

# Multivariate Modeling to Establish Association of LI-RADS Major Criteria with Hepatocellular Carcinoma

*Radiology: Imaging Cancer* 2022; 4(2):e229002 • <https://doi.org/10.1148/rycan.229002> • © RSNA, 2022

## Take-Away Points

- Major Focus: To evaluate each major Liver Imaging Reporting and Data System (LI-RADS) criterion as an independent predictor of hepatocellular carcinoma (HCC).
- Key Result: All major LI-RADS criteria using CT/MRI, except threshold growth, and contrast-enhanced US (CEUS) independently predicted HCC, with the strongest associations for arterial phase hyperenhancement (APHE) and washout.
- Impact: Understanding the relative importance of each major criterion can improve future versions of the LI-RADS system.

**L**I-RADS, most recently updated in 2018, uses imaging to assign risk categories of HCC to liver observations on the basis of major and minor imaging criteria. The category assigned defines prognosis and assists with clinical management decisions.

In this meta-analysis, van der Pol et al synthesized data from 1170 CT observations from six studies and 3341 MRI observations from 17 studies. Multivariate analysis of observations from all five major LI-RADS criteria ( $n = 887$ ) found that all CT/MRI major criteria except threshold growth (odds ratio [OR], 1.6; 95% CI: 0.7, 3.6;  $P = .07$ ) were associated with HCC. Nonperipheral washout (OR, 13.2; 95% CI: 9.0, 19.2;  $P = .01$ ) and nonrim APHE

(OR, 10.3; 95% CI: 6.7, 15.6;  $P = .01$ ) had the strongest associations.

CEUS data were also investigated with 853 observations from six studies. Multivariate analysis found that CEUS major LI-RADS criteria of size, nonrim APHE, and late and mild washout were independently associated with increased odds of HCC, with the strongest association for APHE (OR, 7.3; 95% CI: 4.6, 11.5;  $P = .01$ ). However, rim or peripheral discontinuous globular enhancement correlated with decreased odds of HCC, and marked washout did not define either diagnosis or nondiagnosis of HCC.

This meta-analysis showed different independent associations of individual LI-RADS major criteria for CT/MRI and CEUS with HCC diagnosis. Further understanding of the independent contributions of each current major criterion in determining likelihood of HCC could improve future versions of LI-RADS.

—SURREIN S. DEEN

## Highlighted Article

van der Pol CB, McInnes MDF, Salameh JP, et al. CT/MRI and CEUS LI-RADS major features association with hepatocellular carcinoma: individual patient data meta-analysis. *Radiology* 2022;302(2):326–335. doi: <https://doi.org/10.1148/radiol.202121244>