



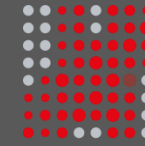
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for screening



BI-RADS in screening





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# BI-RADS in screening

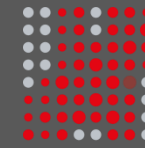
*Radiologists:*

*Ruud Pijnappel*

*Frits Jansen*

*Lucien Duijm*





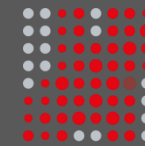
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# Why BI-RADS in screening?



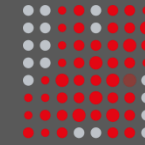
# Risk Stratification



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# Risk Stratification: BI-RADS

- BI-RADS (ACR)
- Breast Imaging Reporting and Data System (2003)
- Goal: to enhance the communication between physicians by a uniform standardized reporting system, and by doing so avoiding mistakes



# BI-RADS: clinical

- 0: Incomplete, additional imaging and / or comparison.
  - 1: Negative (0%)
  - 2: Benign (0%)
  - 3: Probably Benign (> 0% but less than 2%)
  - 4: Suspicious (2 – 95%)
  - 5: Highly Suggestive of Malignancy ( $\geq 95\%$ )
  - 6: Known Biopsy Proven Malignancy
- 
- Level 1 evidence: improves intra- and interobserver variability.



# BI-RADS: **in screening**

- 0: Incomplete, additional imaging and / or comparison.
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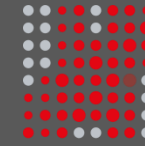
# BI-RADS: in screening

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# BI-RADS: in screening

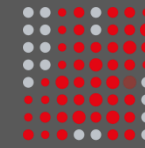


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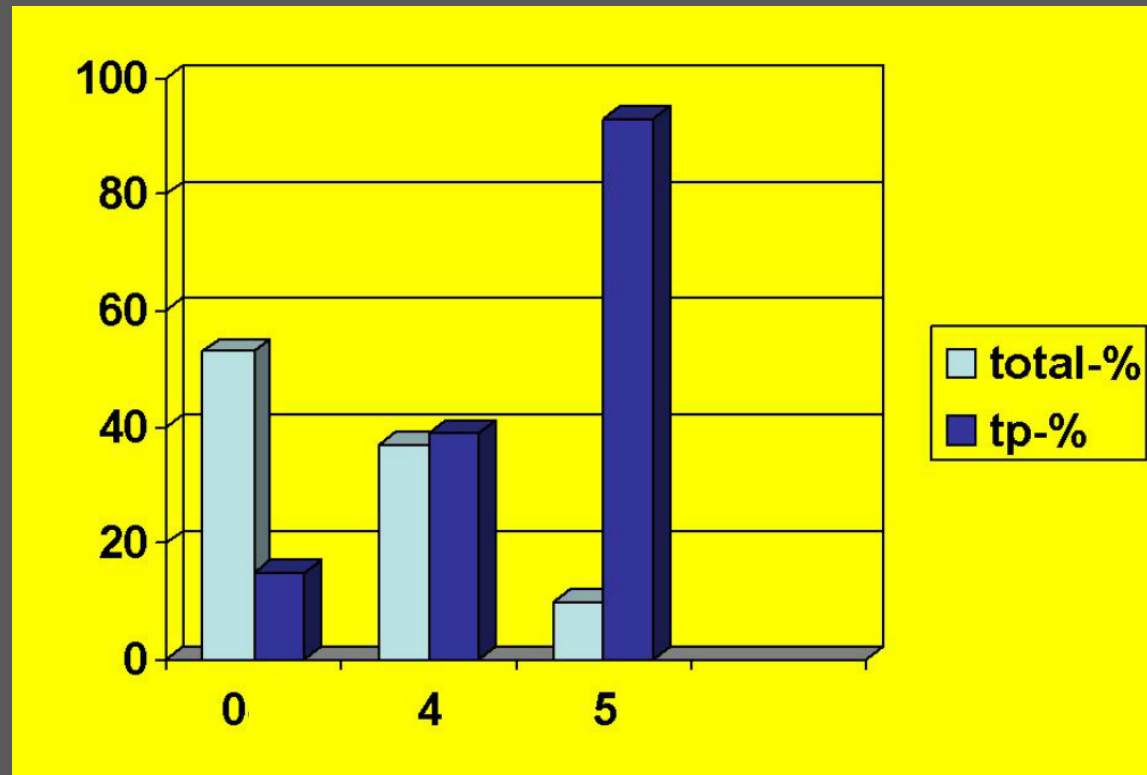
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# Portion and predictive value



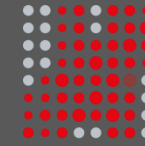
# Lesion and predictive value



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<b>Mammographic features</b>	<b>Breast cancer</b>	<b>BI-RADS</b>
	<b>PPV (%)</b>	
<b>Mass features</b>		
<i>ill-defined</i>	38,6	4
<i>well defined</i>	13,1	0
<i>spiculated</i>	95,8	5
<b>Microcalcifications</b>		
<i>Any clusters</i>	27.8	4
<i>Clusters+mass</i>	88.0	5
<b>Parenchymal Deformity</b>		
<i>True</i>	30	4
<b>Asymmetric Density</b>		
<i>True</i>	10,4	0

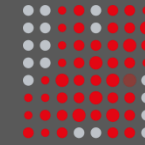


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# Lesions and BI-RADS code





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# Mass



BI-RADS 0

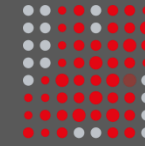


BI-RADS 4



BI-RADS 5





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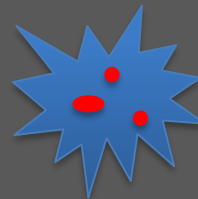
# Massa + Calcifications = BI-RADS 5



BI-RADS 5



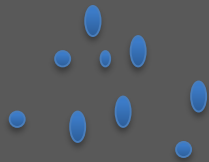
BI-RADS 5



BI-RADS 5



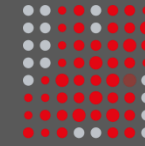
# Calcifications



BI-RADS 4

linear and segmental distribution:  
BI-RADS 5





# Morphology calcifications

Typical benign

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Amorphous

Coarse heterogeneous

Fine pleomorphic

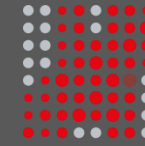
Fine linear



Increase of  
probability of  
malignancy





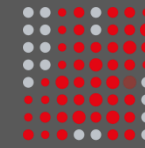


# Amorphous – 'without shape of form'

ca. 20% risk of malignancy

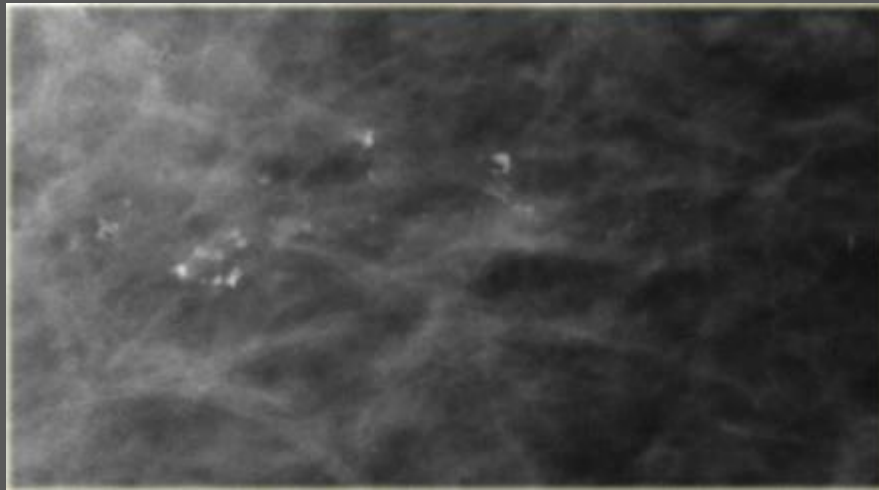
- Morphology
  - small or hazy in appearance (powdered sugar)
- Distribution pattern
  - Diffuse: benign
  - Clustered / regional / segmental / linear: of intermediate concern



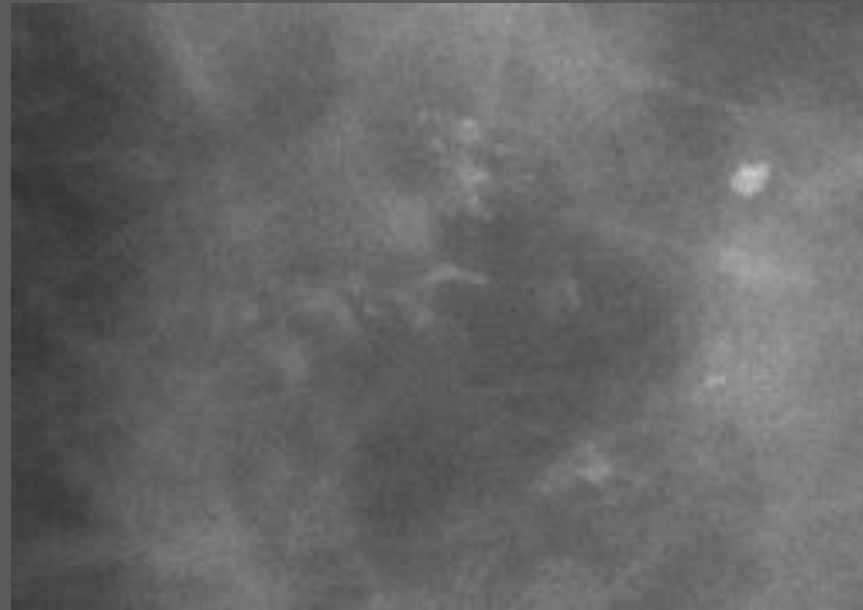


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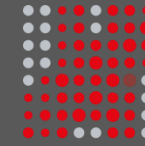
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# Amorphous



# Coarse heterogeneous of intermediate concern



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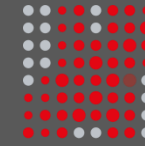
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- Irregular
- generally 0.5 - 1 mm
- tend to coalesce but are not the size of the larger irregular dystrophic calcifications

Diagnosis includes: fibrosis, fibroadenoma and post-traumatic representing evolving dystrophic calcifications (fat necrosis), but also DCIS

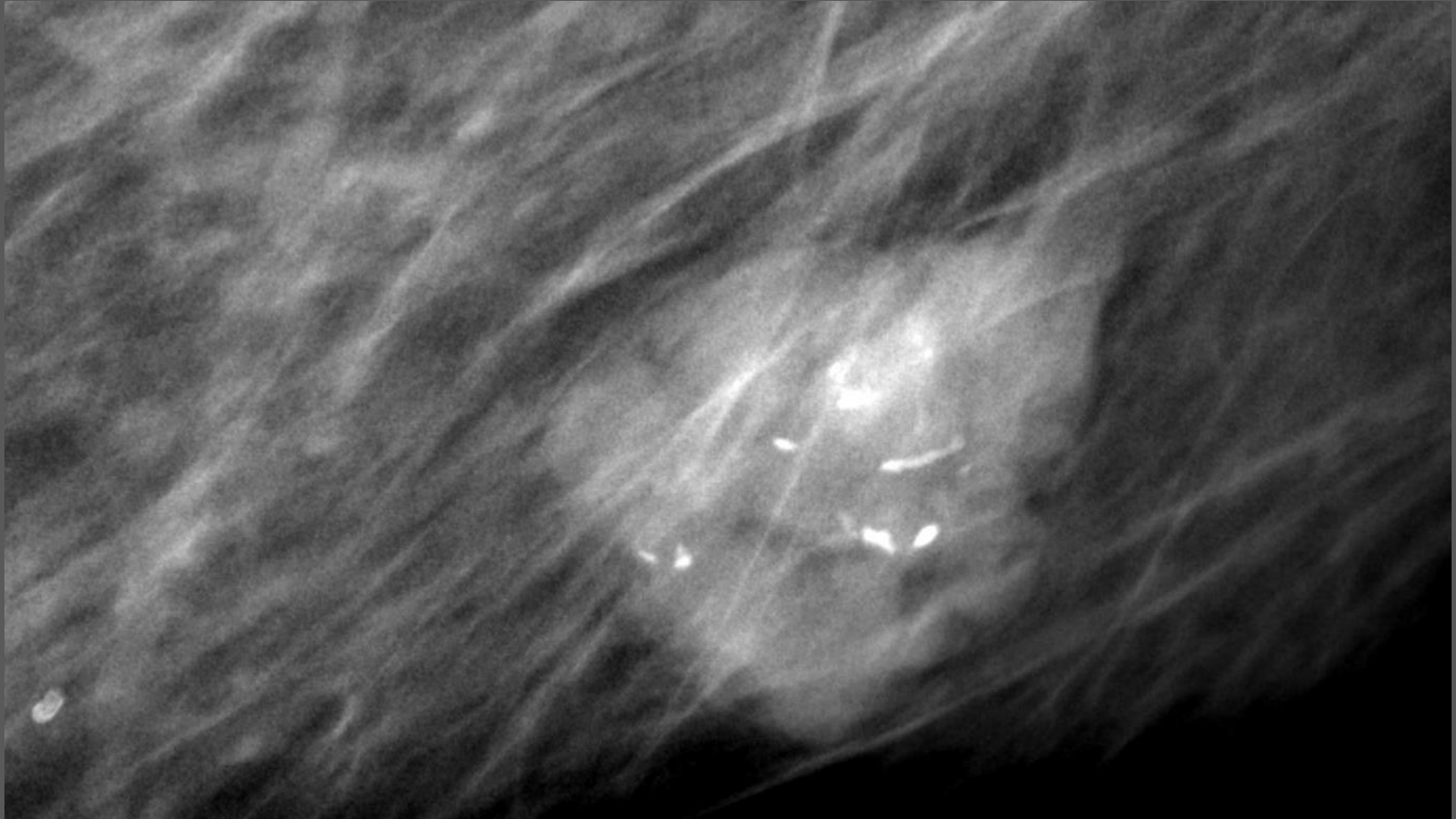


# Coarse heterogeneous



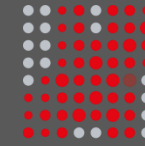
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# Fine Pleomorphic

25-40% risk of malignancy

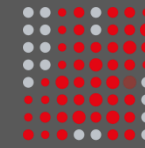


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- More clear than amorphous calcifications
- Never typical benign or malignant
- Irregular
- vary in size and shapes
- Generally  $< 0.5$  mm





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Fine pleomorphic  
(in segment)



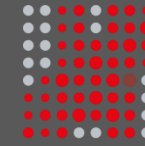
# Fine Linear or Fine Linear Branching

highly suggestive of malignancy

- thin, linear or curvilinear irregular calcifications
- Irregular
- Generally  $< 0.5$  mm diameter
- appearance suggests filling of the lumen of a duct, i.e. 'casting' calcifications

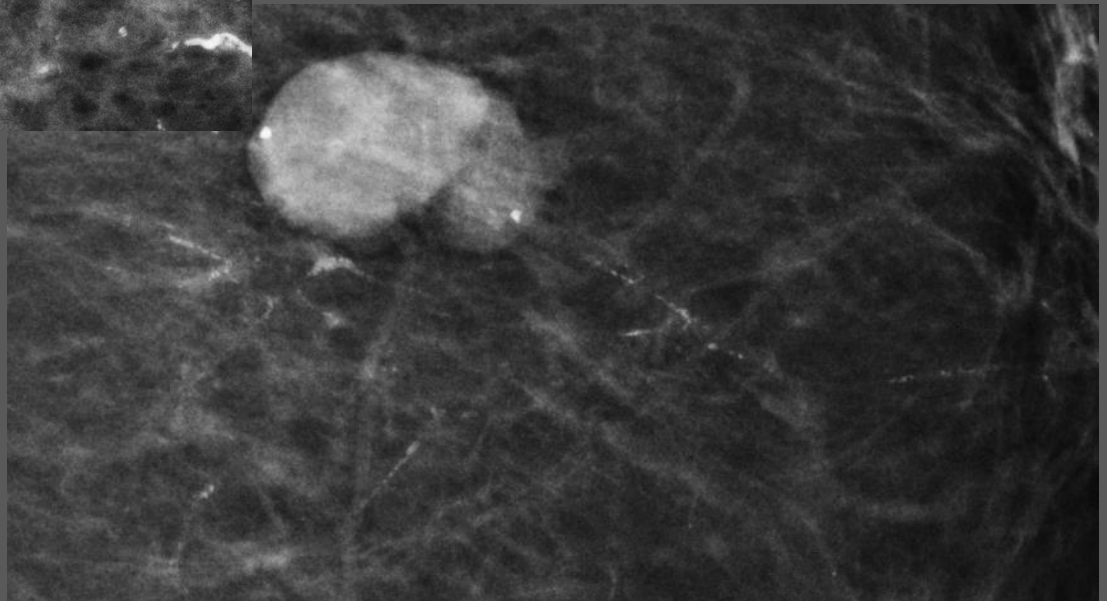
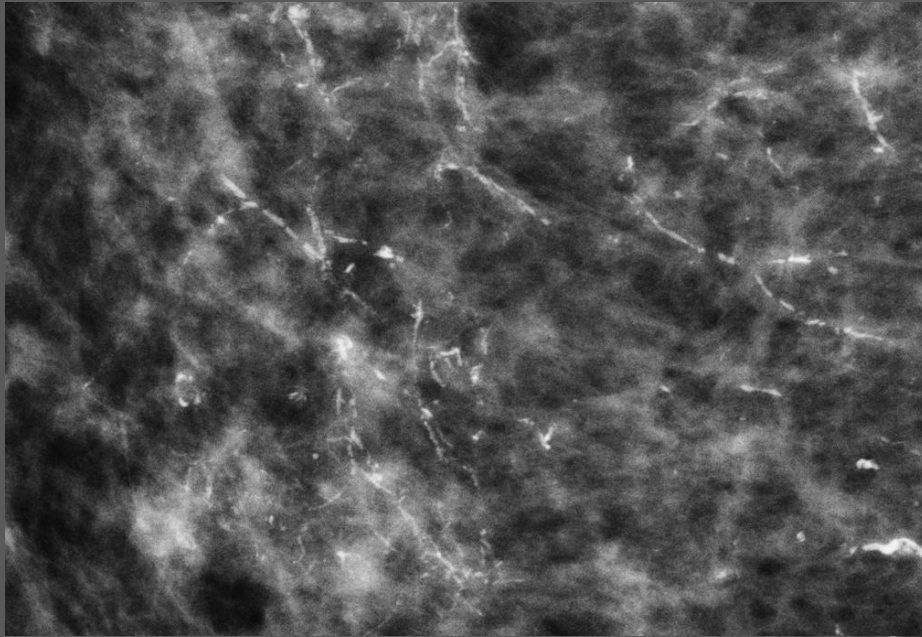


# Fine linear (branching)



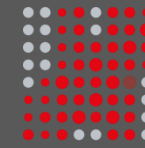
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# Asymmetry

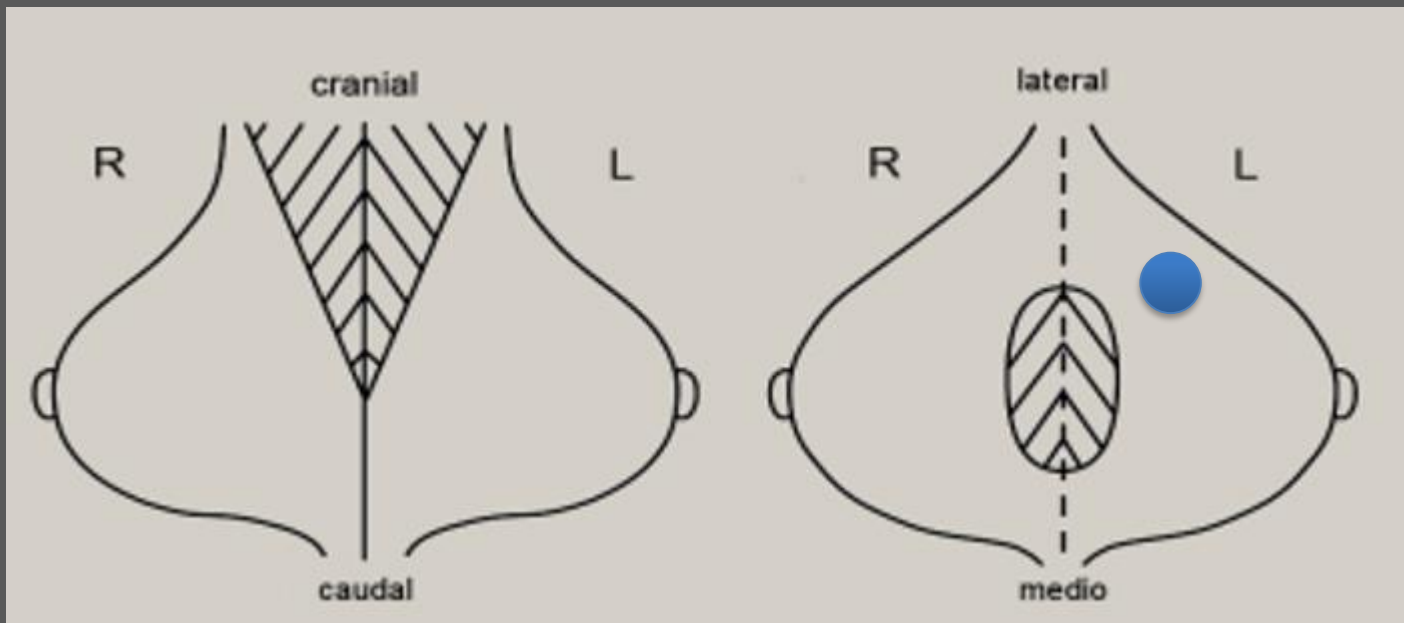


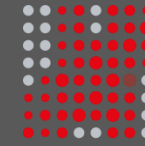
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- Only visible in 1 view

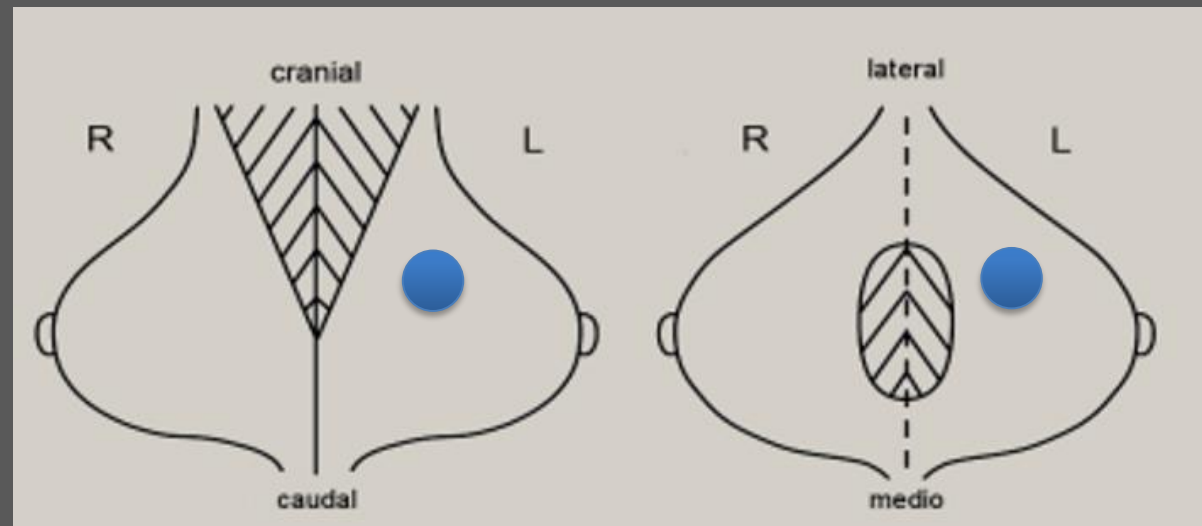
BI-RADS 0



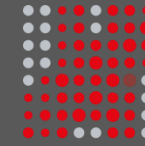


# Asymmetry

- Visible in 2 views:
  - focal:  $< 1$  quadrant BI-RADS 0
  - global:  $> 1$  quadrant BI-RADS 0
  - Developing (new or growing) BI-RADS 4



# Architectural distortion

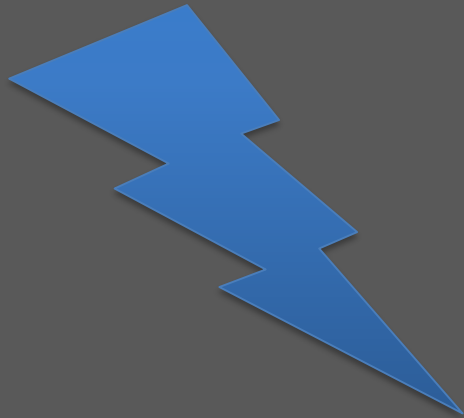


LRCB

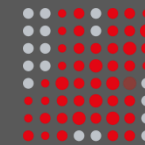
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for screening

- Only visible in 1 view

BI-RADS 0



# Architectural distortion

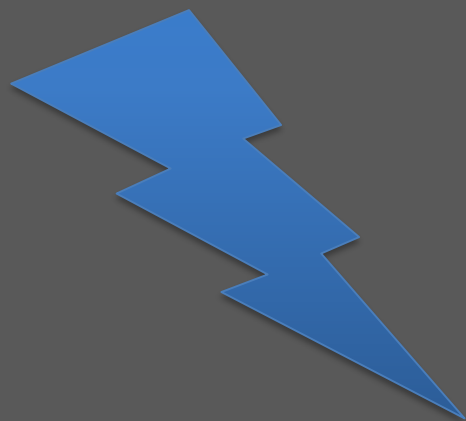


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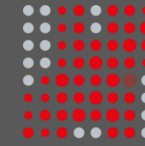
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- Visible in 2 views

BI-RADS 4



# Summary



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- BI-RADS 0:
  - Well defined mass (>75%)
  - Asymmetry
  - Architectural distortion, 1 view
- BI-RADS 4:
  - ill defined mass
  - Grouped calcifications
  - Architectural distortion, 2 view
  - Developing asymmetry
- BI-RADS 5:
  - Spiculated mass
  - Mass & calcifications
  - Fine linear branching calcifications

