

Chapter 14

LI-RADS® Reporting

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Considerations Before Issuing a LI-RADS® Report

Use your judgment and common sense

If a patient has multiple observations:

- Decide whether to report observations individually, in aggregate, or as a combination of both, with the goal of communicating your findings and impression most clearly.

Tailor your recommendations to your patient.

- [Chapter 11, page 4](#) provides general guidance for imaging workup options, but note that optimal management may vary depending on the observation or patient.

Is any observation path-proven to your knowledge?

If an observation has been biopsied and there is no uncertainty about the path diagnosis (i.e., the path diagnosis is a malignant entity such as HCC or the path diagnosis is a non-hepatocellular benign entity such as hemangioma), report the path diagnosis rather than the LI-RADS category.

If an observation has been biopsied but there is either uncertainty about the path diagnosis or the path diagnosis is a potential HCC precursor (i.e. regenerative or dysplastic nodule), report the LI-RADS category and the path diagnosis together. Rationale: reporting both may alert referrer to possible false-negative biopsy results and/or need for close follow-up to detect progression.

Is there widespread malignancy?

If yes, report a limited number of observations. Detailed description of innumerable abnormalities is burdensome for the radiologist and the reader of the report, is generally not necessary for patient's care, and may actually reduce the reader's understanding of the extent of the disease.

Is there tumor in vein?

If yes, report the likely etiology. Most LR-TIV observations are HCC but some may be iCCA, cHCC-CCA, or other non-HCC malignancies.

Is your patient a liver transplant candidate?

If yes, the LI-RADS category needs to be converted to OPTN Class by the radiologist or transplant team. The conversion is straightforward if the following are reported: size, major features, and number of LR-5 observations, and path-proven HCCs – or the viable tumor size if treated. For more advanced disease, report the presence of nodal or distant metastasis and LR-TIV observations. Also, report LR-M observations as these may affect transplant eligibility.

Avoid language that compels biopsy or other invasive procedure. See [page 14-19](#).

Report Elements

Key concepts

Use of standardized reporting is strongly encouraged for consistency across interpreters and to enable clear communication. See [pages 14-22 and 14-23](#) for sample reporting templates.

LI-RADS is most useful when imaging reports provide standardized information to guide clinical management (see [Chapter 11](#)). The guidelines below provide a minimum level of reporting detail for liver observations in patients at risk for developing HCC.

The level of detail used for a reporting template should be adapted according to the preferences and needs of individual radiologists, practices, institutions, and referrers.

Report elements

Reports should be structured according to the typical requirements of the issuing practice or institution, and typically include the following report elements:

- Clinical indication/history (below)
- Comparison exams ([page 14-3](#))
- Technique ([page 14-3](#))
- Findings ([page 14-4](#))
- Impression ([page 14-18](#))

Order of report elements may be modified according to institutional preference.

Clinical indication/history

If available, include the following information in indication/report history:

- | | |
|---|--|
| <ul style="list-style-type: none"> • Risk factors for HCC <ul style="list-style-type: none"> • Presence of cirrhosis • Chronic HBV even if no cirrhosis • Current or prior HCC | <p>⚠ Do not apply LI-RADS if risk factors for HCC are absent. If risk factors are likely present but not established, you may apply LI-RADS conditionally.</p> |
| <ul style="list-style-type: none"> • Etiology(ies) of liver disease <ul style="list-style-type: none"> • HCV, HBV, EtOH, NASH, etc. | <p>⚠ Do not apply LI-RADS if cirrhosis is due congenital hepatic fibrosis or to a vascular disorder.</p> |
| <ul style="list-style-type: none"> • Treatment history <ul style="list-style-type: none"> • Dates and types | <p>💡 Type of treatment and time interval since treatment affects treatment response assessment.</p> |
| <ul style="list-style-type: none"> • Pathology <ul style="list-style-type: none"> • Dates and results | <p>⚠ Do not assign LI-RADS category if observation is path proven to be a benign lesion of non-hepatocellular origin or a malignancy (see page 14-25).</p> |



Report Elements

Comparison exams

List relevant comparison exams.

If possible, provide the following information for each exam:

- Exam modality
- Type of contrast agent if relevant
- Date

Technique

Indicate contrast agent type (extracellular, gadoxetate) and dose (usually in mL).

- **Optional:** *Indicate some or all of the following according to personal or institutional preference: injection rate, volume and rate of saline flush, scan delay to arterial phase, timing method.*

Verify the exam is technically adequate. Indicate if any of the following technical requirement is not met:

- Exam meets minimum LI-RADS technical recommendations, including acquisition of all required phases and sequences (see [Chapter 12](#)).
- There is at least one set of images in the late arterial phase (see [Chapter 12](#)).
- The entire liver is included on all acquired precontrast and contrast-enhanced phases.

Report if subtractions were used to assess APHE or “washout”.

- Example: “Subtractions were used in determining the presence of washout appearance”



Report Elements

Findings

Describe the **background liver**, including:

- Liver surface nodularity
- Steatosis
- Siderosis
- Postsurgical changes if patient has had prior hepatectomy or liver transplant

Optional: Indicate some or all of the following according to personal or institutional preference:

- *Parenchymal heterogeneity*
- *Presence of cirrhotic nodules*
- *Other morphological alterations characteristic of cirrhosis such as segmental or lobar atrophy/hypertrophy, posterior hepatic notching, anterolateral flattening, fissure widening*

See [Chapter 4](#).

Describe the **hepatic vasculature**, including:

- Hepatic arterial anatomic variants (if pertinent). See [Chapter 3, page 8](#).
 - Portal venous and hepatic venous patency
 - If vessels are occluded, indicate involved vessels, type of occlusion (bland thrombosis or tumor in vein), and presence of cavernous transformation.
 - Patency of arterial and venous anastomoses if post transplant
-

Describe the **biliary system**, including:

- Relevant biliary findings such as focal or diffuse ductal dilation, causes of ductal dilation if discernible, and gallbladder abnormalities
- Patency of biliary anastomoses if post transplant



Report Elements

Findings (Cont'd)

Describe **extrahepatic findings**, for example:

- Extrahepatic manifestations of cirrhosis:
 - Portosystemic shunts
 - Esophageal, gastric, splenorenal (“spontaneous splenorenal shunt”), and body wall varices are particularly important
 - Ascites
 - Splenomegaly
 - Gamma-Gandy bodies
 - Extrahepatic metastases, if applicable, including visualized portions of:
 - Lungs
 - Bones
 - Adrenals
 - Peritoneum / Retroperitoneum
 - Other clinically significant extrahepatic findings
 - Splenic artery aneurysms are common
-

Describe **hepatic observations**

Hepatic observation should be described in the manner that conveys the greatest clarity. Depending on the number, extent, and LI-RADS category of individual observations, this may be best accomplished by reporting:

- Observations individually
- Observations in aggregate
- A combination of the two

These concepts are explained and illustrated in the next several pages.



Widespread Malignancy

Widespread malignancy

Malignancy is considered widespread when numerous focal or diffuse observations are seen that in aggregate are interpreted as definitely malignant.

When malignant disease appears widespread throughout the entire liver, only a limited number of hepatic observations should be described since detailed description of individual abnormalities is burdensome for the radiologist and the reader of the report, is generally not necessary for patient's care, and may actually reduce the reader's understanding of the extent of the disease.

The description of widespread disease should include the distribution of the observations (segments involved) as well as more detailed description of a limited number of individual observations:

- Report the size and features of the one or two largest, highest-categorized, untreated observations (see [page 14-10](#)):
 - e.g., LR-TIV, LR-5, LR-M
 - If the highest category of any individual observation is LR-4, report the size and features of the one or two largest LR-4 observations.
 - Report the size and features of the one or two largest, viable, treated observations.
-

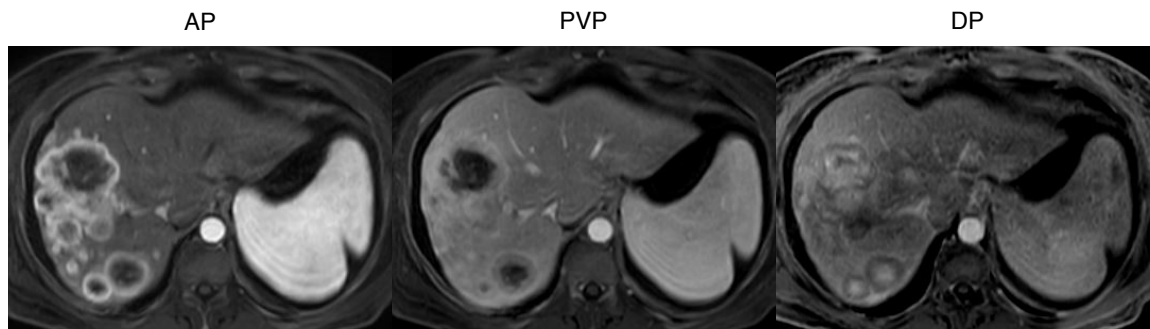
Additionally, report:

- Extrahepatic extension or metastases if present.
- Overall change from prior examination(s), if applicable.
- Other findings that should be routinely reported such as the presence or absence of bland venous thrombosis.



Widespread Malignancy

Example: Widespread malignancy



Sample report

Findings:

Focal hepatic observations:

Numerous hepatic masses involve the right hepatic lobe, consistent with widespread malignancy, not specific for HCC.

The largest hepatic mass, located in segments VIII, measures 73 mm (image #348, series 301). Most of the masses demonstrate rim arterial phase hyperenhancement, many demonstrate peripheral “washout”, some with delayed central enhancement, LR-M, most likely represents iCCA, cHCC-CCA, or HCC with atypical features.

Impression:

Widespread malignancy (LR-M, most likely represents iCCA, cHCC-CCA, or HCC with atypical features), involving the right hepatic lobe.

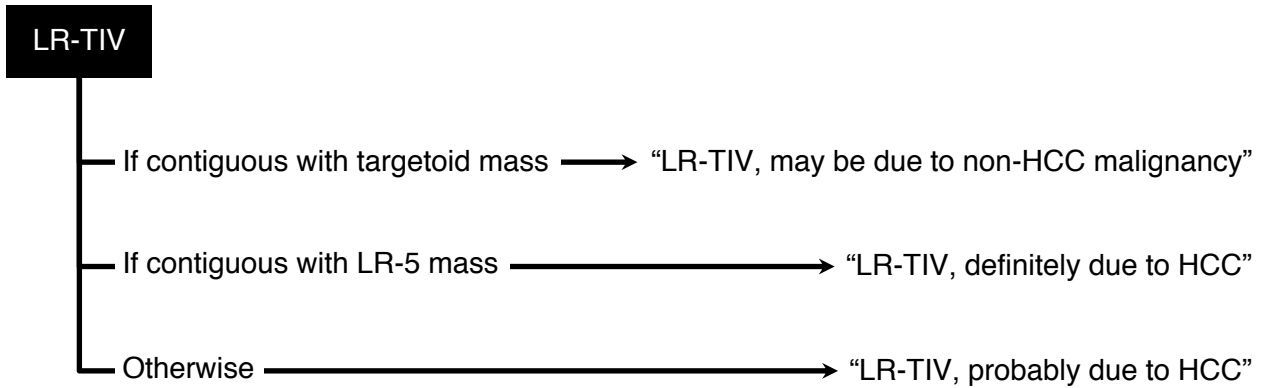
The above is a sample report meant as a guidance. The report elements, order of report elements, terminology, and other details should be customized to match institutional preference.

Note that LI-RADS measurements are given in mm, but each institution should utilize units according to local standards and use them consistently.

Tumor in Vein, Malignancy not Widespread

If tumor in vein is present in the absence of widespread disease:

- Specify the distribution and extent of tumor in vein as well as change from prior examination(s), if applicable.
- Indicate in the report the most likely etiology:

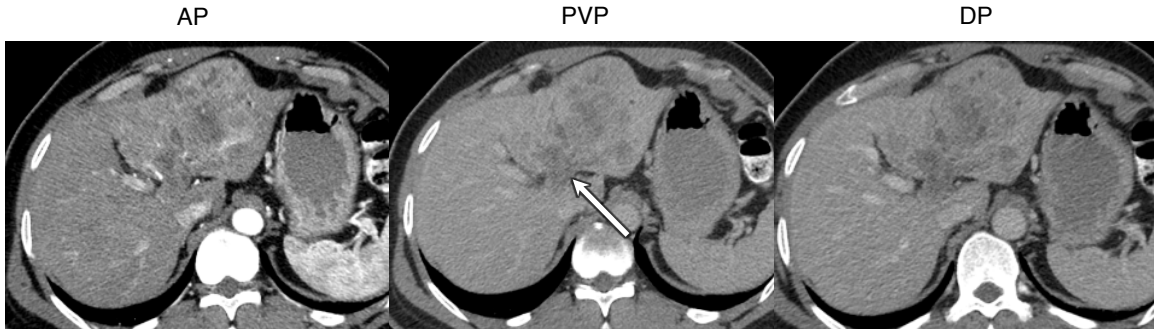


Observations in addition to the tumor in vein

- Observations in addition to the tumor in vein should be reported in aggregate.
- One or two representative observations may be reported individually. See [page 14-10](#) for the instructions on reporting of individual observations.

Tumor in Vein, Malignancy not Widespread

Example: Tumor in vein, malignancy not widespread



Sample report: template A

Observation #1 –

There is an expansile, ill-defined, mass without arterial phase hyperenhancement involving the left portal vein and its peripheral branches, extending into the portal vein confluence. This is associated with a 75-mm LR-5 parenchymal mass involving segments II, III and IV (series 3, image 76), with nonrim arterial phase hyperenhancement, washout appearance, and no capsule appearance.

LR-TIV, definitely due to HCC.

Sample report: template B

Observation #: 1

Location: Segments II, III, IV

Size: 75 mm (image # 76, series 3)

Tumor in vein: Yes; involves the entire left portal vein

LR-M features: None

Nonrim AP hyperenhancement: Yes

Threshold growth: N/A

Nonperipheral washout appearance: Yes

Enhancing capsule appearance: No

Ancillary features:

Favoring benignity: None

Favoring malignancy: None

LI-RADS v2018 Category: LR-TIV (Tumor in vein), definitely due to HCC

The above is a sample report meant as a guidance. The report elements, order of report elements, terminology, and other details should be customized to match institutional preference.

Note that LI-RADS measurements are given in mm, but each institution should utilize units according to local standards and use them consistently.

Untreated Observations Reported Individually

Individual observations, malignancy not widespread, tumor in vein absent

In the absence of widespread malignancy and tumor in vein, observations should be reported individually and/or in aggregate as explained below:

Individual observation reporting

Report observations individually as needed to ensure clear communication of the information needed for tailored clinical management.

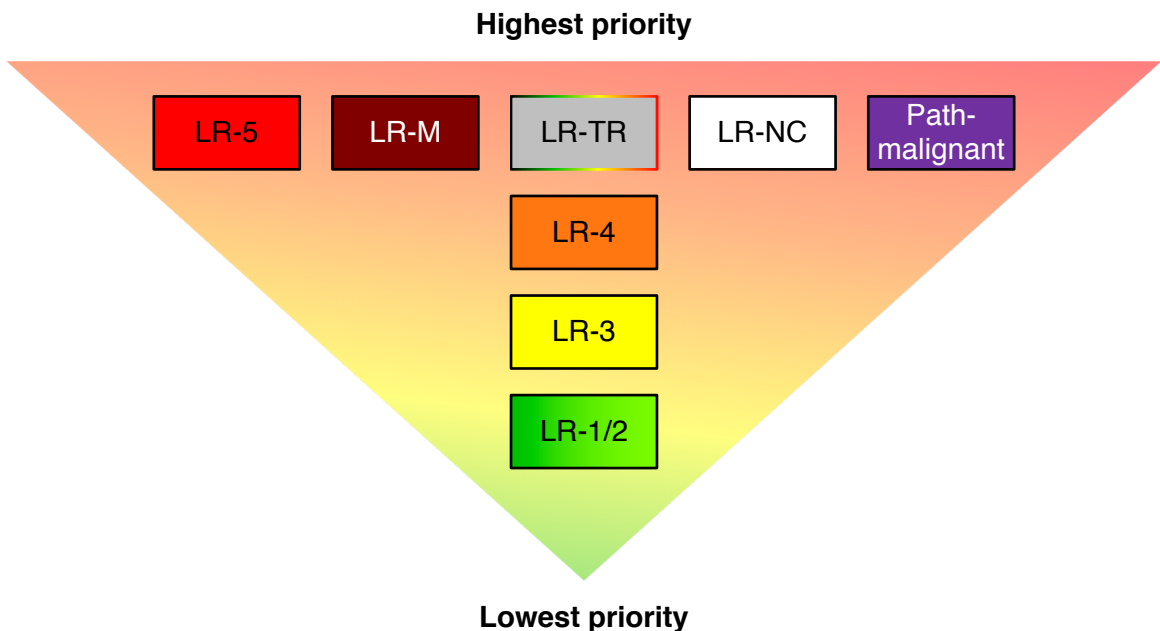
In general, up to five observations should be reported individually, but there may be exceptions:

- Example: If multiple treated observations have varying treatment responses or if multiple observations have developed during longitudinal follow up, it may be necessary to report more than 5 observations individually.

In selecting the observations to be reported individually, the following hierarchy usually should be used, from highest to lowest priority (see diagram below):

- LR-5, LR-M, LR-TR, LR-NC, path-proven malignancy
- LR-4, especially if new, or if there has been a change in category from prior exam, or large
- LR-3, especially if new, or if there has been a change in category from prior exam, or large
- LR-1 and LR-2 observations, especially if observation was considered positive or suspicious on a prior screening or single-phase exam or if previously reported as LR-3, LR-4, or LR-5

Report observations individually as needed to ensure clear communication of the information needed for tailored clinical management





Untreated Observations Reported Individually

Aggregate reporting

Additional LR-5, LR-M, LR-TR, LR-4, and LR-3 observations may be reported in aggregate.

Optional reporting

LR-1 and LR-2 observations may be reported at radiologist's discretion, and may be reported in aggregate.

- Exception: LR-1 and LR-2 observations previously reported as LR-3, LR-4, or LR-5 should be reported individually
-

Observation identifiers

Individually reported observations should be assigned unique identifiers. Identifiers should remain consistent from report to report to facilitate communication about longitudinal change.

- For example, if an observation is labeled "Observation 2" at first description, it should be described as "Observation 2" on all future reports.



Untreated Observations Reported Individually

Untreated observations reported individually

For each untreated observation reported individually, use LI-RADS terminology. Report at a minimum:

- Observation identifier
- Size (maximal long-axis dimension) and the series and image number on which it was measured
- Location of observations in the liver by Couinaud segment(s)
- Major features contributing to LI-RADS categorization
- Ancillary features if applicable
- LR-M features if applicable
- If subtractions were used for feature characterization
- LI-RADS category, unless observation has a definitive pathological diagnosis (see below)

If the observation is categorized LR-M, also report:

- The most probable etiology for each LR-M observation (see [page 14-13](#)).
 - Rationale: this information may influence management, including the need and urgency for biopsy.

If the observation is categorized LR-NC, also report:

- Which imaging features could not be characterized and why.
- Recommendations for repeat or alternative imaging (see [Chapter 11](#)) including technical suggestions (if appropriate) for enabling more reliable assessment.

If the observation has a definitive pathological diagnosis

If an observation has been biopsied and there is no uncertainty about the path diagnosis (i.e., the path diagnosis is a malignant entity such as HCC or the path diagnosis is a non-hepatocellular benign entity such as hemangioma), report the path diagnosis rather than the LI-RADS category.

If an observation has been biopsied but there is either uncertainty about the path diagnosis or the path diagnosis is a potential HCC precursor (i.e. regenerative or dysplastic nodule), report the LI-RADS category and the path diagnosis together.

- Rationale: reporting both may alert referrer to possible false-negative biopsy results and/or need for close follow-up to detect progression.

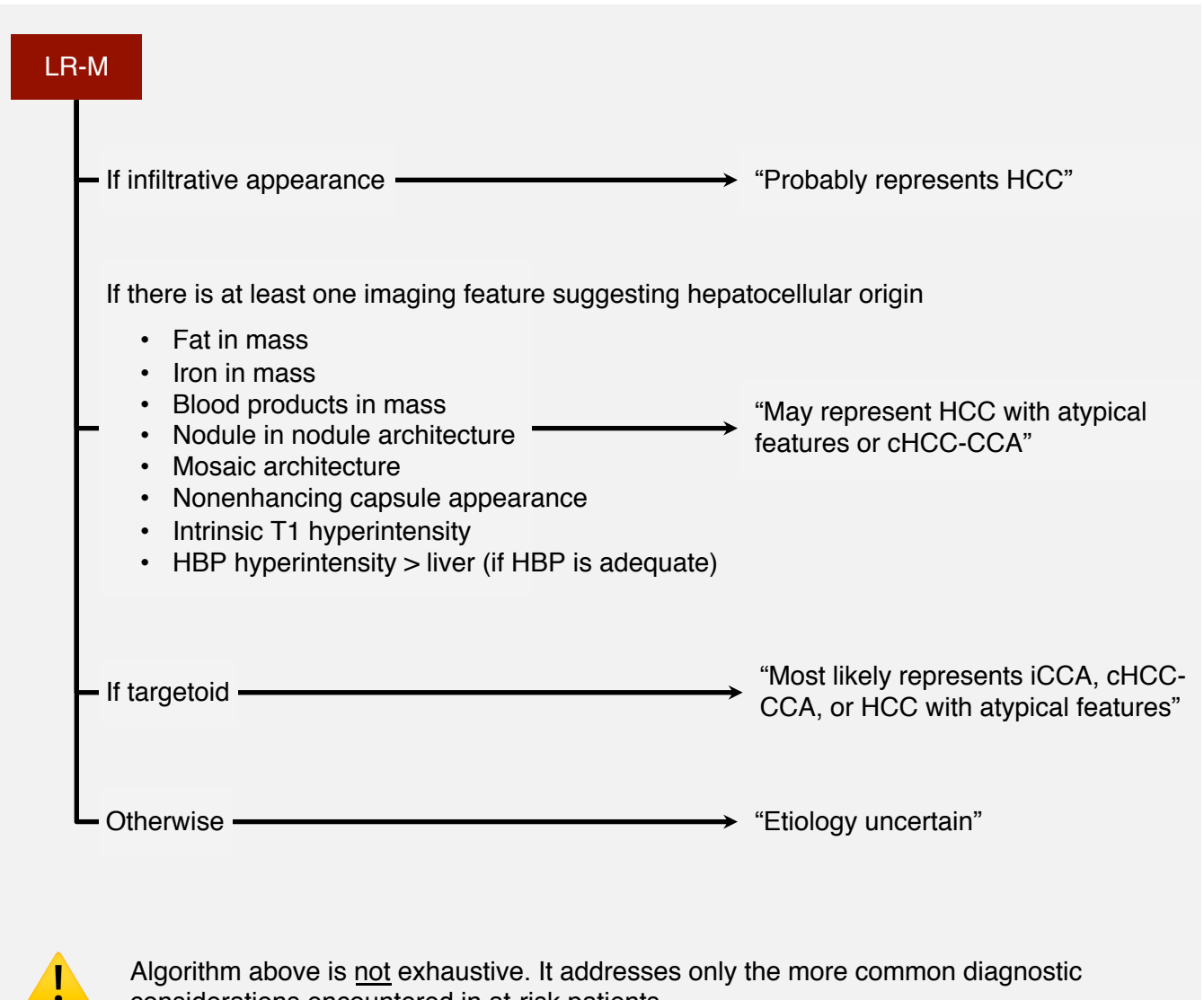
LR-M Reporting

The differential diagnosis of LR-M includes

- More common: HCC with atypical imaging features, iCCA, cHCC-CCA
- Less common: other primary or metastatic malignancies, benign entities such as sclerosing hemangiomas and abscesses

If possible, radiologists should indicate in their report the most probable etiology for each LR-M observation, as this information may influence management, including the need and urgency for biopsy.

The algorithm below provides imaging-based guidance for determining and reporting the most probable etiology among the more common causes. Elevations in circulating tumor biomarkers such as AFP and CA 19-9, if available, can also refine the differential diagnosis (see [Core FAQs page 39](#)).





Treated Observations Reported Individually

Treated observations reported individually

For each treated observation reported individually, use LI-RADS terminology. Report at a minimum:

- Observation identifier
- Treatment response category
- Size of enhancing component, if applicable
- If subtractions were used for feature characterization
- Location of observations in the liver by Couinaud segment(s)
- If known:
 - Pretreatment LI-RADS category if not path proven, pretreatment pathology diagnosis otherwise
 - Pretreatment size
 - Treatment(s) and date(s)

Examples:

- LR-TR Nonviable (pretreatment LR-5, 22 mm)
- LR-TR Viable 20 mm (pretreatment LR-5, 32 mm)
- LR-TR Equivocal 15 mm, (pretreatment path-proven HCC, 21 mm) If the observation is categorized LR-NC, also report:

Rationale: Reporting both posttreatment and pretreatment tumor sizes allows the referring clinician to estimate treatment response at a glance.

If the observation is categorized LR-TR Nonevaluable, also report:

- Which imaging features could not be characterized and why
- Recommendations for repeat or alternative imaging (see [Chapter 11](#)) including technical suggestions (if appropriate) for enabling more reliable assessment.

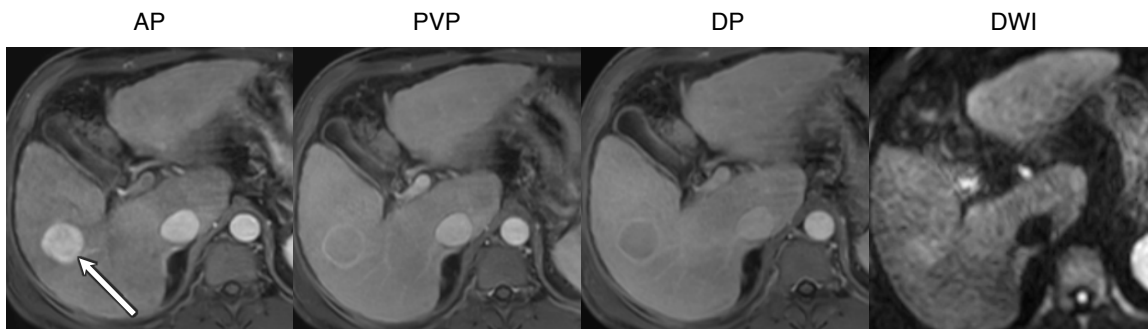
See [Chapter 9, page 10](#) for how to assign a treatment response category and [Chapter 9, page 13](#) for how to measure the enhancing component.

See [Chapter 9](#) for expected radiological changes following locoregional treatments.



Untreated Observations Reported Individually

Example: LR-5



Sample report: template A

Observation #1 – There is a 22-mm observation in segment VI (series 3, image 29) with nonrim arterial phase hyperenhancement, nonperipheral washout appearance, and enhancing capsule appearance. Ancillary features include mildly restricted diffusion. **LR-5.**

Sample report: template B

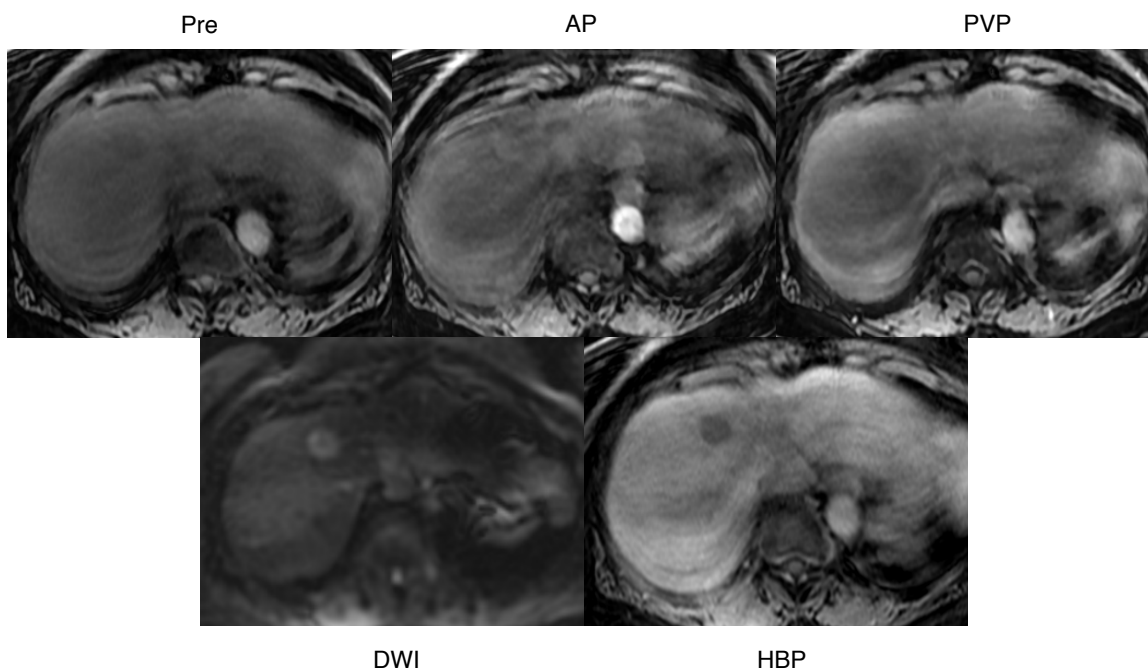
Observation #: 1
Location: Segment VI
Size: 21 x 21 mm (image # 29, series 3)
Tumor in Vein: No
LR-M Features: None
Nonrim AP hyperenhancement: Yes
Threshold growth: N/A
Nonperipheral washout appearance: Yes
Enhancing capsule appearance: Yes
Ancillary features:
 Favoring benignity: None
 Favoring malignancy: Mildly restricted diffusion
LI-RADS v2018 Category: LR-5 (Definite HCC)

The above are sample reports meant as a guidance. The report elements, order of report elements, terminology, and other details should be customized to match institutional preference.

Note that LI-RADS measurements are shown in mm, but each institution should utilize units according to local standards and use them consistently.

Untreated Observations Reported Individually

Example: LR-NC



Sample report

Findings:

Liver: Nodular contour consistent with the provided history of cirrhosis.

Focal hepatic observations:

Evaluation for focal observations is limited by moderate to severe motion artifact on several image series, most notably in the arterial phase. There is a 20-mm observation in hepatic segment VIII (image #89, series #1301) that demonstrates restricted diffusion and HBP hypointensity. This observation is not reliably characterized in the arterial or portal venous phase due to motion. LR-NC, but suspicious for HCC given size and ancillary features above.

Impression:

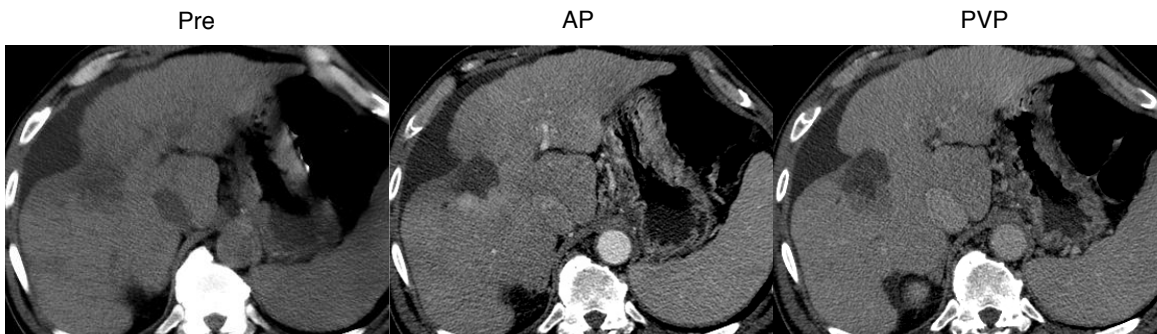
Observation 1: 20-mm observation in hepatic segment VIII, LR-NC, but suspicious for HCC. Recommend alternative imaging with multiphase CT as soon as reasonably possible.

The above is a sample report meant as a guidance. The report elements, order of report elements, terminology, and other details should be customized to match institutional preference.

Note that LI-RADS measurements are shown in mm, but each institution should utilize units according to local standards and use them consistently.

Treated Observations Reported Individually

Example: LR-TR Viable



Sample report: template A

Observation 1 – There is an observation in segment V/VIII (series 4, image 96), previously treated with RF ablation (pretreatment category LR-5, 18 mm). There is a focal masslike area of hyperenhancement and washout arising from the posterior margin of the observation (23 mm, series 4 image 99). **LR-TR Viable**, 23 mm (Pretreatment LR-5, 18 mm).

Sample report: template B

Observation #: 1
Treatment modality: RF ablation
Location: Segment V/VIII (image # 99, series 4)
Pretreatment category: LR-5
Pretreatment size: 18 mm
Enhancement in a nodular, mass-like or thick irregular pattern: Yes
Size of enhancing component: 23 mm
Enhancement characteristics:

- Arterial phase hyperenhancement: Yes
- Washout appearance: Yes
- Other: N/A

Category: LR-TR Viable, 23 mm (Pretreatment LR-5, 18 mm)

The above are sample reports meant as a guidance. The report elements, order of report elements, terminology, and other details should be customized to match institutional preference.

Note that LI-RADS measurements are shown in mm, but each institution should utilize units according to local standards and use them consistently.



Impression

Impression

State if exam does not meet minimum LI-RADS technical recommendations. For example, state if one or more required phases incompletely covered the liver or was not obtained.

State if there is widespread malignancy throughout liver. If so, summarize distribution of involvement and interim change.

Summarize

- **LR-TR observation(s):** include location(s), response categories, size(s) of enhancing components, and interim change.
 - **Path-proven observation(s):** include path diagnosis, location(s), size(s) and interim change.
 - **LR-TIV observation(s):** include likely etiology (see [page 14-8](#)), extent, and interim change.
 - **LR-M observation(s):** include likely etiology (see [page 14-13](#)), location(s), size(s) and interim change
 - **LR-3, LR-4, and LR-5 observations:**
 - Include number of such observations: one, two, three, four, five, “more than five”.
 - Include location(s), size(s), and interim change.
-

LI-RADS observations of same category:

These may be summarized in aggregate in Impression.

Example: Three LR-4 observations (15, 18, 22 mm), unchanged since prior.

LR-1 and LR-2 observations:

Report individually in Impression if they were suspicious nodules on antecedent ultrasound or if they were LR-4, -5, or -M on prior. Otherwise, LR-1 and LR-2 observations may be omitted or summarized in aggregate at radiologist’s discretion.

Recommend appropriate imaging follow-up, including modality and interval

Tailor your recommendations to your patient. [Chapter 11, page 4](#) provides general guidance for imaging workup options, noting that optimal management may vary depending on the observation or patient.



Optional Reporting Elements

The radiologic T-stage

- In some practices, it is considered appropriate to summarize the radiologic T-stage to guide patient management, particularly with regard to eligibility for transplantation
 - See [Chapter 10, page 4](#) for discussion on radiologic staging.
-

Treatment recommendations

- Depending on local practice patterns, recommendations for locoablative therapies may be appropriate in the radiology report, or may be reserved for the multidisciplinary setting.
 - See [Chapter 11, page 13](#) for management options.
-

In general, avoid a recommendation for biopsy

Biopsy decisions should usually be made in a multidisciplinary setting. However, it may be beneficial to suggest appropriate consideration for liver biopsy. Sample phrases that might be used are:

- “Options for diagnostic workup include ____ and possibly biopsy.”
- “The distinction between HCC and ____ in this patient cannot be determined with imaging alone. If distinction would be helpful for patient management, biopsy may be considered.”
- “Biopsy may be necessary to distinguish between HCC and ____.”
- “...probably HCC. To establish a definite diagnosis, biopsy may be considered.”

CT/MRI LI-RADS® v2018 Reporting

Untreated observation	Reporting requirement	Recommended report content
No observation	Should be reported in Impression.	“There are no reportable LI-RADS observations.”
LR-NC	Must be reported in Impression.	Provide causative technical limitations or artifacts, and work-up suggestions.
LR-1 LR-2	Summarize in aggregate OR Report in Impression if: was suspicious nodule on the antecedent ultrasound or was LR-4, -5, or -M on prior.	Provide category range and approximate number of observations. If downgrading from prior exam, provide rationale.
LR-3	Report in Impression if: no higher category observations or was LR-4, LR-5, or LR-M on prior.	Provide major features, growth, and contributory ancillary features. Indicate relevant change since prior.
LR-4 LR-5 LR-M	Must be reported in Findings and Impression. May summarize in aggregate for clarity.	Provide major features, growth, contributory ancillary & other features. Indicate relevant change since prior. If LR-M, indicate likely etiology.
LR-TIV	Must be reported in Findings and Impression.	Indicate likely etiology (HCC, non-HCC, unsure); describe vessel(s) involved.
Treated observation	Reporting requirement	Recommended report content
LR-TR Nonevaluable	Must be reported in Findings and Impression.	Provide causative technical limitations or artifacts, and work-up suggestions.
LR-TR Nonviable LR-TR Equivocal LR-TR Viable	Must be reported in Findings and Impression. May summarize in aggregate for clarity.	Provide pretreatment category and size, current response category. For LR-TR Viable or Equivocal: Report viable tumor size (or range if in aggregate), criteria for viability, and change since prior.

All reported observations should include

- **Identifier:** sequential number or other unique identifier, keep fixed on all exams.
- **Location information:** series and image number on which size is measured. If possible, also save key images on PACS.

Note: if observation is a path-proven malignancy or is a benign lesion of non-hepatocellular origin, report pathology diagnosis rather than LI-RADS category. See [page 14-25](#).

Sample Report Template

Procedure: [MRI Abdomen with and without contrast – (date)]
Indication: [Underlying liver disease, surveillance for hepatocellular carcinoma, history of treatment]
Comparison: [Include modality, presence/absence of contrast material on prior, and date]
Technique: [Precontrast and dynamic postcontrast MR imaging of the abdomen was performed.]
[MRCP was also performed.] Examination [meets LI-RADS technical recommendations.] [is
compromised by the following factor(s): ().]
Intravenous contrast agent: [type]
Volume: [] mL
Rate: [] mL/sec
[Premedication/adverse events:]
Findings:
Liver: [morphology and signal intensity, diffuse findings.]
Focal hepatic observations:
{[Observation 1 – [Features relevant to categorization]. LR-[category]]
[Observation 1 – [Features relevant to categorization]. LR-[category]]
[Observation 1 – [Features relevant to categorization]. LR-[category]]}
Hepatic vasculature: [potentially relevant anatomic variants, patency]
Biliary system: []
Extrahepatic findings: [none, splenomegaly, collaterals, ascites]
[Other organs, findings, etc.:]
Impression:
 Hepatic findings:
[Summary of LI-RADS observations; or LI-RADS negative.]
[Additional liver findings as above.]
 Extrahepatic findings:
[None]

LI-RADS M = Probably or definitely malignant, not HCC specific

LI-RADS TIV = Tumor in vein

LI-RADS 5 = Definitely hepatocellular carcinoma

LI-RADS 4 = Probably hepatocellular carcinoma

LI-RADS 3 = Intermediate probability of malignancy

LI-RADS 2 = Probably benign

LI-RADS 1 = Definitely benign

LI-RADS NC = Noncategorizable

NOTE: LI-RADS categories should be interpreted in the context of other available data, such as biomarkers and the patient's prior probability of developing or having hepatocellular carcinoma. The LI-RADS / OPTN classification of liver lesions has been adopted to standardize CT and MRI scan reporting in patients at risk for hepatocellular carcinoma. The imaging criteria for "definite hepatocellular carcinoma" are concordant for the LI-RADS and OPTN systems. LI-RADS criteria and documentation are available online at <https://www.acr.org/Quality-Safety/Resources/LIRADS>. This report utilizes LI-RADS version 2017.

Sample Report Template

Individual untreated LI-RADS observation

Sample template A

Observation [#] – A [size] [mm/cm] observation in segment [Couinaud segment] (series [#], image [#]), with [no] arterial phase hyperenhancement, [no] washout appearance, and [no] capsule appearance. Ancillary features include: [none / list positive ancillary features]. LR-[category].

Sample template B

Observation #: 1/2/3/4/5
Location: Segment I/II/III/IVa/IVb/V/VI/VII/VIII
Size: [] x [] [mm/cm] (image # [], series [])
Tumor in Vein: [No/Yes (*describe the involved vessels*)]
LR-M Features: [None/List all that apply]
Nonrim AP hyperenhancement: [Yes/No]
Threshold growth: [Yes/No/Not applicable]
Nonperipheral washout appearance: [Yes/No]
Enhancing capsule appearance: [Yes/No]
Ancillary features:
 Favoring benignity: [None/List all that apply]
 Favoring malignancy: [None/List all that apply]
LI-RADS v2018 Category: [NC/1/2/3/4/5/TIV/M]



Sample Report Template

Individual treated LI-RADS observation

Sample template A

Observation [#] - There is an observation in segment [Couinaud segment[(series [#], image [#]), previously treated with [locoregional treatment modality] (pretreatment size [#] mm/cm, pretreatment category LR-[pretreatment category]). There is [a focal masslike area of thick, irregular rind with] [no] hyperenhancement [and/or no] washout [describe location] ([#] [mm/cm], series [#] image [#]). **LR-TR** [Viable/Equivocal] ([#] [mm/cm]) (Pretreatment [LR1/2/3/4/5/M/TIV/Path-proven, [size] [mm/cm])

OR

Observation [#] - There is an observation in segment [Couinaud segment[(series [#], image [#]), previously treated with [locoregional treatment modality] (pretreatment size [#] [mm/cm], pretreatment category LR-[pretreatment category]). There is [no associated enhancement/expected post-treatment change including thin peripheral rim enhancement]. **LR-TR Nonviable** (Pretreatment [LR1/2/3/4/5/M/TIV/Path-proven, [size] [mm/cm])

Sample template B

Observation #: 1/2/3/4/5

Treatment modality: []

Location: Segment I/II/III/IVa/IVb/V/VI/VII/VIII (image # [], series [])

Pretreatment category: []

Pretreatment size: [] [mm/cm]

Enhancement in a nodular, mass-like or thick irregular pattern: [Yes/No/Equivocal]

Size of enhancing component: [[] [mm/cm] / N/A]

Enhancement characteristics:

- Arterial phase hyperenhancement: [Yes/No/Equivocal]
- Washout appearance: [Yes/No/Equivocal]
- Other: [Enhancement similar to pretreatment/NA]

Category: LR-TR [Nonviable/Equivocal/Viable] [size] [mm/cm] (Pretreatment [LR1/2/3/4/5/M/TIV/Path-proven, [size] [mm/cm])

Note: For treated observations, report size of enhancing component as explained in Treatment Response Chapter (see [Chapter 9, page 13](#)).

Frequently Asked Questions

How many observations should I report individually?

Use your judgment in deciding how many observations to report individually, in aggregate, or as a combination of both. Use the method that conveys your clinically relevant findings and impression in the clearest manner.

What should I report if I see no concerning observations?

LR-1 and LR-2 observations can be reported in aggregate in the Findings. The Impression should convey a simple summary statement such as “no LI-RADS observations suspicious for malignancy”.

How should I report a treated observation?

Report the current response category and current tumor viable size if appropriate. Also, whenever possible, report the pretreatment LI-RADS category (or path diagnosis), and the pretreatment size.

- For example:
- LR-TR Nonviable, (pretreatment LR-5, 22 mm)
 - LR-TR Viable 20 mm, (pretreatment, LR-5, 32 mm)
 - LR-TR Equivocal 15 mm, (pretreatment path-proven HCC, 21 mm)

Any special reporting considerations for transplant candidates with HCC?

A standard CT/MRI LI-RADS report contains the needed information for transplant candidates with HCC: number and size of LR-5 observations and path-proven HCCs, or their viable tumor sizes if treated by a locoregional therapy. List major features for each LR-5 observation. Also report LR-M and LR-TIV observations, as these may affect pretransplant workup and transplant eligibility.



10-19 mm observations with APHE and WO and no TG or “capsule” should be reported but they do not contribute to OPTN staging.

What should I report if an observation is biopsied and has a path-proven diagnosis?

This depends on the path diagnosis:

- If malignant or if benign of non-hepatocellular origin (e.g., hemangioma): report observation’s path diagnosis, clinically relevant imaging features, and change since prior: e.g., “path-proven hemangioma, stable in size and other imaging features since prior.”
- If benign of hepatocellular origin (e.g., regenerative or dysplastic nodule): report observation’s LI-RADS category and pathology diagnosis, imaging features, and change since prior: e.g., “LR-4 with path diagnosis of dysplastic nodule, has new APHE and interval growth from 12 to 16 mm.”



Frequently Asked Questions

What if the path diagnosis is discordant with the LI-RADS category?

Indicate in your report there is discordance, providing the LI-RADS category and the path diagnosis. Explain briefly why this represents a discordance. Consider multidisciplinary discussion with consensus review of the histology, imaging, and other clinical data to adjudicate the discordance.

If I am not supposed to assign a LI-RADS category for path-proven observations, why am I supposed to report their imaging features and change since prior?

Radiologists should continue to characterize major features and key ancillary features for biopsy-proven observations as changes in these features may be clinically relevant. Examples: “Path-proven cholangiocarcinoma with interval growth, based on imaging, from 22 mm to 28 mm” or “Path-proven HCC with interval development, based on imaging, of tumor in vein”.

Can you provide an example of how to report an 18-mm observation which meets criteria for LR-4 and on pathology was a high-grade dysplastic nodule?

18-mm LR-4 (Probable HCC), biopsy on (insert date) suggested a high grade dysplastic nodule; describe change/lack of change in size and imaging features since prior.

Can you provide an example of how to report a 22-mm observation which meets criteria for LR-4 and on pathology was a iCCA?

22-mm path-proven iCCA; describe change/lack of change in size and imaging features since prior.
