

Breast MRI

Medicare Rebate Information

Queensland X-Ray is pleased to advise that the Federal Government has approved new Medicare Rebates for MRI examinations of the breast, effective from 1st February 2009. The new Medicare rebate for an MRI scan of the breast is available to asymptomatic women under 50 who are at high risk of breast cancer. Strict criteria apply and full details are available on the medicare website or from our Breast MRI practices.

Breast Cancer

Breast cancer detection with MRI is based on enhancement of abnormal tissue as a result of tumour induced angiogenesis which causes an increase in the blood vessel density and increased gadolinium concentration. An MRI scan of the breast is both a morphological and a biological imaging test that is not affected by breast density unlike mammography. Queensland X-Ray has a state-of-the-art Breast MRI program with advanced hardware and CAD software. Breast MRI examinations are reported by our experienced and dedicated Radiologists who have a particular interest in women's imaging.

We also offer Breast MRI vacuum assisted biopsy and hookwire localisation at Greenslopes Private Hospital, for those lesions detected by MRI which cannot be found on retrospective targeted ultrasound or mammography.

For the majority of patients, mammography and breast ultrasound perform well, however there are some patients for whom further imaging with MRI is required. In particular, women who have very dense fibroglandular tissue in which the sensitivity of mammography is reduced, or where there is high clinical concern where mammograms and ultrasound have not been conclusive, and in women at high risk for breast cancer, e.g BRCA gene carriers, or those with a very strong family history.

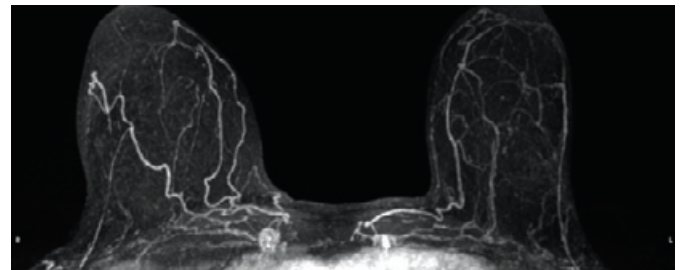


Figure 5: Breast MRI - 3D image, normal study.

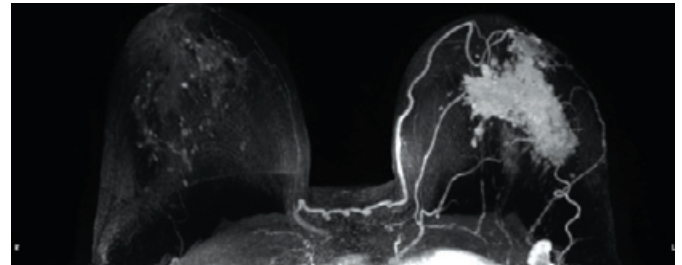


Figure 6: Breast MRI - 3D image showing mass in the left breast with abnormal lymph nodes in the axilla.

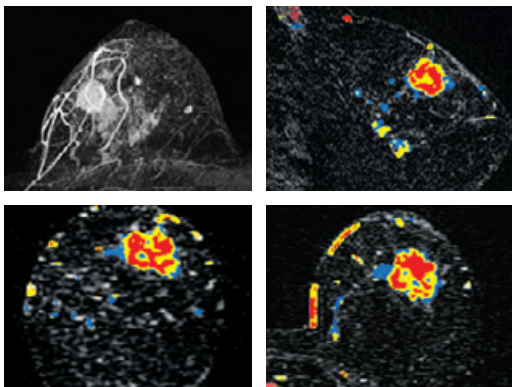


Figure 1, 2, 3 and 4: Breast MRI – an example of how cancer typically presents on MRI.

As the tumour enhances, it becomes high in signal intensity in the otherwise low signal intensity breast. The colour coding aids in detection and characterisation of areas that enhance. The presented images are 3D, sagittal, coronal and axial images of the left breast.

The American Cancer Society released the following statement in 2007:

“Based on the evidence from studies of MR screening high risk women and the limitation of Mammography and clinical exam alone, the ACS recommends the annual MR screening in conjunction with Mammography in women at significantly increased risk of breast cancer.”

(20% lifetime risk as determined by risk models such as available online at www.seemyrisk.com)

The suggested regime is breast MRI alternating with mammography and ultrasound at 6 month intervals.

Key Breast MRI Benefits

- Breast MRI sensitivity to detect cancer is in the order of 95%, with specificity with new techniques such as MR spectroscopy in the order of 80-85%. The high sensitivity of MRI can lead to benign proliferative breast tissue also showing avid enhancement in some women. In many cases retrospective targeted ultrasound or a 6 month MRI follow-up can clarify these findings. In certain cases, an MR-guided biopsy is needed.
- Breast MRI is able to detect more than 95% of high grade Ductal Carcinoma in Situ (DCIS) and 80% of low grade DCIS, compared to 50% for mammography for DCIS overall. It also detects the vast majority of Lobular Cancers, again at a much higher rate than mammography. Up to 40% of DCIS does not calcify and is not detectable on mammography, and often the full extent is underestimated on mammography.
- In 6% of patients with diagnosed ipsilateral breast cancer, MRI will detect cancer in the contralateral breast originally not evident on mammography and ultrasound.
- Breast MRI has been shown in overseas trials to be cost-effective for screening high-risk patients.
- Breast MRI may be very useful in assessing patients with implants for whom mammography is very difficult, and in the assessment of the integrity of implants/presence of rupture. Breast MRI is useful in assessing extent of lobular carcinoma which can be difficult to detect on mammography. MRI is the most accurate means of monitoring the response to neoadjuvant chemotherapy. MRI combined with mammography is considered the optimal method for early cancer detection in the high risk group. This has been recommended by the American Cancer Society and the National Institute for Clinical Excellence UK (NICE).

Case Study One

History – Patient scanned for investigation of new tender lump in the left upper inner quadrant, increasing in size over one month and not seen on imaging in 2008.

Diagnosis – Ring enhancing spiculated mass, biopsy proven to be invasive breast cancer.

Figure 7. T1 fat suppressed post contrast sagittal image of invasive breast cancer.

Figure 8. 3D reconstruction demonstrating vascularity of lesion.

Figure 9. Contrast enhancement kinematic graph of the invasive breast cancer showing rapid contrast uptake with a peak contrast enhancement of 220% and early washout, typical of cancer.

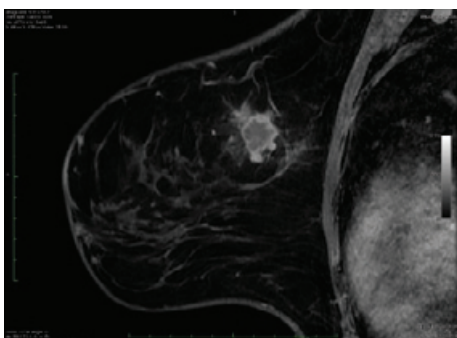


Figure 7

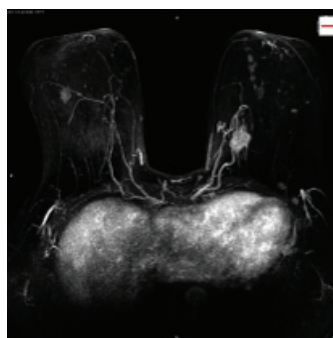


Figure 8

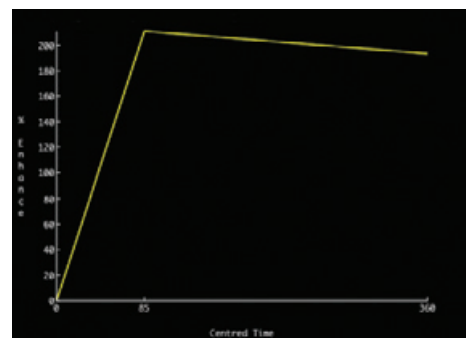


Figure 9

Case Study Two

History – Patient with a diagnosis of DCIS, scanned post lumpectomy with query for any residual disease in the right breast.

Diagnosis – Extensive pathological enhancement in the right breast surrounding the seroma cavity, indicative of high grade DCIS and invasive ductal carcinoma.

Figure 10. Parametric colour enhancement showing tumour outside the seroma.

Figure 11. 3D reconstruction demonstrating vascularity of lesion.

Figure 12. STIR axial image showing the seroma cavity, post surgery.

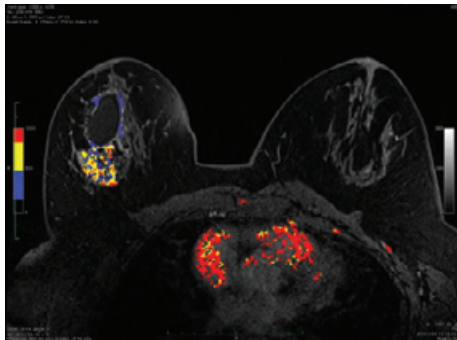


Figure 10

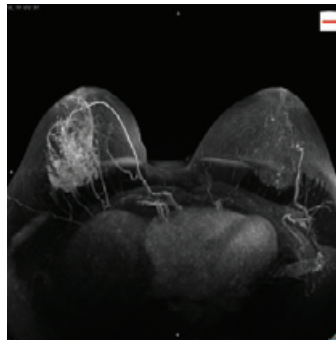


Figure 11

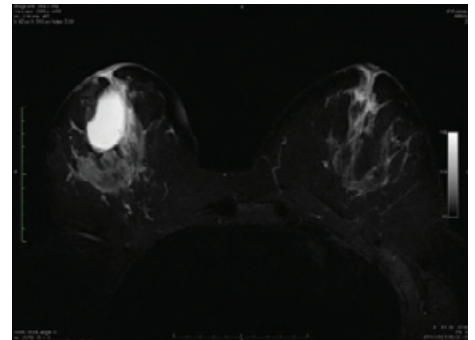


Figure 12

Case Study Three

History – Patient with strong family history of breast cancer, with left axillary swelling.

Diagnosis – Two spiculated enhancing lesions in the left breast, biopsy proven for invasive ductal carcinoma.

Figure 13. 3D reconstruction demonstrating vascularity of lesions.

Figure 14. Axial T1 fat suppressed dynamic scan depicting two enhancing lesions.

Figure 15. Contrast enhancement kinematic graph of the invasive ductal carcinoma showing rapid contrast uptake with a peak contrast enhancement of 230% and early washout, typical of cancer.



Figure 13

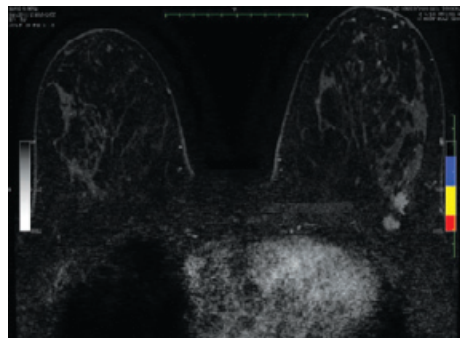


Figure 14

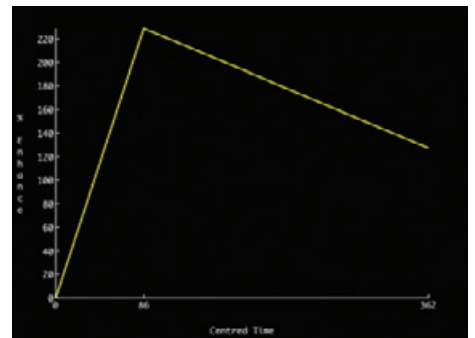


Figure 15

Breast MRI Trained Radiologists



Dr Neels Grobbelaar
MBChB, FCRAD, FRANZCR

Completed internship in 1994 at Pretoria Academic Hospital (South Africa) followed by one year as a medical officer at the Orthopaedics Department of 1-Military Hospital in

Pretoria. Registrar training completed from 1996-2000 in Radiology. He undertook an MRI Fellowship in Detroit, Michigan at the Henry Ford Hospital, before moving to Australia in 2001. He commenced with Castlereagh Imaging in 2001 and relocated to Queensland X-Ray in 2005. **Areas of special interest:** Musculoskeletal imaging, intervention, infant hip ultrasound, and women's imaging.



Dr Elizabeth Carter
MBBS, FRANZCR

Trained in Adelaide. Overseas experience includes UK Senior Registrar Cardiothoracic, MRI, Vascular Imaging, Southampton and St Thomas' Hospitals. MRI,

Vascular and Women's Imaging Poole and Bournemouth Hospitals. Commenced private practice in 1994, joining Queensland X-Ray in 1997. VMC Breast Screen Queensland.

Areas of special interest: Women's imaging, echocardiography, cardiothoracic and cardiovascular.



Dr Kerry McMahon
MBBS, FRANZCR

Trained at Royal Brisbane Hospital. Overseas experience includes Senior Registrar Post at Royal Infirmary, Edinburgh, predominantly in Women's Imaging and obtained

Fellowship at 'Sally Jobe Breast Centre', Denver Colorado (USA). Joined Queensland X-Ray in 1999 and is a visiting consultant to Breast Screen. **Areas of special interest:** Breast, obstetric and gynaecology imaging and bone mineral densitometry.



Dr Stephen Keller
MBBS, FRANZCR

Graduated from the University of Queensland in 1979 with M.B.B.S. (Honours).

Internship and two years of internal medicine training at the Royal Brisbane Hospital

followed by Radiology Registrar Post at the Princess Alexandra Hospital. He obtained FRANZCR in 1987. He commenced private practice with Queensland X-Ray in 1988 and is VMO to Breast Screen Queensland. **Areas of special interest:** Women's, musculoskeletal and chest imaging.



Dr Bronwyn Rogers
MBBS, FRANZCR

Radiology training at the Mater Public and Princess Alexandra Hospitals. Completed a Clinical Fellowship in Ultrasound at the Health Sciences Centre,

Winnipeg (Canada). Joined Queensland X-Ray in 1997 and is a visiting consultant to Breast Screen. **Areas of special interest:** Mammography, obstetric and gynaecology ultrasound and bone mineral densitometry.



Dr Robert Anderson
MBChB, FRANZCR

Graduated from Otago University in 1971. Radiological Registrar at Auckland Hospital 1974-76. Overseas experience includes

Asst. Professor of Radiology at the Montreal Childrens Hospital and McGill University, Canada and University of South Carolina, Charleston, USA. Specialist in Diagnostic Radiology and Nuclear Medicine with the Queensland Medical Board in 1994. Supervising Radiologist in MRI with Accreditation (RANZCR & HIC) received in 1999. Accreditation in Positron Emission Tomography in 2006. **Areas of special interest:** Paediatric Radiology, MRI and Correlative Imaging.

When to Refer for Breast MRI

1. For further evaluation in a patient with suspicious clinical or imaging finding, for whom mammography and breast ultrasound have been inconclusive/discordant.
2. For further evaluation in a patient with a current diagnosis of breast cancer:
 - To identify occult primary in the breast in a patient with axillary adenopathy.
 - To improve accuracy of extent of disease within the breast. To exclude contralateral synchronous breast cancer particularly with lobular histology.
 - To improve the prediction/assessment of response to therapy in a patient receiving chemotherapy prior to surgery.
3. As a screening tool in a patient at high genetic/familial risk for breast cancer.

Patient Eligibility

The new Medicare Rebate patient eligibility is based on the following:

- Strong family history of breast or ovarian cancer (i.e. 2 or more first or second degree relative less than 50)
- Presence of bone or soft tissue sarcomas;
- Ashkenazi Jewish ancestry; and
- Genetic testing demonstrating mutations in the BRCA genes.

Please note:

The full detailed list of eligibility criteria can be found from Medicare online.

Queensland X-Ray offers Medicare-eligible Breast MRI Studies at the following practices.

Greenslopes Private Hospital, Brisbane

Newdegate Street, Greenslopes
Ph: 07 3421 0444

Greenslopes also offers MRI-guided hook wire localisation and biopsy.

Mater Private Hospital Townsville

Fulham Road, Pimlico
Ph: 07 4759 2800

Queensland X-Ray also offers non-rebateable Breast MRI studies at the following practices.

Coorparoo

342 Old Cleveland Road, Coorparoo
Ph: 07 3456 3100

Mater Private Hospital Mackay

76 Willets Road, North Mackay
Ph: 07 4965 6200

St Vincent's Hospital

Scott Street, Toowoomba
Ph: 07 4659 4500

Cairns Private Hospital

Level 3 144 Lake Street,
Ph: 07 4046 7800

Southport

128 Queen Street, Southport
Ph: 07 5581 0900