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*Note that these questions and answers pertain to the ACR BI-RADS Atlas Fifth Edition. If a more recent version becomes available when you are studying for your board exams, refer to that version!

What are the BIRADS 5th Edition descriptors for “Typically Benign” calcifications on mammography?

“Typically benign” calcifications in BIRADS 5th Edition are:

Skin, Vascular, Coarse or “popcorn like”, large rod-like, round, rim, dystrophic, milk of calcium, and suture.

What are the BIRADS descriptors for “suspicious morphology” calcifications?

Amorphous, coarse heterogeneous, fine pleomorphic and fine linear or fine-linear branching

What are the BIRADS descriptors for “breast composition” on mammography?

According to the BIRADS Atlas, breast composition is divided into 4 categories based on increasing breast density (categories A through D) as follows:

- 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.

What are BIRADS descriptors for margins of a mass on mammography?

Circumscribed, obscured, microlobulated, indistinct, spiculated.

What are BIRADS descriptors for margins of a mass on ultrasound?

On ultrasound, the first descriptor division is whether the mass is circumscribed or not circumscribed. If not circumscribed, additional descriptors apply which are indistinct, angular, microlobulated and spiculated.

What are BIRADS descriptors for margins of a mass on MRI?

Like ultrasound, margins of a mass start with determining whether the mass is circumscribed or not circumscribed. If not circumscribed, additional descriptors apply which are irregular or spiculated.

What are BIRADS descriptors for internal enhancement characteristics of masses on MRI?

For masses on MRI, internal enhancement characteristics are homogeneous, heterogeneous, rim enhancement and dark internal septations. Note that rim enhancement is typically benign, such as that surrounding a seroma or inflamed cyst if it is thin and uniform. However, if rim enhancement is thick or nodular this can be suspicious and associated with malignancy. Dark internal septations are most classic for a fibroadenoma, but not exclusively so and can unfortunately also be seen with some malignancies.

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What are BIRADS descriptors for internal enhancement patterns of non-mass enhancement on MRI?

Non-mass enhancement can demonstrate homogeneous, heterogeneous, clumped, or clustered ring internal enhancement patterns. Note that clustered ring enhancement pattern of non-mass enhancement may be the most commonly tested of these on board exams, so make sure you know what this looks like, and realized that this is a very suspicious pattern of enhancement for DCIS.

According to BIRADS, what are the associated features of breast cancer that should be evaluated on MRI?

According to BIRADS, on MRI associated features of breast cancer that need to be evaluated, and reported if present, are nipple retraction, nipple invasion, skin retraction, skin thickening, skin invasion which is further broken down to direct skin invasion versus skin invasion from inflammatory carcinoma, axillary adenopathy, pectoralis muscle invasion, chest wall invasion and architectural distortion.

According to BIRADS, fat containing lesions on MRI include what entities?

Lymph nodes (which can be normal or abnormal based on morphology), fat necrosis, hamartoma, and postoperative seroma/hematoma with fat. Remember to use comparison between non-fat saturated and fat-saturated images to confirm intralesional fat on MRI, whether a breast MRI or otherwise.

What are the background parenchymal enhancement descriptors on MRI per BIRADS?

Level of background parenchymal enhancement should be reported as minimal, mild, moderate, or marked. This may thereafter be reported as symmetric or asymmetric. Note that all background enhancement level descriptors begin with "M". This can help you avoid confusion that a breast that has the highest degree of background enhancement has "marked" enhancement, not "extreme" enhancement. "Extreme" is a descriptor for amount of fibroglandular tissue on MRI, but not for background parenchymal enhancement.

What are BIRADS descriptors for shapes of a mass on MRI, Ultrasound, and Mammography?

Oval, round, and irregular. I personally rearrange the order to ROI (round, oval, irregular), as that is easier for me to remember as it's already well known in radiology for other purposes (Region of Interest=ROI). Of these, oval is the most benign shape statistically (though can still be cancer), round is more suspicious for cancer than oval as this means the mass may be disrespecting normal anatomic planes that promote an oval shape, and irregular is the most suspicious for malignancy.

True or False? Per BIRADS, description of orientation of a mass as parallel or non-parallel applies to ultrasound only.

True. We typically do not describe masses as parallel or non-parallel on mammography or MRI but do describe this routinely on ultrasound. Remember that masses with non-parallel orientation are more suspicious than masses with parallel orientation.

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What are BIRADS echo pattern descriptors on ultrasound?

Anechoic, hyperechoic, complex cystic and solid, hypoechoic, isoechoic, and heterogeneous.

What is the reference on ultrasound to which the echogenicity of a breast mass should be compared to determine whether it is hypo-, iso-, or hyperechoic?

Normal subcutaneous fat in the breast is the reference by which echogenicity can be determined. For example, a hyperechoic lesion is one that is hyperechoic compared to normal subcutaneous fat in the breast.

What is the reference to which density of a mass on mammography is compared?

Normal breast fibroglandular tissue (not fat) is the reference for density on mammograph. A high-density mass is a mass that is more dense than normal breast fibroglandular tissue in that breast. Density options for masses on mammography are specified by BIRADS as high density, equal density, low density, and fat-containing.

What are the associated features of breast cancer for mammography that should be evaluated, and reported (if present) per BIRADS?

Skin retraction, nipple retraction, skin thickening, trabecular thickening, axillary adenopathy, architectural distortion, and calcifications.

What are the four types of asymmetries on mammography per BIRADS?

Asymmetry, global asymmetry, focal asymmetry, developing asymmetry.

What are BIRADS descriptors for distribution of calcifications on mammography?

Diffuse, regional, grouped, linear and segmental.

What are BIRADS descriptors for distribution of non-mass enhancement on MRI?

Focal, linear, segmental, regional, multiple regions, and diffuse.