Bi-RADS for Mammography

Bi-RADS is to standardise great imaging reporting and to reduce confusion in great imaging interpretations.

Standard Reporting

Describe the indication for the study

Includes the patient history.

Breast Composition

Describe any significant finding using standardised terminology

Use the morphological descriptors: **mass, asymmetry, architectural distortion and calcifications**.These findings may have associated features, like for instance a mass can be accompanied with skin thickening, nipple retraction, calcifications etc.

Compare to previous studies.

Awaiting previous examinations for comparison should only take place if they are required to make a final assessment

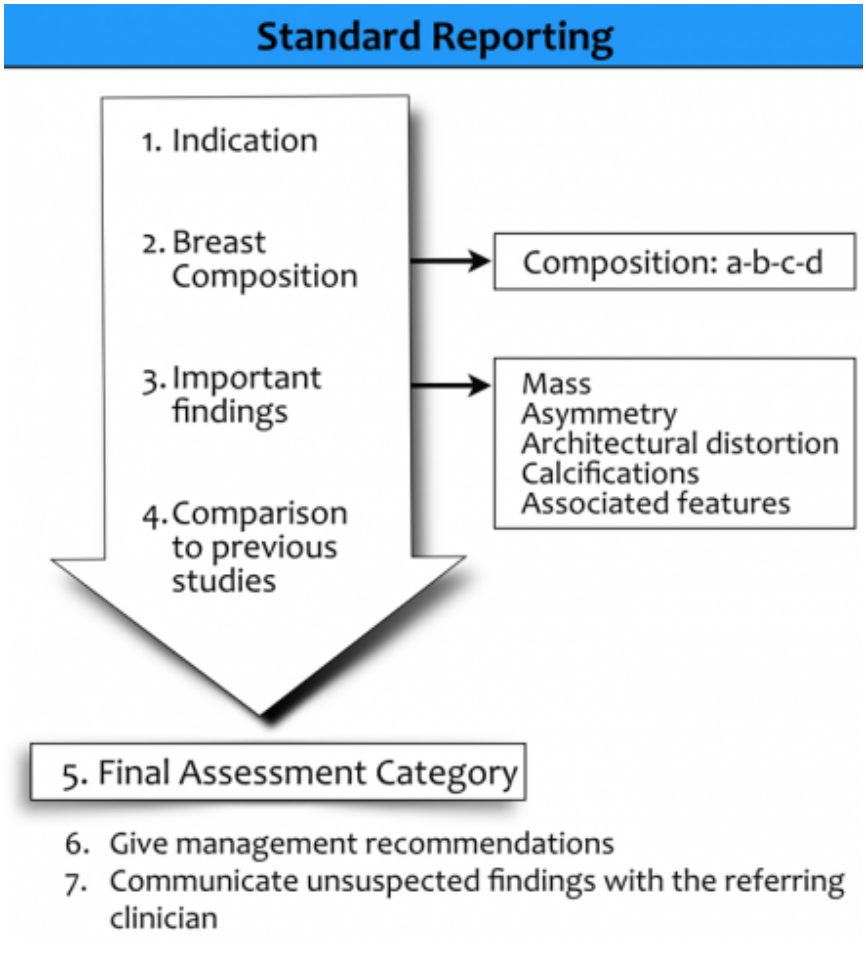
Conclude to a final assessment category.

Use BI-RADS categories 0-6 and the phrase associated with them.If Mammography and US are performed: overall assessment should be based on the most abnormal of the two breasts, based on the highest likelihood of malignancy.

Give management recommendations.

Communicate unexpected findings with the referring clinician.

Verbal discussions between radiologist, patient or referring clinician should be documented in the report.



Mammography and Ultrasound Lexicon

Mammography Lexicon

Breast composition	A. entirely fatty B. scattered areas of fibroglandular density C. heterogeneously dense, which may obscure masses D. extremely dense, which lowers sensitivity		
Mass	**shape**	oval - round - irregular	
	margin	circumscribed - obscured - microlobulated - indistinct - spiculated	
	density	fat - low - equal - high	
Asymmetry	asymmetry - global - focal - developing		
Architectural distortion	distorted parenchyma with no visible mass		
Calcifications	**morphology**	typically benign	
		suspicious	1. amorphous 2. coarse heterogeneous 3. fine pleiomorphic 4. fine linear or fine linear branching
	distribution	diffuse - regional - grouped - linear - segmental	
Associated features	skin retraction - nipple retraction - skin thickening - trabecular thickening - axillary adenopathy - architectural distortion - calcifications		

Ultrasound Lexicon

Breast composition	a. homogeneous - fat b. homogeneous - fibroglandular c. heterogeneous	
Mass	**shape**	oval - round - irregular
	margin	Circumscribed **or** Not-circumscribed: indistinct, angular, microlobulated, spiculated
	orientation	parallel - not parallel
	echo pattern	anechoic - hyperechoic - complex cystic/solid hypoechoic - isoechoic - heterogeneous
	posterior features	no features - enhancement - shadowing - combined pattern
Calcifications	in mass - outside mass - intraductal	
Associated features	architectural distortion - duct changes - skin thickening - skin retraction - edema - vascularity (absent, internal, rim) - elasticity	
Special cases *(cases with a unique diagnosis)*	simple cyst - clustered microcysts - complicated cyst - mass in or on skin - foreign body (including implants) - intramammary lymph node - AVM - Mondor disease - postsurgical fluid collection - fat necrosis	

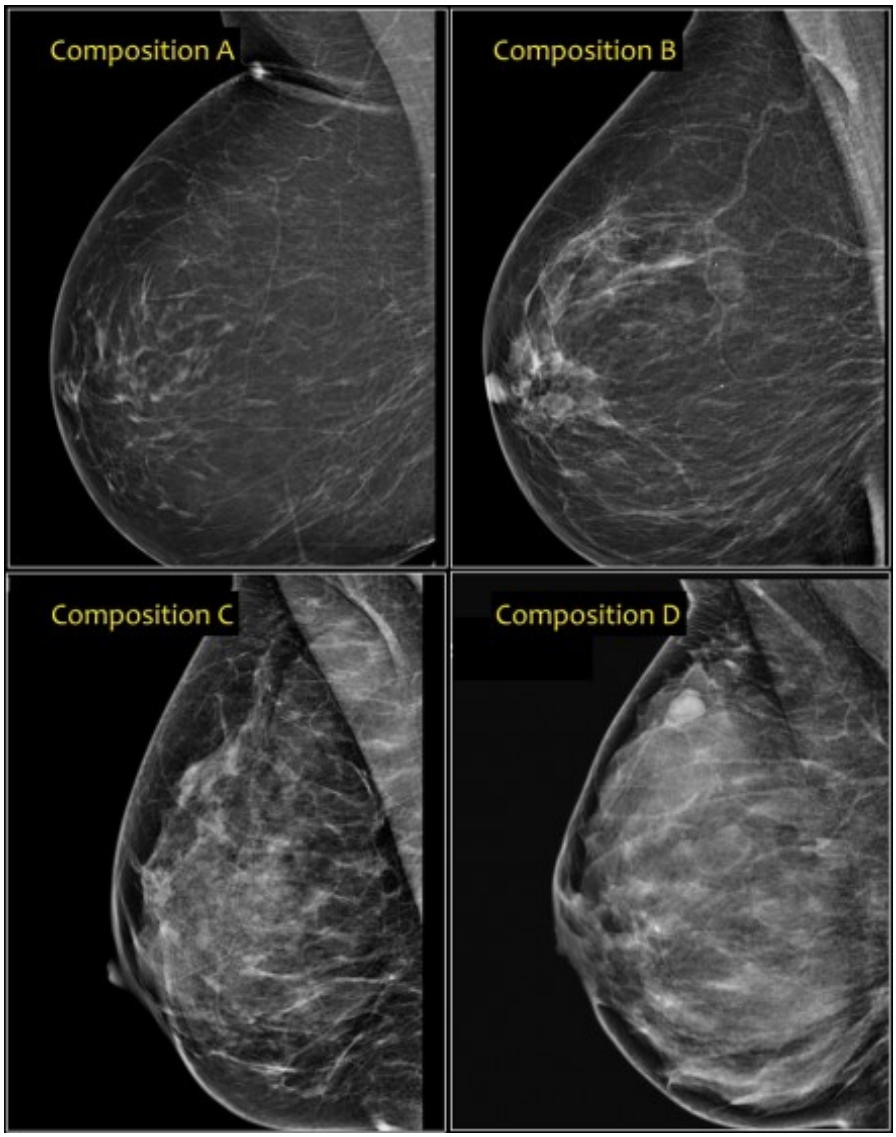
BI-RADS Assessment Categories
Breast Imaging-Reporting and Data System

Final Assessment Categories			
	Category	Management	Likelihood of cancer
0	Need additional imaging or prior examinations	Recall for additional imaging and/or await prior examinations	n/a
1	Negative	Routine screening	Essentially 0%
2	Benign	Routine screening	Essentially 0%
3	Probably Benign	Short interval-follow-up (6 month) or continued	>0 % but ≤ 2%
4	Suspicious	Tissue diagnosis	4a. low suspicion for malignancy (>2% to ≤ 10%) 4b. moderate suspicion for malignancy (>10% to ≤ 50%) 4c. high suspicion for malignancy (>50% to <95%)
5	Highly suggestive of malignancy	Tissue diagnosis	≥95%
6	Known biopsy-proven	Surgical excision when clinical appropriate	n/a

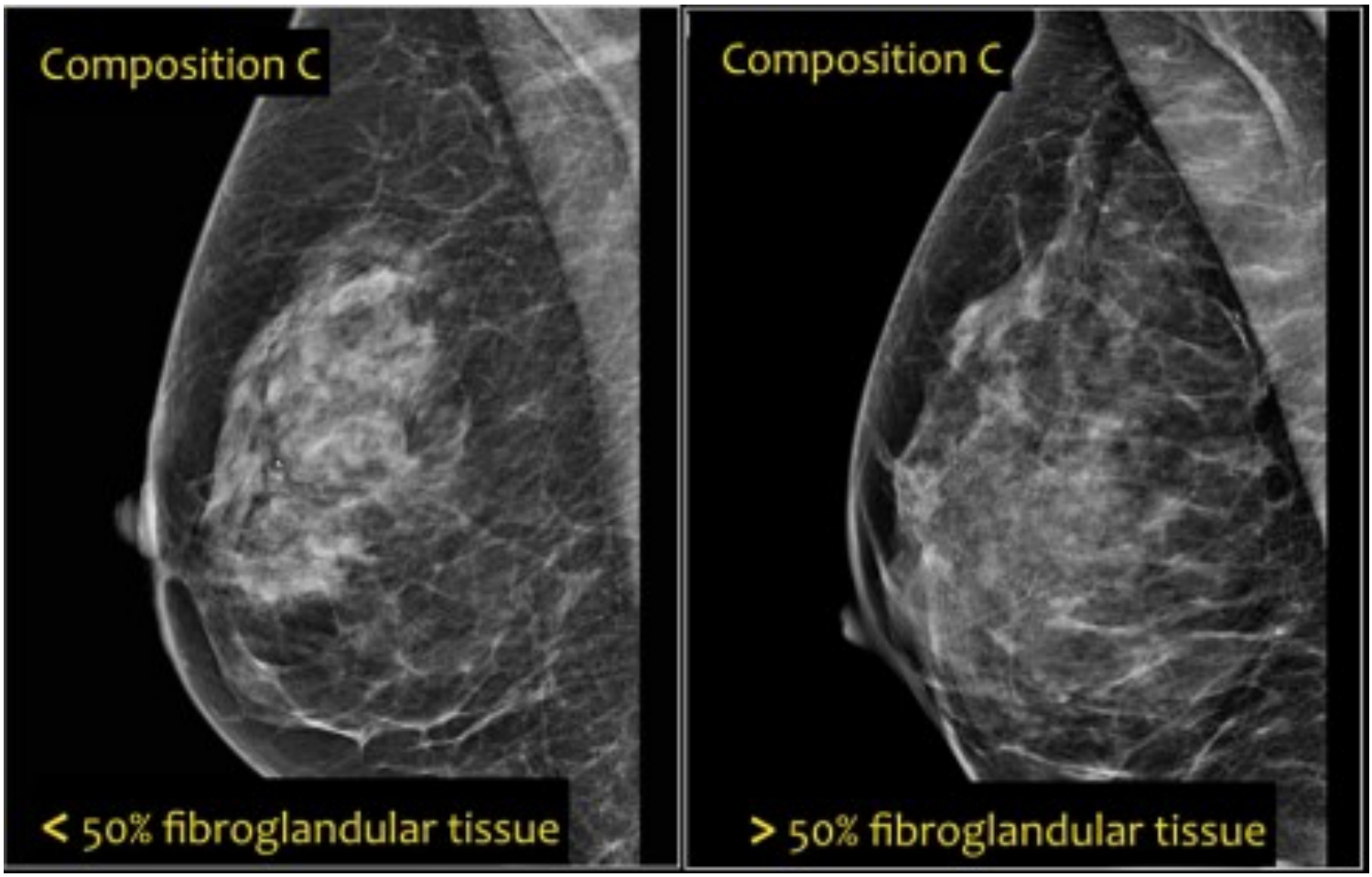
Mammography - Breast Imaging Lexicon

Breast Composition

In the BI-RADS edition 2003 the assignment of the breast composition was based on the overall density resulting in ACR
category 1 (<25% fibroglandular tissue),
category 2 (25-50%),
category 3 (50-75%)
category 4 (>75%).
In the BI-RADS edition 2013 the assignment of the breast composition is changed into a, b, c and d-categories followed by a description:



- **a**- *The breast are almost entirely fatty.* Mammography is highly sensitive in this setting.
- **b**- *There are scattered areas of fibroglandular density.*
- The term density describes the degree of x-ray attenuation of breast tissue but not discrete mammographic findings.
- **c**- *The breasts are heterogeneously dense, which may obscure small masses.*
- Some areas in the breasts are sufficiently dense to obscure small masses.
- **d** - *The breasts are extremely dense, which lowers the sensitivity of mammography.*

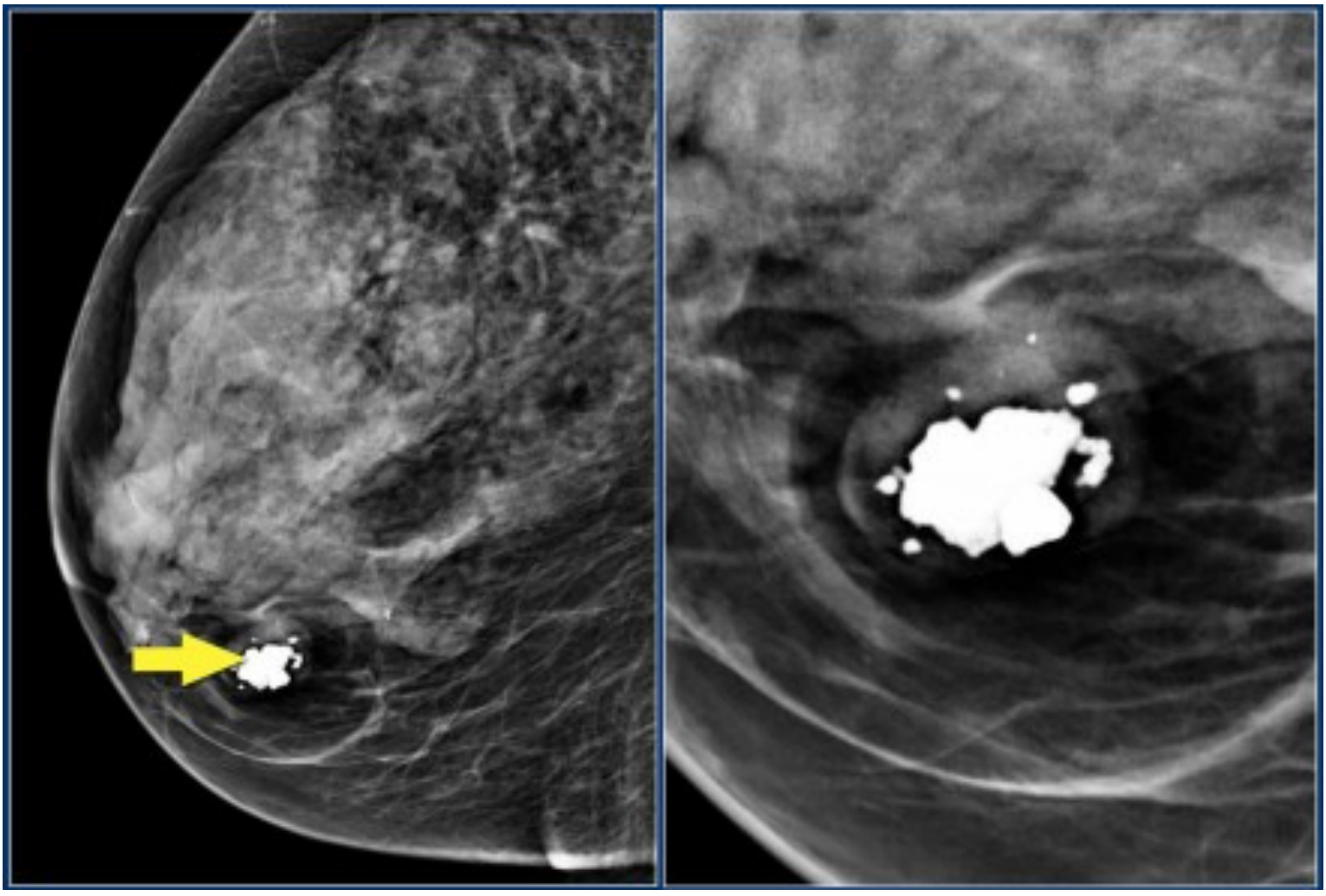

Composition C
< 50% fibroglandular tissue
Composition C
> 50% fibroglandular tissue

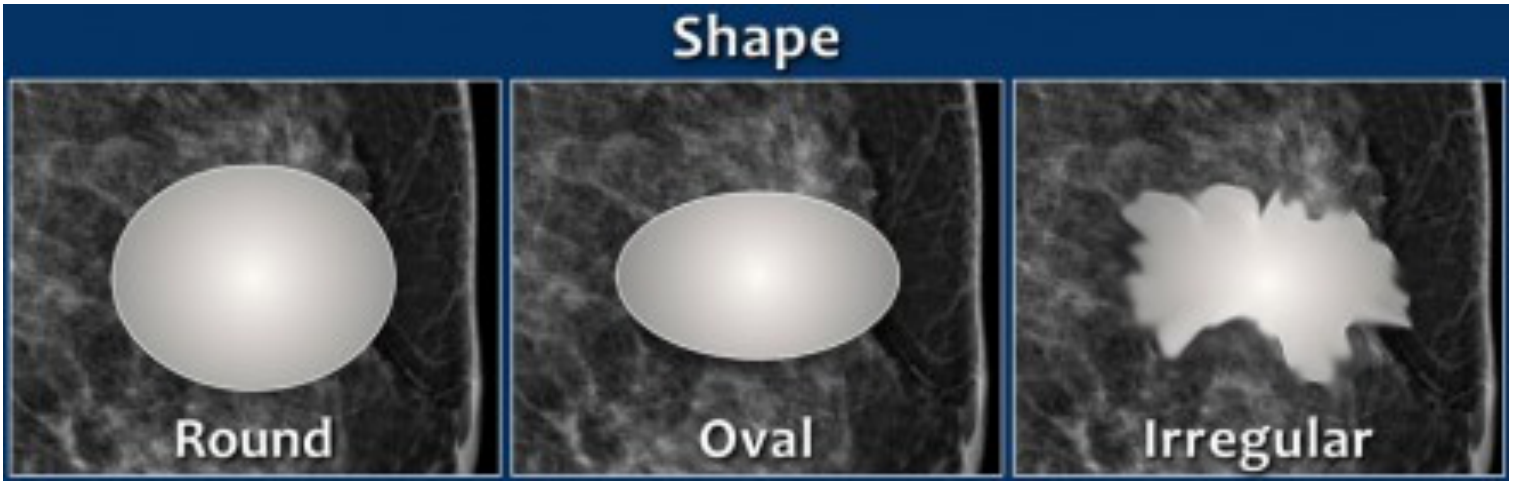
Mass

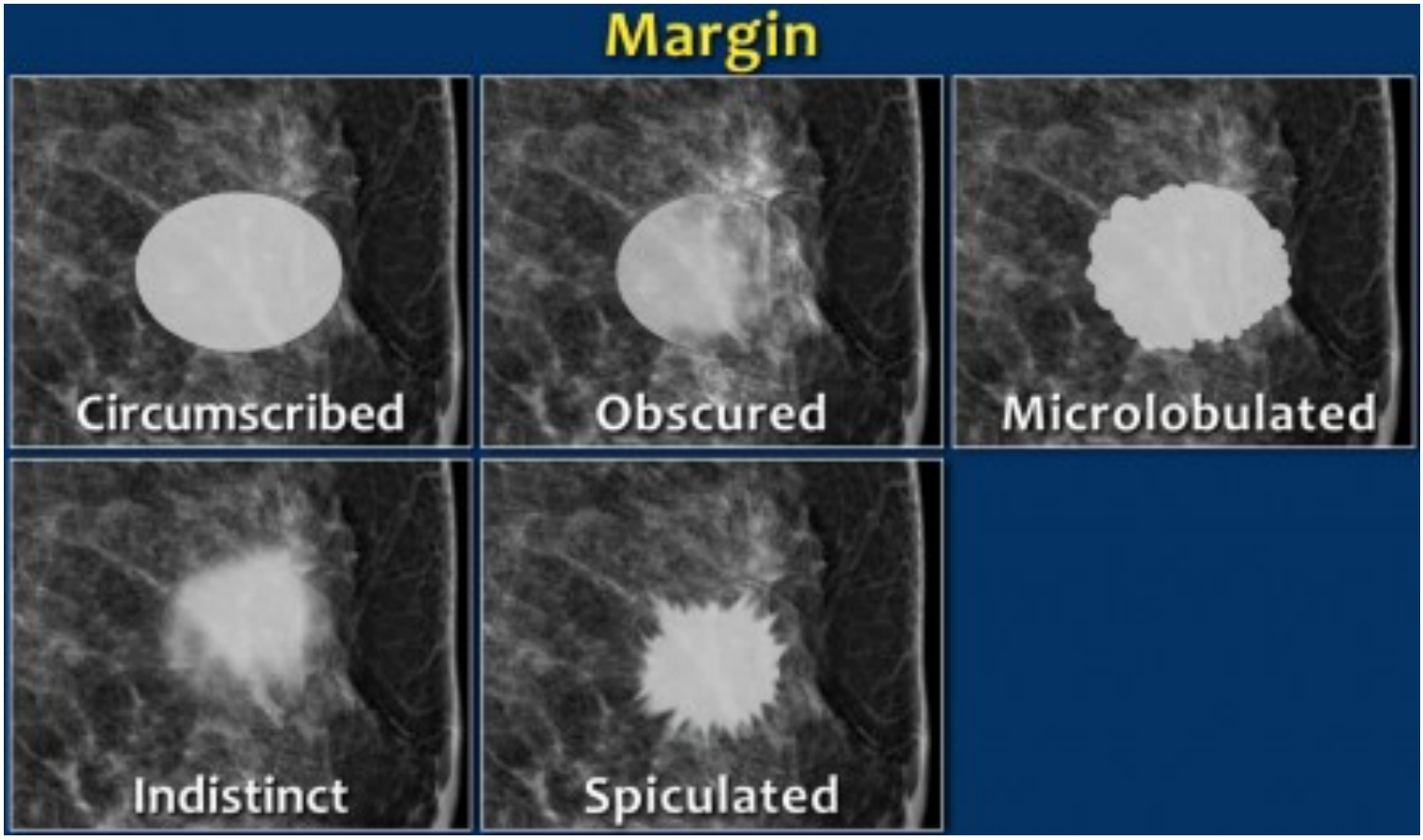
A 'Mass' is a space occupying 3D lesion seen in two different projections.
If a potential mass is seen in only a single projection it should be called a 'asymmetry' until its three-dimensionality is confirmed.

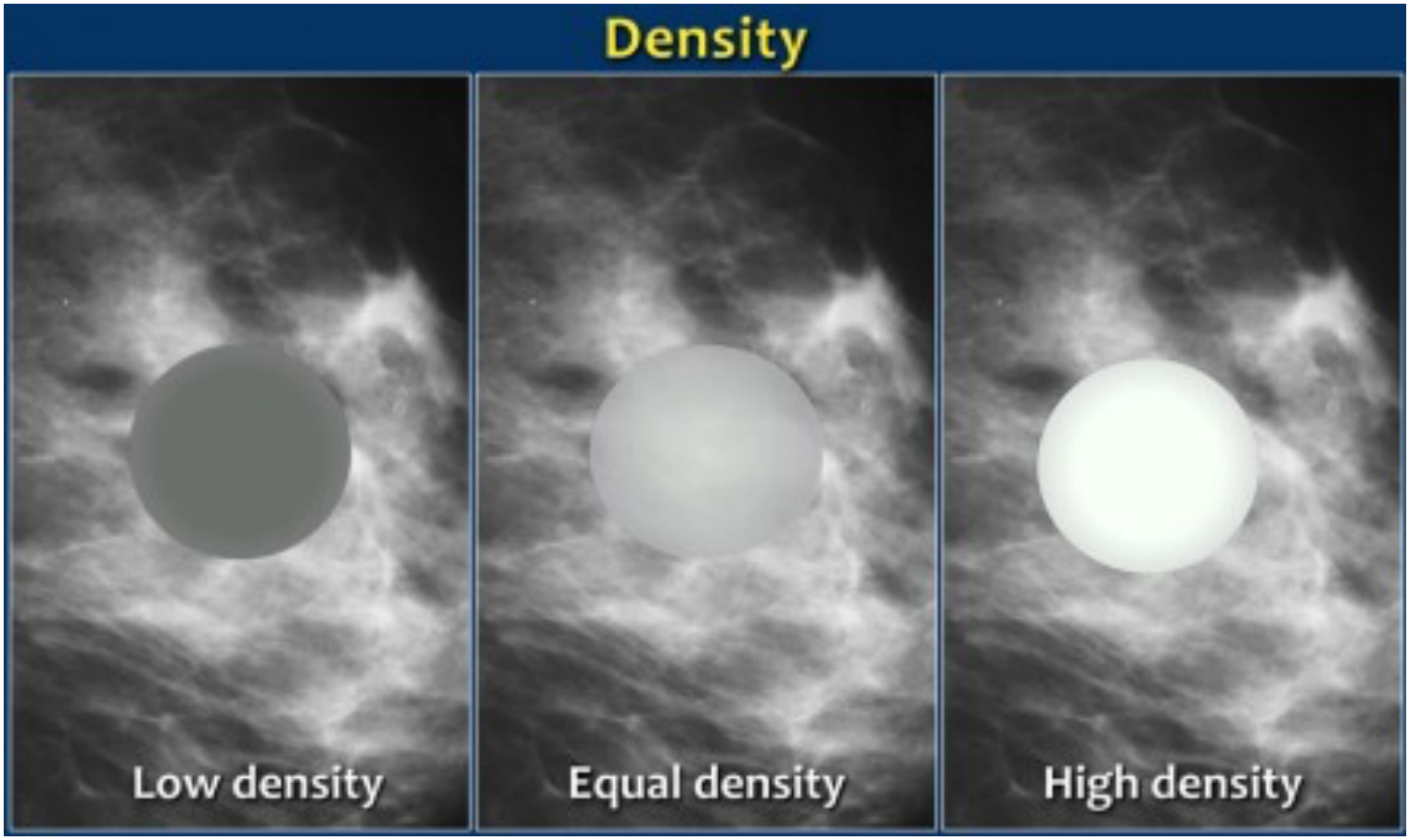
1. **Shape**: oval (may include 2 or 3 lobulations), round or irregular
2. **Margins**: circumscribed, obscured, microlobulated, indistinct, spiculated
3. **Density**: high, equal, low or fat-containing.

The images show a fat-containing lesion with a popcorn-like calcification. All fat-containing lesions are typically benign.These image-findings are diagnostic for a hamartoma - also known as fibroadenolipoma.

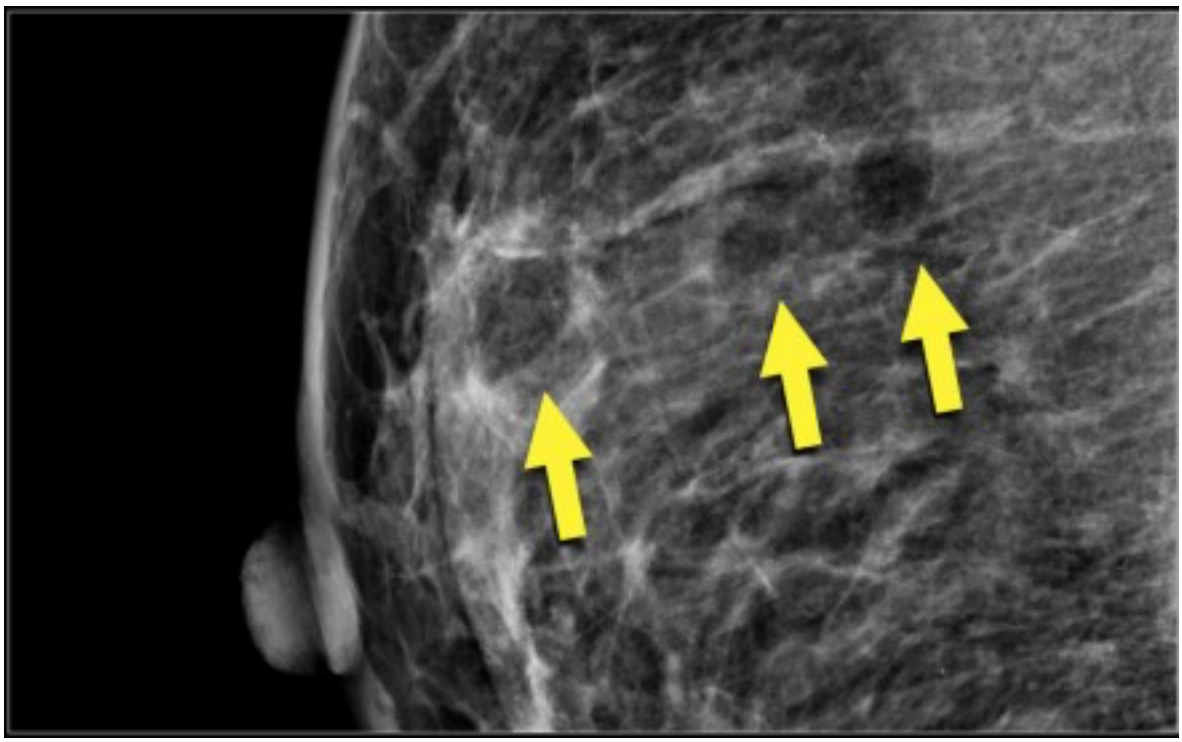





Margin
Circumscribed
Obscured
Microlobulated
Indistinct
Spiculated


Density
Low density
Equal density
High density

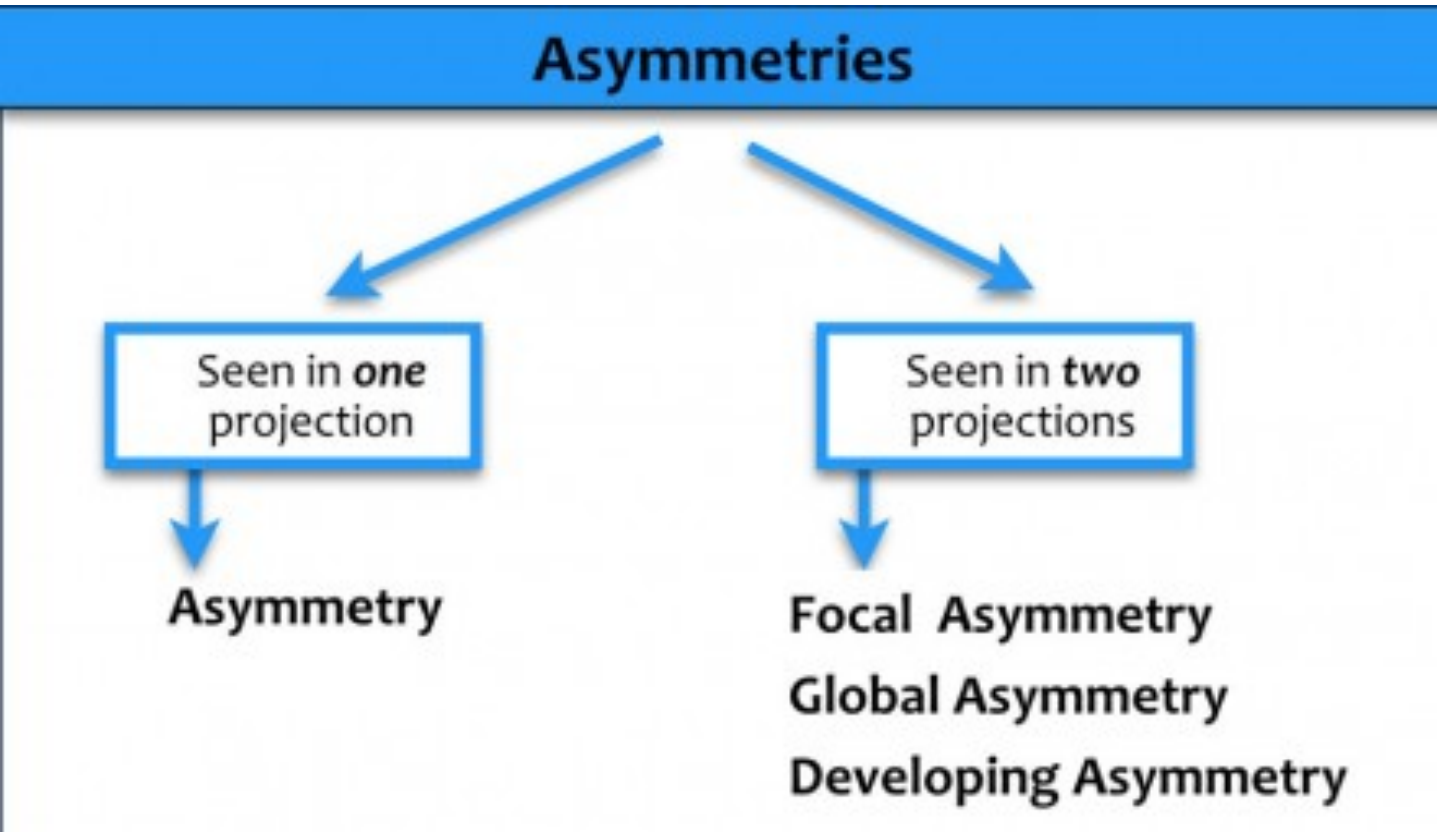
Here multiple round circumscribed low density masses in the right breast. These were the result of lipofilling, which is transplantation of body fat to the breast.

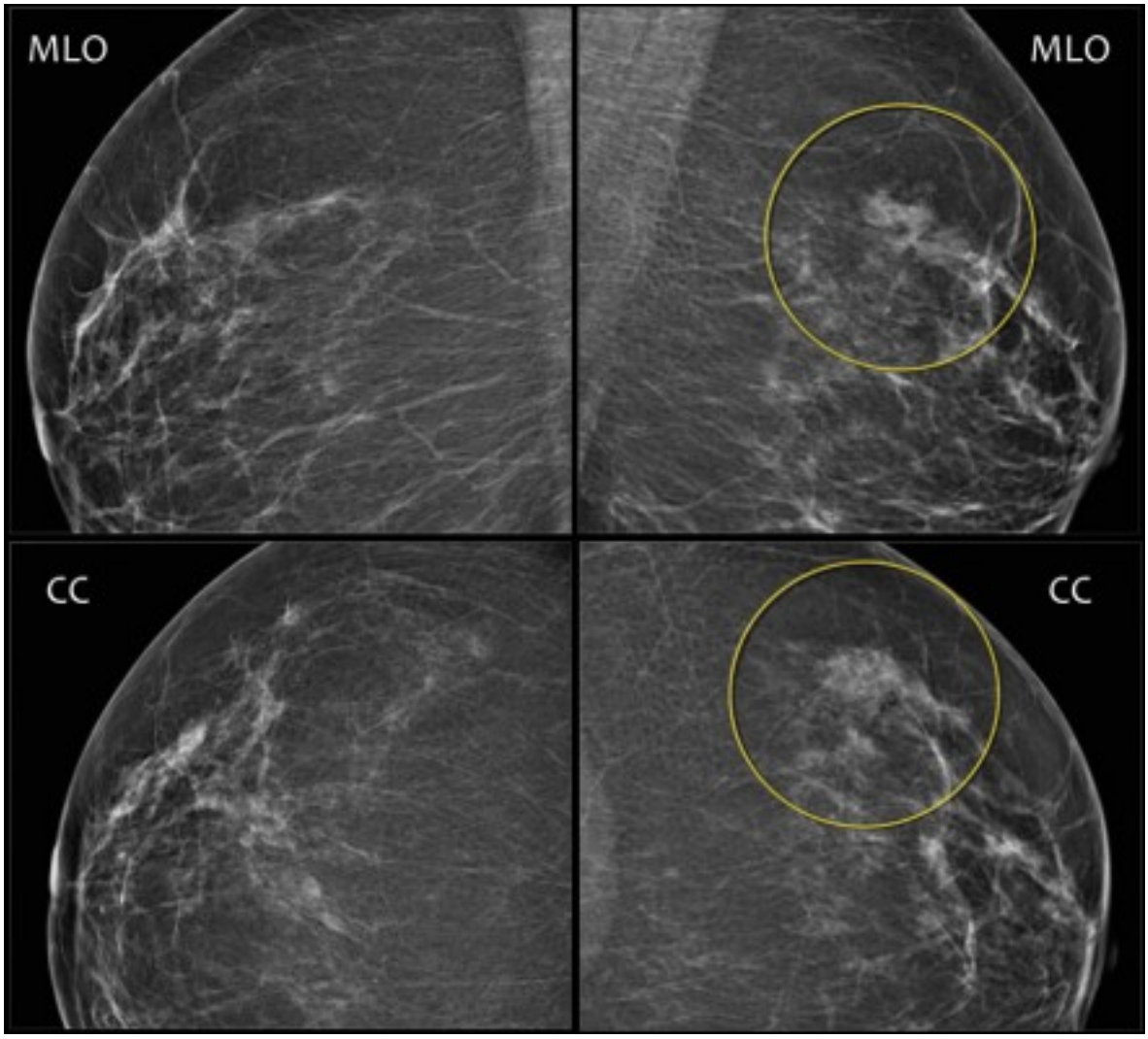


Asymmetries

Findings that represent unilateral deposits of fibroglandulair tissue not conforming to the definition of a mass.

- **Asymmetry** as an area of fibroglandulair tissue visible on only ***one*** mammographic projection, mostly caused by superimposition of normal breast tissue.
- **Focal asymmetry** visible on two projections, hence a real finding rather than superposition.
- This has to be differentiated from a mass.
- **Global asymmetry** consisting of an asymmetry over at least one quarter of the breast and is usually a normal variant.
- **Developing asymmetry** new, larger and more conspicuous than on a previous examination.




MLO
MLO
CC
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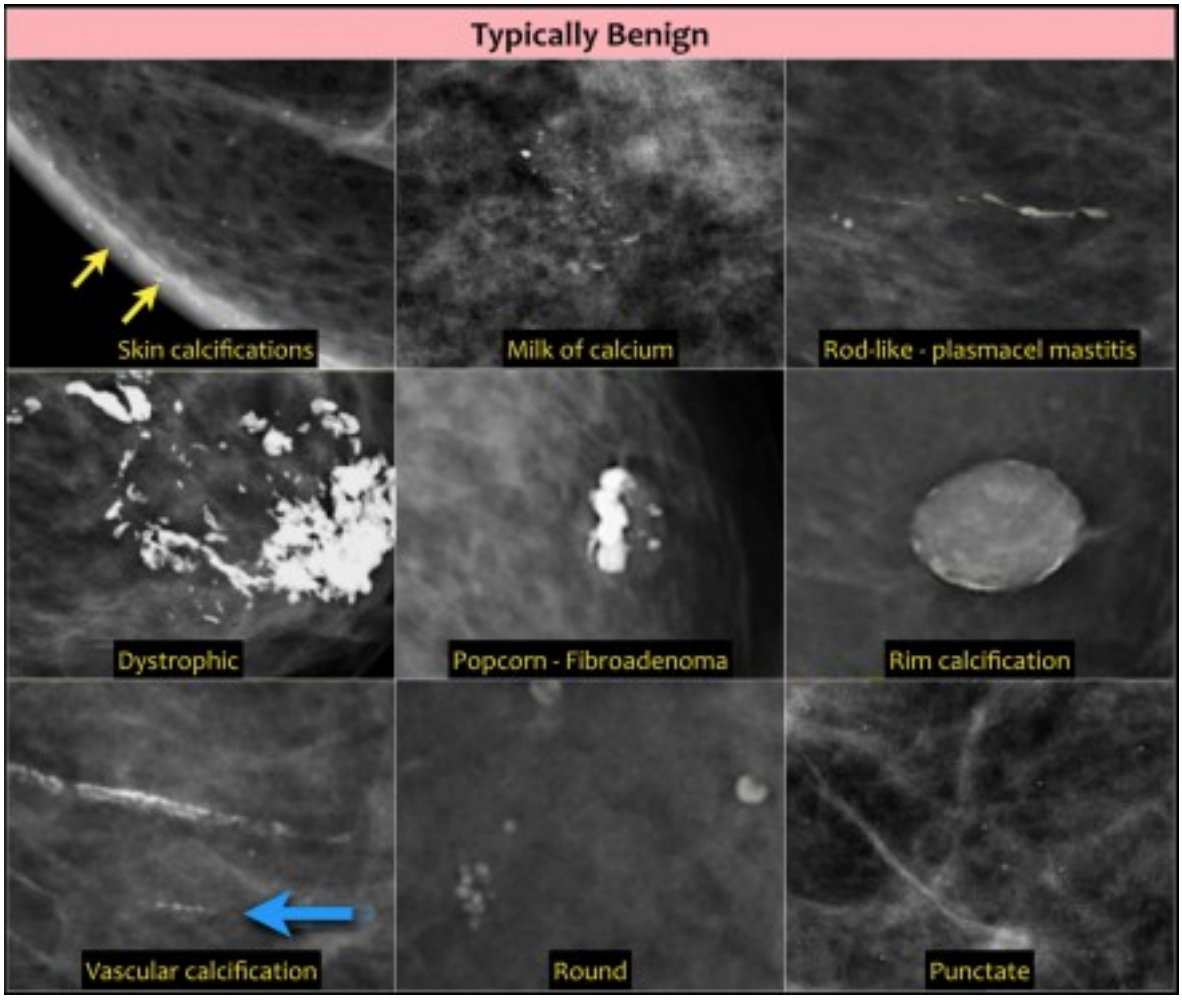
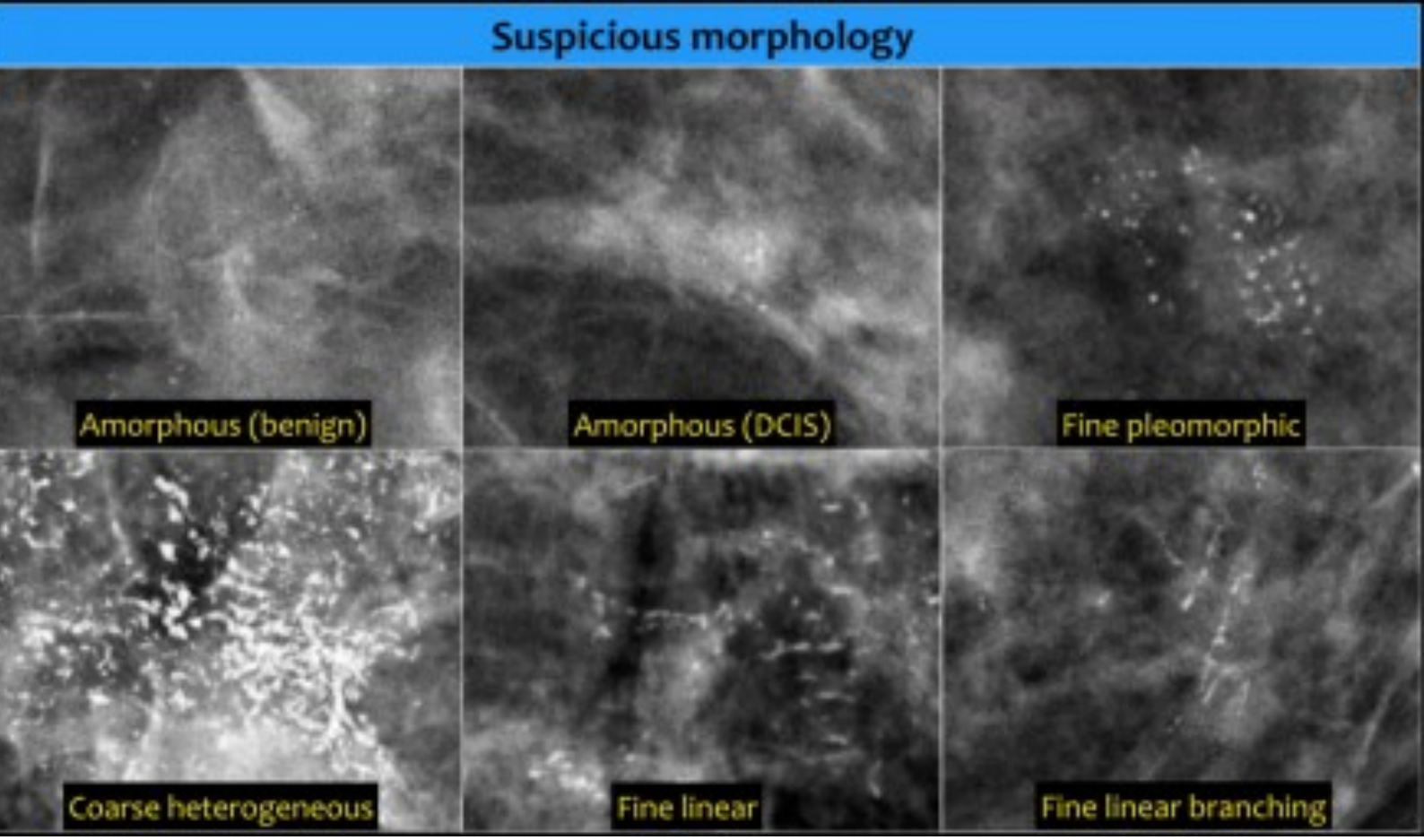
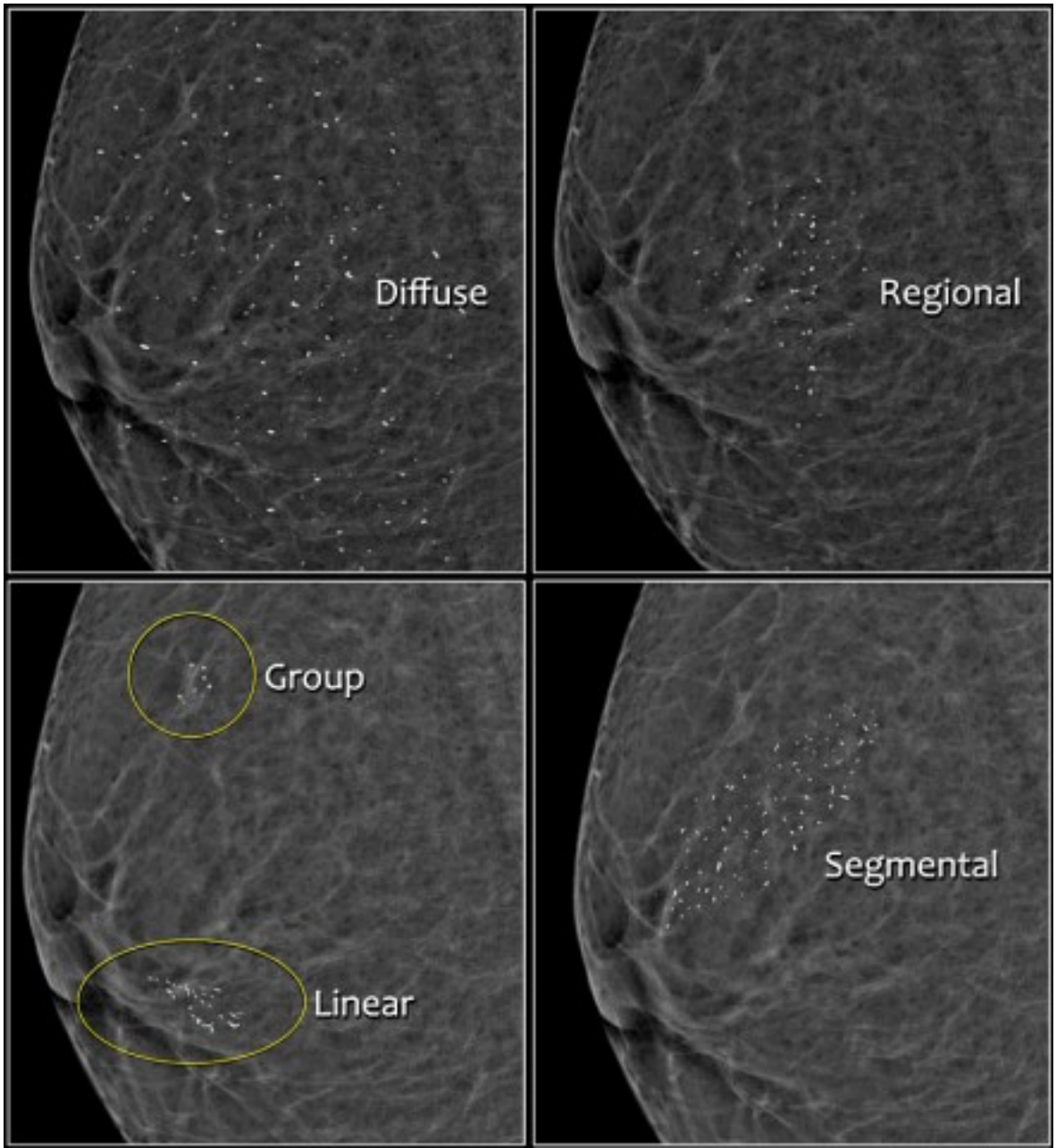

Typically Benign
Skin calcifications
Milk of calcium
Rod-like - plasmacel mastitis
Dystrophic
Popcorn - Fibroadenoma
Rim calcification
Vascular calcification
Round
Punctate


Suspicious morphology
Amorphous (benign)
Amorphous (DCIS)
Fine pleomorphic
Coarse heterogeneous
Fine linear
Fine linear branching


Diffuse
Regional
Group
Linear
Segmental