MRI is a procedure that uses a magnet, radio waves, and a computer to make a series of detailed pictures of areas inside the body. This procedure is also called nuclear magnetic resonance imaging (NMRI). MRI does not use any x-rays. Breast MRI requires a high field system (minimum 1.5 Tesla magnet), a dedicated breast surface coil (breast images taken in a body scanner are inadequate) and intravenous gadolinium contrast. We currently do not have the dedicated breast coil and required software available in Livingston county.

Breast MRI is not recommended as a routine screening tool for all women. MRI of the breast is not a replacement for mammography or ultrasound imaging but rather a supplemental tool that has many important uses in supporting the care of the breast patient whether for benign or malignant (cancerous) disease processes, including:

1-SCREENING FOR WOMEN WITH A HIGH RISK FOR BREAST CANCER

For women at high risk for breast cancer, typically because of a strong family history, MRI may be an appropriate tool to screen for breast cancer. A strong family history is usually a mother or sister who has had breast cancer before age 50. It can also be aunts or cousins, including relatives who have had ovarian cancer. Our future mammograms in the Saint Joseph Mercy Health System will soon include a assessment of each patients lifetime risk of breast cancer and can help identify patients that may benefit from more diligent monitoring and possibly the need for screening MRI's in addition to yearly mammograms.

The American Cancer Society (ACS) recommends that all high-risk women — those with a greater than 20% lifetime risk of breast cancer — have a breast MRI and a mammogram every year. For most women, these combined screenings should start at age 30 and continue as long as the woman is in good health. According to ACS guidelines, high-risk women include those who:

- have a known BRCA1 or BRCA2 gene mutation
- have a first-degree relative (mother, father, brother, sister, or child) with a BRCA1 or BRCA2 gene mutation and have not had genetic testing themselves
- find out they have a lifetime risk of breast cancer of 20-25% or greater, according to risk assessment tools that are based mainly on family history
- had radiation therapy to the chest for another type of cancer, such as Hodgkin's disease, when they were between the ages of 10 and 30 years
- have a genetic disease such as Li-Fraumeni syndrome, Cowden syndrome, or Bannayan-Riley-Ruvalcaba syndrome, or have one of these syndromes in first-degree relatives

The American Cancer Society also recommends that women at moderately increased risk of breast cancer — those with a 15-20% lifetime risk — talk with their doctors about the possibility of adding breast MRI screening to their yearly mammogram. According to ACS guidelines, this includes women who:

- find out they have a lifetime risk of breast cancer of 15-20%, according to risk assessment tools based mainly on family history
- have a personal history of breast cancer, ductal carcinoma in situ (DCIS), lobular carcinoma in situ (LCIS), or abnormal breast cell changes such as atypical ductal hyperplasia or atypical lobular hyperplasia

2-DETERMINING THE EXTENT OF A NEWLY DIAGNOSED BREAST CANCER

After being diagnosed with breast cancer, a breast MRI may be performed in select patients to determine:

- how large the cancer is and whether it involves the underlying muscle
- if there are other cancers in the same breast and whether there is an unsuspected cancer in the opposite breast.
- if there are any abnormally large lymph nodes in the armpit, which can be a sign the cancer has spread to that site.

3-FURTHER EVALUATING HARD TO ASSESS ABNORMALITIES ON MAMMOGRAPHY

Sometimes an abnormality seen on a mammogram cannot be adequately evaluated by additional mammography and ultrasound alone. In these rare cases, MRI can be used to definitively determine if the abnormality needs biopsy or can safely be left alone.

4-EVALUATING LUMPECTOMY SITES FOLLOWING BREAST CANCER TREATMENT

Scarring and recurrent cancer can look identical on mammography and ultrasound. If there is a change in a lumpectomy scar by either mammography or on a physical exam, MRI can help determine whether the change is normal maturation of the scar or a recurrence of the cancer.

5-FOLLOWING PATIENTS AFTER RECEIVING *Neoadjuvant Chemotherapy*

In some cases, breast cancer will be treated with chemotherapy before it has been removed by surgery. In these cases, MRI is often used to monitor how well the

chemotherapy is working and to reevaluate the amount of tumor still present before the surgery is performed.

6-EVALUATING BREAST IMPLANTS

MRI is the best test for determining whether silicone implants have ruptured.