Diagnostic Imaging Pathways - Breast Symptom (New)

Population Covered By The Guidance

This pathway provides guidance for women at any risk presenting with a new breast symptom including new breast lump, breast pain, breast or nipple asymmetry, skin changes or nipple changes. Imaging of new nipple discharge is covered separately.

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Date of next review: April 2021

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Quick User Guide

Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points. Clicking on the **PINK** text box will bring up the full text. The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

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<thead>
<tr>
<th>SYMBOL</th>
<th>RRL</th>
<th>EFFECTIVE DOSE RANGE</th>
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<tr>
<td></td>
<td>None</td>
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<td></td>
<td>Minimal</td>
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<tr>
<td></td>
<td>High</td>
<td>&gt;10 mSv</td>
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Pathway Diagram
1  Fibroadenoma

Image 1 (Ultrasound): Within the upper outer quadrant of the left breast at the 2 o'clock position is a well circumscribed, ovoid hypoechoic lesion measuring 137mm maximally. No contained calcification or vascularity is identified. The appearance is consistent with, but not diagnostic of, a fibroadenoma.

2  Fibroadenoma
Image 2 (H&E, x2.5): Histological section of a fibroadenoma showing compressed ducts (intra-canaliculard growth pattern) surrounded by mild and bland stromal hypercellularity. The ducts are lined by a dual population of uniform epithelial and myoepithelial cells.

3a Breast Carcinoma

Image 3a (Mammogram, right breast): A non-calcified 22mm mass is present in the upper inner quadrant of the right breast.

3b Breast Carcinoma

Image 3b (Ultrasound, right breast): Ultrasound of the same lesion showed an ill-defined solid mass with irregular margins, distortion of adjacent stroma and posterior acoustic shadowing, features which are suspicious for malignancy. Biopsy confirmed an invasive ductal carcinoma.

4a Breast Carcinoma

Image 4a: Mastectomy showing an irregular pale tumour (arrow) with surrounding fibrosis consistent with a breast carcinoma.

4b Breast Carcinoma

Image 4b (H&E, x2.5): Histological section of a moderately differentiated (Grade 2) invasive ductal carcinoma, type not otherwise specified, infiltrating through the breast parenchyma and surrounded by desmoplastic stroma. Occasional poorly formed tubules can be seen at the periphery (arrows).

5 Breast Carcinoma

Image 5 (H&E, x10): Histological section of a typical invasive lobular carcinoma showing the classical alignment of single cells in rows.

Teaching Points

- Imaging modality of a new breast symptom is dependent on the age of the woman and whether she is currently pregnant or lactating
- Young (<35), pregnant or lactating women should have a breast ultrasound first
- For women over 35, who are not pregnant or lactating, a mammogram is the initial imaging modality, followed by an ultrasound
- The most reliable way to diagnose breast cancer is through the 'Triple Test' consisting of:
  - Medical history and breast examination
  - Imaging (mammogram and/or ultrasound)
  - Non-excisional biopsy (FNA and/or core biopsy)
- The Triple Test is positive if any component is indeterminate, suspicious or malignant. A positive triple test warrants specialist referral
- Although biopsy is not always required, it should be performed when the findings on clinical examination and/or breast imaging are not definitely benign
Imaging a New Breast Symptom

- This pathway outlines some general principles for the evaluation of women with a new breast symptom such as a lump, thickening of the skin, asymmetrical prominence or pain \(^1,2\)
- Breast symptoms in women encompass a spectrum of benign and malignant conditions \(^1,2\)
- Women being investigated for a new breast symptom should be assessed using the Triple Test approach involving breast examination, imaging tests and biopsy \(^3,4\)
  - If there are any concerning findings in any component of the Triple Test, further action is needed, e.g. palpable mass with negative imaging should have a ‘direct’ fine needle aspiration (FNA) by a pathologist
  - If there is concern regarding possible discordance between the components of the Triple Test, then specialist referral is recommended
- The choice of primary breast imaging in examining women with symptoms is partly based on age
- The Cancer Australia Guideline for investigation of a new breast symptom recommends that women younger than 35 years be imaged first with ultrasound and women 35 years and older be imaged first with mammography. \(^4\)
- Most guidelines recommend that younger women be initially investigated with ultrasound, and the recommended age cut-off ranges from 30 to 40 years \(^5-9\)
- This pathway has been adapted from the NHMRC National Breast Cancer Centre guidelines \(^3\) and the Cancer Australia Guideline for investigation of a new breast symptom \(^4\)

Mammography

- Standard mammography involves two views: cranio-caudal and medio-lateral oblique \(^13\)
- The radiation dose from digital mammography (DM) is extremely low and the risk of radiation-induced breast cancer is minimal \(^14\)
- The diagnostic accuracy of mammography is enhanced through the use of further views and/or tomosynthesis
- Magnified and coned compression views image a target area of breast tissue rather than the whole breast, resulting in better spatial and contrast resolution than the baseline mammogram of the whole breast \(^15-17\)
- Digital breast tomosynthesis (DBT) is a type of mammography that uses a low-dose x-ray system and computer reconstructions to create layered images of the breasts \(^18\)
- In DBT, multiple images of the compressed breast are taken from different angles and reconstructed to a 3D volume using mathematical algorithms \(^18, 19\)
- Adding DBT may increase the sensitivity and specificity of DM for diagnosing cancer in symptomatic women, particularly with dense and fatty breasts, \(^20, 21\) and improve the assessment of screen-detected abnormalities \(^18, 20, 22\)
- Although further research is required, early evidence suggests that DBT has the potential to increase workflow efficiency in a diagnostic setting by reducing benign biopsy rates \(^23, 24\)
- Abnormalities on mammography are generally categorised as \(^15\)
  - Masses
  - Asymmetric densities
  - Architectural distortions
  - Calcifications
  - A combination of these
- Although mammography is an excellent tool for evaluating breast lesions, it has a false-negative rate. \(^25\)
- The reported false-negative rates of mammography are variable and depend on multiple factors including the presence of symptoms, breast density, age and modality used \(^4, 13, 26\)
**Ultrasound**

- Is an important and relatively inexpensive diagnostic tool in the evaluation of breast lesions.\(^{10,11}\)
- Ultrasonography of the breast is useful because of its high sensitivity, specificity and diagnostic value.\(^{12}\)
- Often used complementary to mammography but may be the initial and only imaging modality required for women younger than 35.\(^1,6\)
- Breast ultrasound is the preferred initial imaging modality for women with palpable lumps who are pregnant or lactating as it does not expose the patient to ionising radiation.\(^3,10\)
- Situations where ultrasound is useful include: \(^6,10\)
  - For evaluating palpable masses not seen on mammography
  - For further evaluation of indeterminate lesions seen on mammography
  - For detection of any underlying mass or altered architecture associated with calcification or asymmetric densities seen on mammography
  - For implant evaluation
  - For guidance of percutaneous biopsy

**FNA or Core biopsy**

- FNA or core biopsy is a reliable alternative to surgical biopsy for a histological diagnosis
- Core biopsy can provide more information than FNA as tissue structure is preserved
- FNA and core biopsy have comparable diagnostic accuracy, however a disadvantage of FNA is that a considerable proportion of biopsies are non-diagnostic.\(^27-30\) Another limitation of FNA is that cytology cannot discern between DCIS and invasive cancer.\(^28\)
- Percutaneous biopsy is minimally invasive, quick and leaves minimal scarring. Complications such as haematoma and infection are rare.\(^31\)

**References**

**Date of literature search:** August 2017 – April 2018

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. [Download the document](#).

5. Jackson VP, Reynolds HE, Hawes DR. *Sonography of the breast.* Seminars in Ultrasound, CT and MRI. 1996;17(5):460-75. [View the reference](#)


30. Al Nemer A. **Combined use of unguided FNA and CNB increases the diagnostic accuracy for palpable breast lesions.** Diagn Cytopathol. 2016;44(7):578-81. [View the reference](#).


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<table>
<thead>
<tr>
<th>Information from this website</th>
<th>Information from the Royal Australian and New Zealand College of Radiologists’ website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consent to Procedure or Treatment</td>
<td>Plain Radiography/X-rays</td>
</tr>
<tr>
<td>Radiation Risks of X-rays and Scans</td>
<td>Radiation Risk of Medical Imaging During Pregnancy</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>Radiation Risk of Medical Imaging for Adults and Children</td>
</tr>
<tr>
<td>Plain Radiography (X-ray)</td>
<td>Ultrasound</td>
</tr>
<tr>
<td>Breast Ultrasound</td>
<td>Diagnostic Mammography</td>
</tr>
<tr>
<td>Screening Mammography</td>
<td></td>
</tr>
</tbody>
</table>

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