

LI-RADS version 2018: What is new and what does this mean to my radiology reports?

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Liver Imaging Reporting and Data System (LI-RADS) is a radiology-driven and multidisciplinary collaborative categorization system aimed at standardizing liver imaging in patients at an increased risk for hepatocellular carcinoma (HCC). First published in 2011, the system has been updated in 2013, 2014, and 2017, based on evolution of published evidence, integration of new technology, and incorporation of user feedback [1, 2].

Although the original plan was to release additional updates every 3–4 years to permit system stability, an important event took place early in 2018, whereby the American Association for the Study of Liver Diseases (AASLD) integrated LI-RADS into its HCC clinical practice guidance [3]. Given that HCC is one of the few malignancies which can be diagnosed by imaging alone, it is of particular significance that LI-RADS is now part of the clinical algorithm endorsed by the AASLD. The integration of LI-RADS into the AASLD guidance solidifies the role of radiologists in this multidisciplinary process and ensures that radiologists continue to champion evidence-based improvements in specificity and accuracy of imaging categorization of primary liver malignancies.

This integration required a few changes in the CT/MRI algorithm of LI-RADS, released as “version 2018”. The main areas of change include simplification of the definition of threshold growth, update to one of the LR-5 criteria, and the removal of the qualifiers -us and -g from LR-5 category (Fig. 1). Previously, a 10–19 mm observation with nonrim arterial phase hyperenhancement (APHE) and nonperipheral “washout” would be categorized LR-5us if it was identified by antecedent surveillance ultrasound (US). The requirement of US

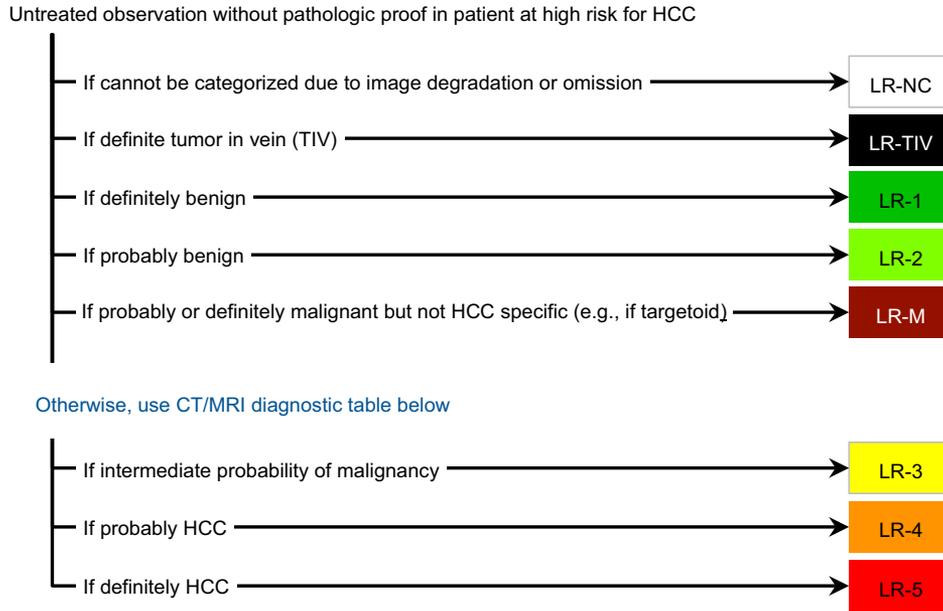
visibility was removed in v2018, so that 10–19 mm observations with nonrim APHE and nonperipheral “washout” are categorized LR-5 (without any modifier). The definition of threshold growth was simplified to match that of Organ Procurement and Transplantation Network (OPTN): $\geq 50\%$ size increase of a mass in ≤ 6 months. Additional definitions of growth that qualified as threshold growth in the prior versions of LI-RADS now qualify as subthreshold growth, which is considered an ancillary rather than a major feature.

As in prior versions, ancillary features of benignity, malignancy in general and HCC specifically, may be used to upgrade or downgrade the category by one category, at the discretion of the radiologist. Ancillary features cannot be used to upgrade an observation from LR-4 to LR-5 so as to preserve high specificity for that category.

A number of new Frequently Asked Questions have been added to the LI-RADS v2018 Core document to clarify potential ambiguities.

The LI-RADS ultrasound surveillance algorithm, the LI-RADS contrast-enhanced ultrasound diagnostic algorithm, and the LI-RADS treatment response algorithm, all introduced in version 2017, remain unchanged. All these algorithms, including the CT/MRI v2018 diagnostic algorithm, can be accessed through the American College of Radiology’s LI-RADS website [2].

Future research will continue to help refine the diagnostic algorithms and further improve the diagnostic performance of LI-RADS in the high-risk patient population. Future integration into other international guidelines is the ultimate goal, given that this system has been adopted in many international centers by radiology colleagues and LI-RADS v2017 has been translated into eight national and supra-regional languages (Chinese simplified, Chinese traditional, French, German, Italian, Japanese, Korean, Portuguese, and Spanish) by members



CT/MRI Diagnostic Table

Arterial phase hyperenhancement (APHE)		No APHE		APHE (not rim)		
		< 20	≥20	< 10	10-19	≥20
Observation size (mm)						
Count major features: <ul style="list-style-type: none"> • “Washout” (not peripheral) • Enhancing “capsule” • Threshold growth 	None	LR-3	LR-3	LR-3	LR-3	LR-4
	One	LR-3	LR-4	LR-4		LR-5
	≥Two	LR-4	LR-4	LR-4	LR-5	LR-5

Observations in this cell are categorized LR-4, except:
 • LR-5g, if ≥50% diameter increase in < 6 months (equivalent to OPTN 5A-g)
 • LR-5us, if “washout” and visibility at screening ultrasound (per AASLD HCC criteria)

If unsure about the presence of any major feature: characterize that feature as absent

Fig. 1. ACR version 2018 LI-RADS CT/MRI algorithm published with kind permission of ©ACR 2018. All Rights Reserved.

of the LI-RADS International Working Group. The next major update is scheduled for approximately 2021, and user feedback on version 2018 is welcome to help inform the improvements to be made in the next version.

References

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 3. Marrero JA, Kulik LM, Sirlin C, et al. (2018) Diagnosis, staging and management of hepatocellular carcinoma: 2018 Practice Guidance by the American Association for the Study of Liver Diseases. Hepatology. <https://doi.org/10.1002/hep.29913>