BREAST DISEASE GUIDELINE

BREAST DISEASE EXPERT PANEL MEMBERS

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Canadian Association of Radiologists
L'Association canadienne des radiologistes

Contents

ABBREVIATIONS

ACR	American College of Radiology
AGREE-II	Appraisal of Guidelines for Research & Evaluation Instrument
AI	Artificial Intelligence
CAR	Canadian Association of Radiologists
CT	Computed Tomography
DBT	Digital Breast Tomosynthesis
EP	Expert Panel
EtD	Evidence to Decision
GRADE	Grading of Recommendations Assessment, Development and Evaluation
MRI	Magnetic Resonance Imaging
NICE	National Institute for Health and Care Excellence
RCR	Royal College of Radiologists
US	Ultrasound

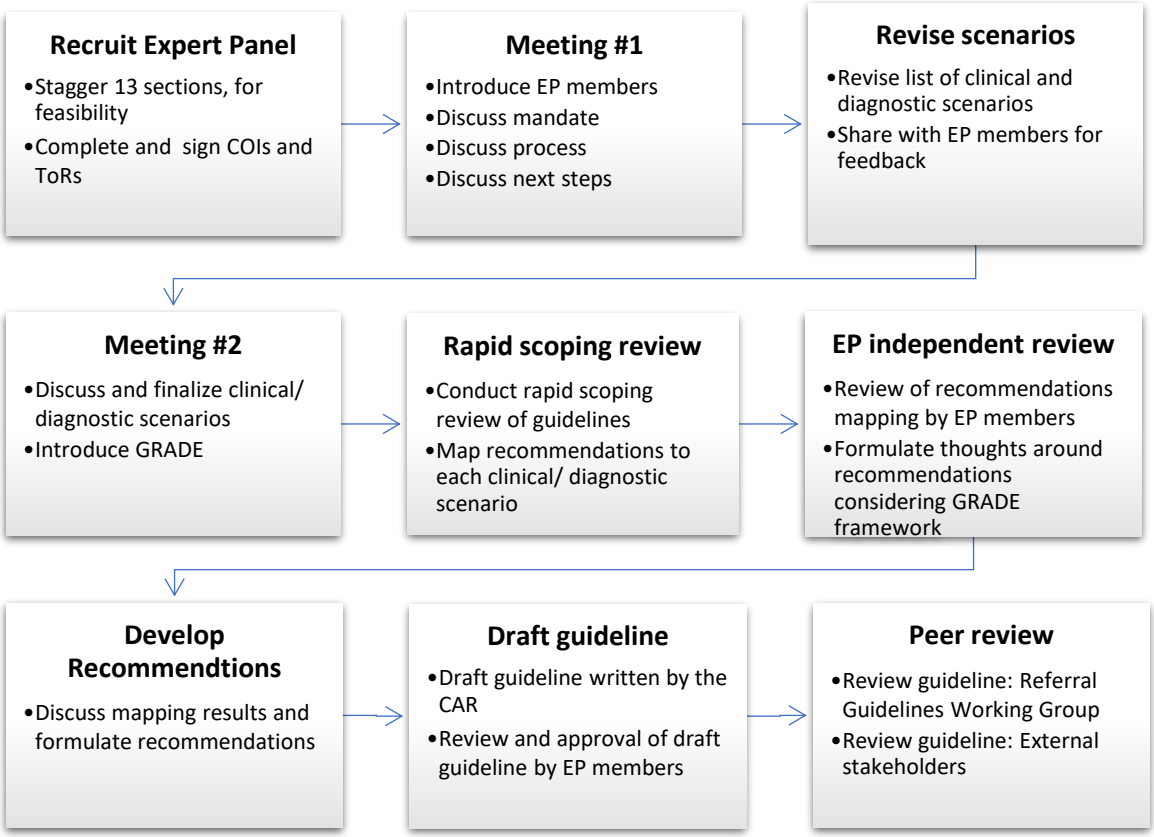
INTRODUCTION

The Canadian Association of Radiologists (CAR) last published their diagnostic imaging referral recommendations in 2012. These recommendations were made up of 13 sections, one of which was Breast Disease. In 2020, the CAR, funded by the Canadian Medical Association (CMA), developed a plan to create new CAR diagnostic imaging referral recommendation using a rapid guideline development approach. The general guideline development process is presented in **Figure 1**.

The project mandate is to develop a comprehensive set of evidence-based diagnostic imaging referral guidelines suited for integration into clinical decision support (CDS) systems.

An Expert Panel (EP) made up of breast disease radiologists, referring clinicians, a patient representative, and an evidence review/ guideline methodologist from across Canada met over a series of 10 meetings from November 2021 to July 2022.

The eight clinical/diagnostic scenarios in the 2012 CAR recommendations were used as the starting point for discussions. After a review and update of these scenarios, a list of 23 clinical/diagnostic scenarios was created, which informed the systematic search strategy and systematic rapid scoping review.



Abbreviations: CAR = Canadian Association of Radiologists; **COI** = Conflict of Interest; **EP** = Expert Panel; **GRADE** = Grading of Recommendations Assessment, Development and Evaluation; **ToR** = Terms of Reference

Figure 1 – Guideline Development Process

WHO ARE THESE RECOMMENDATIONS FOR?

These recommendations are primarily for referring clinicians (e.g., physicians, nurse practitioners); however, they may also be used by radiologists, patients, and/or patient representatives.

Scope

The guideline recommendations are to assist the choice of imaging modality in situations where it is felt clinically necessary to obtain imaging. Imaging should not delay definitive management.

DISCLAIMER

These recommendations are not intended to stand alone. Medical care should be based on evidence, a clinician's expert judgment, the patient's circumstances, values, and preferences, and resource availability.

We recognize that not all imaging modalities are available in all treating locations, particularly in rural or remote areas of Canada. Decisions about whether to transport a patient for recommended imaging or perform alternate imaging locally or serial clinical examination/observation, etc. can be difficult, and should consider the expected benefits of recommended imaging, risks of transport, patient preference, and other factors.

METHODS OF THE RAPID SCOPING REVIEW

The conduct of the systematic rapid scoping review was guided by empirical review guidance: the Joanna Briggs Institute scoping review guidance [1], the Cochrane Handbook [2], and the rapid review interim guidance from the Cochrane Rapid Review Methods Group [3].

Inclusion Criteria

Publications were included if they met the following criteria:

Study design: Guidelines providing diagnostic imaging recommendations for one or more of the clinical/diagnostic scenarios identified by the Breast Disease EP. Guidelines also had to be produced using three criteria in the AGREE-II assessment tool [4]:

(1) Systematic methods were used to search for evidence: Searched and named at least one electronic database using an electronic search strategy (e.g., Medline, Embase, PubMed, CENTRAL);
(2) The criteria for selecting the evidence are clearly described: Described a formal process for study selection; AND reported the inclusion and exclusion criteria; OR if it is based on a systematic review, even if it does not provide explicit methods; and
(3) The strengths and limitations of the body of evidence are clearly described: Performed critical appraisal on the included studies (e.g., risk of bias, describe study limitations); OR if it is based on a systematic review and GRADE is performed.

Interventions: We included any diagnostic imaging modality (e.g., mammography, digital breast tomosynthesis [DBT], radiograph [XR], magnetic resonance imaging [MRI], computed tomography [CT], ultrasound [US]).

Date of publication: We included guidelines that were published or updated in 2016 onward, to identify the most recent guidelines, which would contain the most recently published primary studies, and for feasibility.

Language of publication: English, for feasibility.

Search

An experienced information specialist, in consultation with the guideline methodologist, developed a systematic search strategy (**Appendix 1**) using the list of clinical/diagnostic scenarios identified by the Breast Disease EP members. The search was run in Medline and

Embase on January 7, 2022. The search was limited to publications from 2016 onward to capture the most recent guidelines, and for feasibility. There was no language restriction in the search. Supplemental searching included searching the following national radiology and/or guideline groups: the American College of Radiology (ACR), the National Institute for Health and Care Excellence (NICE), and the Royal College of Radiologists (RCR) 8th Edition (2017).

Title/abstract screening

Using a standardized form in DistillerSR, an online systematic review software [5], one reviewer screened the records in prioritized order, using the artificial intelligence (AI) re-ranking tool in DistillerSR. A stop-screening approach was implemented once 95% of the predicted included studies were identified [6,7]. The AI reviewer tool in DistillerSR excluded the remaining records. The AI audit tool was run to identify any records that were excluded that had high score for inclusion (i.e., a prediction score of 0.85 and above). These records were rescreened to ensure that they should have been excluded. A second reviewer verified a random sample of 10% of the included records and 20% of the excluded records, without knowledge of the inclusion or exclusion decision by the first reviewer. Any disagreements were resolved through discussion. The AI audit tool was rerun, and any records with a prediction score of ≥0.85 were rescreened.

Full text screening

Using a standardized form in DistillerSR, one reviewer evaluated the full texts of the guidelines against the eligibility criteria described above in the Inclusion Criteria.

Mapping

One senior reviewer extracted recommendations from all included guidelines and presented these in tabular form for each clinical/diagnostic scenario. The senior reviewer produced a synopsis (i.e., a condensed version of the evidence table) for each clinical/ diagnostic scenario based on the information in the evidence tables. These synopses highlighted the main recommendations across guidelines, with a focus on guidelines that used GRADE, and highlighted any discordant recommendations. EP members used these to help guide discussion when formulating the recommendations.

Critical appraisal

Each guideline was assessed for the level of quality using the AGREE-II instrument [4]. This was performed by one reviewer with a quality control check on a random sample of 10% of the guidelines.

FORMULATING RECOMMENDATIONS

Over a series of eight virtual meetings (April to July 2022), the Expert Panel members discussed each of the clinical scenarios using the information in the synopses as a guide. When required, the full evidence tables (**Appendix 2**) were consulted for additional information. During these discussions, there were modifications to the list of clinical/diagnostic scenarios by merging one with another. This resulted in a final list of 20 clinical/diagnostic scenarios.

NOTE: Details have been removed from Appendix 2 to comply with copyright protection. For additional information on these recommendations, please access the full publications.

The focus of these recommendations was to provide the recommendation for the initial imaging modality, for the next imaging modality or an alternative to the first imaging modality, in situations where the first imaging modality is negative, indeterminate, may not be available, or if additional imaging is required.

Specifying contrast protocols

The recommendations do not specify when contrast should or should not be used, as this decision may vary based on clinical presentation, regional practice preferences, preference of the referring clinician, radiologist and the patient, and resource availability.

Grading of Recommendations Assessment, Development and Evaluation

The Grading of Recommendations Assessment, Development and Evaluation (GRADE) for Guidelines framework [8,9] was used as a guide to determine the strength (i.e., strong, conditional) and direction (i.e., for, against) of the recommendation. As the GRADE methodology requires an Evidence to Decision (EtD) framework for each recommendation, this would not have been feasible as:

(i) We used recommendations from existing guidelines as our evidence base, thereby not allowing for full assessment of each outcome within the primary studies, including the five GRADE domains to evaluate the certainty of the evidence: risk of bias, indirectness, imprecision, inconsistency, and publication bias [10]. Therefore, this information was inferred by the level and strength of the evidence provided in the included guidelines.

(ii) We covered 20 clinical/diagnostic scenarios in the Breast Disease section, which could have included several diagnostic imaging modality comparisons. This would have resulted in a minimum of 20 EtD frameworks, but realistically many more, as we would have had to create an EtD for each comparison (e.g., mammogram vs MRI, digital breast tomosynthesis vs MRI, mammogram vs US) within each clinical/diagnostic scenario.

Therefore, in addition to the diagnostic imaging recommendations presented by each included guideline, and the clinical expertise of the EP members, additional criteria were considered specific to the Canadian healthcare context:

- Certainty of the evidence (as presented in the included guidelines)
- Consideration of benefits and harms (e.g., ionizing radiation exposure)
- Values and preferences
- Equity, accessibility, and feasibility
- Resource use and costs

The strength and direction of the recommendations are represented by arrow directions and colours. Using GRADE as a guide [8], these can be interpreted as:

- **Strong recommendation ("recommend"), for (↑↑)**: All or almost all informed people would want/recommend this intervention and only a small proportion would not. If this intervention is not offered, the patient or patient representative should request a discussion.
- **Conditional recommendation ("suggest"), for (↑)**: Most informed people would choose/recommend this intervention, but a substantial number would not. This may be conditional upon patient values and preferences, the resources available or the setting in which the intervention will be implemented.
- **Conditional recommendation ("suggest"), against (↓)**: Most informed people would not choose/recommend this intervention, but a substantial number would. This may be conditional upon patient values and preferences, the resources available or the setting in which the intervention will be implemented.
- **Strong recommendation ("recommend"), against (↓↓)**: All or almost all informed

people would not want/recommend this intervention, but a small proportion would.

When there were no guidelines to support recommendations, the EP formulated recommendations based on their clinical expertise while considering values and preferences, resources, cost, equity, and accessibility. These recommendations are denoted with (EP consensus).

The recommendations for each clinical/ diagnostic scenario are presented below, with reference to the guidelines that were included for that scenario. Recommendations are also summarized in tabular form in **Appendix 3**.

Sex and gender in recommendations

As sex differences influence cancer susceptibility at the genetic and molecular levels and sex hormones affect the development of different cancers [11], several recommendations in this guideline are sex (biologically) specific. For this reason, where appropriate, the terms female and male are used in these recommendations to apply to the individuals who would have been assigned a sex at birth of either male or female.

INCLUDED GUIDELINES

A total of 2168 records were identified through the electronic database. After reviewing 882 records, the AI reviewer excluded the remaining records (n=1286), as 95% of the predicted included records had been identified and the likelihood for inclusion of the remaining records was low (highest remaining prediction score of 7.8%). A second reviewer screened a set of randomly selected records (n=475) for verification (~10% of included and 20% of excluded records). Among these, there were three conflicts, all between the two human screeners. These conflicts were resolved through discussion. An additional three records were added from the supplemental searching. The full text for one record was not retrievable, and 12 records were non-English publications (**Appendix 4**). Among the remaining 117 full texts that were screened for eligibility, six were not guidelines providing recommendations for breast disease imaging, 48 did not use systematic methods or sufficiently describe the methods used in the formulation of the guideline, and 15 were excluded for 'other' reasons. A list of excluded records with reasons is available upon request. Recommendations from 30 guidelines (plus five companion papers) were included (**Figure 2 – PRISMA flow diagram**).

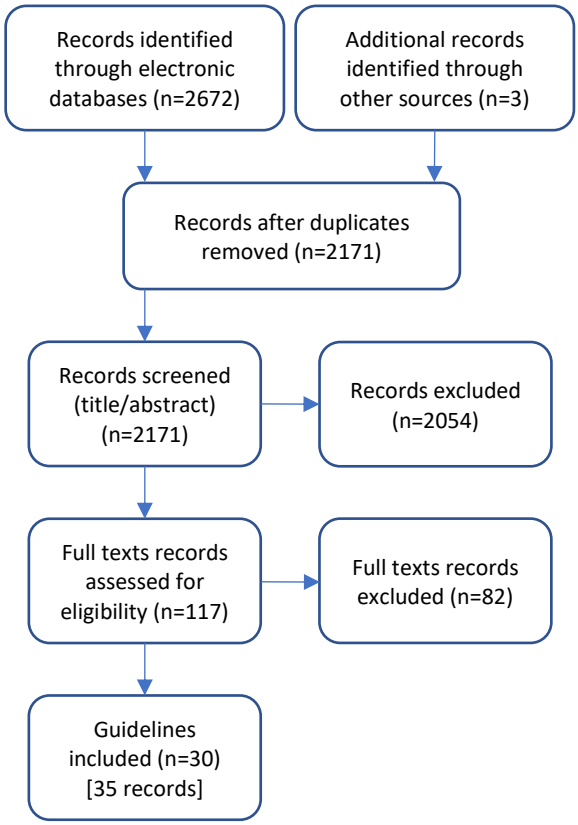


Figure 2 - PRISMA flow diagram

The number of guidelines included per clinical/diagnostic scenario ranged from zero to 17. Where available, the certainty of the evidence and/or strength of the recommendations are highlighted to provide a sense of the certainty of the evidence of the included primary studies (**Appendix 2**).

Most guidelines were rated as moderate or high quality, using the AGREE-II tool (**Appendix 5**). Often, reasons for rating an item down were due to a lack of reporting.

LIMITATIONS OF THE RAPID SCOPING REVIEW

As the unit of inclusion for the rapid scoping review was guidelines, the recommendations were extracted as presented in the guidelines. We also extracted the level/certainty of the evidence based on the criteria presented in the completed guidelines. There were several tools/methods used to assess the level/certainty of the evidence, for example GRADE [10], the Oxford Centre for Evidence-based Medicine 2009 and 2011 [12,13], Level of Appropriateness (American College of Radiologists), consensus, or an adaptation/ modification of one or more methods. For feasibility, primary studies were not reviewed, and the level/certainty of the evidence was taken at face value from the guideline.

IONIZING RADIATION EXPOSURE

We have elected to not include any effective dose values (mSv), related metrics, or qualitative descriptors of radiation risk (e.g., symbol, risk level, approximate equivalent background radiation, lifetime additional risk of cancer induction/exam) for several reasons:

1) The Expert Panel members have considered the risks of ionizing radiation (i.e., GRADE for Guidelines benefits and harms) when formulating the recommendations.
2) The levels of ionizing radiation in modern medical imaging equipment should not unduly influence patient decision-making. The anticipated benefits of imaging to the patient, if a test is clinically indicated are likely to outweigh any potential small risks [14].
3) Per the following points, effective dose values and related metrics such as equivalent background radiation have very large uncertainties, and their utility is thus limited:
    - There is uncertainty in the relative values of the effective dose for a reference patient with variation in the standard error [15];
    - Effective doses are measured using reference phantoms with population, age and sex-averaged tissue weighting factors [15], therefore these should not be considered as the doses received by specific individuals;
    - The publications providing data used to estimate the effective dose per scan (e.g., International Commission on Radiological Protection (ICRP) 1990 [16], 2007 [17]) are occasionally updated and may impact the effective dose values;
    - There is variation in the average dose from natural background radiation by geographic location. For example, in Canada, the average is 1.8 mSv/year, which ranges from 1.3 mSv/year in Vancouver to 4.1 mSv/year in Winnipeg [18]; and
    - There are variables around the equipment (e.g., age) and facility (e.g., protocol) that may impact the actual amount of ionizing radiation exposure used for any particular exam.

EXTERNAL REVIEW

This guideline and its recommendations have been externally reviewed by the CAR Diagnostic Imaging Referral Guidelines Working Group (**Box 1**), and other external peer-reviewers: Jackie Elliott (Community Family Physician, NL), David Lim (Breast Surgical Oncologist, ON), Colin Mar

(Radiologist, BC), Dr. Melina Wu (GP Oncology, ON).

FUTURE RESEARCH IN THIS AREA

This guideline will be updated upon the emergence of new evidence that may change the validity of the recommendations.

We plan on developing Patient Friendly Summaries for some of the clinical/diagnostic scenarios covered in this guideline. The selection of scenarios will be dependent on a prioritization exercise, as well as funding. These summaries will be made available on the CAR website (www.car.ca).

Box 1. CAR Diagnostic Imaging Referral Guideline Working Group Members

Ryan Margau (co-chair), North York General Hospital, ON
Paul Pageau (co-chair), The Ottawa Hospital, ON

Other members listed alphabetically:
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Noel Corser, Hinton Medical Clinic, AB
Nicolas Dea, Vancouver Spine Surgery Institute, BC
Naila Kassam, Western University, Department of Family Medicine, ON
Edmund Kwok, University of Ottawa, Faculty of Medicine, Department of Emergency Medicine, ON
Cathy MacLean, University of Saskatchewan, Department of Academic Family Medicine, SK
Erin Sarrazin, Nurse Practitioner Association of Canada, NS
Charlotte Yong-Hing, BC Cancer, Vancouver, BC
Kaitlin Zaki-Metias, Trinity Health Oakland Hospital, USA

Italicized name is a WG member who was also a member of the Breast Disease Expert Panel.

BREAST DISEASE CLINICAL/DIAGNOSTIC SCENARIOS

RECOMMENDATIONS

These recommendations are not intended to stand alone. Medical care should be based on evidence, a clinician's expert judgment, the patient's circumstances, values, and preferences, and resource availability.

We recognize that not all imaging modalities are available in all locations, particularly in rural or remote areas of Canada. Decisions about whether to recommend that a patient travel for recommended imaging or perform alternate imaging locally can be difficult, and should consider the expected benefits of recommended imaging, risks of travel, patient preference, and other factors. This guideline is based on evidence related to diagnostic imaging tests only, not the clinical management of a patient.

As discussed in the 'Sex and gender in recommendations' section, where appropriate, the terms female and male are used in these recommendations to apply to the individuals who would have been assigned a sex at birth of either male or female.

B01. Average risk screening

B01A. Screening females at average risk of breast cancer

Recommendations

These recommendations apply for screening females at average risk of breast cancer with or without breast implants.

1. In females younger than 40 years old, at average risk of breast cancer, we recommend **against routine mammography** screening (↓↓).
2. In females 40 to 49 years of age, at average risk of breast cancer, we suggest **annual mammography/digital breast tomosynthesis** screening (↑).

   The age to begin screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, and patient preference. If the patient requests screening after this discussion, screening should be offered.

3. In females 50 years of age and older, at average risk of breast cancer, we recommend **mammography/digital breast tomosynthesis** screening every one to two years (↑↑).

   The frequency of screening and decision to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.

4. In females undergoing screening with mammographically confirmed extremely dense breast tissue (i.e., ACR category D), we suggest **supplementary imaging** (↑).

   The supplemental screening modality may vary based on regional practice preferences and resource availability.

↳ **4.1** In females with mammographically confirmed ACR category C dense breast tissue, we suggest **supplementary imaging**, depending on capacity constraints (↑).

The capacity for supplementary screening may vary between provinces and between regions within a province.

Recommendations from 17 guidelines were used during the discussions and formulation of these recommendations: the 2012 CAR recommendations [19], the 2017 American College of Obstetricians and Gynecologists (ACOG) guideline on breast cancer risk assessment and screening in average risk women [20,21], the 2019 ACP guideline on breast cancer screening [22,23], the ACR and Society of Breast Imaging 2021 guideline [24], the 2017 ACR Appropriateness Criteria® guideline on breast cancer screening [25], the 2021 ACR Appropriateness Criteria® guideline on supplemental breast cancer screening based on breast density [26], the ACR Appropriateness Criteria® 2018 guideline on breast imaging of pregnant and lactating women [27], the 2018 Brazilian guideline for early detection of breast cancer [28], the 2017 Brazilian guideline on breast cancer screening [29], the 2018 Canadian Task Force for Preventive Health Care guideline on breast cancer screening [30], the 2020 European breast guideline [31], the 2021 EUSOMA/SIOG guideline on management of older patients with breast cancer [32], the 2018 German guideline on the screening, diagnosis, treatment, and follow-up of breast cancer [33,34], the 2016 Japanese guideline for breast cancer screening [35], the RCR iRefer 2017 guideline [36], the 2021 Tunisian guideline on breast cancer screening [37], and the 2016 USPSTF guidelines on screening for breast cancer [38–40] (**Appendix 2: Table B01A**).

B01B. Trans people at average risk of breast cancer

Recommendations

1. In transmasculine people under 40 years of age (with or without bilateral mastectomies) and in transfeminine individuals with no or < 5 years of hormone use, at average risk of breast cancer, we recommend **against routine mammography/digital breast tomosynthesis screening** (↓↓).
2. In transmasculine people at average risk of breast cancer, aged 40 to 49 years of age, who have not undergone bilateral mastectomies, we suggest **annual mammography/ digital breast tomosynthesis** screening (↑).

   The age to begin screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, and patient preference. If the patient requests screening after this discussion, screening should be offered.

3. In transmasculine people at average risk of breast cancer, aged 50 years and older, who have not undergone bilateral mastectomies, we recommend **mammography/digital breast tomosynthesis** screening every one to two years (↑↑).

   The frequency of screening and decision to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.

4. In transfeminine people at average risk of breast cancer with or without breast implants, aged 40 to 49 years of age, with past or current hormone use for ≥ 5 years, we suggest **annual mammography/digital breast tomosynthesis** screening (↑).

The age to begin screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, and patient preference. If the patient requests screening after this discussion, screening should be offered.

5. In transfeminine people at average risk of breast cancer with or without breast implants, aged 50 years and older, with past or current hormone use for ≥ 5 years, we suggest **mammography/digital breast tomosynthesis** screening every one to two years (↑).

The frequency of screening and decision to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.

Recommendations from one guideline were used during the discussions and formulation of these recommendations: the ACR Appropriateness Criteria® 2021 guideline on Transgender Breast Cancer Screening [41] (**Appendix 2: Table B01B**).

B02. High-risk screening

B02A. Screening females at increased risk of breast cancer

Recommendations

These recommendations apply for screening females at increased risk of breast cancer with or without breast implants.

1. In females at high risk of breast cancer due to prior chest wall irradiation between the ages of 10 to 30 years, we recommend **annual mammography/digital breast tomosynthesis and MRI** screening starting 8 years after chest irradiation, but not before 25 years of age (↑↑).

   ↳ **1.1** If MRI is not tolerated, contraindicated, or unavailable, we suggest **US** as an alternative imaging technique (↑).

The decision to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.

2. In females with BRCA gene mutations, we recommend **annual mammography/digital breast tomosynthesis and MRI** screening, starting between the ages of 25 and 30 years (↑↑).

   ↳ **2.1** If MRI is not tolerated, contraindicated, or unavailable, we suggest **US** as an alternative imaging technique (↑).

The decision to initiate and to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.

3. The role of screening in females with other high-risk gene mutations is an evolving science and further research is required to guide recommendations in this field. Any decision for screening should be made through shared decision making between the physician and the patient (EP consensus).
4. In females with lifetime risk of ≥20% (based on risk assessment tool), we suggest **annual mammography/digital breast tomosynthesis and supplementary screening**, preferably with **MRI**, starting between the ages of 25 and 30 years (↑).

> *The supplemental screening modality may vary based on regional practice preferences and resource availability.*
>
> *The decision to initiate and to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.*

Recommendations from eight guidelines were used during the discussions and formulation of these recommendations: the 2017 ACR Appropriateness Criteria® guideline on breast cancer screening [25], the 2021 ACR Appropriateness Criteria® guideline on supplemental breast cancer screening based on breast density [26], the 2017 Brazilian guideline on breast cancer screening [29], the 2018 German guideline on the screening, diagnosis, treatment, and follow-up of breast cancer [33,34], the 2017 RCR iRefer guideline [36], the 2018 ACR Appropriateness Criteria® guideline on screening in women at higher than average risk [42], the 2020 International Guidelines on Harmonization Group for Female Survivors of Childhood, Adolescent, and Young Adult Cancer [43], and the 2019 NICE guideline on familial breast cancer [44] (**Appendix 2: Table B02A**).

B02B. Trans people at increased risk of breast cancer

Recommendations

1. In transfeminine people at high risk for breast cancer✧, aged 30 years and older, with past or current hormone use ≥ 5 years, guideline recommendations are identical to those presented in B02A.
2. In transmasculine people at high risk for breast cancer✧, aged 30 years and older, who have not undergone bilateral mastectomies, guideline recommendations are identical to those presented in B02A.

✧*As presented in B02A*

Recommendations from two guidelines were used during the discussions and formulation of these recommendations: the ACR Appropriateness Criteria® 2021 guideline on supplemental breast cancer screening based on breast density [26], and the 2021 ACR Appropriateness Criteria® guideline on transgender breast cancer Screening [41] (**Appendix 2: Table B02B**).

B02C. Pregnant/lactating people at increased risk of breast cancer

Recommendations

These recommendations apply for screening people at increased risk of breast cancer with or without breast implants.

1. In pregnant people at high risk of breast cancer who choose to continue screening, we suggest **mammography/digital breast tomosynthesis✧ screening and supplemental screening with US✧✧** (↑).

2. In lactating people at high risk of breast cancer who choose to continue screening, we suggest that **annual mammography/digital breast tomosynthesis and MRI screening** resume after one year (↑).

> *Breast imaging during pregnancy and lactation is challenging due to physiologic and structural breast changes that increase the difficulty of clinical and radiologic evaluation. The decision to continue screening during pregnancy and lactation should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, expected duration of lactation, and time since last screened. If the patient requests screening after this discussion, screening should be offered.*

✧*Screening mammography/DBT will have reduced sensitivity due to increased breast density during pregnancy and lactation.*
✧✧*Screening US may increase the false positive rate and prompt additional biopsies.*

Recommendations from one guideline were used during the discussions and formulation of these recommendations: the 2018 ACR Appropriateness Criteria® guideline on breast imaging of pregnant and lactating women [27] (**Appendix 2: Table B02C**).

B03. Symptomatic patients

B03A. Palpable mass

Recommendations

1. In females under 30 years of age with a palpable breast mass, we recommend **targeted US** of the area of clinical concern as the initial imaging technique (↑↑).

↳ **1.1** If US findings are negative, we recommend that any decision for further work-up should be based on radiologist discretion and/or clinical grounds (EP consensus).

2. In females 30 years of age and older with a palpable breast mass, we recommend **mammography/digital breast tomosynthesis and targeted US** of the area of clinical concern as the initial imaging techniques (↑↑).

3. In females of any age with a palpable breast mass that is clinically concerning for malignancy, and mammography and US are negative, we recommend that any decision for further intervention (e.g., palpation-guided biopsy, MRI) should be based on clinical grounds (EP consensus).

Recommendations from six guidelines were used during the discussions and formulation of these recommendations: the 2012 CAR recommendations [19], the ACR Appropriateness Criteria® 2018 guideline on breast imaging of pregnant and lactating women [27], the 2018 German guideline on the screening, diagnosis, treatment, and follow-up of breast cancer [33,34], the 2017 RCR iRefer guideline [36], the 2017 ACR Appropriateness Criteria® guideline on Palpable Breast Masses [45], and the 2018 National Comprehensive Cancer Network guideline on breast cancer screening and diagnosis [46] (**Appendix 2: Table B03A**).

B03B. Suspicious nipple discharge

Recommendations

1. In females, at any age, with physiological nipple discharge✧, we recommend **against imaging** (↓↓).

2. In females under 30 years of age with non-physiological nipple discharge, we recommend **targeted US of the retroareolar region** as the initial imaging technique (↑↑).

3. In females 30 years of age and older with non-physiological nipple discharge, we recommend **mammography/digital breast tomosynthesis and targeted US of the retroareolar region** as the initial imaging techniques (↑↑).

↳ **3.1** If the mammography and US are negative or inconclusive, we recommend **MRI or ductography** as the next imaging technique (↑↑).

↳ **3.2** If all imaging is negative, we recommend that any decision for further work-up be based on clinical grounds, with consideration for surgical consult (EP consensus).

✧ *Physiological discharge can be characterized as non-spontaneous, bilateral, originating from multiple ducts, and white/green/yellow/black in colour.*

Recommendations from three guidelines were used during the discussions and formulation of these recommendations: the 2012 CAR recommendations [19], the 2018 National Comprehensive Cancer Network guideline on breast cancer screening and diagnosis [46], and the 2017 ACR Appropriateness Criteria® guideline on Evaluation of Nipple Discharge [47] (**Appendix 2: Table B03B**).

B03C. Suspected Paget's Disease of the breast/nipple

Recommendations

1. In females with clinical suspicion of Paget's disease, we recommend **mammography/ digital breast tomosynthesis ± US** as the initial imaging techniques (↑↑).

↳ **1.1** If mammography ± US are negative but clinical findings remain suspicious for Paget's disease, we recommend that any decision for further intervention (e.g., punch biopsy, MRI) should be based on clinical grounds (EP consensus).

Recommendations from two guidelines were used during the discussions and formulation of these recommendations: the 2012 CAR recommendations [19] and the 2018 National Comprehensive Cancer Network guideline on breast cancer screening and diagnosis [46] (**Appendix 2: Table B03C**).

B03D. Suspected inflammatory breast cancer

Recommendations

1. In females with clinical suspicion of inflammatory breast cancer✧, we recommend **mammography/digital breast tomosynthesis and US** as the initial imaging techniques (↑↑).

↳ **1.1** If mammography and US are negative but clinical findings remain suspicious for inflammatory breast cancer, we recommend that any decision for further intervention (e.g., punch biopsy, MRI) should be based on clinical grounds (EP consensus)**.**

✧ *Rapid onset of erythema, edema, and a peau d'orange appearance, and/or abnormal breast warmth, with or without a palpable mass, AND erythema that covers at least one third of the breast, AND symptoms that have been present for less than 6 months* [48].

Recommendations from three guidelines were used during the discussions and formulation of these recommendations: the 2012 CAR recommendations [19], the 2017 RCR iRefer [36], and the 2018 National Comprehensive Cancer Network guideline on breast cancer screening and diagnosis [46] (**Appendix 2: Table B03D**).

B03E. Suspected axillary lymphadenopathy

Recommendations

1. In patients under 30 years of age with a palpable area of concern in the axilla, we suggest **axillary US** as the initial imaging technique (EP consensus).
2. In patients 30 years of age and older with a palpable area of concern in the axilla, we recommend **axillary US ± diagnostic mammography/digital breast tomosynthesis** as the initial imaging techniques (↑↑).
    - ↳ **2.1** In patients with bilateral axillary lymphadenopathy on an otherwise normal mammogram AND systemic disease that is known to account for the lymphadenopathy, we recommend **against further imaging** (↓↓).

Recommendations from one guideline was used during the discussions and formulation of these recommendations: the 2018 National Comprehensive Cancer Network guideline on breast cancer screening and diagnosis [46] (**Appendix 2: Table B03E**).

B03F. Pregnant/lactating symptomatic patients

Recommendations

1. In symptomatic✧ pregnant and lactating patients, we recommend **targeted US** as the initial imaging technique (↑↑).
    - ↳ **1.1** In patients with US findings that are indeterminate or suspicious, we recommend **mammography/digital breast tomosynthesis** as the next imaging technique (↑↑).
        - ↳ **1.2** In patients with clinical findings that are concerning for malignancy, and US and mammography are negative, we recommend that any decision for further intervention (e.g., palpation-guided biopsy) should be based on clinical grounds (EP consensus).

✧ *For example: palpable breast mass, clinically non-physiological nipple discharge or skin changes*

Recommendations from three guidelines were used during the discussions and formulation of these recommendations: the 2012 CAR recommendations [19], the 2018 ACR Appropriateness Criteria® guideline on Breast Imaging of Pregnant and Lactating Women [27], the 2017 ACR Appropriateness Criteria® guideline on palpable breast mass [45] (**Appendix 2: Table B03F**).

B03G. Male symptomatic patients

Recommendations

1. In males, of any age, with symptoms and physical examination consistent with gynecomastia or pseudogynecomastia, we recommend **against imaging** (↓↓).
2. In males under the age of 25 presenting with suspicious physical examination findings✧, we recommend **targeted US** as the initial imaging technique (↑↑).
3. In males 25 years of age and older, with suspicious physical examination findings✧, we recommend **diagnostic mammography/digital breast tomosynthesis or US** as the initial imaging technique (↑↑).

✧ *For example: palpable breast mass, axillary adenopathy, nipple discharge, nipple retraction*

Recommendations from four guidelines were used during the discussions and formulation of these recommendations: the ACR Appropriateness Criteria ® 2017 guideline on Evaluation of Nipple Discharge [47], the ACR Appropriateness Criteria® 2018

guideline on Evaluation of the Symptomatic Male Breast [49], the 2018 German guideline on the screening, diagnosis, treatment, and follow-up of breast cancer [33,34], and the 2017 RCR iRefer [36] (**Appendix 2: Table B03G**).

B03H. Pediatric/adolescent symptomatic patients

Recommendations

No guidelines were identified specific to the pediatric and adolescent population (**Appendix 2: Table B03H**). Therefore, the EP members formulated recommendations based on clinical expertise, while considering values and preferences, equity, accessibility, costs, and resources.

1. In paediatric and adolescent✧ patients presenting with a palpable area of concern, we suggest **targeted US** as the initial imaging technique (EP consensus).
2. In paediatric and adolescent✧ patients presenting with a palpable area of concern, we recommend **against mammography** (EP consensus).

✧ *<18 years of age*

B04. Previous diagnosis of a high-risk lesion

Recommendations

1. In females with a previous diagnosis of a high-risk lesion✧, we recommend annual **mammography/ digital breast tomosynthesis** screening beginning at diagnosis, but not earlier than 30 years of age (↑↑).
   - ↳ **1.1** In females with extremely dense breast tissue (i.e., ACR category D), we suggest annual **MRI** as an adjunct (↑).
     - ↳ **1.2** In females where MRI is not tolerated, contraindicated, or unavailable, we suggest screening **US** as a substitute (↑).

✧*For example, atypical ductal hyperplasia, atypical lobular hyperplasia, lobular carcinoma in situ*

Recommendations from three guidelines were used during the discussions and formulation of these recommendations: the ACR Appropriateness Criteria® 2017 guideline on Breast cancer screening [25], the ACR Appropriateness Criteria ® 2018 guideline on screening in women at higher than average risk [42], and the 2017 Brazilian guideline on breast cancer screening [29] (**Appendix 2: Table B04**).

B05. Assessment of breast implants

Recommendations

1. In asymptomatic people, with breast implants of any type, we recommend **against imaging for implant evaluation** (↓↓).
2. In people with saline breast implants and clinically definitive rupture, we recommend **against imaging** (↓↓).
3. In people under 30 years of age with suspected breast implant complications, we recommend **US** as the initial imaging technique (↑↑).
4. In people 30 years and older with suspected breast implant complications, we recommend

mammography/digital breast tomosynthesis and US as the initial imaging techniques (↑↑).

5. In people with suspected rupture of silicone breast implant or implant associated lymphoma and equivocal mammography/US findings, we recommend **MRI** for optimal assessment (↑↑).

Recommendations from three guidelines were used during the discussions and formulation of these recommendations: the 2012 CAR recommendations [19], the 2017 RCR iRefer guideline [36], the 2018 ACR Appropriateness Criteria® guideline on Breast Implant Evaluation [50] (**Appendix 2: Table B05**).

B06. Breast pain assessment

B06A. Cyclic or non-cyclic diffuse breast pain

Recommendations

1. In patients with cyclical breast pain, intermittent breast pain, or non-cyclic diffuse breast pain, we recommend **against imaging**, beyond usual screening recommendations✧ (↓↓).

✧*See B01. Average risk screening or B02. High risk screening*

Recommendations from three guidelines were used during the discussions and formulation of these recommendations: the ACR Appropriateness Criteria® 2018 guideline on Breast Pain [51], the National Comprehensive Cancer Network guideline on breast cancer screening and diagnosis [46], and the 2017 RCR iRefer [36] (**Appendix 2: Table B06A**).

B06B. Non-cyclic focal breast pain

Recommendations

1. In patients under 30 years of age with focal, non-cyclical persistent breast pain, we suggest **targeted US** as the initial imaging technique (↑).
2. In patients 30 years of age and older, with focal, non-cyclical persistent breast pain, we recommend **bilateral mammography/digital breast tomosynthesis and targeted US** as the initial imaging techniques (↑↑).

Recommendations from two guidelines were used during the discussions and formulation of these recommendations: the ACR Appropriateness Criteria® 2018 guideline on Breast Pain [51], and the 2018 National Comprehensive Cancer Network guideline on breast cancer screening and diagnosis [46] (**Appendix 2: Table B06B**).

B07. Mastitis/infection and abscess assessment

Recommendations

1. In patients with clinical signs and symptoms of mastitis and suspected breast abscess, we recommend **targeted US** as the initial imaging technique (↑↑).
2. In patients with no clinical improvement in suspected mastitis following antibiotics, we suggest **diagnostic mammography/digital breast tomosynthesis and US** as the initial imaging techniques (EP consensus).

There is little information on abscess in two guidelines and no information on mastitis (**Appendix 2: Table B07**). Therefore, the EP members formulated recommendations based on clinical expertise, while considering values and preferences, equity, accessibility, costs, and resources.

B08. Patients with history of breast cancer

Recommendations

Patients with breast conserving surgery

1. In asymptomatic patients, with a personal history of breast cancer, we recommend **annual surveillance mammography/digital breast tomosynthesis** (↑↑).

> *The decision to discontinue surveillance should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests surveillance after this discussion, surveillance should be offered.*

↳ **1.1** In patients with history of breast cancer and extremely dense breast tissue (i.e., ACR category D), we suggest **supplemental annual surveillance with US or MRI** (↑).

> *Supplemental surveillance may also be offered in other scenarios (e.g., previous mammographically occult cancer, ACR category C dense breast tissue, regional practice preference, and resource constraints).*

Patients with therapeutic mastectomy

2. In patients with a history of breast cancer, we recommend **contralateral annual surveillance mammography/digital breast tomosynthesis** (↑↑).

> *The decision to discontinue surveillance should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should include a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests surveillance after this discussion, surveillance should be offered.*

↳ **2.1** In patients with history of breast cancer and extremely dense breast tissue (i.e., ACR category D), we suggest **supplemental annual surveillance with US or MRI** (↑).

> *Supplemental surveillance may also be offered in other scenarios (e.g., previous mammographically occult cancer, ACR category C dense breast tissue, regional practice preference, and resource constraints).*

3. In patients with therapeutic mastectomy (bilateral or unilateral) without breast reconstruction, we suggest **no imaging** for breast cancer surveillance on the side(s) of mastectomy (↓).

4. In patients with therapeutic mastectomy without reconstruction presenting with a palpable area of concern, we recommend **targeted US** as the initial imaging technique (↑↑).

5. In patients with therapeutic mastectomy and reconstruction (bilateral or unilateral), we suggest **no imaging** for breast cancer surveillance on the reconstructed side(s) (↓).

6. In patients with therapeutic mastectomy and reconstruction presenting with a palpable area of concern, we recommend **mammography/digital breast tomosynthesis and targeted US** as the initial imaging techniques (↑↑).

> *Imaging with mammography and US may differ based on facility practice when evaluating patients with autologous tissue versus implant-based reconstruction. For example, patients with implant-based reconstruction may initially undergo US, with mammography being performed only if feasible.*

Recommendations from seven guidelines were used during the discussions and formulation of these recommendations: the 2012 CAR recommendations [19], the ACR Appropriateness Criteria® 2018 guideline on screening in women at higher than average risk [42], the ACR Appropriateness Criteria® 2019 guideline on stage I breast cancer [52], the 2020 ASCO guideline on management of male breast cancer [53], the 2021 EUSOMA/ SIOG guideline on management of older patients with breast cancer [32], the 2018 German guideline on the screening, diagnosis, treatment, and follow-up of breast cancer [33,34], and the 2019 NICE guideline on familial breast cancer [44] (**Appendix 2: Table B08**).

B09. Patients following risk-reduction mastectomy (with or without autologous or implant-based reconstruction)

Recommendations

1. In patients with risk-reduction mastectomy and reconstruction (bilateral or unilateral), we suggest **no imaging** for breast cancer screening on the reconstructed side(s) (↓).
2. In patients with risk-reduction mastectomy and reconstruction presenting with a palpable area of concern, we recommend **mammography/digital breast tomosynthesis and targeted US** as the initial imaging techniques (↑↑).

> *Imaging with mammography and US may differ based on facility practice when evaluating patients with autologous tissue versus implant-based reconstruction. For example, patients with implant-based reconstruction may initially undergo US, with mammography being performed only if feasible.*

3. In patients with risk-reduction mastectomy without reconstruction, we suggest **no imaging** for breast cancer screening (↓).
4. In patients with risk-reduction mastectomy without reconstruction presenting with a palpable area of concern, we recommend **targeted US** as the initial imaging technique (↑↑).

Recommendations from three guidelines were used during the discussions and formulation of these recommendations: the ACR Appropriateness Criteria® 2020 guideline on imaging after mastectomy and breast reconstruction [54], and the 2018 German guideline on the screening, diagnosis, treatment, and follow-up of breast cancer [33,34], and the 2019 NICE guideline on familial breast cancer [44] (**Appendix 2: Table B09**).

REFERENCES

[1] Peters M, Godfrey C, McInerney P, Munn Z, Tricco A, Khalil H. Chapter 11: Scoping Reviews. In: Aromataris E, Munn Z (Editors). JBI Manual for Evidence Synthesis. The Joanna Briggs Institute; 2020.

[2] Higgins J, Thomas J, Chandler J, Cumpston M, Li T, Page M, et al. Cochrane Handbook for Systematic Reviews of Interventions version 6.2 (updated February 2021). 2021.

[3] Garritty C, Gartlehner G, Nussbaumer-Streit B, King VJ, Hamel C, Kamel C, et al. Cochrane Rapid Reviews Methods Group offers evidence-informed guidance to conduct rapid reviews. J Clin Epidemiol 2021;130:13–22. https://doi.org/10.1016/j.jclinepi.2020.10.007.

[4] Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. AGREE II: advancing guideline development, reporting and evaluation in health care. CMAJ 2010;182:E839-842. https://doi.org/10.1503/cmaj.090449.

[5] Evidence Partners. DistillerSR 2011.

[6] Hamel C, Kelly SE, Thavorn K, Rice DB, Wells GA, Hutton B. An evaluation of DistillerSR's machine learning-based prioritization tool for title/abstract screening - impact on reviewer-relevant outcomes. BMC Med Res Methodol 2020;20:256. https://doi.org/10.1186/s12874-020-01129-1.

[7] Howard BE, Phillips J, Tandon A, Maharana A, Elmore R, Mav D, et al. SWIFT-Active Screener: Accelerated document screening through active learning and integrated recall estimation. Environ Int 2020;138:105623. https://doi.org/10.1016/j.envint.2020.105623.

[8] Andrews J, Guyatt G, Oxman AD, Alderson P, Dahm P, Falck-Ytter Y, et al. GRADE guidelines: 14. Going from evidence to recommendations: the significance and presentation of recommendations. J Clin Epidemiol 2013;66:719–25. https://doi.org/10.1016/j.jclinepi.2012.03.013.

[9] Andrews JC, Schünemann HJ, Oxman AD, Pottie K, Meerpohl JJ, Coello PA, et al. GRADE guidelines: 15. Going from evidence to recommendation-determinants of a recommendation's direction and strength. J Clin Epidemiol 2013;66:726–35. https://doi.org/10.1016/j.jclinepi.2013.02.003.

[10] Balshem H, Helfand M, Schünemann HJ, Oxman AD, Kunz R, Brozek J, et al. GRADE guidelines: 3. Rating the quality of evidence. J Clin Epidemiol 2011;64:401–6. https://doi.org/10.1016/j.jclinepi.2010.07.015.

[11] Kim H-I, Lim H, Moon A. Sex Differences in Cancer: Epidemiology, Genetics and Therapy. Biomol Ther (Seoul) 2018;26:335–42. https://doi.org/10.4062/biomolther.2018.103.

[12] Oxford Centre for Evidence-based Medicine. Levels of Evidence 2009. https://www.cebm.ox.ac.uk/resources/levels-of-evidence/oxford-centre-for-evidence-based-medicine-levels-of-evidence-march-2009 (accessed July 22, 2021).

[13] OCEBM Levels of Evidence Working Group. The Oxford Levels of Evidence 2. Oxford Centre for Evidence-Based Medicine 2009. https://www.cebm.ox.ac.uk/resources/levels-of-evidence/ocebm-levels-of-evidence (accessed January 11, 2022).

[14] Governance: AAPM Position Statement on Radiation Risks from Medical Imaging Procedures. Policy number PS4-A. American Association of Physicists in Medicine 2018. https://www.aapm.org/org/policies/detail

s.asp?type=PP&id=2548 (accessed January 9, 2023).
[15] ICRP. Use of dose quantities in radiological protection. ICRP Publication 147. 2021.
[16] ICRP. 1990 Recommendations of the International Commission on Radiological Protection. Report number 60 (Users Edition). 1991.
[17] ICRP. 2007 Recommendations of the International Commission on Radiological Protection. Report number 103 (Users Edition). 2007.
[18] Radiation Doses. Government of Canada: Canadian Nuclear Safety Commission 2020. http://nuclearsafety.gc.ca/eng/resources/radiation/introduction-to-radiation/radiation-doses.cfm (accessed January 3, 2023).
[19] Canadian Association of Radiologists. 2012 CAR Diagnostic Imaging Referral Guidelines. Canadian Association of Radiologists; 2012.
[20] Practice Bulletin No. 179 Summary: Breast Cancer Risk Assessment and Screening in Average-Risk Women. Obstet Gynecol 2017;130:241–3. https://doi.org/10.1097/AOG.0000000000002151.
[21] Practice Bulletin Number 179: Breast Cancer Risk Assessment and Screening in Average-Risk Women. Obstet Gynecol 2017;130:e1–16. https://doi.org/10.1097/AOG.0000000000002158.
[22] Qaseem A, Lin JS, Mustafa RA, Horwitch CA, Wilt TJ, Clinical Guidelines Committee of the American College of Physicians, et al. Screening for Breast Cancer in Average-Risk Women: A Guidance Statement From the American College of Physicians. Ann Intern Med 2019;170:547–60. https://doi.org/10.7326/M18-2147.
[23] Summaries for Patients: Breast Cancer Screening in Average-Risk Women. Ann Intern Med 2019;170:I–18. https://doi.org/10.7326/P19-0007.
[24] Monticciolo DL, Malak SF, Friedewald SM, Eby PR, Newell MS, Moy L, et al. Breast Cancer Screening Recommendations Inclusive of All Women at Average Risk: Update from the ACR and Society of Breast Imaging. J Am Coll Radiol 2021;18:1280–8. https://doi.org/10.1016/j.jacr.2021.04.021.
[25] Mainiero MB, Moy L, Baron P, Didwania AD, diFlorio RM, Green ED, et al. ACR Appropriateness Criteria® Breast Cancer Screening. J Am Coll Radiol 2017;14:S383–90. https://doi.org/10.1016/j.jacr.2017.08.044.
[26] Weinstein SP, Slanetz PJ, Lewin AA, Battaglia T, Chagpar AB, Dayaratna S, et al. ACR Appropriateness Criteria® Supplemental Breast Cancer Screening Based on Breast Density. Journal of the American College of Radiology 2021;18:S456–73. https://doi.org/10.1016/j.jacr.2021.09.002.
[27] diFlorio-Alexander RM, Slanetz PJ, Moy L, Baron P, Didwania AD, Heller SL, et al. ACR Appropriateness Criteria® Breast Imaging of Pregnant and Lactating Women. Journal of the American College of Radiology 2018;15:S263–75. https://doi.org/10.1016/j.jacr.2018.09.013.
[28] Migowski A, Silva GAE, Dias MBK, Diz MDPE, Sant'Ana DR, Nadanovsky P. Guidelines for early detection of breast cancer in Brazil. II - New national recommendations, main evidence, and controversies. Cad Saude Publica 2018;34:e00074817. https://doi.org/10.1590/0102-311X00074817.
[29] Urban LABD, Chala LF, Bauab S di P, Schaefer MB, Dos Santos RP, Maranhão NM de A, et al. Breast cancer screening: updated recommendations of the Brazilian College of Radiology and Diagnostic Imaging, Brazilian Breast

Disease Society, and Brazilian Federation of Gynecological and Obstetrical Associations. Radiol Bras 2017;50:244–9. https://doi.org/10.1590/0100-3984.2017-0069.

[30] Klarenbach S, Sims-Jones N, Lewin G, Singh H, Thériault G, Tonelli M, et al. Recommendations on screening for breast cancer in women aged 40-74 years who are not at increased risk for breast cancer. CMAJ 2018;190:E1441–51. https://doi.org/10.1503/cmaj.180463.

[31] Schünemann HJ, Lerda D, Quinn C, Follmann M, Alonso-Coello P, Rossi PG, et al. Breast Cancer Screening and Diagnosis: A Synopsis of the European Breast Guidelines. Ann Intern Med 2020;172:46–56. https://doi.org/10.7326/M19-2125.

[32] Biganzoli L, Battisti NML, Wildiers H, McCartney A, Colloca G, Kunkler IH, et al. Updated recommendations regarding the management of older patients with breast cancer: a joint paper from the European Society of Breast Cancer Specialists (EUSOMA) and the International Society of Geriatric Oncology (SIOG). Lancet Oncol 2021;22:e327–40. https://doi.org/10.1016/S1470-2045(20)30741-5.

[33] Wöckel A, Festl J, Stüber T, Brust K, Stangl S, Heuschmann PU, et al. Interdisciplinary Screening, Diagnosis, Therapy and Follow-up of Breast Cancer. Guideline of the DGGG and the DKG (S3-Level, AWMF Registry Number 032/045OL, December 2017) - Part 1 with Recommendations for the Screening, Diagnosis and Therapy of Breast Cancer. Geburtshilfe Frauenheilkd 2018;78:927–48. https://doi.org/10.1055/a-0646-4522.

[34] Wöckel A, Albert U-S, Janni W, Scharl A, Kreienberg R, Stüber T. The Screening, Diagnosis, Treatment, and Follow-Up of Breast Cancer. Dtsch Arztebl Int 2018;115:316–23. https://doi.org/10.3238/arztebl.2018.0316.

[35] Hamashima C, Japanese Research Group for the Development of Breast Cancer Screening Guidelines, Hamashima C C, Hattori M, Honjo S, Kasahara Y, et al. The Japanese Guidelines for Breast Cancer Screening. Jpn J Clin Oncol 2016;46:482–92. https://doi.org/10.1093/jjco/hyw008.

[36] The Royal College of Radiologists. RCR iRefer Guidelines: Making the best use of clinical radiology. London: The Royal College of Radiologists; 2017.

[37] Kahale LA, Ouertatani H, Brahem AB, Grati H, Hamouda MB, Saz-Parkinson Z, et al. Contextual differences considered in the Tunisian ADOLOPMENT of the European guidelines on breast cancer screening. Health Res Policy Syst 2021;19:80. https://doi.org/10.1186/s12961-021-00731-z.

[38] Siu AL, U.S. Preventive Services Task Force. Screening for Breast Cancer: U.S. Preventive Services Task Force Recommendation Statement. Ann Intern Med 2016;164:279–96. https://doi.org/10.7326/M15-2886.

[39] Summaries for Patients. Screening for Breast Cancer: Recommendations From the U.S. Preventive Services Task Force. Ann Intern Med 2016;164. https://doi.org/10.7326/P16-9005.

[40] Screening for Breast Cancer: Recommendation Statement. AFP 2016;93.

[41] Brown A, Lourenco AP, Niell BL, Cronin B, Dibble EH, DiNome ML, et al. ACR Appropriateness Criteria® Transgender Breast Cancer Screening. Journal of the American College of Radiology 2021;18:S502–15. https://doi.org/10.1016/j.jacr.2021.09.005.

[42] Monticciolo DL, Newell MS, Moy L, Niell B, Monsees B, Sickles EA. Breast Cancer Screening in Women at Higher-Than-Average Risk: Recommendations From the ACR. J Am Coll Radiol 2018;15:408–14. https://doi.org/10.1016/j.jacr.2017.11.034.

[43] Mulder RL, Hudson MM, Bhatia S, Landier W, Levitt G, Constine LS, et al. Updated Breast Cancer Surveillance Recommendations for Female Survivors of Childhood, Adolescent, and Young Adult Cancer From the International Guideline Harmonization Group. JCO 2020;38:4194–207. https://doi.org/10.1200/JCO.20.00562.
[44] National Institute for Health and Care Excellence. NICE (CG164): Familial breast cancer: classification, care and managing breast cancer and related risks in people with a family history of breast cancer. National Institute for Health and Care Excellence (NICE); 2019.
[45] Moy L, Heller SL, Bailey L, D'Orsi C, DiFlorio RM, Green ED, et al. ACR Appropriateness Criteria® Palpable Breast Masses. Journal of the American College of Radiology 2017;14:S203–24. https://doi.org/10.1016/j.jacr.2017.02.033.
[46] Bevers TB, Helvie M, Bonaccio E, Calhoun KE, Daly MB, Farrar WB, et al. Breast Cancer Screening and Diagnosis, Version 3.2018, NCCN Clinical Practice Guidelines in Oncology. J Natl Compr Canc Netw 2018;16:1362–89. https://doi.org/10.6004/jnccn.2018.0083.
[47] Lee S-J, Trikha S, Moy L, Baron P, diFlorio RM, Green ED, et al. ACR Appropriateness Criteria® Evaluation of Nipple Discharge. Journal of the American College of Radiology 2017;14:S138–53. https://doi.org/10.1016/j.jacr.2017.01.030.
[48] Inflammatory Breast Cancer - How is inflammatory breast cancer diagnosed? National Cancer Institute 2016. https://www.cancer.gov/types/breast/ibc-fact-sheet#how-is-inflammatory-breast-cancer-diagnosed (accessed December 15, 2022).
[49] Niell BL, Lourenco AP, Moy L, Baron P, Didwania AD, diFlorio-Alexander RM, et al. ACR Appropriateness Criteria® Evaluation of the Symptomatic Male Breast. Journal of the American College of Radiology 2018;15:S313–20. https://doi.org/10.1016/j.jacr.2018.09.017.
[50] Lourenco AP, Moy L, Baron P, Didwania AD, diFlorio RM, Heller SL, et al. ACR Appropriateness Criteria® Breast Implant Evaluation. Journal of the American College of Radiology 2018;15:S13–25. https://doi.org/10.1016/j.jacr.2018.03.009.
[51] Holbrook AI, Moy L, Akin EA, Baron P, Didwania AD, Heller SL, et al. ACR Appropriateness Criteria® Breast Pain. Journal of the American College of Radiology 2018;15:S276–82. https://doi.org/10.1016/j.jacr.2018.09.014.
[52] Lewin AA, Moy L, Baron P, Didwania AD, diFlorio-Alexander RM, Hayward JH, et al. ACR Appropriateness Criteria® Stage I Breast Cancer: Initial Workup and Surveillance for Local Recurrence and Distant Metastases in Asymptomatic Women. Journal of the American College of Radiology 2019;16:S428–39. https://doi.org/10.1016/j.jacr.2019.05.024.
[53] Hassett MJ, Somerfield MR, Baker ER, Cardoso F, Kansal KJ, Kwait DC, et al. Management of Male Breast Cancer: ASCO Guideline. J Clin Oncol 2020;38:1849–63. https://doi.org/10.1200/JCO.19.03120.
[54] Heller SL, Lourenco AP, Niell BL, Ajkay N, Brown A, Dibble EH, et al. ACR Appropriateness Criteria® Imaging After Mastectomy and Breast Reconstruction. Journal of the American College of Radiology 2020;17:S403–14. https://doi.org/10.1016/j.jacr.2020.09.009.

APPENDIX 1. SEARCH STRATEGIES

2022 Jan 7
Ovid Multifile
Database: Embase Classic+Embase <1947 to 2022 January 06>, Ovid MEDLINE(R) ALL <1946 to January 06, 2022>
Search Strategy:

1 Ultrasonography, Mammary/ (15288)
2 exp Breast Diseases/ and Mass Screening/ (15624)
3 exp Breast Diseases/ and Early Detection of Cancer/ (8234)
4 (((areola? or breast* or mamma or mammar* or nipple*) adj3 (atypical or clinical* or disorder? or irregular* or medical* or problem*)) and ((early or earlier or earliest) adj3 (detect* or diagnos* or identif* or recogni*))).tw,kw,kf. (2478)
5 ((mastopath* or mastos#s) and ((early or earlier or earliest) adj3 (detect* or diagnos* or identif* or recogni* or screen*))).tw,kw,kf. (94)
6 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (screen* or detect*)).tw,kw,kf. (55083)
7 exp Breast Neoplasms/ (924699)
8 exp Breast Carcinoma In Situ/ (29834)
9 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (adenocarcinoma* or cancer* or carcinoma* or lesion? or lump? or mass$2 or neoplasm* or sarcoma* or tumour* or tumor*)).tw,kw,kf. (960164)
10 ((ductal or intraductal or intra-ductal or lobular) adj (carcinoma? or hyperplasia?)).tw,kw,kf. (49656)
11 DCIS.tw,kw,kf. (15852)
12 (lobul* carcinoma? adj2 "in situ").tw,kw,kf. (2835)
13 LCIS.tw,kw,kf. (1728)
14 Paget* disease?.tw,kw,kf. (19746)
15 (paget* and (areola? or breast* or mamma or mammar* or nipple*)).tw,kw,kf. (3424)
16 ((peau d'orange or dermal edema? or dermal oedema?) adj10 (areola? or breast* or mamma or mammar* or nipple*)).tw,kw,kf. (135)
17 (IBC adj10 breast*).tw,kw,kf. (2979)
18 (axillary adj3 (adenopath* or lymphadenopath* or lymph-adenopath*)).tw,kw,kf. (2559)
19 or/2-18 [BREAST CANCER, ETC] (1176527)
20 "Exudates and Transudates"/ (24513)
21 Nipples/ (15003)
22 20 and 21 (241)
23 limit 22 to yr="1900-2016" (234)
24 Nipple Discharge/ (2214)
25 (nipple* adj3 (discharg* or secrete? or secreting or secretion?)).tw,kw,kf. (3112)
26 ((areola? or breast* or mamma or mammar*) adj3 (duct or ductal or ducts) adj5 (discharg* or secrete? or secreting or secretion?)).tw,kw,kf. (142)
27 or/23-26 [NIPPLE DISCHARGE] (4111)
28 Breast Implants/ (10892)
29 ((breast* or mamma or mammary) adj3 (implant* or prosthe* or endoprosthe* or endo-prosthe*)).tw,kw,kf. (18155)
30 28 or 29 [BREAST IMPLANTS] (21970)
31 Breast/pa [pathology] (15148)
32 Mammary Glands, Human/pa [pathology] (1189)
33 Nipples/pa [pathology] (1195)
34 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (disease? or patholog*)).tw,kw,kf. (42901)
35 exp Mastitis/ (16832)
36 mastit#s.tw,kw,kf. (29492)
37 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (abscess* or inflam* or infect* or pain*)).tw,kw,kf. (24113)
38 or/31-37 [BREAST PATHOLOGY/DISEASE, INFLAMMATION/PAIN] (109993)
39 Mammaplasty/ (32415)
40 (mammaplast* or mastoplast*).tw,kw,kf. (5659)
41 ((areola? or breast* or mamma or mammar* or nipple*) adj5 (amputat* or augment* or reconstruct* or re-construct* or reduc* or remov* or resect* or re-sect* or surger* or surgical*)).tw,kw,kf. (136821)
42 ((areola? or breast* or mamma or mammar* or nipple*) adj5 (postop or post-op or postoperati* or post-operati*)).tw,kw,kf. (8038)
43 exp Breast Diseases/su (111431)
44 exp Mastectomy/ (103134)
45 (lumpectom* or mammectom* or mastectom*).tw,kw,kf. (71418)
46 (postlumpectom* or post-lumpectom* or postmammect* or post-mammect* or postmastectom* or post-mastectom* or postmammaplast* or post-mammaplast* or postmastoplast* or post-mastoplast*).tw,kw,kf. (9459)
47 or/39-46 [BREAST RECONSTRUCTION/SURGERY] (253358)
48 19 or 27 or 30 or 38 or 47 [ALL CONDITIONS OF INTEREST] (1275677)
49 exp Mammography/ (94494)
50 (mammograph* or mammo-graph* or mammogram* or mammo-gram* or mamilloscop* or mamillo-scop* or mastogra* or masto-gra*).tw,kw,kf. (81400)
51 (echomammogra* or echo-mammogra* or scintimammogra* or scinti-mammogra*).tw,kw,kf. (970)
52 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (tomosynthes* or tomo-synthes*)).tw,kw,kf. (2862)
53 (xeromammogra* or xero-mammogra*).tw,kw,kf. (451)
54 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (xeroradiogra* or xero-radiogra*)).tw,kw,kf. (101)
55 exp Ultrasonography/ (1355544)
56 (ultrasound* or ultrasonograph* or ultra-sonograph* or ultrasonic* or ultra-sonic*).tw,kw,kf. (1039939)
57 (echogra* or echo-gra* or echotomogra* or echo-tomogra* or echosonogra* or echo-sonogra*).tw,kw,kf. (28815)
58 exp Magnetic Resonance Imaging/ (1579853)

59 (magnetic resonance imag* or MR imag* or MRI or MRIs or fMRI or fMRIs or magnetic resonance tomograph* or MR tomograph* or NMR imag* or NMR tomograph* or chemical shift imag* or magneti#ation transfer contrast imag* or proton spin tomograph* or spin echo imag* or zeugmatograph* or zeugmato-graph*).tw,kw,kf. (1247839)
60 (galactogra* or galacto-gra* or ductogra* or ducto-gra*).tw,kw,kf. (1035)
61 Diagnostic Imaging/ (259368)
62 dg.fs. [diagnostic imaging] (1331542)
63 (diagnos* adj3 (image? or imaging)).tw,kw,kf. (124259)
64 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (image? or imaging)).tw,kw,kf. (26248)
65 or/49-64 [DIAGNOSTIC IMAGING - GENERAL AND TECHNOLOGIES OF INTEREST] (4605204)
66 48 and 65 [BREAST DISEASES - DI] (173775)
67 1 or 66 [BREAST DISEASES - DI - ALL] (174828)
68 exp Animals/ not Humans/ (17915323)
69 67 not 68 [ANIMAL-ONLY REMOVED] (138427)
70 (case reports or case series or address or autobiography or bibliography or biography or comment or dictionary or directory or editorial or "expression of concern" or festschrift or historical article or interactive tutorial or lecture or legal case or legislation or news or newspaper article or patient education handout or personal narrative or portrait or video-audio media or webcast or (letter not (letter and randomized controlled trial))).pt. (6584083)
71 69 not 70 [OPINION PIECES REMOVED] (120331)
72 exp Guidelines as Topic/ (796076)
73 exp Clinical Protocols/ (290568)
74 Guideline.pt. (16472)
75 Practice Guideline.pt. (29492)
76 standards.fs. (762636)
77 Consensus Development Conference.pt. (12230)
78 Consensus Development Conference, NIH.pt. (801)
79 (consensus or guideline* or guidance? or standards or recommendation*).ti,kw,kf. (498636)
80 (expert consensus or consensus statement* or consensus conference* or clinical guideline? or practice guideline? or treatment guideline? or practice parameter* or position statement* or policy statement* or CPG or CPGs).tw,kw,kf. (279434)
81 or/72-80 [GUIDELINE FILTER] (2119733)
82 71 and 81 [GUIDELINES] (8195)
83 limit 82 to yr="2016-current" (2840)
84 83 use medall [MEDLINE RECORDS] (1349)
85 exp breast disease/ and mass screening/ (15624)
86 exp breast disease/ and cancer screening/ (28879)
87 (((areola? or breast* or mamma or mammar* or nipple*) adj3 (atypical or clinical* or disorder? or irregular* or medical* or problem*)) and ((early or earlier or earliest) adj3 (detect* or diagnos* or identif* or recogni*))).tw,kw,kf. (2478)
88 ((mastopath* or mastos#s) and ((early or earlier or earliest) adj3 (detect* or diagnos* or identif* or recogni* or screen*))).tw,kw,kf. (94)
89 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (screen* or detect*)).tw,kw,kf. (55083)
90 exp breast tumor/ (924699)
91 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (adenocarcinoma* or cancer* or carcinoma* or lesion? or lump? or mass$2 or neoplasm* or sarcoma* or tumour* or tumor*)).tw,kw,kf. (960164)
92 ((ductal or intraductal or intra-ductal or lobular) adj (carcinoma? or hyperplasia?)).tw,kw,kf. (49656)
93 DCIS.tw,kw,kf. (15852)
94 (lobul* carcinoma? adj2 "in situ").tw,kw,kf. (2835)
95 LCIS.tw,kw,kf. (1728)
96 Paget* disease?.tw,kw,kf. (19746)
97 (paget* and (areola? or breast* or mamma or mammar* or nipple*)).tw,kw,kf. (3424)
98 ((peau d'orange or dermal edema? or dermal oedema?) adj10 (areola? or breast* or mamma or mammar* or nipple*)).tw,kw,kf. (135)
99 (IBC adj10 breast*).tw,kw,kf. (2979)
100 (axillary adj3 (adenopath* or lymphadenopath* or lymph-adenopath*)).tw,kw,kf. (2559)
101 or/85-100 [BREAST CANCER, ETC] (1176066)
102 exudate/ (26301)
103 nipple/ (15313)
104 102 and 103 (242)
105 breast discharge/ (2126)
106 (nipple* adj3 (discharg* or secrete? or secreting or secretion?)).tw,kw,kf. (3112)
107 ((areola? or breast* or mamma or mammar*) adj3 (duct or ductal or ducts) adj5 (discharg* or secrete? or secreting or secretion?)).tw,kw,kf. (142)
108 or/104-107 [NIPPLE DISCHARGE] (4108)
109 exp breast endoprosthesis/ (5834)
110 silicone breast implant/ (625)
111 ((breast* or mamma or mammary) adj3 (implant* or prosthe* or endoprosthe* or endo-prosthe*)).tw,kw,kf. (18155)
112 or/109-111 [BREAST IMPLANTS] (20219)
113 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (disease? or patholog*)).tw,kw,kf. (42901)
114 exp mastitis/ (16832)
115 mastit#s.tw,kw,kf. (29492)
116 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (abscess* or inflam* or infect* or pain*)).tw,kw,kf. (24113)
117 or/113-116 [BREAST PATHOLOGY/DISEASE, INFLAMMATION/PAIN] (94903)
118 (mammaplast* or mastoplast*).tw,kw,kf. (5659)
119 ((areola? or breast* or mamma or mammar* or nipple*) adj5 (amputat* or augment* or reconstruct* or re-construct* or reduc* or remov* or resect* or re-sect* or surger* or surgical*)).tw,kw,kf. (136821)
120 ((areola? or breast* or mamma or mammar* or nipple*) adj5 (postop or post-op or postoperati* or post-operati*)).tw,kw,kf. (8038)

121 exp breast surgery/ (92931)
122 (lumpectom* or mammectom* or mastectom*).tw,kw,kf. (71418)
123 (postlumpectom* or post-lumpectom* or postmammect* or post-mammect* or postmastectom* or post-mastectom* or postmammaplast* or post-mammaplast* or postmastoplast* or post-mastoplast*).tw,kw,kf. (9459)
124 or/118-123 [BREAST RECONSTRUCTION/SURGERY] (213229)
125 101 or 108 or 112 or 117 or 124 [ALL CONDITIONS OF INTEREST] (1271818)
126 exp mammography/ (94494)
127 (mammograph* or mammo-graph* or mammogram* or mammo-gram* or mamilloscop* or mamillo-scop* or mastogra* or masto-gra*).tw,kw,kf. (81400)
128 (echomammogra* or echo-mammogra* or scintimammogra* or scinti-mammogra*).tw,kw,kf. (970)
129 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (tomosynthes* or tomo-synthes*)).tw,kw,kf. (2862)
130 (xeromammogra* or xero-mammogra*).tw,kw,kf. (451)
131 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (xeroradiogra* or xero-radiogra*)).tw,kw,kf. (101)
132 exp echography/ (1355544)
133 (ultrasound* or ultrasonograph* or ultra-sonograph* or ultrasonic* or ultra-sonic*).tw,kw,kf. (1039939)
134 (echogra* or echo-gra* or echotomogra* or echo-tomogra* or echosonogra* or echo-sonogra*).tw,kw,kf. (28815)
135 exp nuclear magnetic resonance imaging/ (1081212)
136 (magnetic resonance imag* or MR imag* or MRI or MRIs or fMRI or fMRIs or magnetic resonance tomograph* or MR tomograph* or NMR imag* or NMR tomograph* or chemical shift imag* or magneti#ation transfer contrast imag* or proton spin tomograph* or spin echo imag* or zeugmatograph* or zeugmato-graph*).tw,kw,kf. (1247839)
137 (galactogra* or galacto-gra* or ductogra* or ducto-gra*).tw,kw,kf. (1035)
138 exp diagnostic imaging/ (3027460)
139 (diagnos* adj3 (image? or imaging)).tw,kw,kf. (124259)
140 ((areola? or breast* or mamma or mammar* or nipple*) adj3 (image? or imaging)).tw,kw,kf. (26248)
141 or/126-140 [DIAGNOSTIC IMAGING - GENERAL AND TECHNOLOGIES OF INTEREST] (5538121)
142 125 and 141 [BREAST DISEASES - DI] (181969)
143 exp animal/ or exp animal experimentation/ or exp animal model/ or exp animal experiment/ or nonhuman/ or exp vertebrate/ (57061789)
144 exp human/ or exp human experimentation/ or exp human experiment/ (44508746)
145 143 not 144 (12554937)
146 142 not 145 [ANIMAL-ONLY REMOVED] (177169)
147 (conference abstract or editorial or letter).pt. (7965150)
148 case report/ or exp case study/ or directory/ (5119035)
149 146 not (147 or 148) [CONFERENCES, OPINION PIECES, ETC. REMOVED] (128679)
150 exp practice guideline/ (654057)
151 (consensus or guideline* or guidance? or standards or recommendation*).ti,kw,kf. (498636)
152 (expert consensus or consensus statement* or consensus conference* or clinical guideline? or practice guideline? or treatment guideline? or practice parameter* or position statement* or policy statement* or CPG or CPGs).tw,kw,kf. (279434)
153 or/150-152 [GUIDELINE FILTER] (1177573)
154 149 and 153 [GUIDELINES] (5433)
155 limit 154 to yr="2016-current" (1842)
156 155 use emczd [EMBASE RECORDS] (1323)
157 84 or 156 [BOTH DATABASES] (2672)
158 remove duplicates from 157 [TOTAL UNIQUE RECORDS] (2180)
159 158 use medall [MEDLINE UNIQUE RECORDS] (1347)
160 158 use emczd [EMBASE UNIQUE RECORDS] (833)

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APPENDIX 2. EVIDENCE TABLES

B01. Average risk screening

Table B01A. Screening females at average risk of breast cancer

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
DBT: digital breast tomosynthesis; MRI: magnetic resonance imaging; US: ultrasound	
CAR 2012 [19]	**M01. SCREENING WOMEN UNDER 40 YEARS OLD** - Mammography: Not indicated [B]: Screening mammography in women before the age of 40 is not recommended. **M02. SCREENING WOMEN 40 YEARS OLD AND OVER** - Mammography: Indicated [A]
ACOG 2017 [20,21] Moderate quality	- Mammography screening: <40 years (Level A), 40-75 years (Level A), 75+ years (Level C) - Frequency of screening mammography (Level A)
ACP 2019: Breast cancer screening [22,23] Moderate quality	- Statement 1: In average-risk women aged 40 to 49 years - Statement 2: In average-risk women aged 50 to 74 years - Statement 3: In average-risk women aged 75 years or older or in women with a life expectancy of 10 years or less
ACR and Society of Breast Imaging 2021 [24] Moderate quality	- Mammography screening: 40+ years - Frequency of screening - Supplemental screening in average-risk women, including MRI, whole breast US, contrast-enhanced mammography, and molecular breast imaging
ACR 2017: Breast Cancer Screening [25] Moderate quality	▪ Variant 1. Breast cancer screening. Average-risk women: women with <15% lifetime risk of breast cancer.
ACR 2021: Suppl. Screening based on breast density [26] Moderate quality	▪ Variant 1. Supplemental breast cancer screening. Average-risk females with nondense breasts. ▪ Variant 4. Supplemental breast cancer screening. Average-risk females with dense breasts
ACR 2018: Breast Imaging of Pregnant and Lactating Women [27] Moderate quality	▪ Variant 1. Breast cancer screening during lactation. Initial imaging. ▪ Variant 4. Breast cancer screening during pregnancy. Age 40 years or older, any risk level. Initial imaging.
Brazilian guidelines 2018 [28] Moderate quality	**Breast cancer screening in asymptomatic women** - < 50 years (Strong recommendation), 50 to 59 years (Weak recommendation), 60 to 69 years (Weak recommendation), 70 to 74 years (Weak recommendation), ≥ 75 years (Strong recommendation) - Periodicity (Strong recommendation)

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
DBT: digital breast tomosynthesis; MRI: magnetic resonance imaging; US: ultrasound	
	- MRI, US, thermography, or tomosynthesis alone or as a complement to mammography (Strong recommendation)
Brazilian guideline 2017 (BCRDI, BBDS, BFGOA) [29] Moderate quality	- Screening for women between 40 and 74 years of age (category A recommendation) - US breast cancer screening (no data), US in women with dense breasts (category B recommendation) - MRI (no data) - Tomosynthesis with digital mammography (COMBO or synthesized) (category B recommendation)
CTFPHC 2018 [30] High quality	- Screening women aged 40 to 49 years (conditional recommendation; low-certainty evidence) - Screening women aged 50 to 69 years (conditional recommendation; very low certainty evidence) - Screening women aged 70 to 74 years (conditional recommendation; very low certainty evidence) - MRI, tomosynthesis, US (strong recommendation; no evidence)
European Breast Guidelines 2020 [31] High quality	- Recommendation 1. Women aged 40 to 44 years (conditional recommendation, moderate certainty evidence) - Recommendation 2. Women aged 45 to 49 years (conditional recommendation, moderate certainty evidence) - Recommendation 3. Women aged 50 to 69 years (strong recommendation, moderate certainty evidence) - Recommendation 4. Women aged 70 to 74 years (conditional recommendation, moderate certainty evidence) - Recommendation 5. Women aged 45 to 49 years screening frequency (conditional recommendation, very low certainty evidence) - Recommendations 6 and 7. Women aged 50 to 69 years screening annual frequency (strong recommendation, very low certainty evidence), biennial vs triennial frequency (conditional recommendation, very low certainty evidence) - Recommendations 8 and 9. Women aged 70 to 74 years cancer annual frequency (strong recommendation, very low certainty evidence), biennial vs triennial frequency (conditional recommendation, very low certainty evidence) - Recommendation 10. Digital mammography vs DBT (conditional recommendation, very low certainty evidence) - Recommendation 11. Digital mammography alone vs DBT plus digital mammography (conditional recommendation, very low certainty evidence) - Recommendation 12. Women with high mammographic breast density and negative mammography results, tailored screening with automated breast ultrasonography (ABUS) (conditional recommendation, very low certainty evidence) - Recommendation 13. Women with high mammographic breast density and a negative mammography result, tailored screening with hand-held ultrasound (HHUS) (conditional recommendation, low certainty evidence) - Recommendation 14. Women with high mammographic breast density and a negative mammography result, tailored screening with MRI (conditional recommendation, very low certainty evidence)
EUSOMA/ SIOG 2021 [32] Moderate quality	- Biennial screening mammography in women age 70–75 years of age (level 3) - Screening in women ≥75 years (level 4) - Annual screening mammography in women 75 years of age or older (category D recommendation)
German guidelines 2018 (DGGG and DKG) [33,34] Moderate quality	- German national mammography screening program women aged between 50 and 69 years (LoE: 1a) - Women aged over 70 years (LoE: 1a) - Women between 40 to 49 years (LoE: 1b) - Tomosynthesis, US, MRI, or other techniques (insufficient evidence)

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
DBT: digital breast tomosynthesis; MRI: magnetic resonance imaging; US: ultrasound	
Japanese guidelines 2016 [35] Moderate quality	- Mammographic screening without clinical breast examination for women aged 40–74 years (recommendation grade B) - Mammographic screening with clinical breast examination for women aged 40–64 years (recommendation grade B) - US with and without mammography (recommendation grade I)
RCR 2017 [36] High quality	**B01. BREAST SCREENING: WOMEN <40 YEARS OLD** - Mammography [B] **B02. BREAST SCREENING: WOMEN 40-49 YEARS OLD** - Mammography [A] - US [A] **B03. BREAST SCREENING: WOMEN 50-70 YEARS OLD** - Mammography [A] - US [B] **B04. BREAST SCREENING: WOMEN >70 YEARS OLD** - Mammography [A]
Tunisian guidelines 2021 [37] Moderate quality	This is a Tunisian breast cancer screening guideline which used the GRADE Adolpment process by adapting of the European Guidelines on Breast Cancer Screening and Diagnosis to the Tunisian setting.
USPSTF 2016 [38–40] Moderate quality	These recommendations apply to asymptomatic women aged ≥40 years who do not have pre-existing breast cancer or a previously diagnosed high-risk breast lesion and who are not at high risk for breast cancer because of a known underlying genetic mutation (such as a BRCA1 or BRCA2 gene mutation or other familial breast cancer syndrome) or a history of chest radiation at a young age. - Women aged 50 to 74 years (B recommendation) - Women prior to age 50 years (C recommendation) - Women aged 75 years or older (I statement) - Digital breast tomosynthesis as a primary screening method (I statement) - Adjunctive screening for breast cancer using breast US, MRI, DBT, or other methods in women identified to have dense breasts on an otherwise negative screening mammogram (I statement)

Abbreviations: ACOG: American College of Obstetricians and Gynecologists; ACP: American College of Physicians; ACR: American College of Radiology; CAR: Canadian Association of Radiologists; BBDS: Brazilian Breast Disease Society; BCRDI: Brazilian College of Radiology and Diagnostic Imaging; BFGOA: Brazilian Federation of Gynecological and Obstetrical Associations; CTFPHC: Canadian Task Force for Preventive Health Care; DGGG: German Society for Gynecology and Obstetrics DKG: German Cancer Society; EUSOMA/SIOG: European Society of Breast Cancer Specialists/International Society of Geriatric Oncology; LoE: Level of Evidence; NICE: National Institute for Health and Care Excellence; RCR: Royal College of Radiologists; USPSTF: United States Preventive Services Task Force

Table B01B. Transpeople at average risk of breast cancer

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2021: Transgender breast cancer screening [41] Moderate quality	▪ Variant 1. Breast cancer screening. Transfeminine (male-to-female) patient, 40 years of age or older with past or current hormone use equal to or greater than 5 years. Average-risk patient. ▪ Variant 3. Breast cancer screening. Transfeminine (male-to-female) patient with no hormone use (or hormone use less than 5 years) at any age. Average-risk patient. ▪ Variant 5. Breast cancer screening. Transmasculine (female-to-male) patient with bilateral mastectomies (“top surgery”) at any age and any risk. ▪ Variant 6. Breast cancer screening. Transmasculine (female-to-male) patient with reduction mammoplasty or no chest surgery, 40 years of age or older. Average-risk patient (less than 15% lifetime risk of breast cancer).

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists

B02. High-risk screening

Table B02A. Screening females at increased risk of breast cancer

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
DBT: digital breast tomosynthesis; MRI: magnetic resonance imaging; US: ultrasound	
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2017: Breast Cancer Screening [25] Moderate quality	▪ Variant 3. Breast cancer screening. High-risk women: women with a BRCA gene mutation and their untested first-degree relatives, women with a history of chest irradiation between 10 to 30 years of age, women with 20% or greater lifetime risk of breast cancer.
ACR 2021: Suppl. Screening based on breast density [26] Moderate quality	▪ Variant 2. Supplemental breast cancer screening. Intermediate-risk females with nondense breasts. ▪ Variant 3. Supplemental breast cancer screening. High-risk females with nondense breasts. ▪ Variant 5. Supplemental breast cancer screening. Intermediate-risk females with dense breasts. ▪ Variant 6. Supplemental breast cancer screening. High-risk females with dense breasts.
ACR 2018: Screening in women at higher-than-average risk [42] Moderate quality	- Women with genetics-based increased risk (and their untested first-degree relatives) or with a calculated lifetime risk of 20% or more: recommendations around digital mammography, DBT - Women with histories of chest radiation therapy before the age of 30: recommendations around digital mammography, DBT - Women with genetics-based increased risk (and their untested first-degree relatives), histories of chest radiation (cumulative dose of 10 Gy before age 30), or a calculated life-time risk of 20% or more: recommendations around breast MRI - Women with elevated risk who cannot undergo breast MRI: recommendations around US
Brazilian guideline 2017 (BCRDI, BBDS, BFGOA) [29] Moderate quality	- Women with BRCA1 or BRCA2 gene mutations and with first degree relatives with proven mutation: recommendation around annual breast cancer mammography (category B) - Women with a ≥20% lifetime risk: recommendation around annual breast cancer screening with mammography (category B) - Women with a history of irradiation of the chest between 10 and 30 years of age: recommendation around annual breast cancer screening with mammography (category C) - Women diagnosed with genetic syndromes that increase the risk of breast cancer (such as Li-Fraumeni syndrome and Cowden syndrome) and who have first-degree relatives that have been affected: recommendation around annual breast cancer screening with mammography (category D) - Women with BRCA1 or BRCA2 gene mutations and who have first-degree relatives with a proven mutation: recommendation around annual breast cancer screening with MRI (category A) - Women with a ≥20% lifetime risk: recommendation around annual breast cancer screening with MRI (category A) - Women with a history of irradiation of the chest between 10 and 30 years of age: recommendation around annual breast cancer screening with MRI (category C) - Women diagnosed with genetic syndromes that increase the risk of breast cancer (such as Li-Fraumeni syndrome and Cowden syndrome) and women who have first-degree relatives that have been affected: recommendation around annual breast cancer screening with MRI (category D). - US as a substitute for MRI (category B).

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
DBT: digital breast tomosynthesis; MRI: magnetic resonance imaging; US: ultrasound	
	- Tomosynthesis in association with digital mammography (COMBO or synthesized) (category B)
German guidelines 2018 [33,34] Moderate quality	- Patients with a pathogenic BRCA1/2 mutation (IARCclass4/5) and patients with a residual lifetime risk of ≥30%: recommendation around intensified screening including MRI - Additional mammography screening after the age of 40
International Guideline Harmonization Group 2020 [43] High quality	**Female childhood, adolescent and young adult cancer survivors treated with ≥10 Gy chest radiation** - Breast cancer surveillance (level A evidence, strong recommendation) - Initiation of breast cancer surveillance (level A evidence, strong recommendation) - Age of annual breast cancer surveillance (level A evidence, strong recommendation) - Mammography and breast MRI (level A and B evidence, strong recommendation) - Clinical breast exam (expert opinion, moderate recommendation) **Female childhood, adolescent and young adult cancer survivors treated with upper abdominal radiation exposing breast tissue at a young age** - Breast cancer surveillance (level B evidence, moderate recommendation) - Initiation of breast cancer surveillance (level B evidence, moderate recommendation) - Age of annual breast cancer surveillance (level B evidence, moderate recommendation) - Mammography and breast MRI (level A and B evidence, strong recommendation) - Clinical breast exam (expert opinion, moderate recommendation)
NICE 2019 (CG164) [44] High quality	**Surveillance for women with no personal history of breast cancer** **Mammographic surveillance** - Mammographic surveillance to women: recommendations around age and reason for high-risk - Mammographic surveillance as part of the population screening programme to women: recommendations around age and reason for high-risk - Mammographic surveillance for women: recommendations around age and reason for high-risk - Mammographic surveillance to women: recommendations around age and reason for high-risk **Ultrasound Surveillance** - Recommendations around US surveillance and when it would be considered **MRI surveillance** - MRI surveillance to women: recommendations around age and reason for high-risk - MRI to women: recommendations around age and reason for high-risk
RCR 2017 [36] High quality	**B05. BREAST SCREENING: WOMEN WITH INCREASED LIFETIME RISK OF DEVELOPING BREAST CANCER** - Mammography [B] - MRI [B] - US [B]

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists; NICE: National Institute for Health and Care Excellence; RCR: Royal College of Radiologists

Table B02B. Transpeople at increased risk of breast cancer

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2021: Transgender breast cancer screening [41] Moderate quality	▪ Variant 2. Breast cancer screening. Transfeminine (male-to-female) patient, 25 to 30 years of age or older with past or current hormone use equal to or greater than 5 years. Higher-than-average risk (patient with personal history of breast cancer or chest irradiation at 10 to 30 years of age, patient with genetic predisposition to breast cancer, patient with family history of breast or ovarian cancer, and untested patient with first-degree relative with genetic predisposition to breast cancer). ▪ Variant 4. Breast cancer screening. Transfeminine (male-to-female) patient, 25 to 30 years of age or older with no hormone use (or hormone use less than 5 years). Higher-than-average risk (patient with personal history of breast cancer or chest irradiation at 10 to 30 years of age, patient with genetic predisposition to breast cancer, patient with family history of breast or ovarian cancer, and untested patient with first-degree relative with genetic predisposition to breast cancer) ▪ Variant 8. Breast cancer screening. Transmasculine (female-to-male) patient with reduction mammoplasty or no chest surgery, 25 to 30 years of age or older. High risk (patient with genetic predisposition to breast cancer or untested patient with a first-degree relative with genetic predisposition to breast cancer, patient with a history of chest irradiation between 10 to 30 years of age, patient with 20% or greater lifetime risk of breast cancer).
ACR 2021 : Suppl. Screening based on breast density [26] Moderate quality	▪ Variant 7. Breast cancer screening. Transmasculine (female-to-male) patient with reduction mammoplasty or no chest surgery, 30 years of age or older. Intermediate risk (patient with personal history of breast cancer, lobular neoplasia, atypical ductal hyperplasia, or 15% to 20% lifetime risk of breast cancer)

Abbreviations: ACR: American College of Radiology

Table B02C. Pregnant/lactating persons at increased risk of breast cancer

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2018: Breast Imaging of Pregnant and Lactating Women [27] Moderate quality	▪ Variant 2. Breast cancer screening during pregnancy. Age younger than 30 at high risk. Initial imaging. ▪ Variant 3. Breast cancer screening during pregnancy. Age 30 to 39 years at elevated risk (intermediate or high risk). Initial imaging.

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists

B03. Symptomatic patients

Table B03A. Palpable mass

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
MRI: magnetic resonance imaging; US: ultrasound	
CAR 2012 [19]	**M03. CLINICAL SUSPICION OF CARCINOMA** - Mammography: Indicated [B]: Mammography is the primary investigation to be done in women over 30. - US: Indicated only in specific circumstances [B]: Ultrasound is the initial imaging technique to evaluate palpable masses in women under 30 and in lactating and pregnant women. US is an important adjunctive to mammography test for evaluation of palpable masses in women with mammographically dense breast tissue. US may be the initial imaging test in women with a new clinical concern and recently performed normal mammography. - MRI: Indicted only in specific circumstances [B]: May be indicated as part of initial staging for a documented neoplasm. May be indicated when other imaging techniques are inconclusive.
ACR 2017: Palpable breast mass [45] Moderate quality	▪ Variant 1. Palpable breast mass. Woman 40 years of age or older, initial evaluation. ▪ Variant 3. Palpable breast mass. Woman 40 years of age or older, mammography findings probably benign. Next examination to perform. ▪ Variant 5. Palpable breast mass. Woman 40 years of age or older, mammography findings negative. Next examination to perform. ▪ Variant 6. Palpable breast mass. Woman younger than 30 years of age, initial evaluation. ▪ Variant 8. Palpable breast mass. Woman younger than 30 years of age, US findings probably benign. Next examination to perform. ▪ Variant 10. Palpable breast mass. Woman younger than 30 years of age, US findings negative. Next examination to perform. ▪ Variant 11. Palpable breast mass. Woman 30 to 39 years of age, initial evaluation.
ACR 2018: Breast Imaging of Pregnant and Lactating Women [27] Moderate quality	See **B03F** for recommendations specific to pregnant women with palpable mass.
German guidelines 2018 [33,34] Moderate quality	**Section 2.1. Diagnostic Workup of Breast Cancer: Imaging method** **Note**: These recommendations are not specific to palpable breast mass. They are for any woman with suspicious clinical breast exam. Covers recommendations around: - Mammography - US - Further imaging procedures, mammographically confirmed high density (LoE: 1b) - In a diagnostic setting, MRI with contrast media (LoE: 2a)

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
MRI: magnetic resonance imaging; US: ultrasound	
NCCN 2018 [46] Moderate quality	**Note**: The NCCN guidelines provide algorithms for several "presenting sign/symptoms", diagnostic evaluation and workup. Only the diagnostic evaluation and workup if negative, benign, or probably benign has been captured. These cover imaging recommendations around palpable mass (<30 years and ≥30 years) and asymmetric thickening or nodularity (<30 years and ≥30 years)
RCR 2017 [36] High quality	**B06. BREAST CANCER DIAGNOSIS**: Breast lump; Focal nodularity; Skin tethering; New nipple retraction; Bloody or single-duct nipple discharge; Suspected Paget's disease of the nipple - Mammography (including advanced digital techniques; e.g., tomosynthesis) [B] - US [B] - MRI [B]

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists; LoE: level of evidence; NCCN: National Comprehensive Cancer Network; RCR: Royal College of Radiologists

Table B03B. Suspicious nipple discharge

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
MRI: magnetic resonance imaging; US: ultrasound	
CAR 2012 [19]	**M05. SPONTANEOUS BLOOD OR CLEAR NIPPLE DISCHARGE** - Mammography: Indicated [C]: Mammography is the preferred modality for nipple discharge. - US: Indicated [C]: This is an important additional test for nipple discharge. - Ductography (Galactography): Indicated [C]: Indicated if mammography and US are inconclusive. - MRI: Indicated only in specific circumstances [C]: If all other tests are inconclusive.
ACR 2017: Evaluation of Nipple Discharge [47] Moderate quality	▪ Variant 1. Physiologic nipple discharge. Woman of any age. Initial imaging examination ▪ Variant 2. Pathologic nipple discharge. Man or woman 40 years of age or older. Initial imaging examination. ▪ Variant 3. Pathologic nipple discharge. Man or woman 30 to 39 years of age. Initial imaging examination. ▪ Variant 4. Pathologic nipple discharge. Woman younger than 30 years of age. Initial imaging examination. ▪ Variant 5. Pathologic nipple discharge. Man younger than 30 years of age. Initial imaging examination.
NCCN 2018 [46] Moderate quality	**Note**: The NCCN guidelines provide algorithms for several "presenting sign/symptoms", diagnostic evaluation and workup. Only the diagnostic evaluation and workup if negative, benign, or probably benign has been captured. These cover imaging recommendations around: **Nipple discharge, no palpable mass** - Non-spontaneous or multi-duct (age <40 years and age ≥40 years) - Persistent and reproducible on exam, spontaneous, unilateral, single duct, and clear or bloody (age <30 years and age ≥ 30 years)

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists; NCCN: National Comprehensive Cancer Network

Table B03C. Suspected Paget's disease

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
MRI: magnetic resonance imaging; US: ultrasound	
CAR 2012 [19]	**M04. SUSPECTED PAGET'S DISEASE** - Mammography: Indicated [C]: Mammography will show an abnormality in 50% of women. It is helpful to determine the possibility of image-guided biopsy. When invasive disease is confirmed it will influence the surgical management of the axilla.
NCCN 2018 [46] Moderate quality	**Note**: The NCCN guidelines provide algorithms for several "presenting sign/symptoms", diagnostic evaluation and workup. Only the diagnostic evaluation and workup if negative, benign, or probably benign has been captured. These cover imaging recommendations around: **Skin changes (nipple excoriation, scaling, eczema, skin ulcers)**: Clinical suspicion of Paget's disease or other manifestations of breast cancer: Nipple excoriation, Scaling, Skin ulceration (If clinically of low suspicion for Paget's disease or high suspicion for eczema, a short trial of topical steroids may be indicated) (age <30 years and ≥30 years)

Abbreviations: CAR: Canadian Association of Radiologists; NCCN: National Comprehensive Cancer Network

Table B03D. Suspected inflammatory breast cancer

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
MRI: magnetic resonance imaging; US: ultrasound	
CAR 2012 [19]	**M07. BREAST INFLAMMATION** - Mammography: Specialized investigation [C]: Can help to exclude specific mammographic signs of malignancy when there is clinical doubt. - US: Indicated only in specific circumstances [C]: Useful to detect possible abscess cavity and for sonographic guided aspiration as well as follow-up.
NCCN 2018 [46] Moderate quality	**Note**: The NCCN guidelines provide algorithms for several "presenting sign/symptoms", diagnostic evaluation and workup. Only the diagnostic evaluation and workup if negative, benign, or probably benign has been captured. These cover imaging recommendations around: **Skin changes:** Clinical suspicion of inflammatory breast cancer includes but is not limited to: Peau d'orange (pitted or dimpled appearance of skin), Skin thickening, Edema, Erythema (if clinically of low suspicion for breast cancer or high suspicion for infection, a short trial (7–10 days) of antibiotics for mastitis may be indicated) (age <30 years and ≥30 years)
RCR 2017 [36] High quality	**B09. BREAST INFLAMMATION** - US [C] - Mammography [C] - MRI [C]

Abbreviations: CAR: Canadian Association of Radiologists; NCCN: National Comprehensive Cancer Network; RCR: Royal College of Radiologists

Table B03E. Suspected axillary lymphadenopathy

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.

NCCN 2018 [46]
Moderate quality
	Note: The NCCN guidelines provide algorithms for several "presenting sign/symptoms", diagnostic evaluation and workup. Only the diagnostic evaluation and workup if negative, benign, or probably benign has been captured. These include recommendations around:
	Axillary mass (localized to the axilla and no signs of lymphoma)
	- Bilateral → Systemic evaluation
	  o Systemic disease
	  o No systemic disease
	- Unilateral → No systemic disease

Abbreviations: CAR: Canadian Association of Radiologists; NCCN: National Comprehensive Cancer Network

Table B03F. Pregnant/lactating symptomatic patients

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	**See M03. Clinical suspicion of carcinoma in Table B03A**
ACR 2018: Breast Imaging of Pregnant and Lactating Women [27] Moderate quality	▪ Variant 5. Pregnant women with a palpable breast mass. Initial imaging. ▪ Variant 6. Clinically suspicious nipple discharge during pregnancy. Initial imaging.
ACR 2017: Palpable breast mass [45] Moderate quality	▪ Variant 6. Palpable breast mass. Woman younger than 30 years of age, initial evaluation.

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists

Table B03G. Male symptomatic patients

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
US: ultrasound	
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2017: Evaluation of Nipple Discharge [47] Moderate quality	▪ Variant 2. Pathologic nipple discharge. Man or woman 40 years of age or older. Initial imaging examination. ▪ Variant 3. Pathologic nipple discharge. Man or woman 30 to 39 years of age. Initial imaging examination. ▪ Variant 5. Pathologic nipple discharge. Man younger than 30 years of age. Initial imaging examination.
ACR 2018: Evaluation of the symptomatic male breast [49] Moderate quality	▪ Variant 1. Male patient of any age with symptoms of gynecomastia and physical examination consistent with gynecomastia or pseudogynecomastia. Initial imaging. ▪ Variant 2. Male younger than 25 years of age with indeterminate palpable breast mass. Initial imaging. ▪ Variant 3. Male 25 years of age or older with indeterminate palpable breast mass. Initial imaging. ▪ Variant 4. Male 25 years of age or older with indeterminate palpable breast mass. Mammography or digital breast tomosynthesis Indeterminate or suspicious. ▪ Variant 5. Male of any age with physical examination suspicious for breast cancer (suspicious palpable breast mass, axillary adenopathy, nipple discharge, or nipple retraction). Initial imaging.
German guidelines 2018 [33,34] Moderate quality	**Early detection, mammography screening** Expert consensus around investigation for symptomatic men.
RCR 2017 [36] High quality	**B11. MALE PATIENTS WITH**: Discrete breast lump; New asymmetry; Skin tethering; New nipple retraction; Nipple discharge - US [C] - Mammography [C]

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists; RCR: Royal College of Radiologists

Table B03H. Pediatric/adolescent symptomatic patients

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.

Abbreviations: CAR: Canadian Association of Radiologists

Table B04. Previous diagnosis of a high-risk lesion

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
MRI: magnetic resonance imaging; US: ultrasound	
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2017: Breast Cancer Screening [25] Moderate quality	▪ Variant 2. Breast cancer screening. Intermediate-risk women: women with personal history of breast cancer, lobular neoplasia, atypical ductal hyperplasia, or 15% to 20% lifetime risk of breast cancer.
ACR 2018: Screening in women at higher-than-average risk [42] Moderate quality	In women with atypical ductal hyperplasia, atypical lobular hyperplasia, or lobular carcinoma in situ: - MRI - Adjunctive screening with US For women with elevated risk limited to increased breast density: - US
Brazilian guideline 2017 [29] Moderate quality	Women with a history of atypical lobular hyperplasia, lobular carcinoma in situ, atypical ductal hyperplasia, ductal carcinoma in situ, or invasive breast carcinoma: - Mammography screening (category C recommendation) - MRI screening (category C recommendation) - US (category B recommendation).

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists

Table B05. Assessment of breast implants

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
MRI: magnetic resonance imaging; US: ultrasound	
CAR 2012 [19]	**M06. ASSESSMENT OF INTEGRITY OF SILICONE BREAST IMPLANTS** - Mammography: Indicated [C]: Mammography can detect extracapsular rupture. - US: Indicated [B]: Ultrasound can detect both intra- and extracapsular rupture. - MRI: Specialized investigation [B]: Is the most sensitive test to document implant rupture.
ACR 2018: Breast implant evaluation [50] Moderate quality	▪ Variant 1. Evaluation of saline breast implants. Asymptomatic patient. Any age. Initial imaging. ▪ Variant 2. Evaluation of saline breast implants. Clinical examination equivocal for implant rupture. Age younger than 30 years. Initial imaging. ▪ Variant 3. Evaluation of saline breast implants. Clinical examination equivocal for implant rupture. Age 30–39 years. Initial imaging. ▪ Variant 4. Evaluation of saline breast implants. Clinical examination equivocal for implant rupture. Age 40 years or older. Initial imaging. ▪ Variant 5. Evaluation of silicone breast implants. Asymptomatic patient. Any age. Initial imaging. ▪ Variant 6. Evaluation of silicone breast implants. Suspected implant complication. Age younger than 30 years. Initial imaging. ▪ Variant 7. Evaluation of silicone breast implants. Suspected implant complication. Age 30–39 years. Initial imaging. ▪ Variant 8. Evaluation of silicone breast implants. Suspected implant complication. Age 40 years or older. Initial imaging. ▪ Variant 9. Evaluation of unexplained axillary adenopathy. Silicone breast implants (current or prior). Age younger than 30 years. Initial imaging. ▪ Variant 10. Evaluation of unexplained axillary adenopathy. Silicone breast implants (current or prior). Age 30–39 years. Initial imaging. ▪ Variant 11. Evaluation of unexplained axillary adenopathy. Silicone breast implants (current or prior). Age 40 years or older. Initial imaging. ▪ Variant 12. Suspected breast implant associated anaplastic large-cell lymphoma (BIA-ALCL) (delayed seroma, swelling, mass, pain but no erythema, warmth or skin changes that would raise concern for inflammatory breast cancer or mastitis). Any age. Breast implant of any type. Initial imaging.
RCR 2017 [36] High quality	**B10. ASSESSMENT OF INTEGRITY OF BREAST IMPLANTS** - US & MRI [B]

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists; RCR: Royal College of Radiologists

B06. Breast pain assessment

Table B06A. Cyclic or non-cyclic diffuse breast pain

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
US: ultrasound	
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2018: Breast Pain [51] Moderate quality	▪ Variant 1. Woman with clinically insignificant breast pain (nonfocal [greater than one quadrant], diffuse, or cyclical) without other suspicious clinical finding. Any age. Initial imaging.
NCCN 2018 [46] Moderate quality	**Note**: The NCCN guidelines provide algorithms for several "presenting sign/symptoms", diagnostic evaluation and workup. Only the diagnostic evaluation and workup if negative, benign, or probably benign has been captured. These include recommendations around: Persistent or severe breast pain: Cyclic, diffuse, non-focal pain (larger than quadrant)
RCR 2017 [36] High quality	**B07. BREAST GENERALISED PAIN/TENDERNESS, LUMPINESS WITHOUT LOCALISED CHANGES OR LONG-STANDING NIPPLE RETRACTION** - Mammography [C] - US [C] **B08. CYCLICAL MASTALGIA** - Mammography [B] - US [B]

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists; NCCN: National Comprehensive Cancer Network; RCR: Royal College of Radiologists

Table B06B. Non-cyclic focal

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2018: Breast Pain [51] Moderate quality	**NOTE:** The following discussion is for cases of isolated breast pain without other symptoms. ▪ Variant 2. Woman with clinically significant breast pain (focal and noncyclical). Age less than 30. Initial imaging. ▪ Variant 3. Woman with clinically significant breast pain (focal and noncyclical). Age 30 to 39. Initial imaging. ▪ Variant 4. Woman with clinically significant breast pain (focal and noncyclical). Age greater than or equal to 40. Initial imaging.
NCCN 2018 [46] Moderate quality	**Note**: The NCCN guidelines provide algorithms for several "presenting sign/symptoms", diagnostic evaluation and workup. Only the diagnostic evaluation and workup if negative, benign, or probably benign has been captured. These include recommendations around: Persistent or severe breast pain: Focal pain (<30 years and ≥30 years)

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists; NCCN: National Comprehensive Cancer Network

B07. Mastitis/infection and abscess assessment

Table B07A. Mastitis/infection

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.

Abbreviations: CAR: Canadian Association of Radiologists

Table B07B. Mastitis/suspected abscess

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
US: ultrasound	
CAR 2012 [19]	**M07. BREAST INFLAMMATION** - US: Indicated only in specific circumstances [C]: Useful to detect possible abscess cavity and for sonographic guided aspiration as well as follow-up.
RCR 2017 [36] High quality	**B09. BREAST INFLAMMATION** - US [C]

Abbreviations: CAR: Canadian Association of Radiologists; RCR: Royal College of Radiologists

Table B08. Patients with history of breast cancer

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
MRI: magnetic resonance imaging; PET-CT: positron emission tomography-computed tomography; US: ultrasound	
CAR 2012 [19]	**M08. BREAST CANCER FOLLOW-UP (SURVEILLANCE)** - Mammography: Indicated [A]: Annual mammography is appropriate and should be complemented with breast clinical examination.
ACR 2018: Screening in women at higher-than-average risk [42] Moderate quality	- For women with personal histories of breast cancer and dense breast tissue, or those diagnosed before age 50 - For women with elevated risk who would qualify for but cannot undergo breast MRI
ACR 2019: Stage I Breast [52] Moderate quality	**VARIANT 6. SURVEILLANCE. STAGE I BREAST CANCER. ASYMPTOMATIC. RULE OUT LOCAL RECURRENCE.** Local recurrence is defined as the return of cancer to the breast, regional lymph nodes, or chest wall after treatment.
ASCO 2020 [53] High quality	- Recommendation 8 - Recommendation 9.1 - Recommendation 9.2
EUSOMA/ SIOG 2021 [32] Moderate quality	- Breast cancer survivors ≥70 years - Medical services in patients ≥80 years
German guidelines 2018 [33,34] Moderate quality	**Examination for loco-regional/intramammary recurrence or contralateral breast cancer** - Diagnostic imaging procedures for the detection of local and locoregional recurrence or contralateral cancer - US examinations as part of standard follow **Diagnosis of local/loco-regional recurrence** - In asymptomatic patients - Imaging to clarify a suspicion of local/loco-regional recurrence - Breast MRI - PET-CT

NICE 2019 (CG164) [44]
High quality
	- **Surveillance for women with a personal and family history of breast cancer**
	  o Mammography
	  o Women who have undergone a bilateral mastectomy
	- **Mammographic surveillance**
	- **MRI surveillance**
	  o Women aged 30 to 49 years, Women aged 50 years and over
	- **Surveillance for women who remain at moderate risk of breast 6cancer**

Abbreviations: ASCO: American Society of Clinical Oncology; CAR: Canadian Association of Radiologists; EUSOMA/SIOG: European Society of Breast Cancer Specialists and the International Society of Geriatric Oncology; NICE: National Institute for Health and Care Excellence; RCR: Royal College of Radiologists

Table B09. Patients following risk-reduction mastectomy (with or without autologous or implant-based reconstruction)

Guideline Group AGREE-II Assessment	Imaging modality addressed in guideline recommendations and/or clinical scenarios covered (Note: Recommendations are not included, except for the 2012 CAR guideline)
CAR 2012 [19]	This scenario was not addressed in the 2012 CAR guidelines.
ACR 2020: Imaging after mastectomy and breast reconstruction [54] Moderate quality	▪ Variant 1: Female. Breast cancer screening. History of cancer, mastectomy side(s), no reconstruction ▪ Variant 2: Female. Breast cancer screening. History of cancer, autologous reconstruction side(s) with or without implant. ▪ Variant 3: Female. Breast cancer screening. History of cancer, nonautologous (implant) reconstruction side(s). ▪ Variant 4: Female. Breast cancer screening. High-risk, bilateral prophylactic mastectomy, no reconstruction ▪ Variant 5: Female. Breast cancer screening. High-risk, bilateral prophylactic mastectomy with autologous reconstructions ▪ Variant 6: Female. Breast cancer screening. High-risk, bilateral prophylactic mastectomy with nonautologous (implant) reconstructions ▪ Variant 7: Female. Palpable lump or clinically significant pain on the side of the mastectomy without reconstruction. Initial imaging ▪ Variant 8: Female. Palpable lump or clinically significant pain on the side of the mastectomy with reconstruction (autologous or nonautologous). Initial imaging.
German guidelines 2018 [33,34] Moderate quality	**Follow-up examinations for breast cancer–breast diagnostics after breast conservative therapy and mastectomy** - Ipsilateral breast - Mastectomy - Contralateral breast
NICE 2019 (CG164) [44] High quality	**Surveillance for women with a personal and family history of breast cancer**

Abbreviations: ACR: American College of Radiology; CAR: Canadian Association of Radiologists; NICE: National Institute for Health and Care Excellence

APPENDIX 3A. BREAST DISEASE SUMMARY OF RECOMMENDATIONS (ENGLISH)

Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
B01. AVERAGE RISK SCREENING		
B01A. Screening females at average risk	These recommendations apply for screening females at average risk of breast cancer with or without breast implants.	
	1. In females younger than 40 years old, at average risk of breast cancer, we recommend **against routine mammography screening**.	↓↓
	2. In females 40 to 49 years of age, at average risk of breast cancer, we suggest **annual mammography/DBT screening**. *The age to begin screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, and patient preference. If the patient requests screening after this discussion, screening should be offered.*	↑
	3. In females 50 years of age and older, at average risk of breast cancer, we recommend **mammography/DBT screening** every one to two years. *The frequency of screening and decision to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.*	↑↑
	4. In females undergoing screening with mammographically confirmed extremely dense breast tissue (i.e., ACR category D), we suggest **supplementary imaging**. *The supplemental screening modality may vary based on regional practice preferences and resource availability.*	↑
	↳ **4.1** In females with mammographically confirmed ACR category C dense breast tissue, we suggest **supplementary imaging**, depending on capacity constraints. *The capacity for supplemental screening may vary between provinces and between regions within a province.*	↑
B01B. Screening trans people at average risk	**1.** In transmasculine people under 40 years of age (with or without bilateral mastectomies) and in transfeminine individuals with no or < 5 years of hormone use, at average risk of breast cancer, we recommend **against routine mammography/DBT screening**.	↓↓

These recommendations are not intended to stand alone. Medical care should be based on evidence, a clinician's expert judgment, the patient's circumstances, values, and preferences, and resource availability. We recognize that not all imaging modalities are available in all locations, particularly in rural or remote areas of Canada. Decisions about whether to recommend that a patient travel for recommended imaging or perform alternate imaging locally can be difficult, and should consider the expected benefits of recommended imaging, risks of travel, patient preference, and other factors. This guideline is based on evidence related to diagnostic imaging tests only, not the clinical management of a patient. As discussed in the 'Sex and gender in recommendations' section, where appropriate, the terms female and male are used in these recommendations to apply to the individuals who would have been assigned a sex at birth of either male or female.

Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
	2. In transmasculine people at average risk of breast cancer, aged 40 to 49 years of age, who have not undergone bilateral mastectomies, we suggest **annual mammography/DBT screening**. *The age to begin screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, and patient preference. If the patient requests screening after this discussion, screening should be offered.*	↑
	3. In transmasculine people at average risk of breast cancer, aged 50 years and older, who have not undergone bilateral mastectomies, we recommend **mammography/DBT screening** every one to two years. *The frequency of screening and decision to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.*	↑↑
	4. In transfeminine people at average risk of breast cancer with or without breast implants, aged 40 to 49 years of age, with past or current hormone use for ≥ 5 years, we suggest **annual mammography/DBT screening**. *The age to begin screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, and patient preference. If the patient requests screening after this discussion, screening should be offered.*	↑
	5. In transfeminine people at average risk of breast cancer with or without breast implants, aged 50 years and older, with past or current hormone use for ≥ 5 years, we suggest **mammography/DBT screening** every one to two years. *The frequency of screening and decision to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.*	↑
B02. HIGH-RISK SCREENING		
B02A. Screening females at increased risk	These recommendations apply for screening females at increased risk of breast cancer with or without breast implants.	

Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
	1. In females at high risk of breast cancer due to prior chest wall irradiation between the ages of 10 to 30 years, we recommend **annual mammography/DBT and MRI** screening starting 8 years after chest irradiation, but not before 25 years of age.	↑↑
	↳ **1.1** If MRI is not tolerated, contraindicated, or unavailable, we suggest **US** as an alternative imaging technique. *The decision to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.*	↑
	2. In females with BRCA gene mutations, we recommend **annual mammography/DBT and MRI** screening, starting between the ages of 25 and 30 years.	↑↑
	↳ **2.1** If MRI is not tolerated, contraindicated, or unavailable, we suggest **US** as an alternative imaging technique. *The decision to initiate and to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.*	↑
	3. The role of screening in females with other high-risk gene mutations is an evolving science and further research is required to guide recommendations in this field. Any decision for screening should be made through shared decision making between the physician and the patient.	EPc
	4. In females with lifetime risk of ≥20% (based on risk assessment tool), we suggest **annual mammography/DBT and supplementary screening**, preferably with **MRI**, starting between the ages of 25 and 30 years. *The supplemental screening modality may vary based on regional practice preferences and resource availability.* *The decision to initiate and to discontinue screening should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests screening after this discussion, screening should be offered.*	↑
B02B. Screening trans people at increased risk	**1.** In transfeminine people at high risk for breast cancer✧, aged 30 years and older, with past or current hormone use ≥ 5 years, guideline recommendations are identical to those presented in B02A.	

These recommendations are not intended to stand alone. Medical care should be based on evidence, a clinician's expert judgment, the patient's circumstances, values, and preferences, and resource availability. We recognize that not all imaging modalities are available in all locations, particularly in rural or remote areas of Canada. Decisions about whether to recommend that a patient travel for recommended imaging or perform alternate imaging locally can be difficult, and should consider the expected benefits of recommended imaging, risks of travel, patient preference, and other factors. This guideline is based on evidence related to diagnostic imaging tests only, not the clinical management of a patient. As discussed in the 'Sex and gender in recommendations' section, where appropriate, the terms female and male are used in these recommendations to apply to the individuals who would have been assigned a sex at birth of either male or female.

Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
	2. In transmasculine people at high risk for breast cancer✧, aged 30 years and older, who have not undergone bilateral mastectomies, guideline recommendations are identical to those presented in B02A. ✧*As presented in B02A*	
B02C. Screening pregnant/ lactating persons at increased risk	These recommendations apply for screening people at increased risk of breast cancer with or without breast implants. **1.** In pregnant people at high risk of breast cancer who choose to continue screening, we suggest **mammography/DBT✧ screening and supplemental screening with US✧✧**. ✧*Screening mammography/DBT will have reduced sensitivity due to increased breast density during pregnancy and lactation.* ✧✧*Screening US may increase the false positive rate and prompt additional biopsies.* **2.** In lactating people at high risk of breast cancer who choose to continue screening, we suggest that **annual mammography/digital breast tomosynthesis and MRI screening** resume after one year. *Breast imaging during pregnancy and lactation is challenging due to physiologic and structural breast changes that increase the difficulty of clinical and radiologic evaluation. The decision to continue screening during pregnancy and lactation should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, expected duration of lactation, and time since last screened. If the patient requests screening after this discussion, screening should be offered.*	↑ ↑
B03. SYMPTOMATIC PATIENTS		
B03A. Palpable mass	**1.** In females under 30 years of age with a palpable breast mass, we recommend **targeted US** of the area of clinical concern as the initial imaging technique. ↳ **1.1** If US findings are negative, we recommend that any decision for further work-up should be based on radiologist discretion and/or clinical grounds. **2.** In females 30 years of age and older with a palpable breast mass, we recommend **mammography/DBT and targeted US** of the area of clinical concern as the initial imaging techniques. **3.** In females of any age with a palpable breast mass that is clinically concerning for malignancy, and mammography and US are negative, we recommend that any decision for further intervention (e.g., palpation-guided biopsy, MRI) should be based on clinical grounds.	↑↑ EPc ↑↑ EPc

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Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
B03B. Suspicious nipple discharge	**1.** In females, at any age, with physiological nipple discharge✧, we recommend **against imaging**. ✧ *Physiological discharge can be characterized as non-spontaneous, bilateral, originating from multiple ducts, and white/green/yellow/black in colour.*	↓↓
	2. In females under 30 years of age with non-physiological nipple discharge, we recommend **targeted US of the retroareolar region** as the initial imaging technique.	↑↑
	3. In females 30 years of age and older with non-physiological nipple discharge, we recommend **mammography/DBT and targeted US of the retroareolar region** as the initial imaging techniques.	↑↑
	↳ **3.1** If the mammography and US are negative or inconclusive, we recommend **MRI or ductography** as the next imaging technique.	↑↑
	↳ **3.2** If all imaging is negative, we recommend that any decision for further work-up be based on clinical grounds, with consideration for surgical consult.	EPc
B03C. Suspected Paget's disease of the breast/nipple	**1.** In females with clinical suspicion of Paget's disease, we recommend **mammography/DBT +/- US** as the initial imaging techniques.	↑↑
	↳ **1.1** If mammography +/- US are negative but clinical findings remain suspicious for Paget's disease, we recommend that any decision for further intervention (e.g., punch biopsy, MRI) should be based on clinical grounds**.**	EPc
B03D. Suspected inflammatory breast cancer	**1.** In females with clinical suspicion of inflammatory breast cancer✧, we recommend **mammography/DBT and US** as the initial imaging techniques. ✧ *Rapid onset of erythema, edema, and a peau d'orange appearance, and/or abnormal breast warmth, with or without a palpable mass, AND erythema that covers at least one third of the breast, AND symptoms that have been present for less than 6 months* [48].	↑↑
	↳ **1.1** If mammography and US are negative but clinical findings remain suspicious for inflammatory breast cancer, we recommend that any decision for further intervention (e.g., punch biopsy, MRI) should be based on clinical grounds.	EPc
B03E. Suspected axillary lymphadenopathy	**1.** In patients under 30 years of age with a palpable area of concern in the axilla, we suggest **axillary US** as the initial imaging technique.	EPc
	2. In patients 30 years of age and older with a palpable area of concern in the axilla, we recommend **axillary US ± diagnostic mammography/DBT** as the initial imaging techniques.	↑↑

These recommendations are not intended to stand alone. Medical care should be based on evidence, a clinician's expert judgment, the patient's circumstances, values, and preferences, and resource availability. We recognize that not all imaging modalities are available in all locations, particularly in rural or remote areas of Canada. Decisions about whether to recommend that a patient travel for recommended imaging or perform alternate imaging locally can be difficult, and should consider the expected benefits of recommended imaging, risks of travel, patient preference, and other factors. This guideline is based on evidence related to diagnostic imaging tests only, not the clinical management of a patient. As discussed in the 'Sex and gender in recommendations' section, where appropriate, the terms female and male are used in these recommendations to apply to the individuals who would have been assigned a sex at birth of either male or female.

Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
	↳ **2.1** In patients with bilateral axillary lymphadenopathy on an otherwise normal mammogram AND systemic disease that is known to account for the lymphadenopathy, we recommend **against further imaging**.	↓↓
B03F. Pregnant/ lactation symptomatic patients	**1.** In symptomatic✧ pregnant and lactating patients, we recommend **targeted US** as the initial imaging technique. ✧ *For example: palpable breast mass, clinically non-physiological nipple discharge or skin changes*	↑↑
	↳ **1.1** In patients with US findings that are indeterminate or suspicious, we recommend **mammography/DBT** as the next imaging technique.	↑↑
	↳ **1.2** In patients with clinical findings that are concerning for malignancy, and US and mammography are negative, that any decision for further intervention (e.g., palpation-guided biopsy) should be based on clinical grounds.	EPc
B03G. Male symptomatic patients	**1.** In males, of any age, with symptoms and physical examination consistent with gynecomastia or pseudogynecomastia, we recommend **against imaging**.	↓↓
	2. In males under the age of 25 presenting with suspicious physical examination findings✧, we recommend **targeted US** as the initial imaging technique.	↑↑
	3. In males 25 years of age and older, with suspicious physical examination findings✧, we recommend **diagnostic mammography/DBT or US** as the initial imaging technique. ✧ *For example: palpable breast mass, axillary adenopathy, nipple discharge, nipple retraction*	↑↑
B03H. Pediatric/ adolescent symptomatic patients	**1.** In paediatric and adolescent✧ patients presenting with a palpable area of concern, we suggest **targeted US** as the initial imaging technique.	EPc
	2. In paediatric and adolescent✧ patients presenting with a palpable area of concern, we recommend **against mammography**. ✧ *<18 years of age*	EPc
B04. PREVIOUS DIAGNOSIS OF A HIGH-RISK LESION		
	1. In females with a previous diagnosis of a high-risk lesion✧, we recommend annual **mammography/DBT** screening beginning at diagnosis, but not earlier than 30 years of age.	↑↑
	↳ **1.1** In females with extremely dense breast tissue (i.e., ACR category D), we suggest annual **MRI** as an	↑

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Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
	adjunct. ↳ **1.2** In females where MRI is not tolerated, contraindicated, or unavailable, we suggest screening **US** as a substitute. ✧*For example, atypical ductal hyperplasia, atypical lobular hyperplasia, lobular carcinoma in situ*	↑
B05. ASSESSMENT OF BREAST IMPLANTS		
	1. In asymptomatic people, with breast implants of any type, we recommend **against imaging for implant evaluation**.	↓↓
	2. In people with saline breast implants and clinically definitive rupture, we recommend **against imaging**.	↓↓
	3. In people under 30 years of age with suspected breast implant complications, we recommend **US** as the initial imaging technique.	↑↑
	4. In people 30 years and older with suspected breast implant complications, we recommend **mammography/DBT and US** as the initial imaging techniques.	↑↑
	5. In people with suspected rupture of silicone breast implant or implant associated lymphoma and equivocal mammography/US findings, we recommend **MRI** for optimal assessment.	↑↑
B06. BREAST PAIN ASSESSMENT		
B06A. Cyclic or non-cyclic diffuse breast pain	**1.** In patients with cyclical breast pain, intermittent breast pain, or non-cyclic diffuse breast pain, we recommend **against imaging**, beyond usual screening recommendations✧. ✧*See B01. Average risk screening or B02. High risk screening*	↓↓
B06B. Non-cyclic focal breast pain	**1.** In patients under 30 years of age with focal, non-cyclical persistent breast pain, we suggest **targeted US** as the initial imaging technique.	↑
	2. In patients 30 years of age and older, with focal, non-cyclical persistent breast pain, we recommend **bilateral mammography/DBT and targeted US** as the initial imaging techniques.	↑↑
B07. MASTITIS/ INFECTION AND ABSCESS ASSESSMENT		
	1. In patients with clinical signs and symptoms of mastitis and suspected breast abscess, we recommend **targeted US** as the initial imaging technique.	↑↑
	2. In patients with no clinical improvement in suspected mastitis following antibiotics, we suggest **diagnostic mammography/DBT and US** as the initial imaging techniques.	EPc

These recommendations are not intended to stand alone. Medical care should be based on evidence, a clinician's expert judgment, the patient's circumstances, values, and preferences, and resource availability. We recognize that not all imaging modalities are available in all locations, particularly in rural or remote areas of Canada. Decisions about whether to recommend that a patient travel for recommended imaging or perform alternate imaging locally can be difficult, and should consider the expected benefits of recommended imaging, risks of travel, patient preference, and other factors. This guideline is based on evidence related to diagnostic imaging tests only, not the clinical management of a patient. As discussed in the 'Sex and gender in recommendations' section, where appropriate, the terms female and male are used in these recommendations to apply to the individuals who would have been assigned a sex at birth of either male or female.

Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
B08. PATIENTS WITH A HISTORY OF BREAST CANCER		
	Patients with breast conserving surgery	
	1. In asymptomatic patients, with a personal history of breast cancer, we recommend **annual surveillance mammography/DBT.** *The decision to discontinue surveillance should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should involve a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests surveillance after this discussion, surveillance should be offered.*	↑↑
	↳ **1.1** In patients with history of breast cancer and extremely dense breast tissue (i.e., ACR category D), we suggest supplemental annual surveillance with **US or MRI**. *Supplemental surveillance may also be offered in other scenarios (e.g., previous mammographically occult cancer, ACR category C dense breast tissue, regional practice preference, and resource constraints).*	↑
	Patients with therapeutic mastectomy	
	2. In patients with a history of breast cancer, we recommend **contralateral annual surveillance mammography/DBT**. *The decision to discontinue surveillance should be made at the individual level and should be jointly assessed by the patient and healthcare provider through a shared decision-making process. This process should include a discussion which considers the benefits, risks, patient preference, and life expectancy. If the patient requests surveillance after this discussion, surveillance should be offered.*	↑↑
	↳ **2.1** In patients with history of breast cancer and extremely dense breast tissue (i.e., ACR category D), we suggest supplemental annual surveillance with **US or MRI**. *Supplemental surveillance may also be offered in other scenarios (e.g., previous mammographically occult cancer, ACR category C dense breast tissue, regional practice preference, and resource constraints).*	↑
	3. In patients with therapeutic mastectomy (bilateral or unilateral) without breast reconstruction, we suggest **no imaging** for breast cancer surveillance on the side(s) of mastectomy.	↓
	4. In patients with therapeutic mastectomy without reconstruction presenting with a palpable area of concern, we recommend **targeted US** as the initial imaging technique.	↑↑
	5. In patients with therapeutic mastectomy and reconstruction (bilateral or unilateral), we suggest **no imaging** for breast cancer surveillance on the reconstructed side(s).	↓

These recommendations are not intended to stand alone. Medical care should be based on evidence, a clinician's expert judgment, the patient's circumstances, values, and preferences, and resource availability. We recognize that not all imaging modalities are available in all locations, particularly in rural or remote areas of Canada. Decisions about whether to recommend that a patient travel for recommended imaging or perform alternate imaging locally can be difficult, and should consider the expected benefits of recommended imaging, risks of travel, patient preference, and other factors. This guideline is based on evidence related to diagnostic imaging tests only, not the clinical management of a patient. As discussed in the 'Sex and gender in recommendations' section, where appropriate, the terms female and male are used in these recommendations to apply to the individuals who would have been assigned a sex at birth of either male or female.

Clinical/ Diagnostic Scenario	Recommendations	Strength of Rec.
DBT: digital breast tomosynthesis; **MRI**: magnetic resonance imaging; **US**: ultrasound **Strength of Recommendation:** ↑↑: strong for; ↑: conditional for; ↓: conditional against; ↓↓: strong against; **EPc**: Expert Panel consensus		
	6. In patients with therapeutic mastectomy and reconstruction presenting with a palpable area of concern, we recommend **mammography/DBT and targeted US** as the initial imaging techniques. *Imaging with mammography and US may differ based on facility practice when evaluating patients with autologous tissue versus implant-based reconstruction. For example, patients with implant-based reconstruction may initially undergo US, with mammography being performed only if feasible.*	↑↑
B09. PATIENTS FOLLOWING RISK-REDUCTION MASTECTOMY (WITH OR WITHOUT AUTOLOGOUS OR IMPLANT-BASED RECONSTRUCTION)		
	1. In patients with risk-reduction mastectomy and reconstruction (bilateral or unilateral), we suggest **no imaging** for breast cancer screening on the reconstructed side(s).	↓
	2. In patients with risk-reduction mastectomy and reconstruction presenting with a palpable area of concern, we recommend **mammography/DBT and targeted US** as the initial imaging techniques. *Imaging with mammography and US may differ based on facility practice when evaluating patients with autologous tissue versus implant-based reconstruction. For example, patients with implant-based reconstruction may initially undergo US, with mammography being performed only if feasible.*	↑↑
	3. In patients with risk-reduction mastectomy without reconstruction, we suggest **no imaging** for breast cancer screening.	↓
	4. In patients with risk-reduction mastectomy without reconstruction presenting with a palpable area of concern, we recommend **targeted US** as the initial imaging technique.	↑↑

APPENDIX 3B. BREAST DISEASE SUMMARY OF RECOMMENDATIONS (FRENCH)

Scénario clinique/diagnostique	Recommandations	Force de la rec.
IRM: imagerie par résonance magnétique; **Force de la recommandation:** ↑↑: fortement en faveur; ↑: en faveur sous certaines conditions; ↓: contre sous certaines conditions; ↓↓: fortement contre; **EPc**: Consensus d'un panel d'experts		
B01. DÉPISTAGE DU RISQUE MOYEN		
B01A. Dépistage des femmes ayant un risque moyen de cancer du sein	Ces recommandations s'appliquent au dépistage chez les femmes avec ou sans implants mammaires ayant un risque moyen de cancer du sein.	
	1. Chez les femmes de moins de 40 ans à risque moyen de cancer du sein, nous **déconseillons le dépistage systématique par mammographie**.	↓↓
	2. Chez les femmes âgées de 40 à 49 ans à risque moyen de cancer du sein, nous suggérons un **dépistage annuel par mammographie/tomosynthèse**. *L'âge auquel commencer le dépistage doit être établi individuellement pour chaque patiente après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques et des préférences des patientes. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑
	3. Chez les femmes âgées de 50 ans et plus à risque moyen de cancer du sein, nous recommandons un **dépistage par mammographie/tomosynthèse annuel ou tous les deux ans**. *La fréquence du dépistage et la décision d'interrompre les dépistages doivent être établies au cas par cas après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques, des préférences des patientes et de leur espérance de vie. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑↑
	4. Chez les femmes ayant un tissu mammaire extrêmement dense, confirmé par mammographie (c'est-à-dire catégorie D selon la classification de densité de l'ACR) et subissant un dépistage, nous suggérons un **examen d'imagerie complémentaire**. *La modalité supplémentaire de dépistage peut varier en fonction des préférences de pratique régionales et de la disponibilité des ressources.*	↑
	↳ **4.1** Chez les femmes présentant un tissu mammaire de catégorie C (selon la classification de densité de l'ACR) confirmé par mammographie, nous suggérons **un dépistage complémentaire**, en fonction des contraintes de capacité.	↑

Ces recommandations ne sont pas conçues pour être utilisées seules. Les soins médicaux doivent reposer sur des données probantes, le jugement expert d'un clinicien, la situation, les valeurs et les préférences d'un patient, ainsi que sur la disponibilité des ressources. Nous sommes conscients que certaines modalités d'imagerie ne sont pas disponibles partout, en particulier dans les zones rurales et isolées du Canada. Il peut être difficile de décider s'il vaut mieux recommander à un patient de se déplacer pour obtenir l'imagerie recommandée ou d'effectuer localement un autre type d'imagerie; à cet égard, il faut tenir compte des avantages attendus de l'imagerie recommandée, des risques liés au déplacement, des préférences du patient et d'autres facteurs. La présente ligne directrice repose sur des données probantes liées uniquement aux tests d'imagerie diagnostique et non à la gestion clinique du patient. Comme indiqué dans la section « Le sexe et le genre dans les recommandations », le cas échéant, les termes « femme » et « homme » s'appliquent dans ces recommandations aux individus dont le sexe à la naissance a été assigné comme, respectivement, féminin et masculin.

Scénario clinique/diagnostique	Recommandations	Force de la rec.
IRM: imagerie par résonance magnétique; **Force de la recommandation:** ↑↑: fortement en faveur; ↑: en faveur sous certaines conditions; ↓: contre sous certaines conditions; ↓↓: fortement contre; **EPc**: Consensus d'un panel d'experts		
	La capacité pour les dépistages complémentaires peut varier selon les provinces ainsi que les régions au sein d'une province.	
B01B. Personnes trans à risque moyen de cancer du sein	**1.** Chez les sujets trans masculins âgés de moins de 40 ans (avec ou sans mastectomie bilatérale) et chez les sujets trans féminins ne prenant pas d'hormones ou en prenant depuis moins de cinq ans à risque moyen de cancer du sein, nous **déconseillons le dépistage systématique par mammographie/tomosynthèse**.	↓↓
	2. Chez les sujets trans masculins ayant un risque moyen de cancer du sein et âgés de 40 à 49 ans qui n'ont pas subi de mastectomie bilatérale, nous suggérons un dépistage **annuel par mammographie/ tomosynthèse**. *L'âge auquel commencer le dépistage doit être établi individuellement pour chaque patiente après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques et des préférences des patientes. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑
	3. Chez les sujets trans masculins ayant un risque moyen de cancer du sein et âgés de 50 ans et plus qui n'ont pas subi de mastectomie bilatérale, nous recommandons un dépistage par **mammographie/ tomosynthèse** tous les ans ou tous les deux ans. *La fréquence du dépistage et la décision d'interrompre les dépistages doivent être établies au cas par cas après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques, des préférences des patientes et de leur espérance de vie. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑↑
	4. Chez les sujets trans féminins ayant un risque moyen de cancer du sein, avec ou sans implants mammaires, âgés de 40 à 49 ans, prenant ou ayant pris des hormones depuis ou pendant cinq ans ou plus, nous suggérons un **dépistage annuel par mammographie/tomosynthèse**. *L'âge auquel commencer le dépistage doit être établi individuellement pour chaque patiente après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques et des préférences des patientes. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑

Ces recommandations ne sont pas conçues pour être utilisées seules. Les soins médicaux doivent reposer sur des données probantes, le jugement expert d'un clinicien, la situation, les valeurs et les préférences d'un patient, ainsi que sur la disponibilité des ressources. Nous sommes conscients que certaines modalités d'imagerie ne sont pas disponibles partout, en particulier dans les zones rurales et isolées du Canada. Il peut être difficile de décider s'il vaut mieux recommander à un patient de se déplacer pour obtenir l'imagerie recommandée ou d'effectuer localement un autre type d'imagerie; à cet égard, il faut tenir compte des avantages attendus de l'imagerie recommandée, des risques liés au déplacement, des préférences du patient et d'autres facteurs. La présente ligne directrice repose sur des données probantes liées uniquement aux tests d'imagerie diagnostique et non à la gestion clinique du patient. Comme indiqué dans la section « Le sexe et le genre dans les recommandations », le cas échéant, les termes « femme » et « homme » s'appliquent dans ces recommandations aux individus dont le sexe à la naissance a été assigné comme, respectivement, féminin et masculin.

Scénario clinique/diagnostique	Recommandations	Force de la rec.
IRM: imagerie par résonance magnétique; **Force de la recommandation:** ↑↑: fortement en faveur; ↑: en faveur sous certaines conditions; ↓: contre sous certaines conditions; ↓↓: fortement contre; **EPc**: Consensus d'un panel d'experts		
	5. Chez les sujets trans féminins ayant un risque moyen de cancer du sein, avec ou sans implants mammaires, âgés de 50 ans et plus, prenant ou ayant pris des hormones depuis ou pendant cinq ans ou plus, nous suggérons un dépistage par **mammographie/tomosynthèse** tous les ans ou tous les deux ans. *La fréquence du dépistage et la décision d'interrompre les dépistages doivent être établies au cas par cas après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques, des préférences des patientes et de leur espérance de vie. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑
B02. DÉPISTAGE EN CAS DE RISQUE ÉLEVÉ		
B02A. Dépistage des femmes ayant un plus fort risque de cancer du sein	Ces recommandations s'appliquent au dépistage chez les femmes avec ou sans implants mammaires ayant un plus grand risque accru de cancer du sein.	
	1. Chez des femmes ayant un risque élevé de cancer du sein en raison d'une précédente irradiation de la paroi thoracique entre les âges de 10 et 30 ans, nous recommandons un **dépistage annuel par mammographie/tomosynthèse et IRM**, à mettre en place huit ans après l'irradiation thoracique, mais pas avant l'âge de 25 ans.	↑↑
	↳ **1.1** Si l'IRM n'est pas tolérée par la patiente, est contre-indiquée ou indisponible, nous suggérons **l'échographie** comme technique d'imagerie de remplacement. *La décision d'interrompre les dépistages doit être établie au cas par cas après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques, des préférences des patientes et de leur espérance de vie. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑
	2. Chez les femmes porteuses de mutations du gène BRCA, nous recommandons un **dépistage annuel par mammographie/tomosynthèse et par IRM** à partir de 25-30 ans.	↑↑
	↳ **2.1** Si l'IRM n'est pas tolérée par la patiente, est contre-indiquée ou indisponible, nous suggérons **l'échographie** comme technique d'imagerie de remplacement (↑). *La décision d'enclencher les procédures de dépistage et de les interrompre doit être établie au cas par cas après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques, des*	↑

Scénario clinique/diagnostique	Recommandations	Force de la rec.
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	préférences des patientes et de leur espérance de vie. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé. **3.** La place du dépistage chez les femmes porteuses d'autres mutations génétiques à risque élevé est une science en pleine évolution et des recherches supplémentaires sont nécessaires pour proposer des recommandations dans ce domaine. Toute décision de dépistage doit être prise dans le cadre d'une décision partagée entre le médecin et la patiente. **4.** Chez les femmes ayant un risque à vie entière supérieur ou égal à 20 % (selon l'outil d'évaluation du risque), nous suggérons un **dépistage annuel par mammographie/tomosynthèse et un dépistage supplémentaire**, de préférence par **IRM** à partir de 25-30 ans. *La modalité supplémentaire de dépistage peut varier en fonction des préférences de pratique régionales et de la disponibilité des ressources.* *La décision de débuter les procédures de dépistage et de les interrompre doit être établie au cas par cas après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques, des préférences des patientes et de leur espérance de vie. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	EPc ↑
B02B. Personnes trans à plus fort risque de cancer du sein	**1.** Chez les sujets trans féminins ayant un risque élevé de cancer du sein✧ âgés de 30 ans et plus et prenant ou ayant pris des hormones pendant ou depuis cinq ans ou plus, les recommandations des lignes directrices sont identiques à celles présentées au paragraphe B02A. **2.** Chez les sujets trans masculins ayant un risque élevé de cancer du sein✧ âgés de 30 ans et plus qui n'ont pas subi de mastectomie bilatérale, les recommandations des lignes directrices sont identiques à celles présentées au paragraphe B02A. ✧*Comme présenté au paragraphe B02A*	
B02C. Femmes enceintes/allaitantes ayant un risque plus fort de cancer du sein	Ces recommandations s'appliquent au dépistage chez les personnes avec ou sans implants mammaires ayant un plus fort risque de cancer du sein. **1.** Chez les femmes enceintes à risque élevé de cancer du sein qui choisissent de continuer à se faire dépister, nous suggérons un **dépistage par mammographie/tomosynthèse✧ et un dépistage supplémentaire par échographie**✧✧ (↑).	↑

Ces recommandations ne sont pas conçues pour être utilisées seules. Les soins médicaux doivent reposer sur des données probantes, le jugement expert d'un clinicien, la situation, les valeurs et les préférences d'un patient, ainsi que sur la disponibilité des ressources. Nous sommes conscients que certaines modalités d'imagerie ne sont pas disponibles partout, en particulier dans les zones rurales et isolées du Canada. Il peut être difficile de décider s'il vaut mieux recommander à un patient de se déplacer pour obtenir l'imagerie recommandée ou d'effectuer localement un autre type d'imagerie; à cet égard, il faut tenir compte des avantages attendus de l'imagerie recommandée, des risques liés au déplacement, des préférences du patient et d'autres facteurs. La présente ligne directrice repose sur des données probantes liées uniquement aux tests d'imagerie diagnostique et non à la gestion clinique du patient. Comme indiqué dans la section « Le sexe et le genre dans les recommandations », le cas échéant, les termes « femme » et « homme » s'appliquent dans ces recommandations aux individus dont le sexe à la naissance a été assigné comme, respectivement, féminin et masculin.

Scénario clinique/diagnostique	Recommandations	Force de la rec.
IRM: imagerie par résonance magnétique; **Force de la recommandation:** ↑↑: fortement en faveur; ↑: en faveur sous certaines conditions; ↓: contre sous certaines conditions; ↓↓: fortement contre; **EPc**: Consensus d'un panel d'experts		
	✧*Le dépistage par mammographie/tomosynthèse aura une sensibilité réduite en raison de l'augmentation de la densité des seins au cours de la grossesse et de l'allaitement.* ✧✧*Un dépistage par échographie peut augmenter le taux de faux positifs et inciter à des biopsies supplémentaires.* **2.** Chez les femmes à risque élevé de cancer du sein qui allaitent et qui choisissent de continuer à se faire dépister, nous suggérons **de reprendre les dépistages annuels par mammographie ou tomosynthèse et le dépistage par IRM après un an**. *L'imagerie du sein au cours de la grossesse et de l'allaitement pose des problèmes en raison des modifications physiologiques et structurelles du sein qui augmentent la difficulté d'une évaluation clinique et radiologique. La décision de poursuivre le dépistage pendant la grossesse et l'allaitement doit se faire au cas par cas et doit être évaluée ensemble par la patiente et le professionnel de la santé via un processus de prise de décision partagé. Ce processus doit impliquer une discussion qui tiendra compte des avantages, des risques et des préférences de la patiente, de la durée prévue de l'allaitement, ainsi que du délai écoulé depuis le dernier dépistage. Si la patiente le demande après cette discussion, un dépistage doit être offert.*	↑
B03. PATIENTS SYMPTOMATIQUES		
B03A. Masse palpable	**1.** Chez les patientes âgées de moins de 30 ans ayant une masse palpable au sein, nous recommandons une **échographie ciblée** de la zone cliniquement préoccupante comme technique d'imagerie initiale. ↳ **1.1** Si les constatations à l'issue de l'échographie sont négatives, toute décision devra se baser sur l'avis du radiologiste et/ou des éléments cliniques. **2.** Chez les femmes âgées de 30 ans et plus ayant une masse palpable au sein, nous recommandons une **mammographie/tomosynthèse**, de même qu'une **échographie ciblée** de la zone cliniquement préoccupante comme techniques d'imagerie initiales. **3.** Chez les femmes de tous âges ayant une masse palpable au sein pouvant faire craindre, d'un point de vue clinique, l'existence d'une tumeur maligne et pour lesquelles la mammographie et l'échographie sont négatives, toute décision d'intervention subséquente (par exemple, biopsie guidée par la palpation ou IRM) doit reposer sur des données cliniques.	↑↑ EPc ↑↑ EPc
B03B. Écoulement suspect du mamelon	**1.** Chez les femmes de tous âges présentant un écoulement physiologique du mamelon✧, nous **déconseillons le recours à l'imagerie**. ✧ *Un écoulement physiologique peut être caractérisé de différentes manières : non spontané, bilatéral, provenant de*	↓↓

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	multiples canaux et de couleur blanche/verte/jaune. **2.** Chez les femmes âgées de moins de 30 ans ayant un écoulement non physiologique du mamelon, nous recommandons une **échographie ciblée de la région rétroaréolaire** comme technique d'imagerie initiale. **3.** Chez les femmes âgées de 30 ans et plus ayant un écoulement non physiologique du mamelon, nous recommandons une **mammographie/tomosynthèse et une échographie ciblée de la région rétroaréolaire** comme techniques d'imagerie initiales. ↳ **3.1** Si les résultats de la mammographie et de l'échographie sont négatifs ou non concluants, nous recommandons **une IRM ou une galactographie** comme techniques d'imagerie subséquentes. ↳ **3.2** Si les résultats de toutes les techniques d'imagerie sont négatifs, nous recommandons que toute décision d'examens supplémentaires soit basée sur des données cliniques en tenant compte d'un avis chirurgical.	↑↑ ↑↑ ↑↑ EPc
B03C. Maladie de Paget soupçonnée du sein ou du mamelon	**1.** Chez les femmes chez qui on soupçonne cliniquement une maladie de Paget, nous recommandons une **mammographie/tomosynthèse ± échographie** comme techniques d'imagerie initiales. ↳ **1.1** Si la mammographie ± échographie sont négatives, mais que les constatations cliniques font toujours suspecter une maladie de Paget, toute décision d'intervention subséquente (par exemple, biopsie au trocart ou IRM) doit reposer sur des données cliniques.	↑↑ EPc
B03D. Suspicion de cancer inflammatoire du sein	**1.** Chez les femmes chez qui on soupçonne cliniquement un cancer inflammatoire du sein✧, nous recommandons une **mammographie/tomosynthèse et une échographie** comme techniques d'imagerie initiales. ✧ *Apparition rapide d'un érythème, d'un œdème, et d'un aspect en peau d'orange et/ou chaleur anormale du sein, avec ou sans masse palpable ET érythème qui concerne au moins un tiers du sein ET symptômes présents depuis moins de six mois* [48]. ↳ **1.1** Si les résultats de la mammographie et l'échographie sont négatifs, mais que les constatations cliniques font toujours suspecter un cancer inflammatoire du sein, toute décision d'intervention subséquente (par exemple, biopsie au trocart ou IRM) doit reposer sur des données cliniques.	↑↑ EPc

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B03E. Suspicion d'adénopathies axillaires	**1.** Chez des patients âgés de moins de 30 ans avec une zone palpable inquiétante au niveau du creux axillaire, nous suggérons une **échographie axillaire** comme technique d'imagerie initiale.	EPc
	2. Chez des patients âgés de 30 ans et plus avec une zone palpable inquiétante au niveau du creux axillaire, nous recommandons **échographie axillaire ± mammographie/tomosynthèse à visée diagnostique** comme techniques d'imagerie initiales.	↑↑
	↳ **2.1** Chez des patients ayant des adénopathies axillaires bilatérales avec une mammographie par ailleurs normale ET une maladie systémique connue pour expliquer ces adénopathies multiples, nous **déconseillons la poursuite de l'imagerie**.	↓↓
B03F. Patientes symptomatiques enceintes ou qui allaitent	**1.** Chez des patientes symptomatiques✧ enceintes ou qui allaitent, nous recommandons une **échographie ciblée** comme technique d'imagerie initiale. ✧ *Par exemple: masse palpable du sein, écoulement cliniquement non physiologique du mamelon ou modifications de la peau*	↑↑
	↳ **1.1** Chez des patientes ayant un résultat d'échographie douteux ou suspect, nous recommandons une **mammographie/tomosynthèse** comme technique d'imagerie subséquente	↑↑
	↳ **1.2** Chez des patientes chez lesquelles les constatations cliniques peuvent faire craindre l'existence d'une tumeur maligne et chez lesquelles l'échographie et la mammographie sont négatives, toute décision d'intervention supplémentaire (par exemple via une biopsie guidée par la palpation) doit être prise sur une base clinique.	EPc
B03G. Patients symptomatiques masculins	**1.** Chez des hommes de tous âges avec des symptômes et un examen physique compatible avec une gynécomastie ou une pseudogynécomastie, nous **déconseillons une imagerie**.	↓↓
	2. Chez des hommes âgés de moins de 25 ans avec des constatations suspectes à l'examen physique✧, nous recommandons une **échographie ciblée** comme technique d'imagerie initiale.	↑↑
	3. Chez des hommes âgés de 25 ans et plus avec des constatations suspectes à l'examen physique✧, nous recommandons une **mammographie/tomosynthèse à but diagnostique** ou une **échographie** comme technique d'imagerie initiale. ✧ *Par exemple: masse palpable au sein, adénopathie axillaire, écoulement du mamelon, rétraction du mamelon*	↑↑

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IRM: imagerie par résonance magnétique; **Force de la recommandation:** ↑↑: fortement en faveur; ↑: en faveur sous certaines conditions; ↓: contre sous certaines conditions; ↓↓: fortement contre; **EPc**: Consensus d'un panel d'experts		
B03H. Patients pédiatriques/adolescents symptomatiques	**1.** Chez les patients pédiatriques et adolescents✧ avec une anomalie palpable inquiétante, nous suggérons une **échographie ciblée** comme technique d'imagerie initiale. **2.** Chez les patients pédiatriques et adolescents✧ avec une anomalie palpable inquiétante, nous **déconseillons la mammographie**. ✧ *Âgés de moins de 18 ans*	EPc EPc
B04. DIAGNOSTIC ANTÉRIEUR DE LÉSION À RISQUE ÉLEVÉ		
	1. Chez les femmes ayant reçu précédemment un diagnostic de lésion à risque élevé✧, nous recommandons un dépistage annuel par **mammographie/tomosynthèse** commençant dès le moment du diagnostic, mais pas avant l'âge de 30 ans. ↳ **1.1** Chez les femmes ayant un tissu mammaire extrêmement dense (c'est-à-dire catégorie D selon la classification de densité de l'ACR), nous suggérons d'ajouter une **IRM annuelle**. ↳ **1.2** Chez les femmes où IRM n'est pas tolérée par la patiente, ayant une contre-indication à l'IRM ou lorsqu'une IRM n'est pas disponible, nous suggérons un dépistage par **échographie** à titre de remplacement. ✧*Par exemple, hyperplasie canalaire atypique, hyperplasie lobulaire atypique ou carcinome lobulaire in situ*	↑↑ ↑ ↑
B05. ÉVALUATION DES IMPLANTS MAMMAIRES		
	1. Chez des sujets asymptomatiques porteurs d'implants mammaires, quel qu'en soit le type, nous déconseillons **l'évaluation par imagerie pour l'évaluation des implants**. **2.** Chez les sujets porteurs d'implants mammaires remplis de solution saline et cliniquement indiscutablement rompus, nous déconseillons **l'évaluation par imagerie**. **3.** Chez des sujets âgés de moins de 30 ans présentant de possibles complications liées à leurs implants mammaires, nous recommandons une **échographie** comme technique d'imagerie initiale. **4.** Chez des sujets âgés de 30 ans et plus présentant de possibles complications liées à leurs implants mammaires, nous recommandons une **mammographie/tomosynthèse et une échographie** comme techniques d'imagerie initiales.	↓↓ ↓↓ ↑↑ ↑↑

Ces recommandations ne sont pas conçues pour être utilisées seules. Les soins médicaux doivent reposer sur des données probantes, le jugement expert d'un clinicien, la situation, les valeurs et les préférences d'un patient, ainsi que sur la disponibilité des ressources. Nous sommes conscients que certaines modalités d'imagerie ne sont pas disponibles partout, en particulier dans les zones rurales et isolées du Canada. Il peut être difficile de décider s'il vaut mieux recommander à un patient de se déplacer pour obtenir l'imagerie recommandée ou d'effectuer localement un autre type d'imagerie; à cet égard, il faut tenir compte des avantages attendus de l'imagerie recommandée, des risques liés au déplacement, des préférences du patient et d'autres facteurs. La présente ligne directrice repose sur des données probantes liées uniquement aux tests d'imagerie diagnostique et non à la gestion clinique du patient. Comme indiqué dans la section « Le sexe et le genre dans les recommandations », le cas échéant, les termes « femme » et « homme » s'appliquent dans ces recommandations aux individus dont le sexe à la naissance a été assigné comme, respectivement, féminin et masculin.

Scénario clinique/diagnostique	Recommandations	Force de la rec.
IRM: imagerie par résonance magnétique; **Force de la recommandation:** ↑↑: fortement en faveur; ↑: en faveur sous certaines conditions; ↓: contre sous certaines conditions; ↓↓: fortement contre; **EPc**: Consensus d'un panel d'experts		
	5. Chez des patients chez qui on suspecte la rupture d'un implant mammaire en silicone ou un lymphome mammaire associé aux implants, avec des constatations indéterminées à la mammographie ou à l'échographie, nous recommandons une **IRM** afin d'optimiser l'évaluation.	↑↑
B06. ÉVALUATION D'UNE DOULEUR MAMMAIRE		
B06A. Douleurs mammaires diffuses cycliques et non cycliques	**1.** Chez des patients ayant une douleur mammaire cyclique, une douleur intermittente ou une douleur mammaire diffuse non cyclique, nous **déconseillons une imagerie** allant au-delà des recommandations habituelles de dépistage✧. ✧*Voir B01. Dépistage du risque moyen ou B02. Dépistage en cas de risque élevé*	↓↓
B06B. Douleur mammaire localisée non cyclique	**1.** Chez des patients âgés de moins de 30 ans ayant une douleur mammaire persistante, localisée, non cyclique, nous suggérons une **échographie ciblée** comme technique d'imagerie initiale. **2.** Chez des patients âgés de 30 ans et plus ayant une douleur mammaire persistante, localisée, non cyclique, nous recommandons une **mammographie/tomosynthèse bilatérale et une échographie ciblée** comme techniques d'imagerie initiales.	↑ ↑↑
B07. ÉVALUATION D'UNE MASTITE/INFECTION ET D'UN ABCÈS		
	1. Chez des patients ayant des symptômes et montrant des signes cliniques de mastite et d'abcès du sein suspecté, nous recommandons une **échographie ciblée** comme technique d'imagerie initiale. **2.** Chez des patients n'ayant pas d'amélioration clinique d'une suspicion de mastite traitée avec des antibiotiques, nous suggérons une **mammographie/tomosynthèse diagnostique et une échographie** comme techniques d'imagerie initiales.	↑↑ EPc
B08. PATIENTS AYANT DES ANTÉCÉDENTS DE CANCER DU SEIN		
	Patients ayant bénéficié d'une chirurgie conservatrice du sein **1.** Chez des patients asymptomatiques ayant un antécédent personnel de cancer du sein, nous recommandons une **surveillance annuelle par mammographie/tomosynthèse**. *La décision d'interrompre une surveillance doit être établie au cas par cas après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques, des préférences des patientes et de leur espérance de vie. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑↑

Ces recommandations ne sont pas conçues pour être utilisées seules. Les soins médicaux doivent reposer sur des données probantes, le jugement expert d'un clinicien, la situation, les valeurs et les préférences d'un patient, ainsi que sur la disponibilité des ressources. Nous sommes conscients que certaines modalités d'imagerie ne sont pas disponibles partout, en particulier dans les zones rurales et isolées du Canada. Il peut être difficile de décider s'il vaut mieux recommander à un patient de se déplacer pour obtenir l'imagerie recommandée ou d'effectuer localement un autre type d'imagerie; à cet égard, il faut tenir compte des avantages attendus de l'imagerie recommandée, des risques liés au déplacement, des préférences du patient et d'autres facteurs. La présente ligne directrice repose sur des données probantes liées uniquement aux tests d'imagerie diagnostique et non à la gestion clinique du patient. Comme indiqué dans la section « Le sexe et le genre dans les recommandations », le cas échéant, les termes « femme » et « homme » s'appliquent dans ces recommandations aux individus dont le sexe à la naissance a été assigné comme, respectivement, féminin et masculin.

Scénario clinique/diagnostique	Recommandations	Force de la rec.
IRM: imagerie par résonance magnétique; **Force de la recommandation:** ↑↑: fortement en faveur; ↑: en faveur sous certaines conditions; ↓: contre sous certaines conditions; ↓↓: fortement contre; **EPc**: Consensus d'un panel d'experts		
	↳ **1.1** Chez des patients ayant un antécédent de cancer du sein et un tissu mammaire extrêmement dense (c'est-à-dire catégorie D selon la classification de densité de l'ACR), nous suggérons une surveillance annuelle supplémentaire avec une **échographie** ou une **IRM**. *Une surveillance supplémentaire peut aussi être proposée dans d'autres cas (par exemple, un cancer précédent invisible à la mammographie, un tissu mammaire dense de catégorie C selon la classification de densité de l'ACR, une préférence liée aux pratiques régionales ou des ressources limitées).*	↑
	Patients ayant subi une mastectomie thérapeutique	
	2. Chez des patients ayant des antécédents de cancer du sein, nous recommandons une **mammographie/ tomosynthèse annuelle de surveillance du sein controlatéral.** *La décision d'interrompre une surveillance doit être établie au cas par cas après une évaluation commune entre la patiente et le professionnel de la santé et au terme d'un processus de prise de décision partagée. Ce processus doit inclure une discussion qui tienne compte des avantages, des risques, des préférences des patientes et de leur espérance de vie. Si, au terme de cette discussion, la patiente demande un dépistage, celui-ci doit alors être proposé.*	↑↑
	↳ **2.1** Chez des patients ayant un antécédent de cancer du sein et un tissu mammaire extrêmement dense (c'est-à-dire catégorie D selon la classification de densité de l'ACR), nous suggérons une surveillance annuelle supplémentaire avec une **échographie ou une IRM**. *Une surveillance supplémentaire peut aussi être proposée dans d'autres cas (par exemple, un cancer précédent invisible à la mammographie, un tissu mammaire dense de catégorie C selon la classification de densité de l'ACR, une préférence liée aux pratiques régionales ou des ressources limitées).*	↑
	3. Chez des patients ayant subi une mastectomie thérapeutique (bilatérale ou unilatérale) sans reconstruction mammaire, nous suggérons **de ne pas avoir recours à l'imagerie** de surveillance du cancer du sein du ou des côtés de la mastectomie.	↓
	4. Chez des patients ayant subi une mastectomie thérapeutique sans reconstruction mammaire et présentant une anomalie palpable inquiétante, nous recommandons une **échographie ciblée** comme technique d'imagerie initiale.	↑↑
	5. Chez des patients ayant subi une mastectomie thérapeutique et une reconstruction mammaire (bilatérale ou unilatérale), nous suggérons **de ne pas avoir recours à l'imagerie** de surveillance du cancer du sein du ou des côtés reconstruits.	↓

Ces recommandations ne sont pas conçues pour être utilisées seules. Les soins médicaux doivent reposer sur des données probantes, le jugement expert d'un clinicien, la situation, les valeurs et les préférences d'un patient, ainsi que sur la disponibilité des ressources. Nous sommes conscients que certaines modalités d'imagerie ne sont pas disponibles partout, en particulier dans les zones rurales et isolées du Canada. Il peut être difficile de décider s'il vaut mieux recommander à un patient de se déplacer pour obtenir l'imagerie recommandée ou d'effectuer localement un autre type d'imagerie; à cet égard, il faut tenir compte des avantages attendus de l'imagerie recommandée, des risques liés au déplacement, des préférences du patient et d'autres facteurs. La présente ligne directrice repose sur des données probantes liées uniquement aux tests d'imagerie diagnostique et non à la gestion clinique du patient. Comme indiqué dans la section « Le sexe et le genre dans les recommandations », le cas échéant, les termes « femme » et « homme » s'appliquent dans ces recommandations aux individus dont le sexe à la naissance a été assigné comme, respectivement, féminin et masculin.

Scénario clinique/diagnostique	Recommandations	Force de la rec.
IRM: imagerie par résonance magnétique; **Force de la recommandation:** ↑↑: fortement en faveur; ↑: en faveur sous certaines conditions; ↓: contre sous certaines conditions; ↓↓: fortement contre; **EPc**: Consensus d'un panel d'experts		
	6. Chez des patients ayant subi une mastectomie thérapeutique et une reconstruction mammaire présentant une anomalie palpable inquiétante, nous recommandons une **mammographie/ tomosynthèse et une échographie ciblée** comme techniques d'imagerie initiales. *L'imagerie par mammographie et échographie peut varier en fonctions des habitudes de l'établissement lors de l'évaluation des patients ayant une reconstruction avec tissus autologues comparativement à une reconstruction avec implant. Par exemple, les patients ayant une reconstruction avec implant peuvent être soumis à une échographie initiale, la mammographie n'étant réalisée que si elle est réalisable.*	↑↑
B09. PATIENTS APRÈS MASTECTOMIE DE RÉDUCTION DU RISQUE (AVEC OU SANS RECONSTRUCTION AVEC TISSUS AUTOLOGUES OU IMPLANT)		
	1. Chez des patients ayant subi une mastectomie de réduction du risque et une reconstruction mammaire (bilatérale ou unilatérale), nous suggérons de **ne pas avoir recours à l'imagerie** de dépistage du cancer du sein du ou des côtés reconstruits.	↓
	2. Chez des patients ayant subi une mastectomie de réduction du risque et une reconstruction mammaire présentant une anomalie palpable inquiétante, nous recommandons une **mammographie/ tomosynthèse et une échographie ciblée** comme techniques d'imagerie initiales. *L'imagerie par mammographie et échographie peut varier en fonctions des habitudes de l'établissement lors de l'évaluation des patients ayant une reconstruction avec tissus autologues comparativement à une reconstruction avec implant. Par exemple, les patients ayant une reconstruction avec implant peuvent être soumis à une échographie initiale, la mammographie n'étant réalisée que si elle est réalisable.*	↑↑
	3. Chez des patients ayant subi une mastectomie de réduction du risque sans reconstruction mammaire, nous suggérons de **ne pas avoir recours à l'imagerie** de dépistage du cancer du sein.	↓
	4. Chez des patients ayant subi une mastectomie de réduction du risque sans reconstruction mammaire et présentant une anomalie palpable inquiétante, nous recommandons une **échographie ciblée** comme technique d'imagerie initiale.	↑↑

APPENDIX 4. POTENTIALLY RELEVANT NON-ENGLISH GUIDELINES

1. Forrai G, Kovacs E, Ambrozay, E., Barta, M., Borbely, K., Lengyel, Z., Ormandi, K., Pentek, Z., Tasnadi, T., Sebo, E. [Radiology/Nuclear Medicine Group. Use of imaging methods in the current screening, diagnostics and treatment of breast cancer - Professional guidelines. 4th Breast Cancer Consensus Conference]. *Magyar Onkologia.* 2020. 64:278-299
2. Ceugnart, L., Delaloge, S., Balleyguier, C., Deghaye, M., Veron, L., Kaufmanis, A., Mailliez, A., Poncelet, E., Lenczner, G., Verzaux, L., Gligorov, J., Thomassin-Naggara, I.. [Breast cancer screening and diagnosis at the end of the COVID-19 confinement period, practical aspects and prioritization rules: recommendations of 6 French health professionals societies]. *Bulletin du Cancer.* 2020. 107:623-628
3. Albert, U. S., Schreer, I., Arbeitsgruppe der Stufe-3-Leitlinie, Mammarkarzinom. [S3 guideline breast cancer: update on early detection, and mammography screening]. *Radiologe.* 2019. 59:13-18
4. Forrai, G., Ambrozay, E., Bidlek, M., Borbely, K., Kovacs, E., Lengyel, Z., Ormandi, K., Pentek, Z., Riedl, E., Sebo, E., Szabo, E. [Use of imaging methods in the current screening, diagnostics and treatment of breast cancer - Professional guidelines. 3rd Breast Cancer Consensus Meeting]. *Magyar Onkologia.* 2016. 60:181-93
5. Romics, L., Kocsis, J., Ormandi, K., Molnar, B. A. [Latest international guidelines for screening, prevention and treatment of familial breast cancer - implications for the relevant practice in Hungary]. *Orvosi Hetilap.* 2016. 157:1117-25
6. Cutuli, B., Tunon De Lara, C., Arnaud, A., Bertheau, P., Boulanger, L., Boute, V., Ceugnart, L., Chauvet, M. P., Coutant, C., De Cremoux, P., Fourquet, A., Hennequin, C., Lesieur, A., Lesur, A., Levy, L., Vincent-Salomon, A., Besnard, S., Belorgey, C. [Ductal carcinoma in situ diagnosis: 3 French national guidelines]. *Annales de Pathologie.* 2016. 36:166-73
7. Gabor, F., Eszter, K., Eva, A., Miklos, B., Katalin, B., Zsolt, L., Katalin, O., Zoltan, P., Tunde, T., Eva, S.. Radiology/nuclear medicine group. Use of imaging methods in the current screening, diagnostics and treatment of breast cancer - professional guidelines. 4th breast cancer consensus conference. [Hungarian]. *Magyar Onkologia.* 2020. 64(4):278-299
8. Lipp, M., Bekes, I., Huober, J., Hancke, K.. Cancer during pregnancy-gestational breast cancer. [German]. *Onkologe.* 2020. 26(3):295-302
9. Lipp, M., Bekes, I., Huober, J., Hancke, K.. Cancer during pregnancy-gestational breast cancer. [German]. *Gynakologe.* 2019. 52(12):927-936
10. Hahn, M., Muller-Schimpfle, M. S3 guideline for breast cancer: diagnostics and staging. [German]. *Gynakologe.* 2018. 51(7):521-525
11. Albert, U. S., Schreer, I., Degenhardt, F., Engel, J., Hahn, M., Heywang-Kobrunner, S., Holzel, D., Katalinic, A., Muller-Schimpfle, M. S3 guideline breast cancer: update on early detection, and mammography screening. [German]. *Gynakologe.* 2018. 51(7):514-520
12. Gabor, F., Eva, A., Maria, B., Katalin, B., Eszter, K., Zsolt, L., Katalin, O., Zoltan, P., Erika, R., Eva, S. Use of imaging methods in the current screening, diagnostics and treatment of breast cancer - professional guidelines. 3rd breast cancer consensus meeting. [Hungarian]. *Magyar Onkologia.* 2016. 60(3):181-193

APPENDIX 5. AGREE-II ASSESSMENTS

	Domain 1				Domain 2				Domain 3									Domain 4				Domain 5					Domain 6			Overall quality
Guideline	1	2	3	Score (%)	4	5	6	Score (%)	7	8	9	10	11	12	13	14	Score (%)	15	16	17	Score (%)	18	19	20	21	Score (%)	22	23	Score (%)	
ACOG 2017 [20,21]	3	3	3	9 (100)	1	1	3	5 (56)	3	3	3	2	3	3	1	1	19 (79)	3	3	3	9 (100)	3	2	1	1	7 (58)	1	1	2 (33)	Moderate
ACP 2019 [22,23]	3	2	3	8 (89)	2	3	3	8 (89)	3	3	3	2	3	3	3	2	22 (92)	3	3	3	9 (100)	2	2	1	1	6 (50)	3	3	6 (100)	Moderate
ACR/SBI 2021 [24]	3	2	3	8 (89)	3	2	1	6 (67)	2	1	1	3	2	3	1	3	16 (67)	3	3	3	9 (100)	1	2	1	1	5 (42)	2	2	4 (67)	Moderate
ACR 2017 [25]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	2	4 (67)	Moderate
ACR 2021 [26]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	3	5 (83)	Moderate
ACR 2018 [27]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	3	5 (83)	Moderate
Brazilian Gdl 2018 [28]	2	2	3	7 (78)	2	2	2	6 (67)	2	2	3	2	3	3	1	1	17 (71)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	3	5 (83)	Moderate
Brazilian Gdl 2017 [29]	3	3	3	9 (100)	2	1	1	4 (44)	3	2	3	3	3	3	1	3	21 (88)	3	3	3	9 (100)	2	1	1	1	5 (42)	1	1	2 (33)	Moderate
CTFPHC 2018 [30]	3	2	3	8 (89)	3	2	3	8 (89)	3	3	3	2	3	3	3	1	21 (88)	3	3	3	9 (100)	3	3	2	3	11 (92)	3	3	6 (100)	High
European Gdl 2019 [31]	2	3	3	8 (89)	3	3	3	9 (100)	3	2	3	3	3	3	1	3	21 (88)	3	3	3	9 (100)	2	2	2	1	7 (58)	3	3	6 (100)	High
EUSOMA/SIOG 2021 [32]	3	2	3	8 (89)	3	2	2	7 (78)	3	2	3	3	3	3	1	1	19 (79)	3	3	3	9 (100)	2	2	1	1	6 (50)	1	2	3 (50)	Moderate
German Gdl 2018 [33,34]	3	2	3	8 (89)	3	3	3	9 (100)	3	3	3	3	3	2	1	3	21 (88)	3	3	3	9 (100)	2	2	1	1	6 (50)	1	2	3 (50)	Moderate
Japanese Gdl 2016 [35]	3	2	3	8 (89)	1	3	1	5 (56)	3	3	3	3	3	3	3	1	22 (92)	3	3	3	9 (100)	1	2	1	1	5 (42)	3	3	6 (100)	Moderate
RCR 2017 [36]	3	3	3	9 (100)	3	3	3	9 (100)	3	3	3	3	3	1	3	1	20 (83)	3	3	3	9 (100)	3	2	3	1	9 (75)	2	2	4 (67)	High
Tunisian Gdl 2021 [37]	3	2	2	7 (78)	3	1	2	6 (67)	3	3	3	3	2	2	1	1	18 (75)	2	2	2	6 (67)	1	1	1	1	4 (33)	3	3	6 (100)	Moderate
USPSTF 2016 [38–40]	3	3	3	9 (100)	3	3	2	8 (89)	3	2	2	2	3	3	1	1	17 (71)	3	3	3	9 (100)	2	3	1	1	7 (58)	3	3	6 (100)	Moderate

Appendix 5. AGREE-II assessments

	Domain 1				Domain 2				Domain 3									Domain 4				Domain 5					Domain 6			Overall quality
Guideline	1	2	3	Score (%)	4	5	6	Score (%)	7	8	9	10	11	12	13	14	Score (%)	15	16	17	Score (%)	18	19	20	21	Score (%)	22	23	Score (%)	
ACR 2021 [41]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	3	5 (83)	Moderate
ACR 2018 [42]	3	2	3	8 (89)	3	2	1	6 (67)	2	1	1	3	2	3	1	3	16 (67)	3	3	3	9 (100)	1	2	1	1	5 (42)	2	3	5 (83)	Moderate
Intl Gdl 2020 [43]	3	3	3	9 (100)	3	3	3	9 (100)	3	2	3	3	3	3	3	2	22 (92)	3	3	3	9 (100)	2	3	2	1	8 (67)	3	3	6 (100)	High
NICE 2019 [44]	3	3	3	9 (100)	3	3	3	9 (100)	3	3	3	3	3	3	3	3	24 (100)	3	3	3	9 (100)	2	3	3	3	11 (92)	3	3	6 (100)	High
ACR 2017 [45]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	3	5 (83)	Moderate
NCCN Gdl 2018 [46]	3	2	3	8 (89)	3	3	2	8 (89)	3	2	3	3	3	3	1	3	21 (88)	3	3	3	9 (100)	2	2	1	1	6 (50)	3	3	6 (100)	Moderate
ACR 2017 [47]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	2	4 (67)	Moderate
ACR 2018 [49]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	3	5 (83)	Moderate
ACR 2018 [50]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	3	5 (83)	Moderate
ACR 2018 [51]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	3	5 (83)	Moderate
ACR 2019 [52]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	2	4 (67)	Moderate
ASCO 2020 [53]	3	3	3	9 (100)	3	3	3	9 (100)	3	3	3	3	2	3	3	3	23 (96)	3	3	3	9 (100)	3	3	3	1	10 (83)	3	3	6 (100)	High
ACR 2020 [54]	2	2	3	7 (78)	3	2	3	8 (89)	3	2	2	3	3	3	1	3	20 (83)	3	3	3	9 (100)	2	2	1	1	6 (50)	2	2	4 (67)	Moderate