

		Arterial phase hypo- or iso-enhancement		Arterial phase hyper-enhancement		
		< 20	≥ 20	< 10	10-19	≥ 20
• "Washout" • "Capsule" • Threshold growth	Diameter (mm):					
	None:	LR-3	LR-3	LR-3	LR-3	LR-4
	One:	LR-3	LR-4	LR-4	LR-4 LR-5	LR-5
	≥ Two:	LR-4	LR-4	LR-4	LR-5	LR-5

Apply ancillary features and then tie-breaking rules to adjust category



Observations in this cell are categorized LR-4 except as follows:

- LR-5g, if there is ≥ 50% diameter increase in ≤ 6 months. These observations are equivalent to OPTN 5A-g.
- LR-5us, if there is both "washout" and visibility as discrete nodules at antecedent surveillance ultrasound, per AASLD HCC criteria.

		Arterial phase hypo- or iso-enhancement		Arterial phase hyper-enhancement		
		< 20	≥ 20	< 10	10-19	≥ 20
Diameter (mm):						
<ul style="list-style-type: none"> <li>•“Washout”</li> <li>•“Capsule”</li> <li>•Threshold growth</li> </ul>	None:	LR-3	LR-3	LR-3	LR-3	LR-4
	One:	LR-3	LR-4	LR-4	LR-4 LR-5	LR-5
	≥ Two:	LR-4	LR-4	LR-4	LR-5	LR-5

Observations in this cell are categorized LR-4 except as follows:



- LR-5g, if there is ≥ 50% diameter increase in ≤ 6 months. These observations are equivalent to OPTN 5A-g.
- LR-5us, if there is both “washout” and visibility as discrete nodules at antecedent surveillance ultrasound, per AASLD HCC criteria.

LR-1	<b>Definitely Benign</b>	<p><b>Concept:</b> 100% certainty observation is benign.</p> <p><b>Definition:</b> Observation with imaging features diagnostic of a benign entity, or definite disappearance at follow up in absence of treatment.</p>
LR-2	<b>Probably Benign</b>	<p><b>Concept:</b> High probability observation is benign.</p> <p><b>Definition:</b> Observation with imaging features suggestive but not diagnostic of a benign entity.</p>
LR-3	<b>Intermediate probability for HCC</b>	<p><b>Concept:</b> Both HCC and benign entity have moderate probability.</p> <p><b>Definition:</b> Observation that does not meet criteria for other LI-RADS categories.</p>
LR-4	<b>Probably HCC</b>	<p><b>Concept:</b> High probability observation is HCC but there is not 100% certainty.</p> <p><b>Definition:</b> Observation with imaging features suggestive but not diagnostic of HCC.</p>
LR-5	<b>Definitely HCC</b>	<p><b>Concept:</b> 100% certainty observation is HCC.</p> <p><b>Definition:</b> Observation with imaging features diagnostic of HCC or proven to be HCC at histology.</p>
LR-5V	<b>Definitely HCC with Tumor in Vein</b>	<p><b>Concept:</b> 100% certainty that observation is HCC invading vein.</p> <p><b>Definition:</b> Observation with imaging features diagnostic of HCC invading vein.</p>
LR-M	<b>Probably Malignant, not specific for HCC</b>	<p><b>Concept:</b> Observation is probably malignant, but imaging features are not specific for HCC.</p> <p><b>Definition:</b> Observation with imaging features suggestive of non-HCC malignancy.</p>
LR-Treated	<b>Treated Observation</b>	<p><b>Concept:</b> A loco-regionally treated observation.</p> <p><b>Definition:</b> Observation of any category that has undergone loco-regional treatment.</p>

**Definite benign entities (examples)**

- Cyst
- Hemangioma
- Vascular anomaly
- Perfusion alteration
- Hepatic fat deposition or sparing
- Hypertrophic pseudomass
- Confluent fibrosis
- Focal scar
- Observation that spontaneously disappears

**Probable benign entities (examples)**

- Probable
- Cyst
  - Hemangioma
  - Vascular anomaly
  - Perfusion alteration
  - Hepatic fat deposition or sparing
  - Hypertrophic pseudomass
  - Confluent fibrosis
  - Focal scar
  - LR-2 cirrhosis-associated nodule\*

*\*LR-2 cirrhosis-associated nodule*

- Diameter < 20mm AND
  - Homogeneous AND
  - Iso-enhancement to background cirrhotic nodules in all phases AND
- Differ from background nodules ( $\geq 1$  of following):
    - Distinctly larger than background nodules (but still < 20mm)
    - Mild to moderate CT hyper-attenuation
    - Mild to moderate T1 hyper-intensity
    - Mild T2 or T2\* hypo-intensity
    - Moderate or marked T2 or T2\* hypo-intensity

**The following imaging features, if present, help in differential diagnosis of HCC vs. Non-HCC Malignancy (e.g., ICC)****Features that favor HCC**

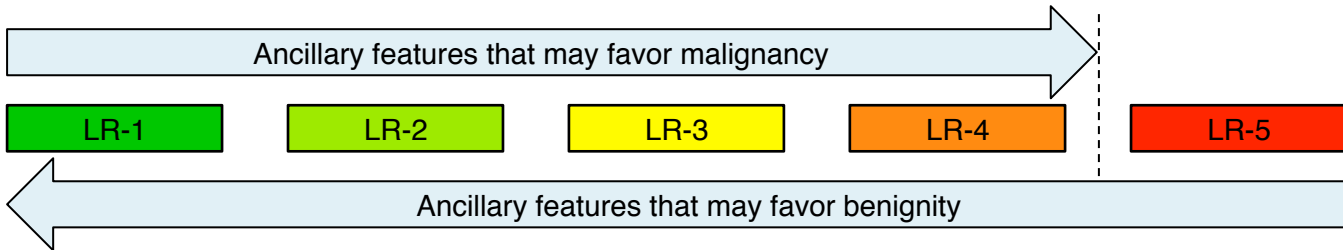
- Diffuse arterial-phase hyper-enhancement
- Diffuse washout appearance
- Capsule appearance
- Distinctive rim
- Intra-lesional fat
- Nodule-in-nodule architecture
- Diffuse T1 hyper-intensity
- Diffuse hepatobiliary phase hyper-intensity

**Features that favor non-HCC malignancy (e.g., ICC)**

- Rim or peripheral arterial-phase hyper-enhancement
- Peripheral washout appearance
- Progressive central enhancement
- Portal venous and delayed phase central enhancement
- Target appearance at DWI or in hepatobiliary phase
- Liver surface retraction
- Biliary dilation

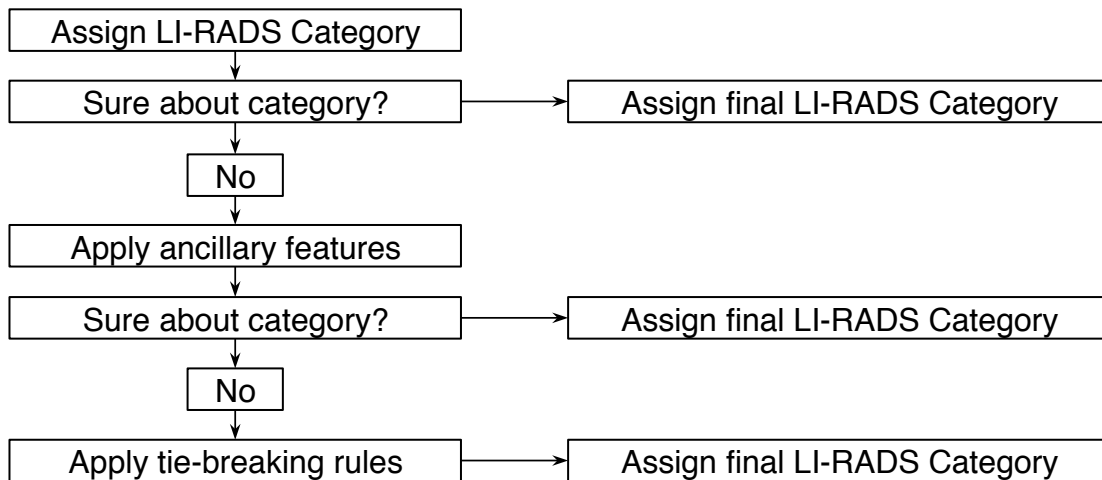
**Ancillary features that may favor malignancy** may be applied to upgrade category by one or more categories (up to but not beyond LR-4). They cannot be used to upgrade category to LR-5. Absence of these features should not be used to downgrade the LR category.

- Mild-moderate T2 hyper-intensity
- Restricted diffusion
- Corona enhancement
- Mosaic architecture
- Nodule-in-nodule architecture
- Intra-lesional fat
- Lesional iron sparing
- Lesional fat sparing
- Blood products
- Diameter increase less than threshold growth
- Distinctive rim
- Hepatobiliary phase hypo-intense rim
- Hepatobiliary phase hypo-intensity



**Ancillary features that may favor benignity** may be applied to downgrade category by one or more categories. Absence of these features should not be used to upgrade the LR category.

- Undistorted vessels
- Homogeneous marked T2 hyper- or hypo-intensity
- Parallels blood pool enhancement
- Diameter reduction
- Diameter stability  $\geq 2$  years
- Hepatobiliary phase iso-intensity



**Tie-breaking rules:** If, after application of ancillary features, a radiologist is still unsure about the final category for an observation, tie-breaking rules should be applied. The tie-breaking rules move observations to a category with a lower degree of certainty.

