BMRI Working Group Report of the Canadian Society of Breast Imaging

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Summary:

Many clinical trials and studies have demonstrated the superior performance of Breast MRI (BMRI) compared to mammography alone or in combination with mammography in screening, not only of high-risk women (lifetime risk (LTR)of developing breast cancer ≥ 20%) (1,2) but also those with intermediate risk (LTR 15-20%) (3). The contribution of BMRI as a supplemental screening tool in women with average and intermediate risk of developing breast was included in the 2017 ACR recommendations (4).

The results of BMRI screening for average risk women (3), the DENSE trial first and second screening rounds (5,6) and the results of the ECOG 1141 trial (7) comparing Abbreviated MRI (A-MRI) to digital breast tomosynthesis (DBT) in women with dense breasts have shown a higher CDR with MRI (15.5-16.5/1000) (5,8) even when an abbreviated protocol is used (11.8/1000 compared to 4.8/1000 with DBT) (7). They have also shown that the interval cancer rate may decrease by 50% when BMRI is used as a supplemental tool in women with dense breasts (5) and that continued screening with BMRI improves the specificity (6).

The Canadian Society of Breast Imaging (CSBI) Breast Magnetic Resonance Imaging (MRI) Working Group was formed Jan. 1, 2020. The objectives were first to identify the barriers of using MRI for breast imaging across Canada and second, to plan strategies that could be used to overcome these barriers. Eight dedicated specialist breast radiologists from across Canada were invited to participate in the working

group for geographical representation. A series of bimonthly meetings were held to establish priorities, identify barriers to the use of BMRI, and plan information sources.

In addition, three distinct surveys were created, one for patients, second for MRI sites in Canada and a third for radiologists. A fourth patient survey will be summarized in a subsequent publication. This report will summarize the key findings of the surveys and provide recommendations for improving BMRI use in Canada.

The survey distributed to radiologists was intended to better understand the availability and daily practice of BMRI use across Canada. The survey was sent to all radiologists by the provincial radiology associations. This survey asked about the availability of BMRI, different indications (diagnostic versus screening) and BMRI quality control. The respondents represent the community of radiologists specialized in breast imaging and more specifically those reading BMRI in each province. We asked how many magnets there are at each site, how many BMRI are performed, and how many are read by each Radiologist. We enquired about the use of MRI for supplemental screening for dense breasts and abbreviated protocols.

When considering recommendations for BMRI, it is important to gather the patient's perspective on their understanding and acceptance of this exam. Understanding the willingness of patients to undergo MRI for breast cancer screening and identifying potential reasons for nonparticipation is important. It allows for informed decision making. Reasons for declining BMRI screening have been explored in studies such as the prospective international multicenter American College of Radiology Imaging Network (ACRIN) protocol 6666 (NCT00072501) (9) and Dense Tissue and Early Breast Neoplasm Screening (DENSE) clinical trials (NCT01315015) (10).

To assess awareness of Canadian women and their attitudes towards breast cancer screening, a survey specifically targeted at Canadian women was distributed. Unlike the ACRIN 6666 and DENSE trials, which collected reasons for nonparticipation in MRI screening from women who were enrolled in these clinical

trials, the survey in this current report was distributed to the general population as Google forms or popularly a Google survey. Google Forms is a survey administration software used as a market research tool in which respondents are internet users who answer study questions to access premium content on the web.

The breast cancer screening awareness survey that was developed for this report targeted Canadian women aged 35 to 65 years of age. The survey was made available in English and French with an aim to receive a total of 300 responses. The survey included questions to investigate awareness on topics related to breast density, breast cancer risk and whether patients would be willing to undergo MRI for breast cancer screening if it was available to them.

According to a 2019-2020 Canadian Medical Imaging Inventory report from the Canadian Agency for Drugs and Technologies in Health (CADTH)(11), there was total of 378 magnetic resonance imaging (MRI) units at 288 sites in Canada, up from 366 units at 261 sites reported in a 2017 CADTH report(12). Most of these MRI sites are in Quebec (n=91), Ontario (n=74), British Columbia (n=46), and Alberta (n=34) where there are 102, 124, 52 and 44 MRI scanners, respectively. Most of these scanners (80%) are 1.5 Tesla field strength.

A representative percentage of all MRI sites were surveyed to investigate the utilization of BMRI in radiology departments across Canada. There were 98 respondents out of 153 sites surveyed, which represents 34% (98/288) of all the MRI sites in Canada. We asked whether MRI is used for breast cancer screening, and whether they had the capability to perform MRI-guided biopsy on-site and were interested in implementing and/or receiving more information about abbreviated protocols for BMRI.

Summary of the findings of the three surveys includes:

1- Access to BMRI in Canada is very limited:

- Most facilities have only one MRI machine
- Most facilities perform between 11-20 BMRIs per week
- The proportion of all MRI dedicated to Breast screening is 3.3% (316/9462 total MRI exams per week)
- The proportion of MRI dedicated to breast screening per week across the country including sites without screening programs is 1.8% (316/17744 total MRI exams per week)
- The average length of time scheduled for BMRI was 40 minutes (mean scheduling time 39 minutes, SD 10 minutes).
- There is a shortage of trained breast radiologists to read BMRI
- Most BMRIs are dedicated to pre-surgical staging, follow up of neoadjuvant treatment and screening high risk women. A minority is dedicated to screening intermediate risk women.
- The majority (78%) of centers are interested in receiving more information about Abbreviated/shortened BMRI protocols and implementing them.

2**. Attitudes to supplemental screening with BMRI:**

- Most radiologists (72%) do not recommend BMRI as a supplemental screening tool in women with dense breasts
- Respondents to google survey, of any gender, are highly aware of different cancer risks between women and of breast density as a risk factor.

- The majority (62%) of these respondents are aware of additional work up that BMRI may incur and only a minority (15%) are reluctant to undergo BMRI given this risk of additional tests.
- The majority (72%) of these respondents are willing to undergo BMRI as a supplemental screening tool, if MRI is available.

3. **Approaches to quality assessment of BMRI:**

- Most radiologists (79%) do not utilize abbreviated BMRI protocols
- Most radiologists (73%) do not double read BMRIs.
- Most radiologists (63%) are not aware of the numbers of BMRI they have read per year or of their assigned BI-RADS categories for MRI, including BI-RADS 3 category.

Recommendations:

While aware of the limited availability of MRI machines in Canadian provinces and territories and the limited capacity for dedicated BMRI and in an effort to promote BMRI not only as a diagnostic tool but also as a supplemental screening tool in women for whom the performance of mammography is suboptimal, the CSBI BMRI working group have these recommendations:

1- Raise awareness of the contribution of BMRI as a supplemental tool not only in diagnostic setting or screening high risk women but also in screening of women with dense breasts, among family physicians and radiologists during their annual meetings.
2- Advocate for increased access to dedicated BMRI with the administration of each facility
3- Encourage academic centers to encourage radiologists and technologists willing to train to read and perform BMRIs
4- Set the minimum number of 150 BMRI to be read by radiologists within 3 consecutive years to maintain competence or begin to interpret BMRI

5- Encourage radiologists to audit their practice to maintain quality and limit the unnecessary benign recalls and unnecessary biopsies.
6- Encourage radiologists to perform shortened BMRI as a supplemental screening tool thus
    a. Optimizing the time scheduled for BMRI
    b. Increase the number of BMRI to be performed per week to improve its availability for more women
7- Encourage technologists to train for BMRI positioning and optimal performance

Summary:

There is limited availability of magnetic resonance imaging (MRI) machines to be utilized in humans in Canadian provinces and territories. There is scientific evidence of the limited capacity for dedicated BMRI scanners. However, to promote BMRI not only as a diagnostic tool but also as a supplemental screening tool in women for whom the performance of mammography is suboptimal, the Canadian Society of Breast Imaging (CSBI) BMRI working group have these recommendations. There is responsibility and opportunity at the individual radiologist level, the institutional level and the radiology organization level:

1. Individual Radiologists

- Advocate for increased access to dedicated BMRI slots of time.
- Audit their practice to maintain quality and limit unnecessary indications, as well minimize benign recalls and MRI-guided biopsies that could be guided by other imaging modalities (e.g. ultrasound).
- Adopt CAR guidelines approved MRI protocols that decrease the magnet time for patients undergoing BMRI without quality prejudice (e.g. shortened, abridged, abbreviated protocols).

2. Institutions

Adopt quality metrics of radiologist training in BMRI interpretation and biopsies.

Support technologist training in BMRI positioning and performance as part of the quality initiatives institutional packages.

Increase the number of BMRI performed per day or week including benchmarks with recognized institutions.

3. Radiology Organizations

Raise awareness of the contribution of BMRI as a valuable tool not only in diagnostic setting or screening high risk women but also in screening of women with dense breasts(ultrasound or contrast-enhanced mammography where MRI is not available), among referring physicians and radiologists during their annual meetings.

Require radiologists read during clinical practice a minimum of 150 BMRI in Canada within 3 consecutive years to maintain competence.

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