Tabar vs BI-RADS – Is it time for BSA to change?

Dr Jill Evans
Radiologist, Clinical Director
Monash BreastScreen

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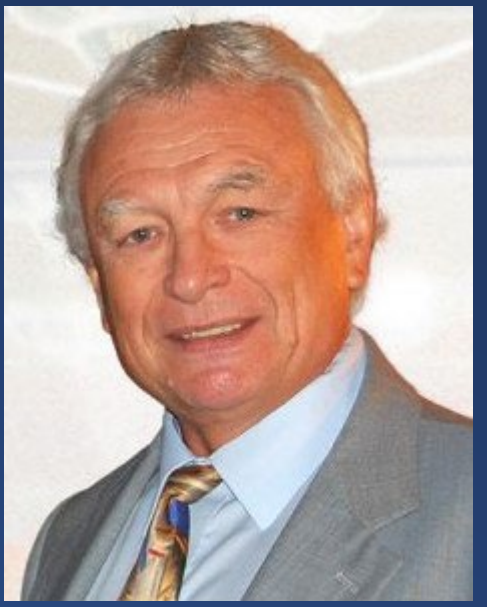
First, some history

- Prof Lazlo Tabar is a famous breast radiologist who led one of the major randomised controlled trials of mammography screening, 'The Two Counties Trial', commencing in 1977 and first published in 1985.

- He has spent the last 40 years innovating in breast radiology and teaching most of us how to best perform and report mammography.



RESEARCH ARTICLE VOLUME 325, ISSUE 8433, P829-832, APRIL 13, 1985

REDUCTION IN MORTALITY FROM BREAST CANCER AFTER MASS SCREENING WITH MAMMOGRAPHY

Randomised Trial from the Breast Cancer Screening Working Group of the Swedish National Board of Health and Welfare

L Tabár • A Gad • L.H Holmberg • U Ljungquist Kopparberg County Project Group • C.J.G Fagerberg • et al.
Show all authors

Published: April 13, 1985 • DOI: https://doi.org/10.1016/S0140-6736(85)92204-4

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Introduction of Screening

- In the early trials it was recognised that in a high throughput, double reading environment, a standardised non-narrative report was required.
- This also allowed easier lesion tracking, data collection and comparison of results.
- The Tabar 5 category lesion grading system was used in the Australian Pilot Programs in the late 1980's and in the BSA Program as it rolled out from 1992.

BSA Categories

Grade 1 – Normal / no significant abnormality
Grade 2 – Benign
Grade 3 – Equivocal / Indeterminate
Grade 4 – Suspicious for malignancy
Grade 5 – Mammographically malignant

- Recall to assessment was set at Grade 3.
- Grading system did not specify percentage likelihood of malignancy.

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Diagnostic Breast Imaging in Australia

It was also recognised in diagnostic imaging that synoptic reporting including checklists and a standard format was one of the best ways to:

- Improve content and completeness of diagnostic reports.
- Facilitate communication between clinicians.
- Allow transfer of information to data bases for quality improvement activities and audit.

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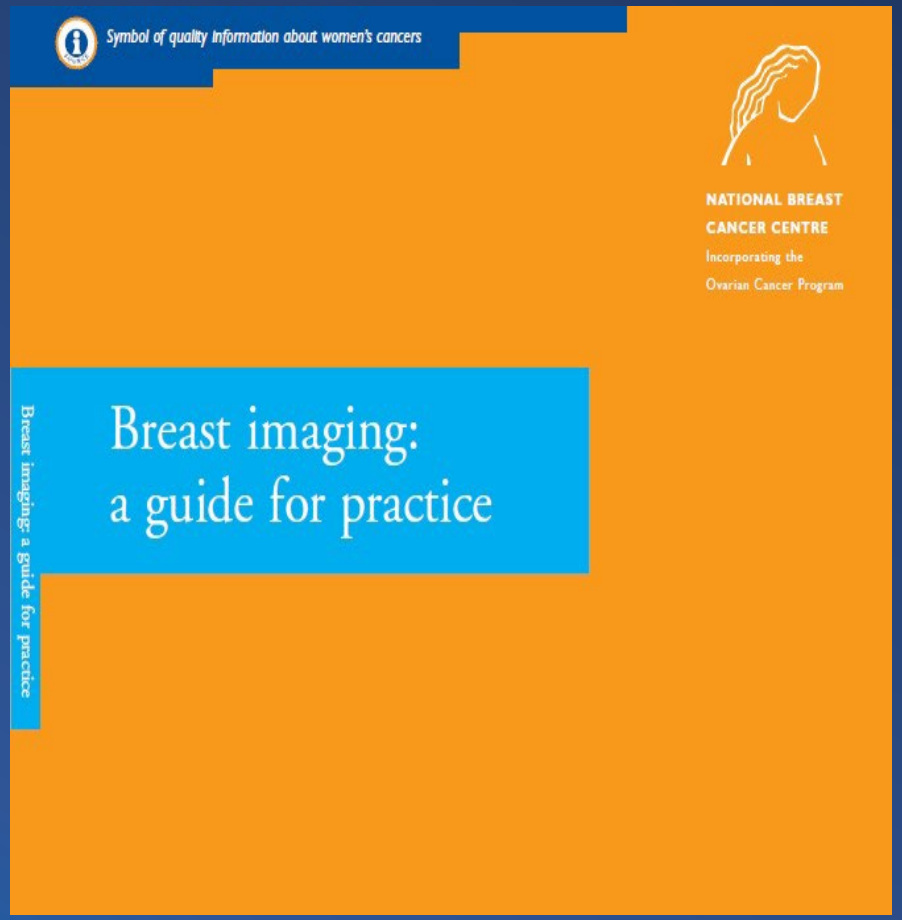
Australian Guidelines 2002

'Breast imaging: a guide for practice', a joint initiative of the National Breast Cancer Centre and RANZCR in 2002, included:

- Five-point lesion grading system
- Standard lesion descriptors
- Ultrasound
- Lesion tracking
- Lesion-based recommendations for further management

It recommended Mammographic Density reporting.



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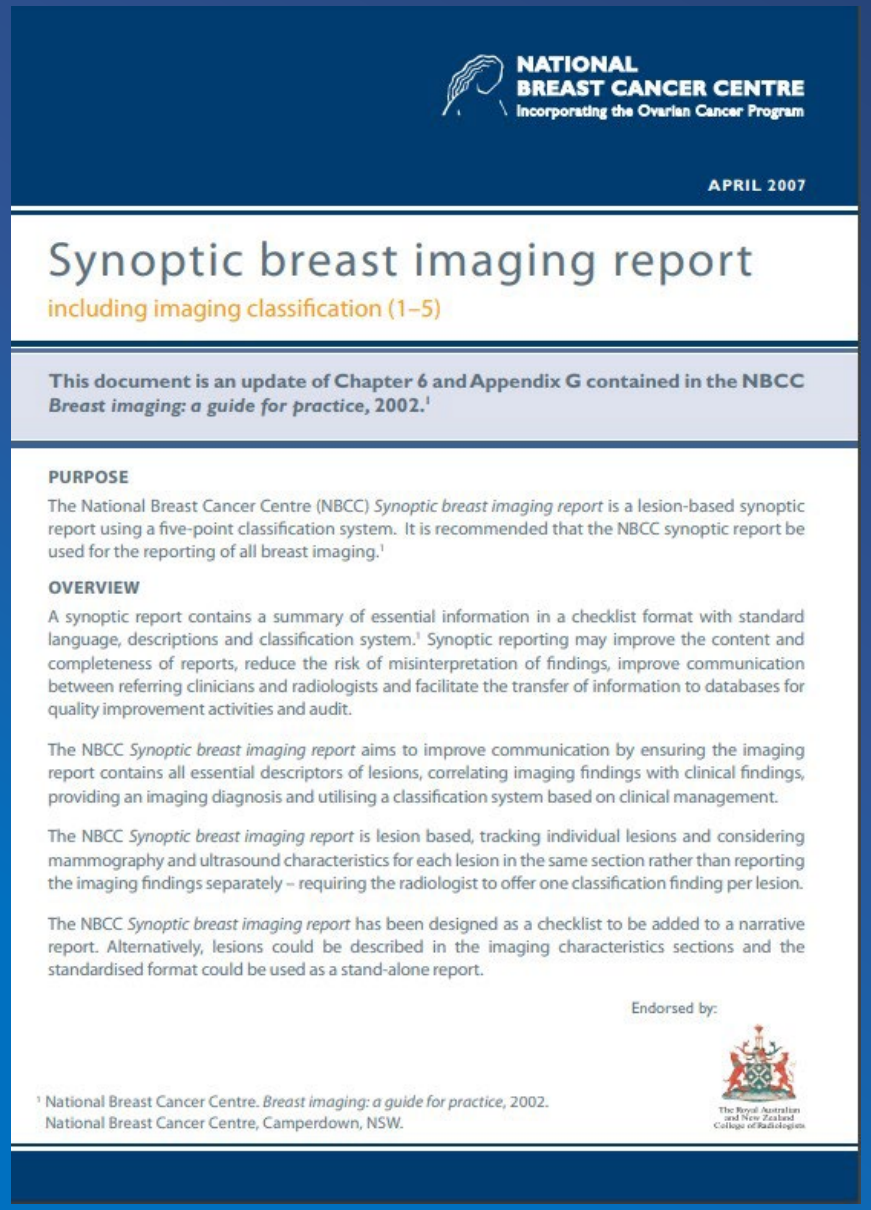
Australian Guidelines 2007



NATIONAL BREAST CANCER CENTRE
Incorporating the Ovarian Cancer Program

APRIL 2007

Synoptic breast imaging report

including imaging classification (1–5)

This document is an update of Chapter 6 and Appendix G contained in the NBCC *Breast imaging: a guide for practice*, 2002.[1]

PURPOSE

The National Breast Cancer Centre (NBCC) *Synoptic breast imaging report* is a lesion-based synoptic report using a five-point classification system. It is recommended that the NBCC synoptic report be used for the reporting of all breast imaging.[1]

OVERVIEW

A synoptic report contains a summary of essential information in a checklist format with standard language, descriptions and classification system.[1] Synoptic reporting may improve the content and completeness of reports, reduce the risk of misinterpretation of findings, improve communication between referring clinicians and radiologists and facilitate the transfer of information to databases for quality improvement activities and audit.

The NBCC *Synoptic breast imaging report* aims to improve communication by ensuring the imaging report contains all essential descriptors of lesions, correlating imaging findings with clinical findings, providing an imaging diagnosis and utilising a classification system based on clinical management.

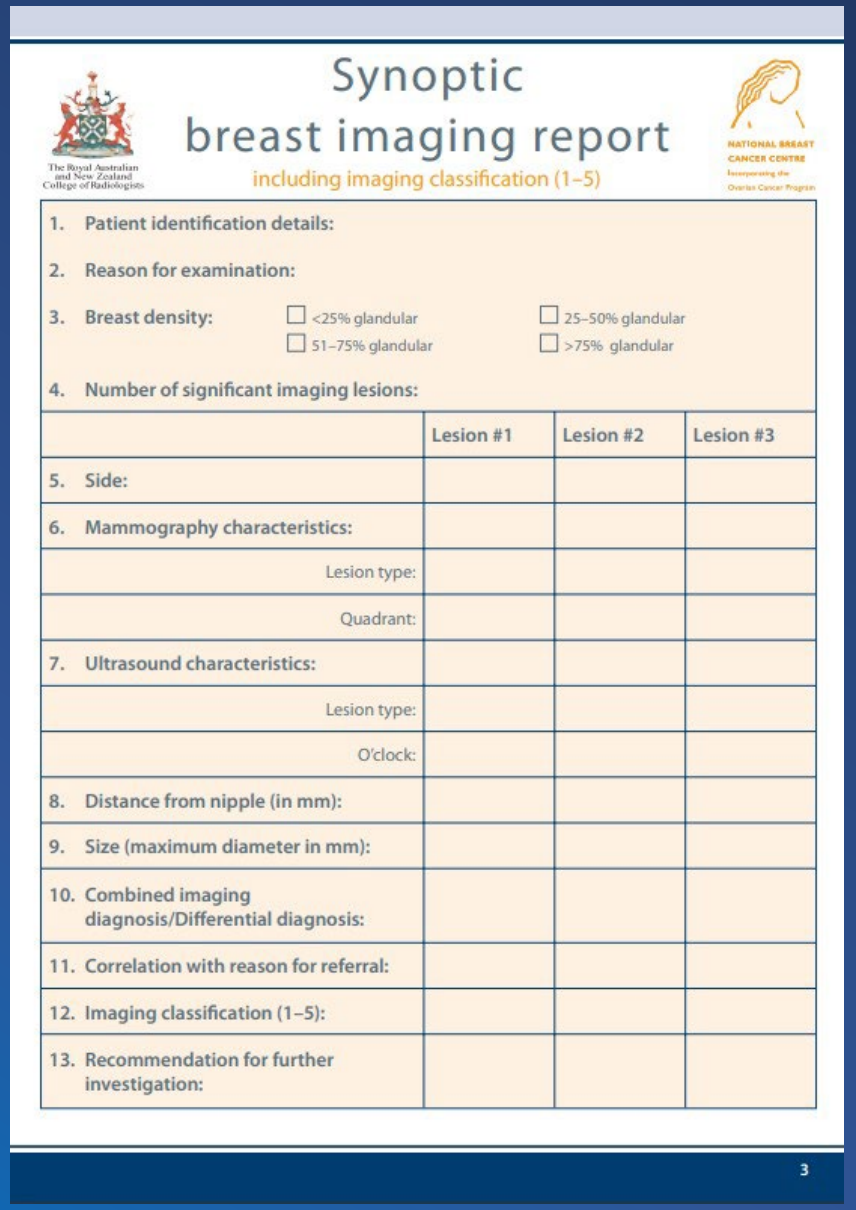
The NBCC *Synoptic breast imaging report* is lesion based, tracking individual lesions and considering mammography and ultrasound characteristics for each lesion in the same section rather than reporting the imaging findings separately – requiring the radiologist to offer one classification finding per lesion.

The NBCC *Synoptic breast imaging report* has been designed as a checklist to be added to a narrative report. Alternatively, lesions could be described in the imaging characteristics sections and the standardised format could be used as a stand-alone report.

Endorsed by:

The Royal Australian and New Zealand College of Radiologists

[1] National Breast Cancer Centre. *Breast imaging: a guide for practice*, 2002. National Breast Cancer Centre, Camperdown, NSW.



The Royal Australian and New Zealand College of Radiologists

Synoptic breast imaging report

including imaging classification (1–5)

NATIONAL BREAST CANCER CENTRE
Incorporating the Ovarian Cancer Program

1. Patient identification details:
2. Reason for examination:
3. Breast density: ☐ <25% glandular ☐ 25–50% glandular ☐ 51–75% glandular ☐ >75% glandular
4. Number of significant imaging lesions:

	Lesion #1	Lesion #2	Lesion #3
5. Side:			
6. Mammography characteristics:			
Lesion type:			
Quadrant:			
7. Ultrasound characteristics:			
Lesion type:			
O'clock:			
8. Distance from nipple (in mm):			
9. Size (maximum diameter in mm):			
10. Combined imaging diagnosis/Differential diagnosis:			
11. Correlation with reason for referral:			
12. Imaging classification (1–5):			
13. Recommendation for further investigation:			

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Formalised in the BSA NAS

In the BreastScreen Australia Program the reading outcomes of each of the screen readers is usually directly entered into the jurisdictional Program's Clinical Information System. The two independent screen readers will use the National Breast Cancer Centre (NBCC) Synoptic Breast Imaging Report[30] endorsed by the Royal Australian and New Zealand College of Radiologists (RANZCR) to record their reading outcome. This is a lesion based synoptic reporting system that uses a five-point imaging classification with agreed standard language and descriptions of the imaging findings. The use of this system, in the screening context, allows for tracking of individual lesions, to guide further assessment and can be used to systematise the correlation of the two reading outcomes into a single non-narrative recommendation for the screening episode for the woman. The business rules for correlation of the reading outcomes will be standardised and agreed in consultation with the readers and approved by the SCU.

BSA NAS March 2022 p54

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Similar process in the UK

- Earliest published scoring system was from Smallwood in 1984 – included clinical examination and cytology.
- In 1998 Goddard et al proposed 2 differing scoring systems one for symptomatic patients the other for screening.
- In 2001 the first NHSBSP screening assessment guidelines suggested a five-point scoring system but indicated that categories could be agreed locally.
- In 2009 the Royal College of Radiologists Breast Group (Maxwell et al) recommended a standardised scoring system to be used in the reporting of all breast examinations in the UK.

Clinical Radiology (2009) 64, 624–627

The Royal College of Radiologists Breast Group breast imaging classification

A.J. Maxwell[a,*], N.T. Ridley[b], G. Rubin[c], M.G. Wallis[d], F.J. Gilbert[e], M.J. Michell[f],
on behalf of the Royal College of Radiologists Breast Group

Classification

The level of suspicion for malignancy on imaging should be categorised from 1–5 as follows:

1. normal; there is no significant imaging abnormality.
2. Benign findings; the imaging findings are benign, and further investigation purely on the basis of the imaging findings is not indicated.
3. Indeterminate/probably benign findings; there is a small risk of malignancy, and further investigation is indicated.
4. Findings suspicious of malignancy; there is a moderate risk of malignancy and further investigation is indicated.
5. Findings highly suspicious of malignancy; there is a high risk of malignancy and further investigation is indicated.

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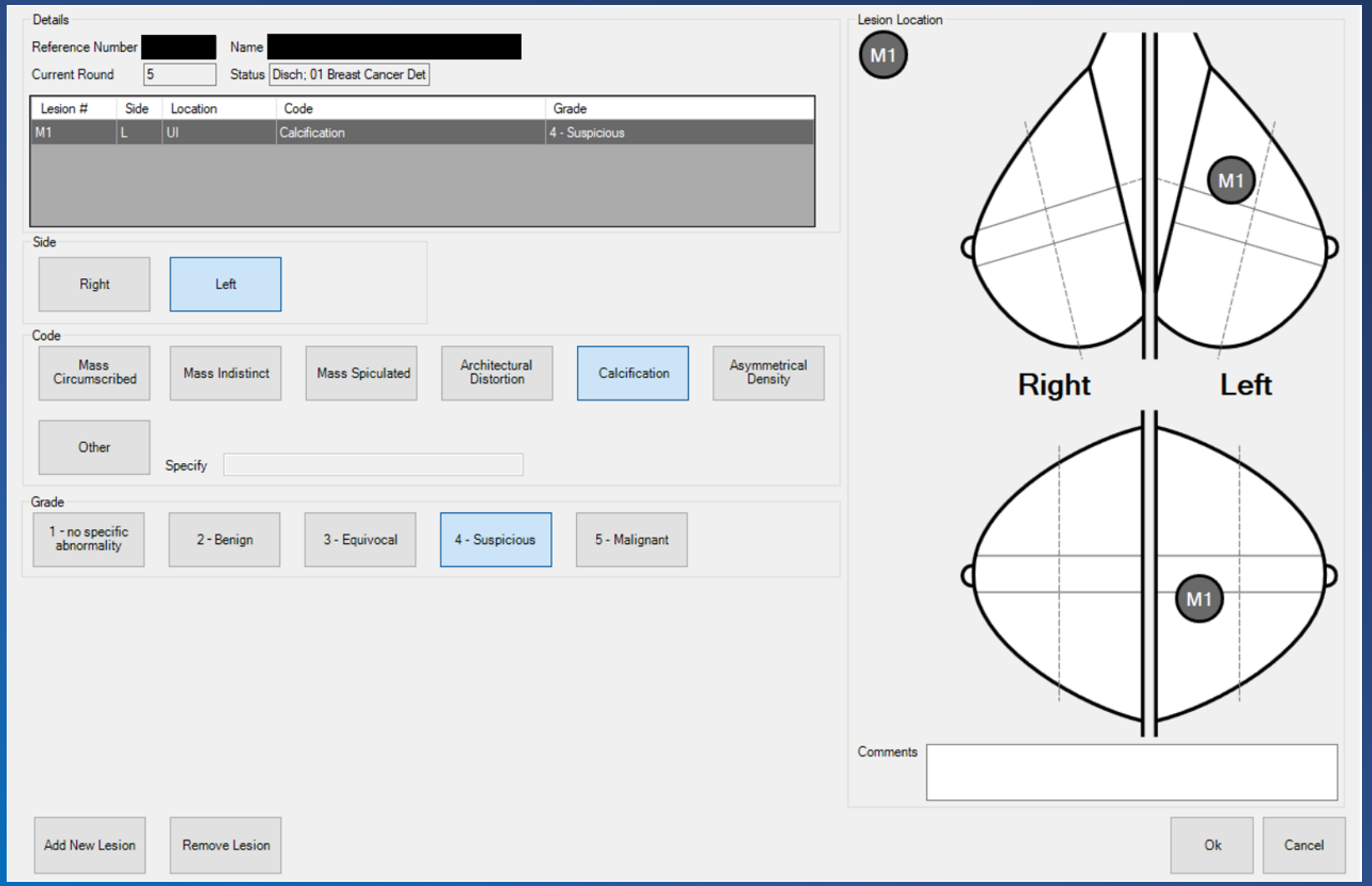
Current BSA Status

- The five-grade system has been implemented across all BSA services.
- It is entrenched in electronic data systems, electronic client records and "paperwork".
- It has been extended to include Ultrasound and more recently other modalities especially MRI and CEM.
- Consistency across jurisdictions has allowed improved communication, benchmarking, accreditation and QI strategies.

Adapted for electronic screen reading

- Interactive reading touch screen



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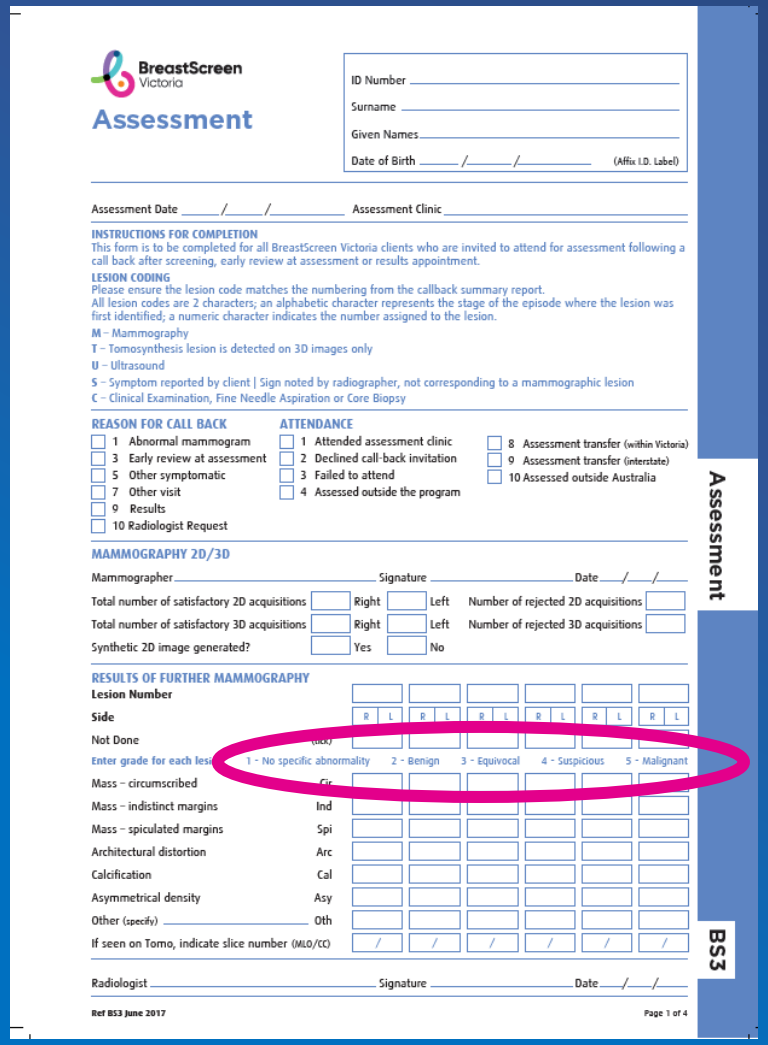
Assessment



BreastScreen Victoria

Assessment

ID Number
Surname
Given Names
Date of Birth ___/___/___ (Affix I.D. Label)

Assessment Date ___/___/___ Assessment Clinic

INSTRUCTIONS FOR COMPLETION
This form is to be completed for all BreastScreen Victoria clients who are invited to attend for assessment following a call back after screening, early review at assessment or results appointment.

LESION CODING
Please ensure the lesion code matches the numbering from the callback summary report.
All lesion codes are 2 characters; an alphabetic character represents the stage of the episode where the lesion was first identified; a numeric character indicates the number assigned to the lesion.
M – Mammography
T – Tomosynthesis lesion is detected on 3D images only
U – Ultrasound
S – Symptom reported by client | Sign noted by radiographer, not corresponding to a mammographic lesion
C – Clinical Examination, Fine Needle Aspiration or Core Biopsy

REASON FOR CALL BACK
- 1 Abnormal mammogram
- 3 Early review at assessment
- 5 Other symptomatic
- 7 Other visit
- 9 Results
- 10 Radiologist Request

ATTENDANCE
- 1 Attended assessment clinic
- 2 Declined call-back invitation
- 3 Failed to attend
- 4 Assessed outside the program
- 8 Assessment transfer (within Victoria)
- 9 Assessment transfer (interstate)
- 10 Assessed outside Australia

MAMMOGRAPHY 2D/3D
Mammographer ___ Signature ___ Date ___/___/___
Total number of satisfactory 2D acquisitions ___ Right ___ Left ___ Number of rejected 2D acquisitions ___
Total number of satisfactory 3D acquisitions ___ Right ___ Left ___ Number of rejected 3D acquisitions ___
Synthetic 2D image generated? ___ Yes ___ No

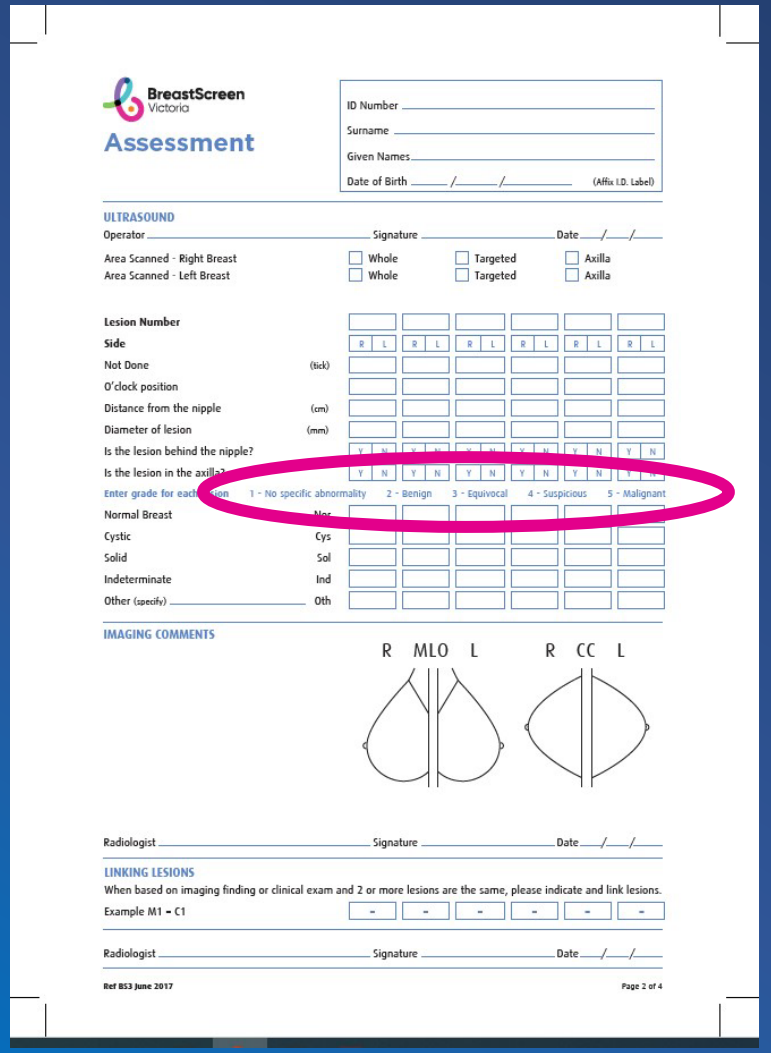
RESULTS OF FURTHER MAMMOGRAPHY

Lesion Number						
Side	R L	R L	R L	R L	R L	R L
Not Done (tick)						
Enter grade for each lesion: 1 - No specific abnormality 2 - Benign 3 - Equivocal 4 - Suspicious 5 - Malignant						
Mass – circumscribed Cir						
Mass – indistinct margins Ind						
Mass – spiculated margins Spi						
Architectural distortion Arc						
Calcification Cal						
Asymmetrical density Asy						
Other (specify) ___ Oth						
If seen on Tomo, indicate slice number (MLO/CC)	/	/	/	/	/	/

Radiologist ___ Signature ___ Date ___/___/___

Ref BS3 June 2017 Page 1 of 4

Assessment BS3



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Assessment

ID Number
Surname
Given Names
Date of Birth ___/___/___ (Affix I.D. Label)

ULTRASOUND
Operator ___ Signature ___ Date ___/___/___
Area Scanned - Right Breast ☐ Whole ☐ Targeted ☐ Axilla
Area Scanned - Left Breast ☐ Whole ☐ Targeted ☐ Axilla

Lesion Number						
Side	R L	R L	R L	R L	R L	R L
Not Done (tick)						
O'clock position						
Distance from the nipple (cm)						
Diameter of lesion (mm)						
Is the lesion behind the nipple?	Y N	Y N	Y N	Y N	Y N	Y N
Is the lesion in the axilla?	Y N	Y N	Y N	Y N	Y N	Y N
Enter grade for each lesion: 1 - No specific abnormality 2 - Benign 3 - Equivocal 4 - Suspicious 5 - Malignant						
Normal Breast Nor						
Cystic Cys						
Solid Sol						
Indeterminate Ind						
Other (specify) ___ Oth						

IMAGING COMMENTS

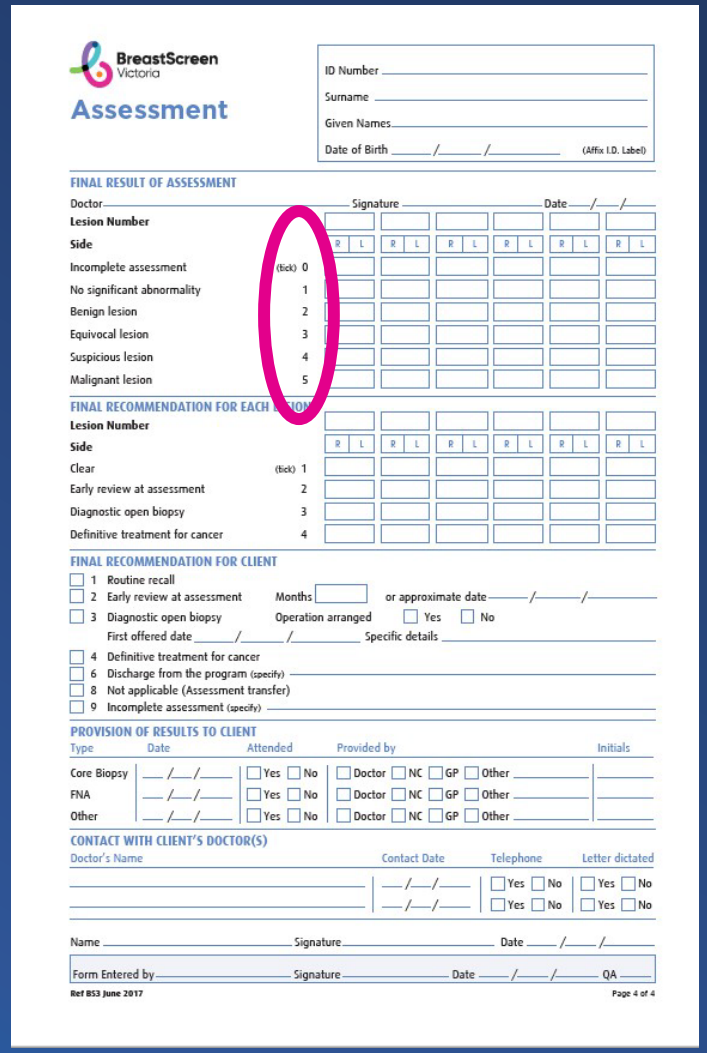
Radiologist ___ Signature ___ Date ___/___/___

LINKING LESIONS
When based on imaging finding or clinical exam and 2 or more lesions are the same, please indicate and link lesions.
Example M1 = C1

	-	-	-	-	-	-

Radiologist ___ Signature ___ Date ___/___/___

Ref BS3 June 2017 Page 2 of 4



BreastScreen Victoria

Assessment

ID Number
Surname
Given Names
Date of Birth ___/___/___ (Affix I.D. Label)

FINAL RESULT OF ASSESSMENT
Doctor ___ Signature ___ Date ___/___/___

Lesion Number						
Side	R L	R L	R L	R L	R L	R L
Incomplete assessment (tick) 0						
No significant abnormality 1						
Benign lesion 2						
Equivocal lesion 3						
Suspicious lesion 4						
Malignant lesion 5						

FINAL RECOMMENDATION FOR EACH LESION

Lesion Number						
Side	R L	R L	R L	R L	R L	R L
Clear (tick) 1						
Early review at assessment 2						
Diagnostic open biopsy 3						
Definitive treatment for cancer 4						

FINAL RECOMMENDATION FOR CLIENT
- ☐ 1 Routine recall
- ☐ 2 Early review at assessment Months ___ or approximate date ___/___/___
- ☐ 3 Diagnostic open biopsy Operation arranged ☐ Yes ☐ No
  First offered date ___/___/___ Specific details ___
- ☐ 4 Definitive treatment for cancer
- ☐ 6 Discharge from the program (specify) ___
- ☐ 8 Not applicable (Assessment transfer)
- ☐ 9 Incomplete assessment (specify) ___

PROVISION OF RESULTS TO CLIENT

Type	Date	Attended	Provided by	Initials
Core Biopsy	___/___/___	☐ Yes ☐ No	☐ Doctor ☐ NC ☐ GP ☐ Other ___	
FNA	___/___/___	☐ Yes ☐ No	☐ Doctor ☐ NC ☐ GP ☐ Other ___	
Other	___/___/___	☐ Yes ☐ No	☐ Doctor ☐ NC ☐ GP ☐ Other ___	

CONTACT WITH CLIENT'S DOCTOR(S)

Doctor's Name	Contact Date	Telephone	Letter dictated
	___/___/___	☐ Yes ☐ No	☐ Yes ☐ No
	___/___/___	☐ Yes ☐ No	☐ Yes ☐ No

Name ___ Signature ___ Date ___/___/___
Form Entered by ___ Signature ___ Date ___/___/___ QA ___

Ref BS3 June 2017 Page 4 of 4

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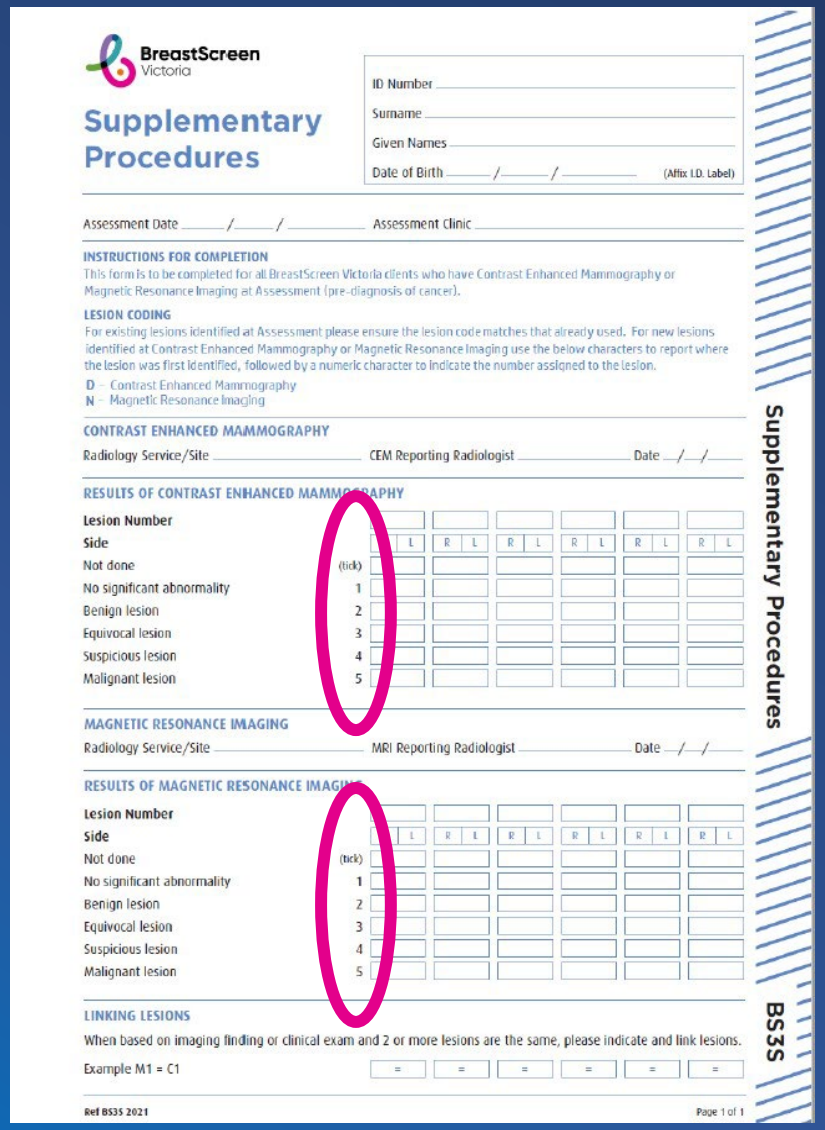
Supplementary Imaging:

Linking with BI-RADS becomes tricky



BreastScreen Victoria

Supplementary Procedures

ID Number
Surname
Given Names
Date of Birth ___/___/___ (Affix I.D. Label)

Assessment Date ___/___/___ Assessment Clinic

INSTRUCTIONS FOR COMPLETION

This form is to be completed for all BreastScreen Victoria clients who have Contrast Enhanced Mammography or Magnetic Resonance Imaging at Assessment (pre-diagnosis of cancer).

LESION CODING

For existing lesions identified at Assessment please ensure the lesion code matches that already used. For new lesions identified at Contrast Enhanced Mammography or Magnetic Resonance Imaging use the below characters to report where the lesion was first identified, followed by a numeric character to indicate the number assigned to the lesion.

D – Contrast Enhanced Mammography
N – Magnetic Resonance Imaging

CONTRAST ENHANCED MAMMOGRAPHY

Radiology Service/Site ___ CEM Reporting Radiologist ___ Date ___/___/___

RESULTS OF CONTRAST ENHANCED MAMMOGRAPHY

Lesion Number													
Side		L	R	L	R	L	R	L	R	L	R	L	
Not done	(tick)												
No significant abnormality	1												
Benign lesion	2												
Equivocal lesion	3												
Suspicious lesion	4												
Malignant lesion	5												

MAGNETIC RESONANCE IMAGING

Radiology Service/Site ___ MRI Reporting Radiologist ___ Date ___/___/___

RESULTS OF MAGNETIC RESONANCE IMAGING

Lesion Number													
Side		L	R	L	R	L	R	L	R	L	R	L	
Not done	(tick)												
No significant abnormality	1												
Benign lesion	2												
Equivocal lesion	3												
Suspicious lesion	4												
Malignant lesion	5												

LINKING LESIONS

When based on imaging finding or clinical exam and 2 or more lesions are the same, please indicate and link lesions.

Example M1 = C1 | = | = | = | = | = | =

Ref BS3S 2021 Page 1 of 1

Supplementary Procedures BS3S

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Breast Imaging Reporting and Data System (BI-RADS)

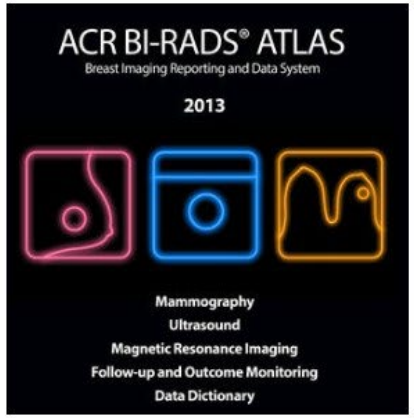
- In the USA a parallel process was occurring through the American College of Radiology (ACR).
- BI-RADS was first introduced as a pamphlet in 1992.
- US and MRI were added in 2003.
- CEM added in 2022.
- For mammography the current document is Edition 5, 2013.

Breast Imaging Reporting and Data System (BI-RADS)

Breast Imaging Reporting & Data System (BI-RADS®)

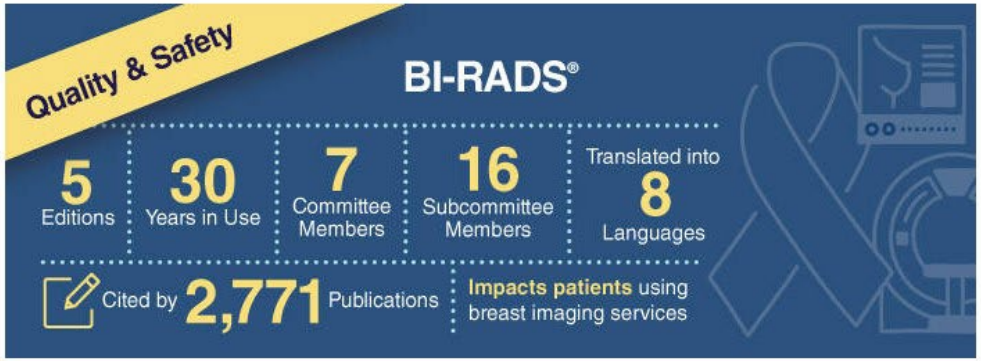
The BI-RADS atlas provides standardized breast imaging terminology, report organization, assessment structure and a classification system for mammography, ultrasound and MRI of the breast. BI-RADS reporting enables radiologists to communicate results to the referring physician clearly and consistently, with a final assessment and specific management recommendations.

Through a medical audit and outcome monitoring, the system provides important mechanisms for peer review and quality assurance data to improve the quality of patient care. Standardized results permit maintenance and analysis of demographic and outcome data. BI-RADS Atlas 5th Edition preface »



The BI-RADS atlas includes:

- Over 700 clinical images
- Follow-up and outcome monitoring includes mammography, ultrasound and MRI
- Updated breast composition descriptors
- Guidance with FAQ for each section
- New elasticity assessment descriptors for ultrasound
- New breast implant descriptors for MRI



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BI-RADS is much more than a lesion grading system

- Recommendations on report organisation
- Guidance on reporting breast composition (mammographic density). Categories a,b,c,d. Updated in Ed 5.
- Provides a lexicon for lesion types and how to describe lesions within each type with standard descriptors for morphology and distribution.
- Describes seven Assessment Categories linked to a percentage likelihood of malignancy.
- Assessment categories are linked to management recommendations.
- Assessment categories are generally assigned after complete imaging workup.
- Provides a platform for medical outcome monitoring and audit.
- Atlas of over 600 images

Use of an assessment category in the overall report summary is mandated in the USA by the FDA

The synoptic reporting system has extended to other imaging: PI-RADS, TI-RADS and Lung-RADS

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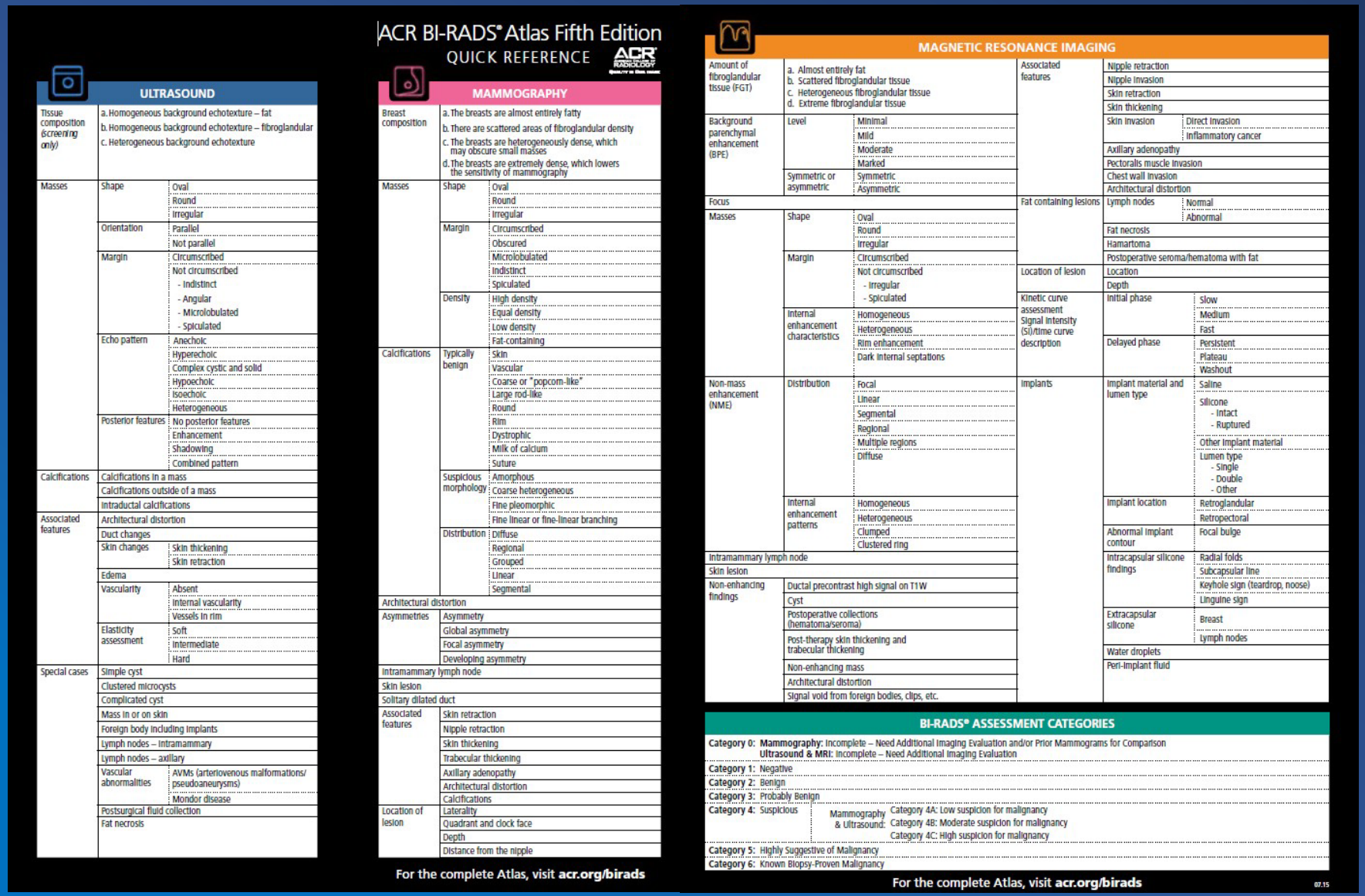
Breast Imaging Reporting and Data System (BI-RADS)



ACR BI-RADS® Atlas Fifth Edition
QUICK REFERENCE

ULTRASOUND

Tissue composition (screening only)	a. Homogeneous background echotexture – fat b. Homogeneous background echotexture – fibroglandular c. Heterogeneous background echotexture	
Masses	Shape	Oval Round Irregular
	Orientation	Parallel Not parallel
	Margin	Circumscribed Not circumscribed - Indistinct - Angular - Microlobulated - Spiculated
	Echo pattern	Anechoic Hyperechoic Complex cystic and solid Hypoechoic Isoechoic Heterogeneous
	Posterior features	No posterior features Enhancement Shadowing Combined pattern
Calcifications	Calcifications in a mass	
	Calcifications outside of a mass	
	Intraductal calcifications	
Associated features	Architectural distortion	
	Duct changes	
	Skin changes	Skin thickening Skin retraction
	Edema	
	Vascularity	Absent Internal vascularity Vessels in rim
	Elasticity assessment	Soft Intermediate Hard
Special cases	Simple cyst	
	Clustered microcysts	
	Complicated cyst	
	Mass in or on skin	
	Foreign body including implants	
	Lymph nodes – intramammary	
	Lymph nodes – axillary	
	Vascular abnormalities	AVMs (arteriovenous malformations/ pseudoaneurysms) Mondor disease
	Postsurgical fluid collection	
	Fat necrosis	

MAMMOGRAPHY

Breast composition	a. The breasts are almost entirely fatty b. There are scattered areas of fibroglandular density c. The breasts are heterogeneously dense, which may obscure small masses d. The breasts are extremely dense, which lowers the sensitivity of mammography	
Masses	Shape	Oval Round Irregular
	Margin	Circumscribed Obscured Microlobulated Indistinct Spiculated
	Density	High density Equal density Low density Fat-containing
Calcifications	Typically benign	Skin Vascular Coarse or "popcorn-like" Large rod-like Round Rim Dystrophic Milk of calcium Suture
	Suspicious morphology	Amorphous Coarse heterogeneous Fine pleomorphic Fine linear or fine-linear branching
	Distribution	Diffuse Regional Grouped Linear Segmental
Architectural distortion		
Asymmetries	Asymmetry	
	Global asymmetry	
	Focal asymmetry	
	Developing asymmetry	
Intramammary lymph node		
Skin lesion		
Solitary dilated duct		
Associated features	Skin retraction	
	Nipple retraction	
	Skin thickening	
	Trabecular thickening	
	Axillary adenopathy	
	Architectural distortion	
	Calcifications	
Location of lesion	Laterality	
	Quadrant and clock face	
	Depth	
	Distance from the nipple	

For the complete Atlas, visit **acr.org/birads**

MAGNETIC RESONANCE IMAGING

Amount of fibroglandular tissue (FGT)	a. Almost entirely fat b. Scattered fibroglandular tissue c. Heterogeneous fibroglandular tissue d. Extreme fibroglandular tissue		Associated features	Nipple retraction	
				Nipple invasion	
				Skin retraction	
				Skin thickening	
Background parenchymal enhancement (BPE)	Level	Minimal		Skin invasion	Direct invasion Inflammatory cancer
		Mild		Axillary adenopathy	
		Moderate		Pectoralis muscle invasion	
		Marked		Chest wall invasion	
	Symmetric or asymmetric	Symmetric		Architectural distortion	
		Asymmetric			
Focus			Fat containing lesions	Lymph nodes	Normal Abnormal
Masses	Shape	Oval		Fat necrosis	
		Round		Hamartoma	
		Irregular		Postoperative seroma/hematoma with fat	
	Margin	Circumscribed	Location of lesion	Location	
		Not circumscribed - Irregular - Spiculated		Depth	
	Internal enhancement characteristics	Homogeneous	Kinetic curve assessment Signal intensity (SI)/time curve description	Initial phase	Slow Medium Fast
		Heterogeneous		Delayed phase	Persistent Plateau Washout
		Rim enhancement			
		Dark internal septations			
Non-mass enhancement (NME)	Distribution	Focal	Implants	Implant material and lumen type	Saline Silicone - Intact - Ruptured Other implant material Lumen type - Single - Double - Other
		Linear			
		Segmental			
		Regional			
		Multiple regions			
		Diffuse			
	Internal enhancement patterns	Homogeneous		Implant location	Retroglandular Retropectoral
		Heterogeneous		Abnormal implant contour	Focal bulge
		Clumped		Intracapsular silicone findings	Radial folds Subcapsular line Keyhole sign (teardrop, noose) Linguine sign
		Clustered ring			
Intramammary lymph node				Extracapsular silicone	Breast Lymph nodes
Skin lesion				Water droplets	
Non-enhancing findings	Ductal precontrast high signal on T1W			Peri-implant fluid	
	Cyst				
	Postoperative collections (hematoma/seroma)				
	Post-therapy skin thickening and trabecular thickening				
	Non-enhancing mass				
	Architectural distortion				
	Signal void from foreign bodies, clips, etc.				

BI-RADS® ASSESSMENT CATEGORIES

Category 0:	**Mammography:** Incomplete – Need Additional Imaging Evaluation and/or Prior Mammograms for Comparison **Ultrasound & MRI:** Incomplete – Need Additional Imaging Evaluation	
Category 1:	Negative	
Category 2:	Benign	
Category 3:	Probably Benign	
Category 4:	Suspicious	Mammography & Ultrasound: Category 4A: Low suspicion for malignancy Category 4B: Moderate suspicion for malignancy Category 4C: High suspicion for malignancy
Category 5:	Highly Suggestive of Malignancy	
Category 6:	Known Biopsy-Proven Malignancy	

For the complete Atlas, visit **acr.org/birads**

07.15

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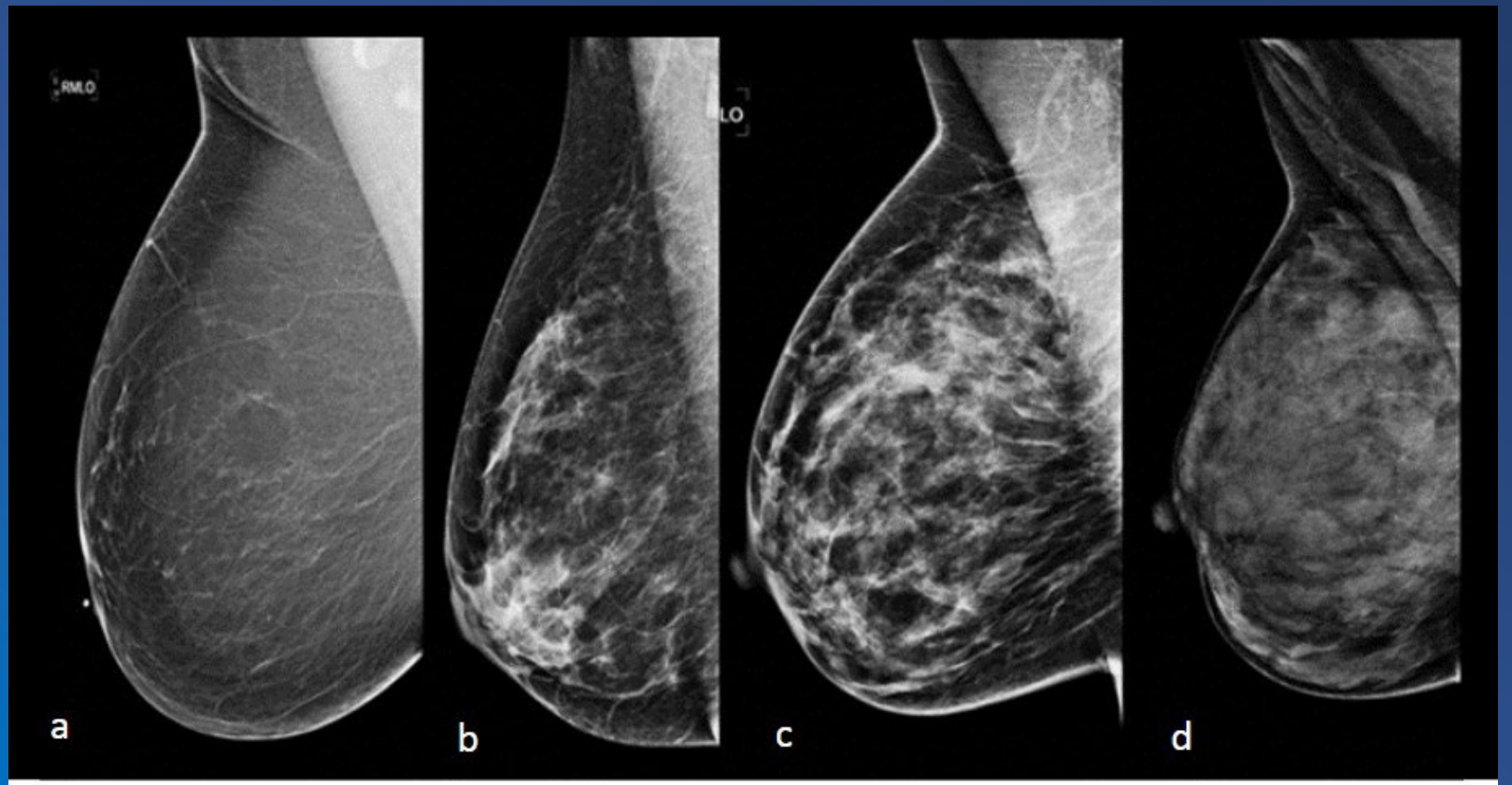
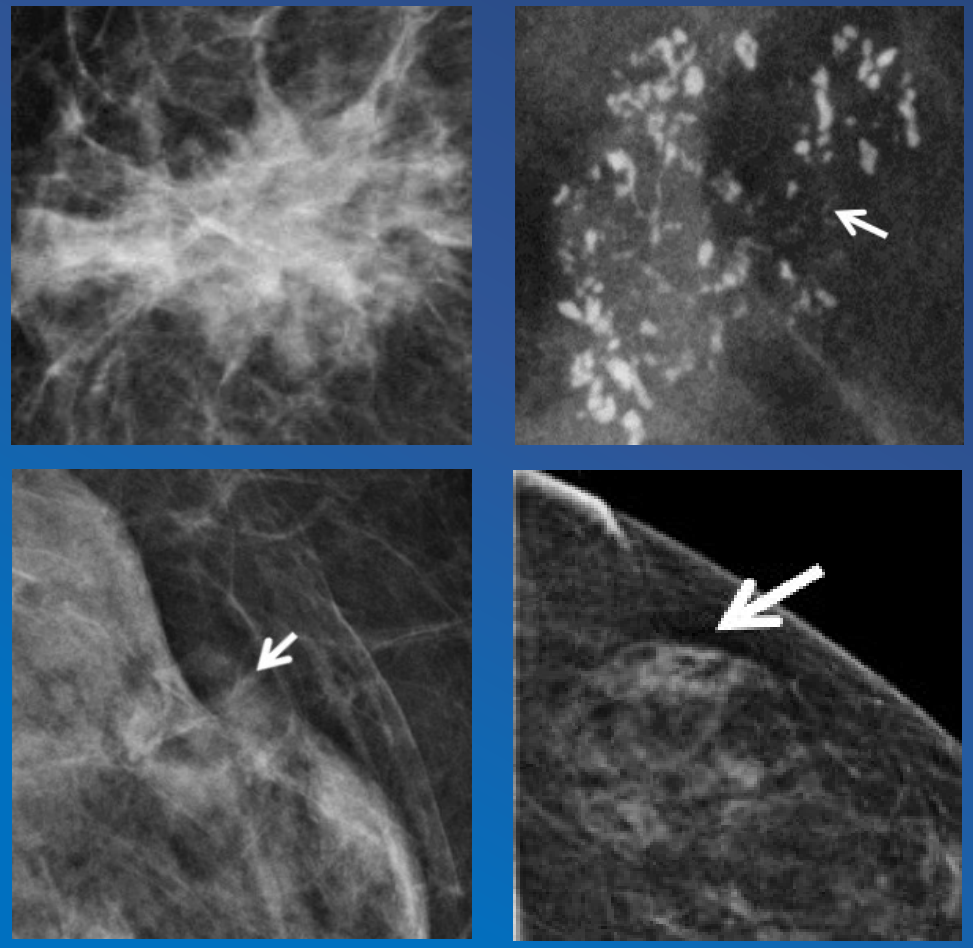
BI-RADS

Breast Composition Categories



Radiographics: https://doi.org/10.1148/rg.2019180068

BI-RADS
Lesion descriptors



Radiographics: https://doi.org/10.1148/rg.2019180068

3. CLEAR DESCRIPTION OF ANY IMPORTANT FINDINGS

(It is assumed that most important findings are either of concern at screening, inherently suspicious, new, or seen to be larger/more extensive when compared to previous examination.)

a. **Mass:**
   - Size
   - Morphology (shape, margin)
   - Density
   - Associated calcifications
   - Associated features
   - Location

b. **Calcifications:**
   - Morphology — describe typically benign type or describe shape of particles
   - Distribution (may not be appropriate for typically benign calcifications)
   - Associated features
   - Location

c. **Architectural Distortion:**
   - Associated calcifications
   - Associated features
   - Location

d. **Asymmetries** (asymmetry, global asymmetry, focal asymmetry, developing asymmetry):
   - Associated calcifications
   - Associated features
   - Location

e. **Intramammary lymph node** (rarely important):
   - Location

f. **Skin lesion** (rarely important):
   - Location

g. **Solitary dilated duct** (rarely present):
   - Location

ACR BI-RADS® ATLAS — **MAMMOGRAPHY**

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BI-RADS

Assessment Categories

ACR BI-RADS® ATLAS — **MAMMOGRAPHY**

Assessment	Management	Likelihood of Cancer
Category 0: Incomplete – Need Additional Imaging Evaluation and/or Prior Mammograms for Comparison	Recall for additional imaging and/or comparison with prior examination(s)	N/A
Category 1: Negative	Routine mammography screening	Essentially 0% likelihood of malignancy
Category 2: Benign	Routine mammography screening	Essentially 0% likelihood of malignancy
Category 3: Probably Benign	Short-interval (6-month) follow-up or continued surveillance mammography (Figure 155, see page 152)	> 0% but ≤ 2% likelihood of malignancy
Category 4: Suspicious Category 4A: *Low suspicion* for malignancy Category 4B: *Moderate suspicion* for malignancy Category 4C: *High suspicion* for malignancy	Tissue diagnosis	> 2% but < 95% likelihood of malignancy > 2% to ≤ 10% likelihood of malignancy > 10% to ≤ 50% likelihood of malignancy > 50% to < 95% likelihood of malignancy
Category 5: Highly Suggestive of Malignancy	Tissue diagnosis	≥ 95% likelihood of malignancy
Category 6: Known Biopsy-Proven Malignancy	Surgical excision when clinically appropriate	N/A

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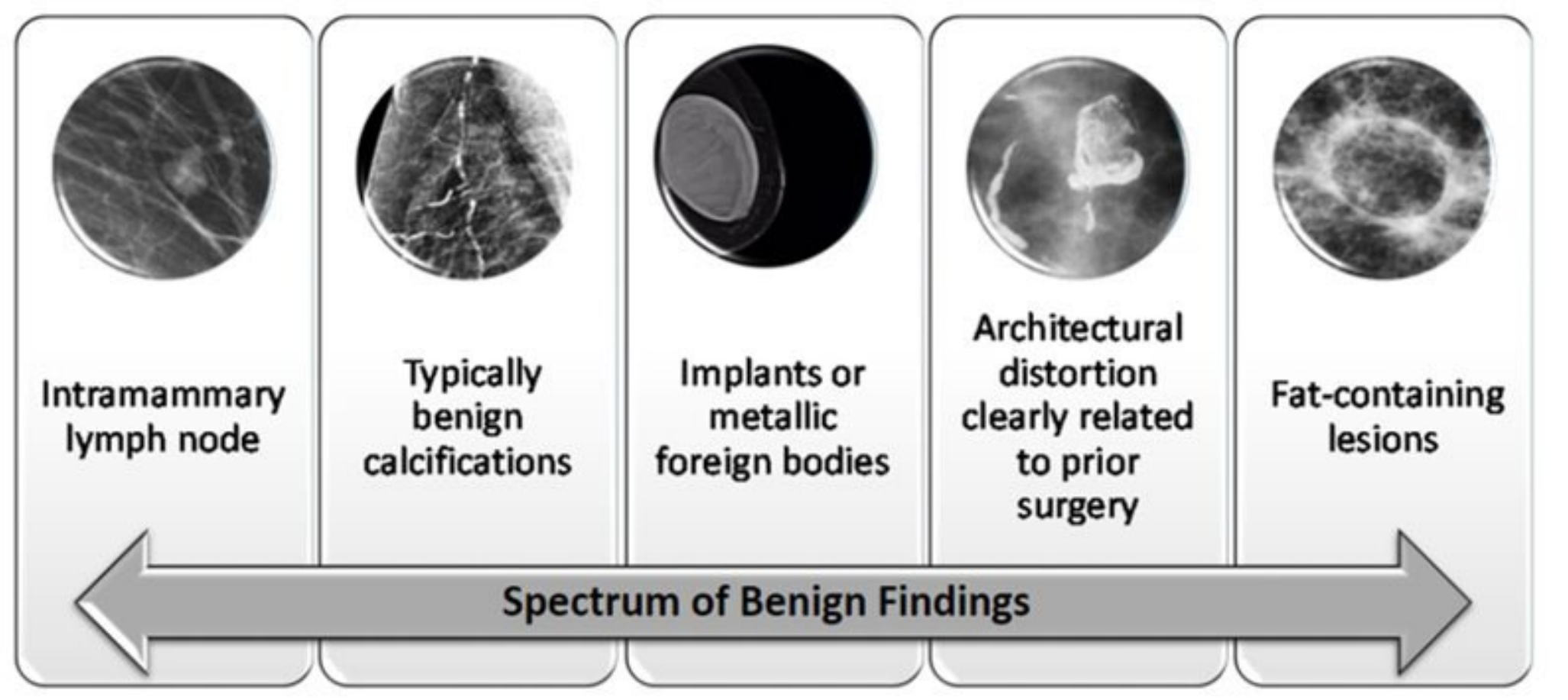
BI-RADS Assessment Categories
Category 2 - Benign

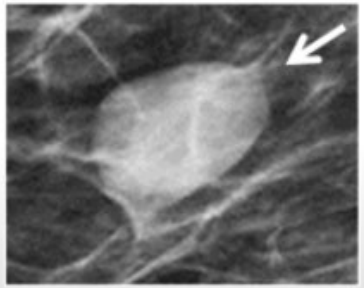


Radiographics: https://doi.org/10.1148/rg.2019180068

BI-RADS Assessment Categories

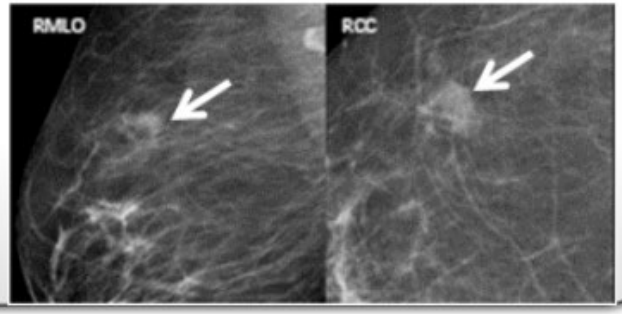
Category 3 - Probably Benign

Noncalcified circumscribed solid mass (arrow)



Focal asymmetry (arrows)

A focal asymmetry should be nonpalpable and should not have have a sonographic correlate.

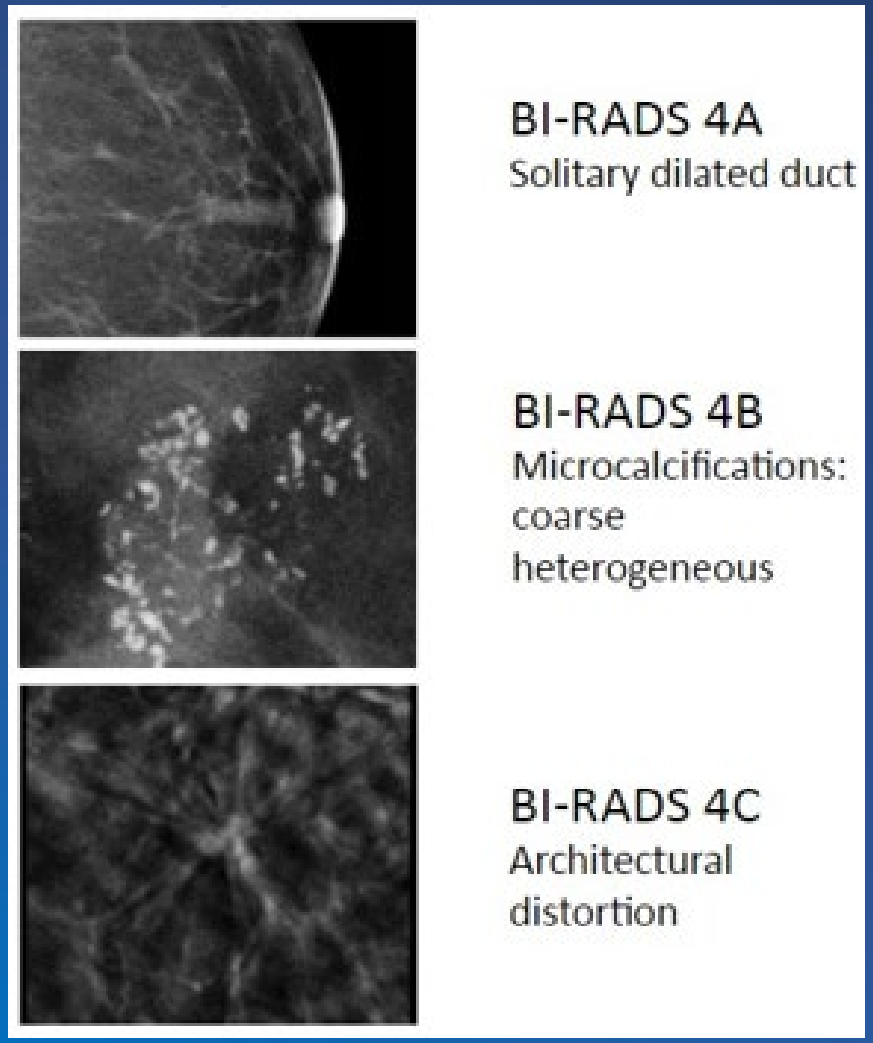


Solitary group of punctate calcifications (arrow)

Radiographics: https://doi.org/10.1148/rg.2019180068

BI-RADS Assessment Categories

Category 4 - Suspicious



Radiographics: https://doi.org/10.1148/rg.2019180068

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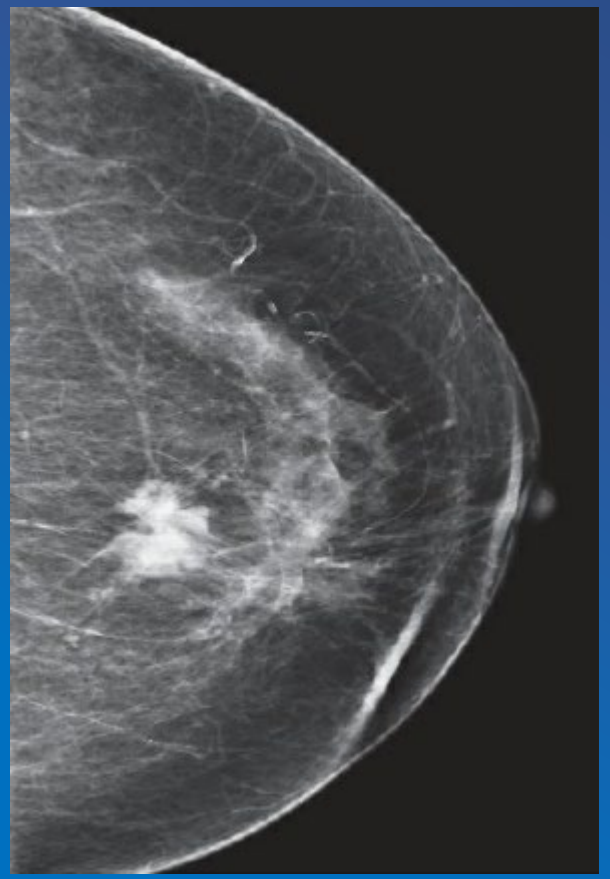
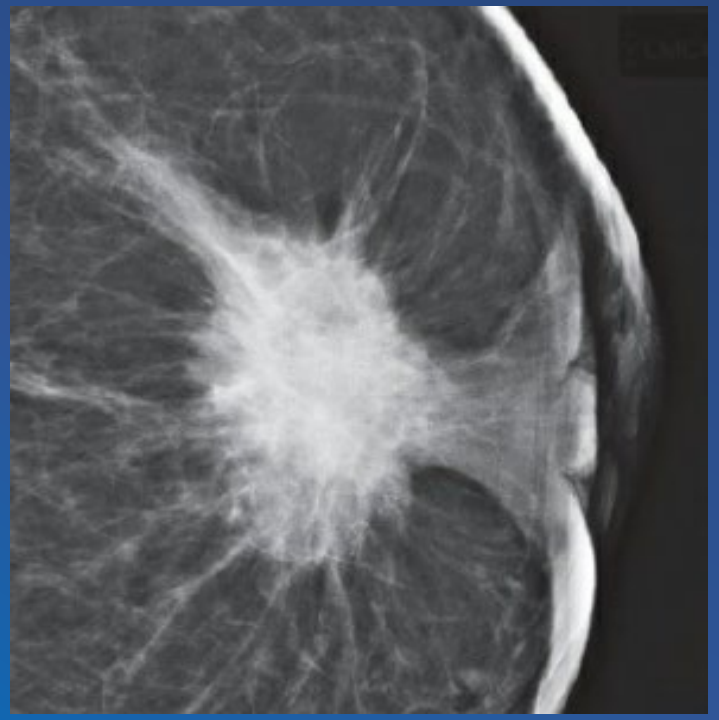
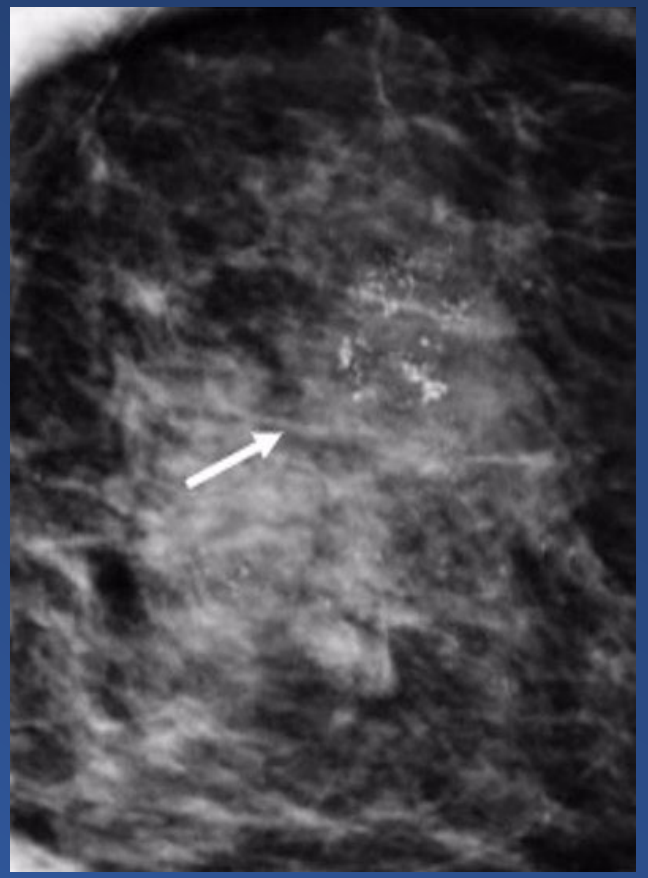
BI-RADS Assessment Categories

Category 5 – highly suggestive of malignancy







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Radiographics: https://doi.org/10.1148/rg.2019180068

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BI-RADS Edition 5

- Generally Category 0 (incomplete) has been assigned to a screening setting when a woman is recalled for further assessment.
- Edition 5 also now allows flexibility to separate assessment categories from management, acknowledging that a Category 3 lesion may undergo needle biopsy rather than short term follow up.

BI-RADS vs TABAR

Table 1 Comparison of imaging classification systems

Category	BI-RADS	NBCC	RCRBG
0	Assessment incomplete. *Need to review prior studies and/or complete additional imaging*		
1	Negative. *Continue routine screening*	No significant abnormality. *There is no significant imaging abnormality*	Normal/no significant abnormality. *There is no significant imaging abnormality*
2	Benign finding. *Continue routine screening*	Benign findings. *No further imaging is required*	Benign findings. *The imaging findings are benign.*
3	Probably benign finding. (*<2% chance of malignancy) Short-term follow-up mammogram at 6 months, then every 6–12 months for 1–2 years*	Indeterminate/equivocal findings. *Requires further investigation, usually FNA cytology/core biopsy*	Indeterminate/probably benign findings. *There is a small risk of malignancy. Further investigation is indicated.*
4	Suspicious abnormality. *Perform biopsy, preferably needle biopsy*	Suspicious findings of malignancy. *Requires further investigation. May require excisional biopsy*	Findings suspicious of malignancy. *There is a moderate risk of malignancy. Further investigation is indicated.*
5	Highly suspicious of malignancy: appropriate action should be taken. *Biopsy and treatment, as necessary.*	Malignant findings. *Requires further investigation, even if non-excision (percutaneous) sampling is benign*	Findings highly suspicious of malignancy. *There is a high risk of malignancy. Further investigation is indicated.*
6	Known biopsy-proven malignancy, treatment pending. *Assure that treatment is completed*		

Maxwell et al Clinical Radiology (2009) 64, 624-627

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BI-RADS vs TABAR

In 2018 RANZCR issued a comparison and advice document

Breast Imaging Grading Comparison and Lesion Classification lists

Breast Imaging Lesion Classification

There are two different classification systems in common use for classifying lesions discovered on breast imaging:

1. The Tabar/RANZCR classification, used in BreastScreen Australia and BreastScreen Aotearoa, and traditionally in diagnostic radiology as well. This grades abnormalities based on a simple 1-5 scale, with 1 being normal and 5 a malignant appearance. The Tabar/RANZCR classification is used for mammography and ultrasound.
2. The BI-RADS lexicon, has been formulated by the American College of Radiologists. This classification of breast lesions is used in mammography, ultrasound, MRI and other imaging modalities.

There has been some confusion amongst Part Two candidates about which to use, as both are commonly used in different sites where training occurs, and the RANZCR Curriculum currently specifies the BI-RADS classification.

The distinction is important, as the BI-RADS category 3 specifies short-term follow-up, and the Tabar category 3 usually prompts percutaneous biopsy.

BREAST LESION GRADING COMPARISON

BI-RADS	Tabar / RANZCR / BS Australia	BreastScreen Aotearoa
BIRADS 0		
BIRADS 1	Grade 1	Category 1
BIRADS 2	Grade 2	Category 1
BIRADS 3	Grade 3	Category 2
BIRADS 4A	Grade 3	Category 2&3
BIRADS 4B	Grade 4	Category 3
BIRADS 4C	Grade 4	Category 4
BIRADS 5	Grade 5	Category 5
BIRADS 6		

Breast Lesion Classification by System

BIRADS (5th Edition)

- BIRADS 0: Incomplete
- BIRADS 1: Negative
- BIRADS 2: Benign
- BIRADS 3: Probably benign
- BIRADS 4A: Low suspicion
- BIRADS 4B: Moderate suspicion
- BIRADS 4C: High suspicion
- BIRADS 5: Highly suggestive of malignancy
- BIRADS 6: Biopsy-proven malignancy

Tabar/RANZCR/BreastScreen Australia

- Grade 1: Normal
- Grade 2: Benign
- Grade 3: Indeterminate
- Grade 4: Suspicious
- Grade 5: Highly suspicious

BreastScreen Aotearoa

- category 1: normal/benign
- category 2: probably benign
- category 3: indeterminate
- category 4: probably malignant
- category 5: malignant

RECOMMENDATION

The Breast Imaging Advisory Committee (BIAC) recommends that since both classification systems are in common use, that either be accepted in the Part Two viva examinations as valid, as long as the candidates are aware of the important differences between the two classification systems.

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Why change now?

- In '*Breast imaging: a guide for practice' (*2002), the NBCC committee considered BI-RADS "not applicable to the Australian setting".
- A similar statement was made by RCRBG in the paper by Maxwell et al in 2009.

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Why change now?

- BI-RADS has been extensively implemented across the world and its use allows direct comparison with overseas performance.
- It is widely used for MRI and CEM reporting, including in Australia, and would allow BSA data systems to record outside imaging done as part of risk assessment or problem solving. There is likely to be more of this in the future.

Use of one system across screening and diagnostic services should improve communication with treating clinicians to minimise misinterpretation or error.

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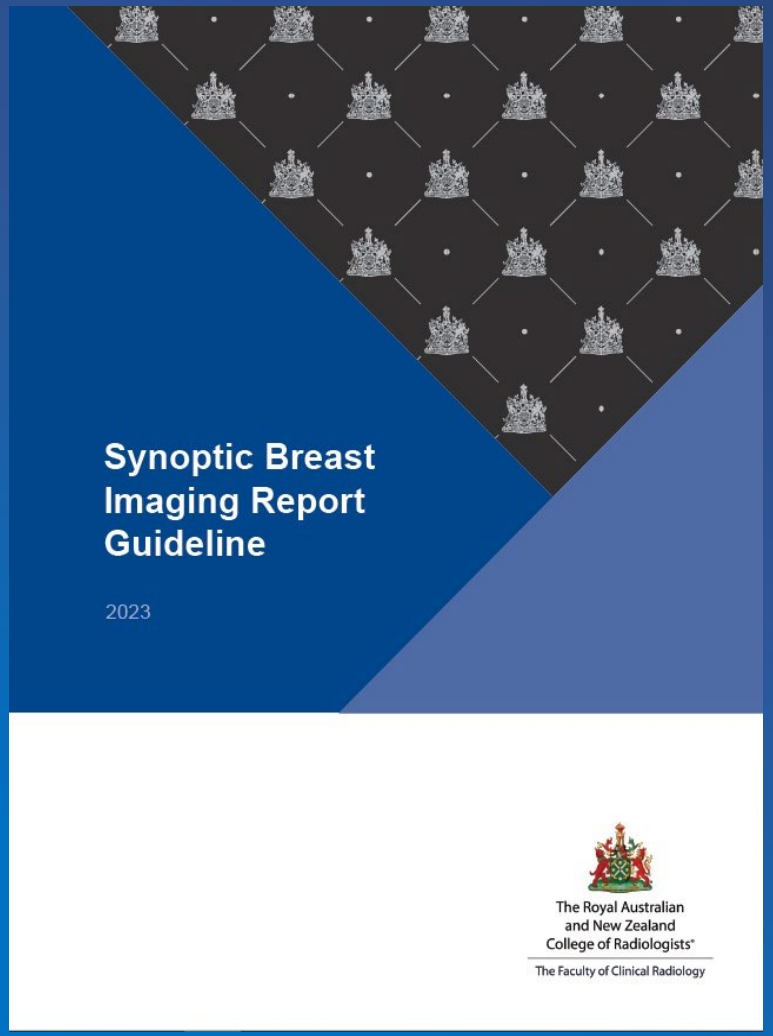
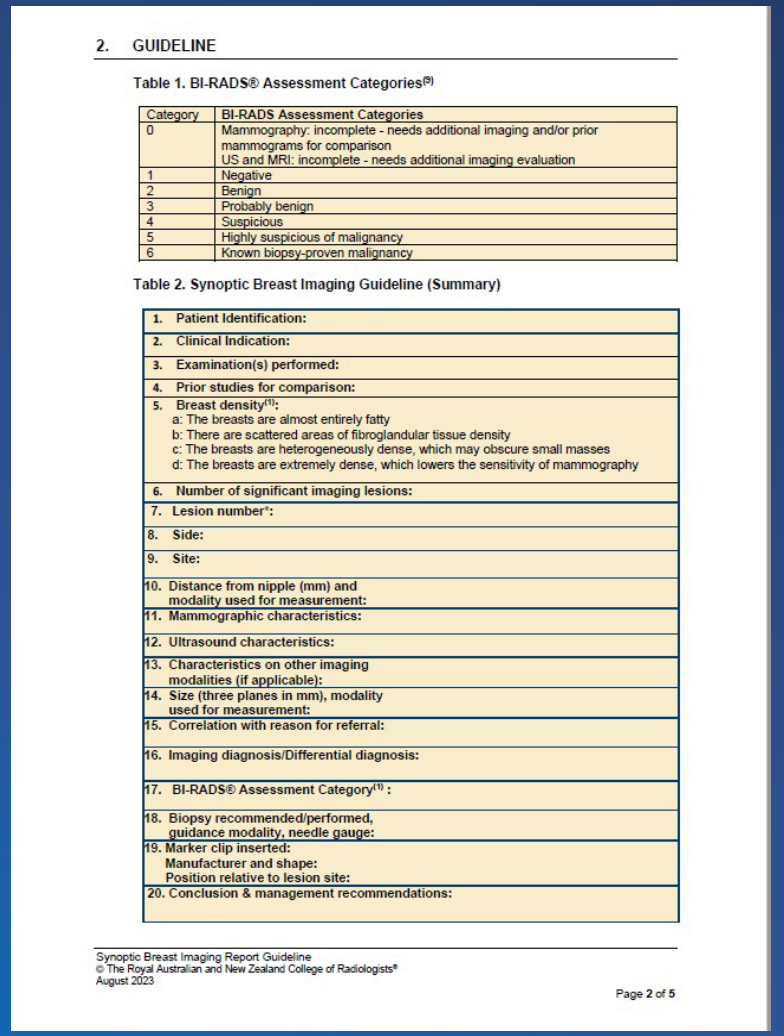
In August 2023 RANZCR changed its guidance recommending adoption of BI-RADS for diagnostic breast imaging in Australia





2. GUIDELINE

Table 1. BI-RADS® Assessment Categories[5]

Category	BI-RADS Assessment Categories
0	Mammography: incomplete - needs additional imaging and/or prior mammograms for comparison US and MRI: incomplete - needs additional imaging evaluation
1	Negative
2	Benign
3	Probably benign
4	Suspicious
5	Highly suspicious of malignancy
6	Known biopsy-proven malignancy

Table 2. Synoptic Breast Imaging Guideline (Summary)

1. Patient Identification:
2. Clinical Indication:
3. Examination(s) performed:
4. Prior studies for comparison:
5. Breast density[1]: a: The breasts are almost entirely fatty b: There are scattered areas of fibroglandular tissue density c: The breasts are heterogeneously dense, which may obscure small masses d: The breasts are extremely dense, which lowers the sensitivity of mammography
6. Number of significant imaging lesions:
7. Lesion number*:
8. Side:
9. Site:
10. Distance from nipple (mm) and modality used for measurement:
11. Mammographic characteristics:
12. Ultrasound characteristics:
13. Characteristics on other imaging modalities (if applicable):
14. Size (three planes in mm), modality used for measurement:
15. Correlation with reason for referral:
16. Imaging diagnosis/Differential diagnosis:
17. BI-RADS® Assessment Category[1] :
18. Biopsy recommended/performed, guidance modality, needle gauge:
19. Marker clip inserted: Manufacturer and shape: Position relative to lesion site:
20. Conclusion & management recommendations:

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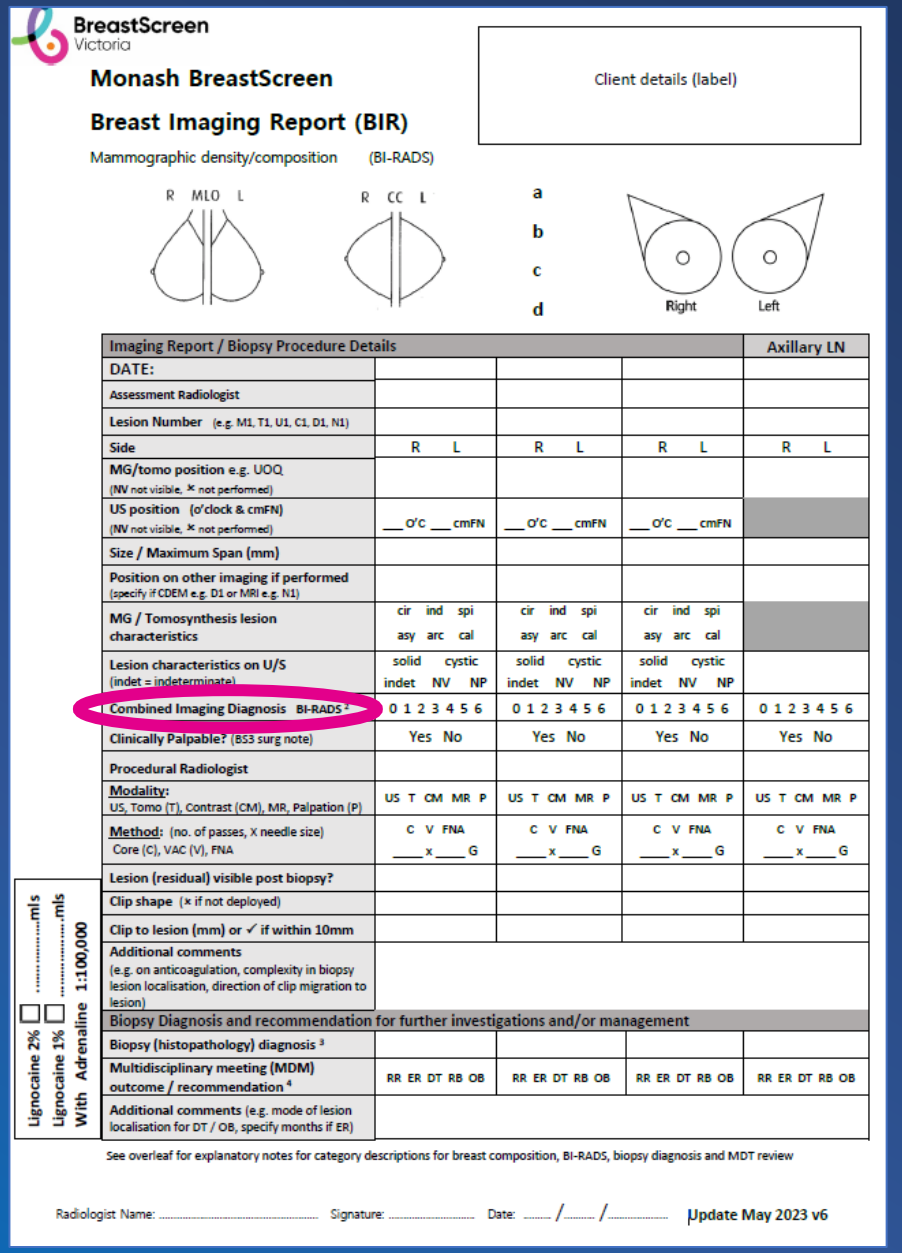
Possible next steps

BSA services can continue to use Tabar and implement communication tools that bridge the gap

OR

BSA can consider change across the program



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Breast Imaging Report (BIR)

Client details (label)

Mammographic density/composition (BI-RADS)

R MLO L

R CC L

a

b

c

d

Right Left

Imaging Report / Biopsy Procedure Details				Axillary LN
DATE:				
Assessment Radiologist				
Lesion Number (e.g. M1, T1, U1, C1, D1, N1)				
Side	R L	R L	R L	R L
MG/tomo position e.g. UOQ (NV not visible, × not performed)				
US position (o'clock & cmFN) (NV not visible, × not performed)	__ o'c __ cmFN	__ o'c __ cmFN	__ o'c __ cmFN	
Size / Maximum Span (mm)				
Position on other imaging if performed (specify if CDEM e.g. D1 or MRI e.g. N1)				
MG / Tomosynthesis lesion characteristics	cir ind spi asy arc cal	cir ind spi asy arc cal	cir ind spi asy arc cal	
Lesion characteristics on U/S (indet = indeterminate)	solid cystic indet NV NP	solid cystic indet NV NP	solid cystic indet NV NP	
Combined Imaging Diagnosis BI-RADS [2]	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6	0 1 2 3 4 5 6
Clinically Palpable? (B53 surg note)	Yes No	Yes No	Yes No	Yes No
Procedural Radiologist				
Modality: US, Tomo (T), Contrast (CM), MR, Palpation (P)	US T CM MR P	US T CM MR P	US T CM MR P	US T CM MR P
Method: (no. of passes, X needle size) Core (C), VAC (V), FNA	C V FNA ___x___G	C V FNA ___x___G	C V FNA ___x___G	C V FNA ___x___G
Lesion (residual) visible post biopsy?				
Clip shape (× if not deployed)				
Clip to lesion (mm) or ✓ if within 10mm				
Additional comments (e.g. on anticoagulation, complexity in biopsy lesion localisation, direction of clip migration to lesion)				
Biopsy Diagnosis and recommendation for further investigations and/or management				
Biopsy (histopathology) diagnosis [3]				
Multidisciplinary meeting (MDM) outcome / recommendation [4]	RR ER DT RB OB	RR ER DT RB OB	RR ER DT RB OB	RR ER DT RB OB
Additional comments (e.g. mode of lesion localisation for DT / OB, specify months if ER)				

☐☐ Lignocaine 2% ……mls
Lignocaine 1% ……mls
With Adrenaline 1:100,000

See overleaf for explanatory notes for category descriptions for breast composition, BI-RADS, biopsy diagnosis and MDT review

Radiologist Name: ……. Signature: ……. Date: ……/……/…… Update May 2023 v6

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Issues

- Resistance to change - "The current system has served us well, why change?"
- Education of clinicians and other staff required both within BSA and externally.
- Adaptation of current IT systems and data bases would be required.
- BSA currently uses Tabar categories both at reading and after assessment, BI-RADS categories are usually assigned after imaging work-up.
- Changes to the NAS guidelines would be required.

Change always requires resources and funding. However, with the current BSA review, timing might now align to start a discussion.

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Artist: Sam Bates, Wirrabara SA

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Thank you

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