predisposition to breast cancer, and current problems with the breast.

## Patient preparation and positioning

For the examination, the patient receives a surgical gown (can be closed from the front) and pants to prevent possible MRT artifacts due to metal parts in their clothing, and to enable more comfortable positioning. Prior to beginning the examination, an intravenous port is inserted with an extension tube for mechanical contrast agent application. The patient should be provided with hearing protection such as headphones or ear plugs to keep noise



**2** Planning transverse slices using coronal and sagittal scouts.



**3** In the T2\_tse\_tra(a) and T1\_fl\_3d\_tra\_native (B) measurements, no indication of suspected findings. Only in the T1\_fl\_3d\_KM (C), and in subtraction (D), is it possible to make out a tumor manifestation in the outer, lower quadrant.

exposure to a minimum. In addition, the patient should be instructed to remain still during the examination to keep motion artifacts to a minimum. This includes gentle, shallow breathing during the examination.

For MR mammography, the patient is placed in prone position on the breast coil (Fig. 1). A cushion is placed under the head, the arms are positioned at the sides of the body. In exceptional cases for extremely obese patients, the arms can be folded at the head (disadvantage: the breast is not fully covered by the breast coil). If necessary, an additional OR cloth can be placed on the patient cushions. Using the integrated compression device (Fig. 1B), the breast is fixed lateromedially

in the breast coil (phased array breast coil; Siemens, Erlangen, Germany). A foam cushion placed under the ankle enables comfortable positioning.

### Examination sequence

First, planning of the transverse slices is performed using coronal and sagittal scouts (Fig. 2). The examination begins with a T2-weighted Turbo-Spin-Echo (TSE) sequence at a 2 mm slice thickness, for the display of structures containing water, such as cysts and edema. Then, 6 dynamic T1-weighted GRE (Flash 3D) sequences are performed. The slice thickness of the dynamic sequences is 2 mm, without gaps, lasting 2 minutes each. The first dynamic T1-weighted GRE sequence

is performed in native technique. One minute after the start of the second dynamic T1-weighted GRE sequence (and 3 minutes after the start of the dynamic sequences), cm is applied.

### Evaluation

After the examination, the dynamic sequences are subtracted: the post-cm sequences from the pre-cm sequences. As a result we obtain 5 subtraction sequences. In MR mammography, subtraction enables better visualization of breast lesions that have taken up cm.

\*WIP – Works in Progress. This information about this product is preliminary. The product is under development and not commercially available in the U.S., and its future availability cannot be ensured.