LI-RADS

ERÜ õppepäev 19.04.2024

Kärt Seer

Liver Imaging Reporting & Data System

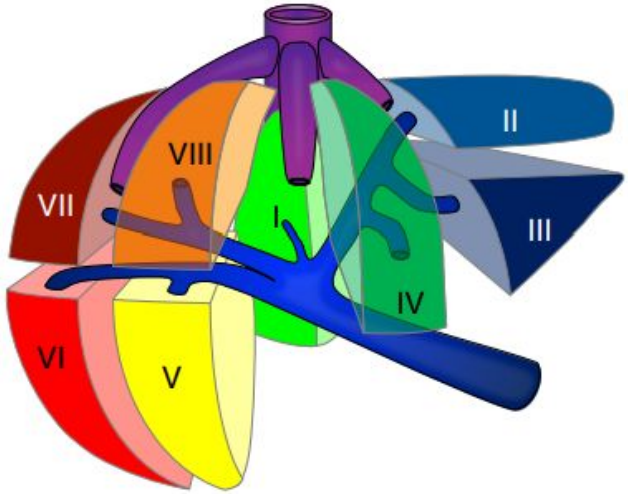
CT/MRI Diagnostic Table

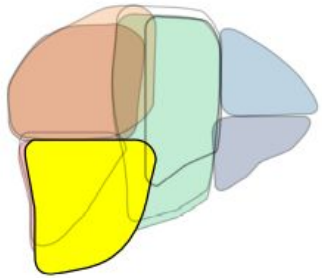
Arterial phase hyperenhancement (APHE)		No APHE		Nonrim APHE		
Observation size (mm)		< 20	≥ 20	< 10	10-19	≥ 20
Count additional major features: • Enhancing “capsule” • Nonperipheral “washout” • Threshold growth	None	LR-3	LR-3	LR-3	LR-3	LR-4
	One	LR-3	LR-4	LR-4	LR-4 / LR-5	LR-5
	≥ Two	LR-4	LR-4	LR-4	LR-5	LR-5

- https://www.acr.org/Clinical-Resources/Reporting-and-Data-Systems/LI-RADS
- CT/MRI LI-RADS v2018 CORE - 60 lk pdf
- LI-RADS v2018 Manual - 823 lk pdf
- Hetkel värskeim 2018 versioon, Googeldades kasuta “lirads 2018”

LI-RADS® v2018 Manual - sisukord

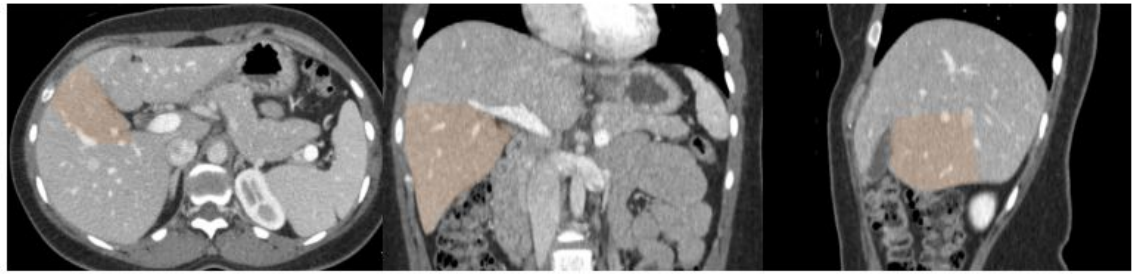
Table of Contents

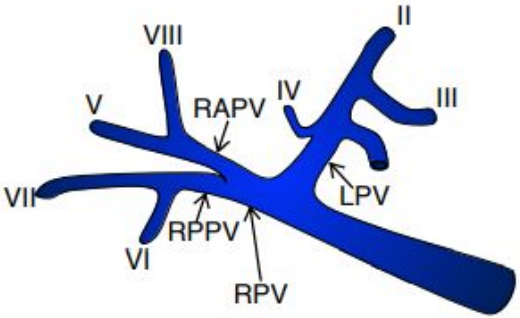




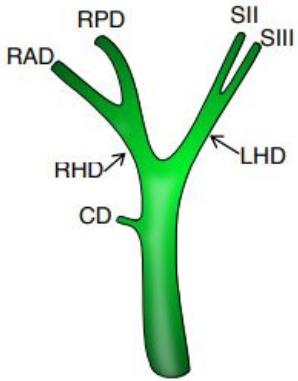
Segment V: Inferior segment of the right anterior sector/section

Bounded anteriorly by the gallbladder fossa and posteriorly by the plane of the right hepatic vein, superiorly bounded by the plane of MPV bifurcation

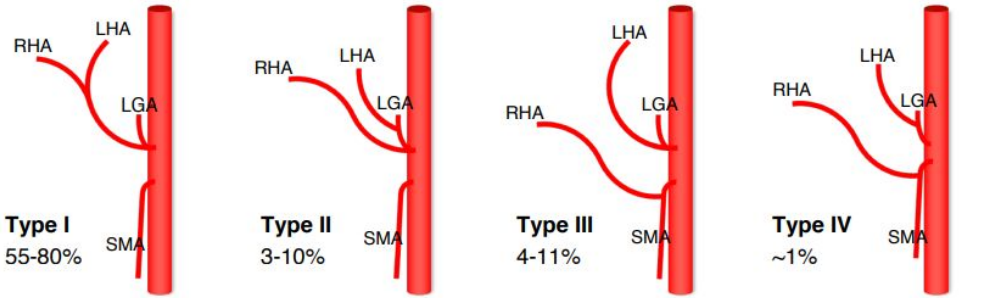




Standard anatomy
(65-80%)

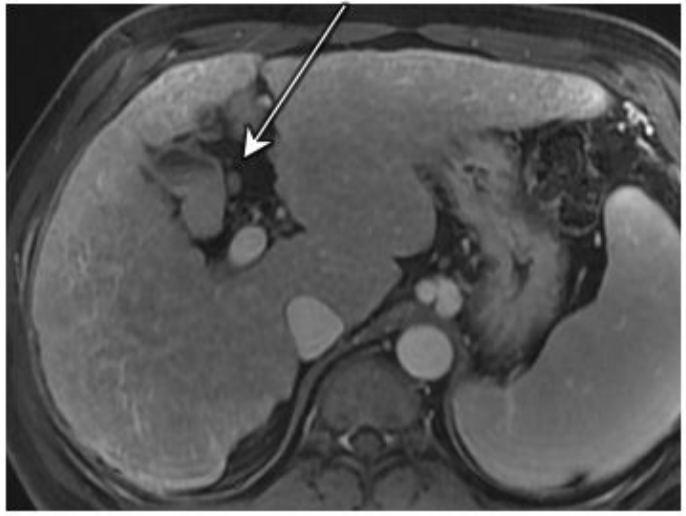


Standard anatomy (63%)



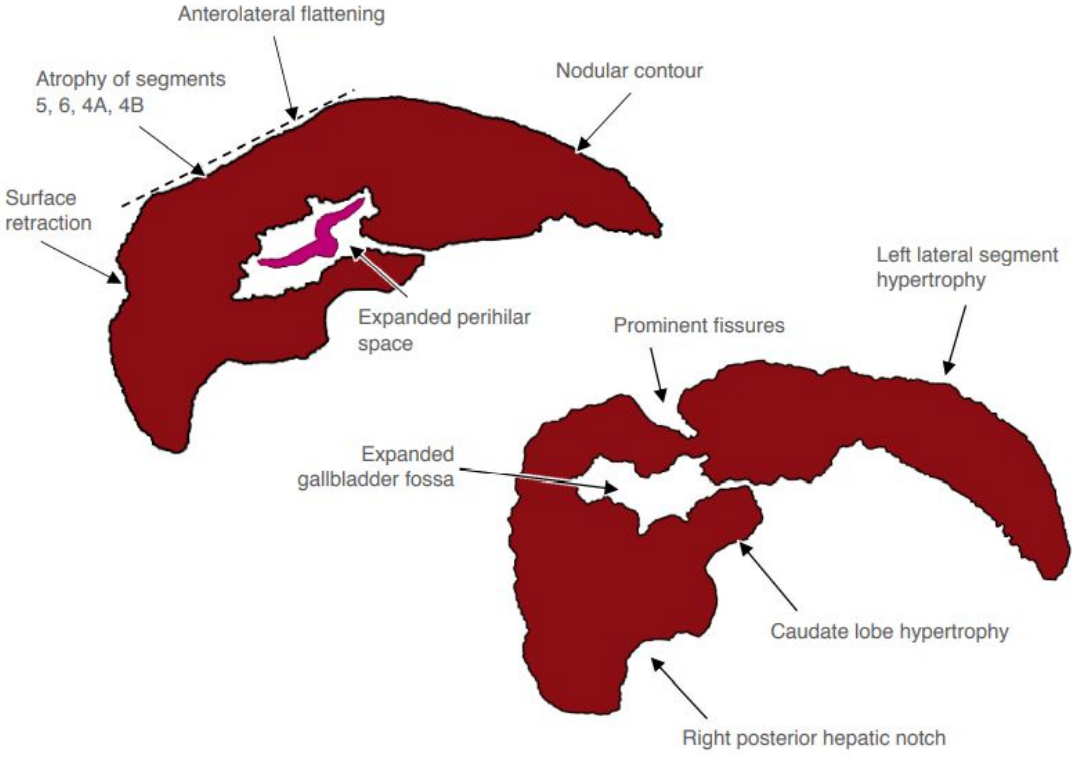
What are the Imaging manifestations of cirrhosis?

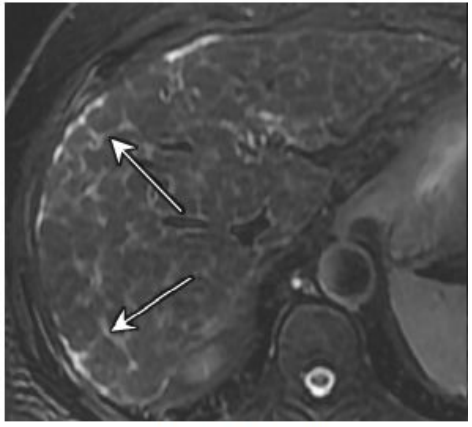
- The cirrhotic liver is carved into innumerable nodules by fibrous scars. Since the nodules and scars may be imperceptible, however, the cirrhotic liver may appear normal at imaging.
- ⚠ ***Thus, a normal-appearing liver at US, CEUS, MRI, or CT does not exclude cirrhosis.***



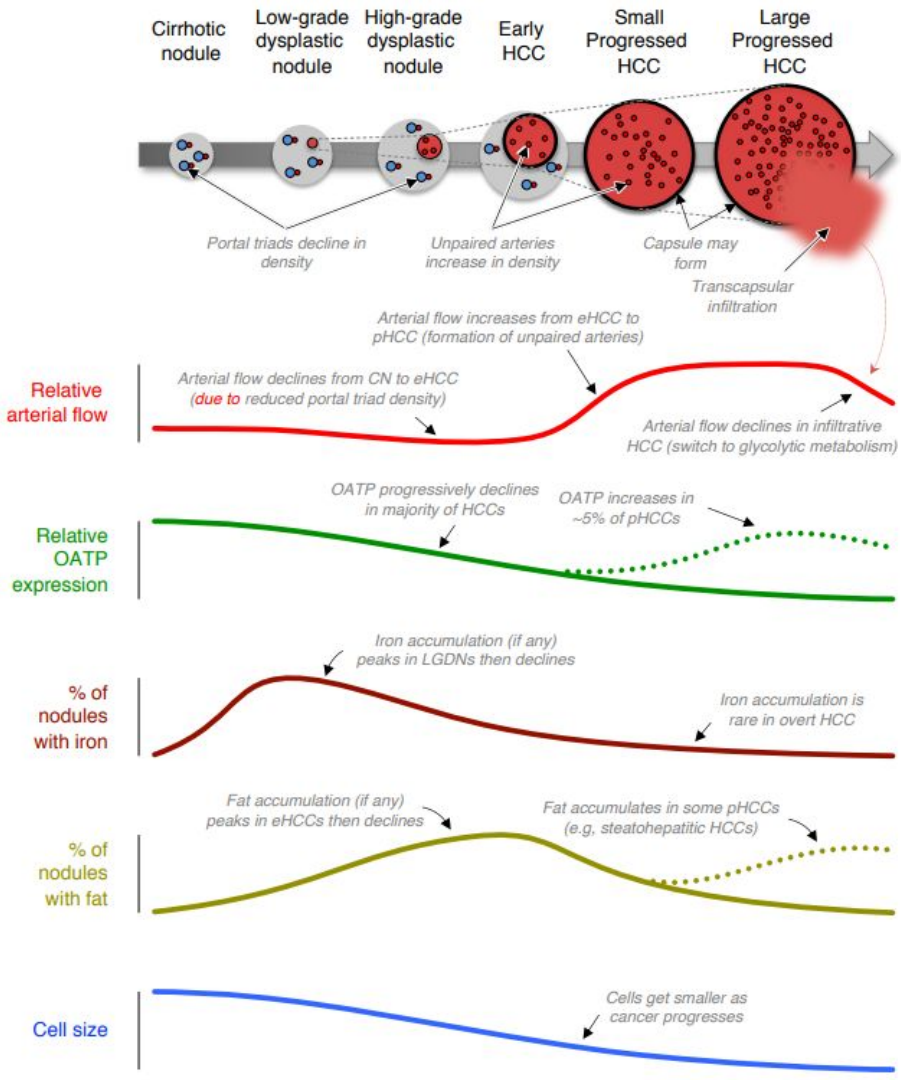
Expansion of gallbladder fossa

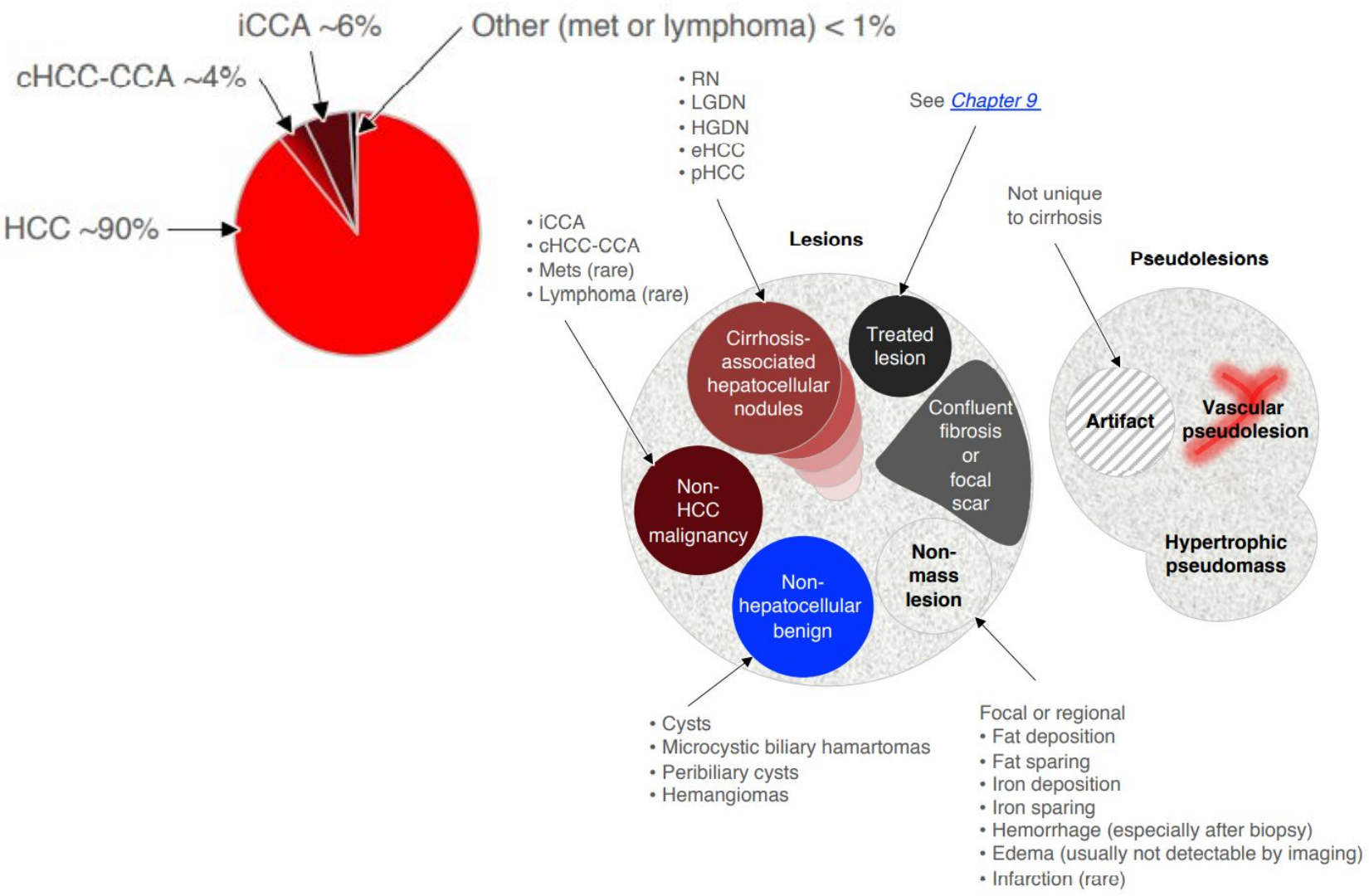
Morphological alterations of cirrhosis that may be evident at imaging





High signal


Cirrhotic nodule
Low-grade dysplastic nodule
High-grade dysplastic nodule
Early HCC
Small Progressed HCC
Large Progressed HCC
Portal triads decline in density
Unpaired arteries increase in density
Capsule may form
Transcapsular infiltration
Arterial flow increases from eHCC to pHCC (formation of unpaired arteries)
Relative arterial flow
Arterial flow declines from CN to eHCC (due to reduced portal triad density)
Arterial flow declines in infiltrative HCC (switch to glycolytic metabolism)
Relative OATP expression
OATP progressively declines in majority of HCCs
OATP increases in ~5% of pHCCs
% of nodules with iron
Iron accumulation (if any) peaks in LGDNs then declines
Iron accumulation is rare in overt HCC
% of nodules with fat
Fat accumulation (if any) peaks in eHCCs then declines
Fat accumulates in some pHCCs (e.g, steatohepatitic HCCs)
Cell size
Cells get smaller as cancer progresses


iCCA ~6%
Other (met or lymphoma) < 1%
cHCC-CCA ~4%
HCC ~90%
• RN
• LGDN
• HGDN
• eHCC
• pHCC
See Chapter 9
Not unique to cirrhosis
• iCCA
• cHCC-CCA
• Mets (rare)
• Lymphoma (rare)
Lesions
Pseudolesions
Cirrhosis-associated hepatocellular nodules
Treated lesion
Confluent fibrosis or focal scar
Non-HCC malignancy
Non-hepatocellular benign
Non-mass lesion
Artifact
Vascular pseudolesion
Hypertrophic pseudomass
• Cysts
• Microcystic biliary hamartomas
• Peribiliary cysts
• Hemangiomas
Focal or regional
• Fat deposition
• Fat sparing
• Iron deposition
• Iron sparing
• Hemorrhage (especially after biopsy)
• Edema (usually not detectable by imaging)
• Infarction (rare)

✓

Apply in patients at high risk for HCC, namely those with:

- Cirrhosis **OR**
- Chronic hepatitis B viral infection **OR**
- Current or prior HCC

Including adult liver transplant candidates and recipients posttransplant

✗

Do not apply in patients:

- Without the above risk factors
- < 18 years old
- With cirrhosis due to congenital hepatic fibrosis
- With cirrhosis due to a vascular disorder such as hereditary hemorrhagic telangiectasia, Budd-Chiari syndrome, chronic portal vein occlusion, cardiac congestion, or diffuse nodular regenerative hyperplasia

✓

Apply for multiphase exams performed with:

- CT or MRI with extracellular contrast agents (ECA) **OR**
- MRI with hepatobiliary contrast agents (HBA)

✗

Do not assign LI-RADS categories for observations:

- That are path-proven malignancies **OR**
- That are path-proven benign lesions of non-hepatocellular origin such as hemangiomas

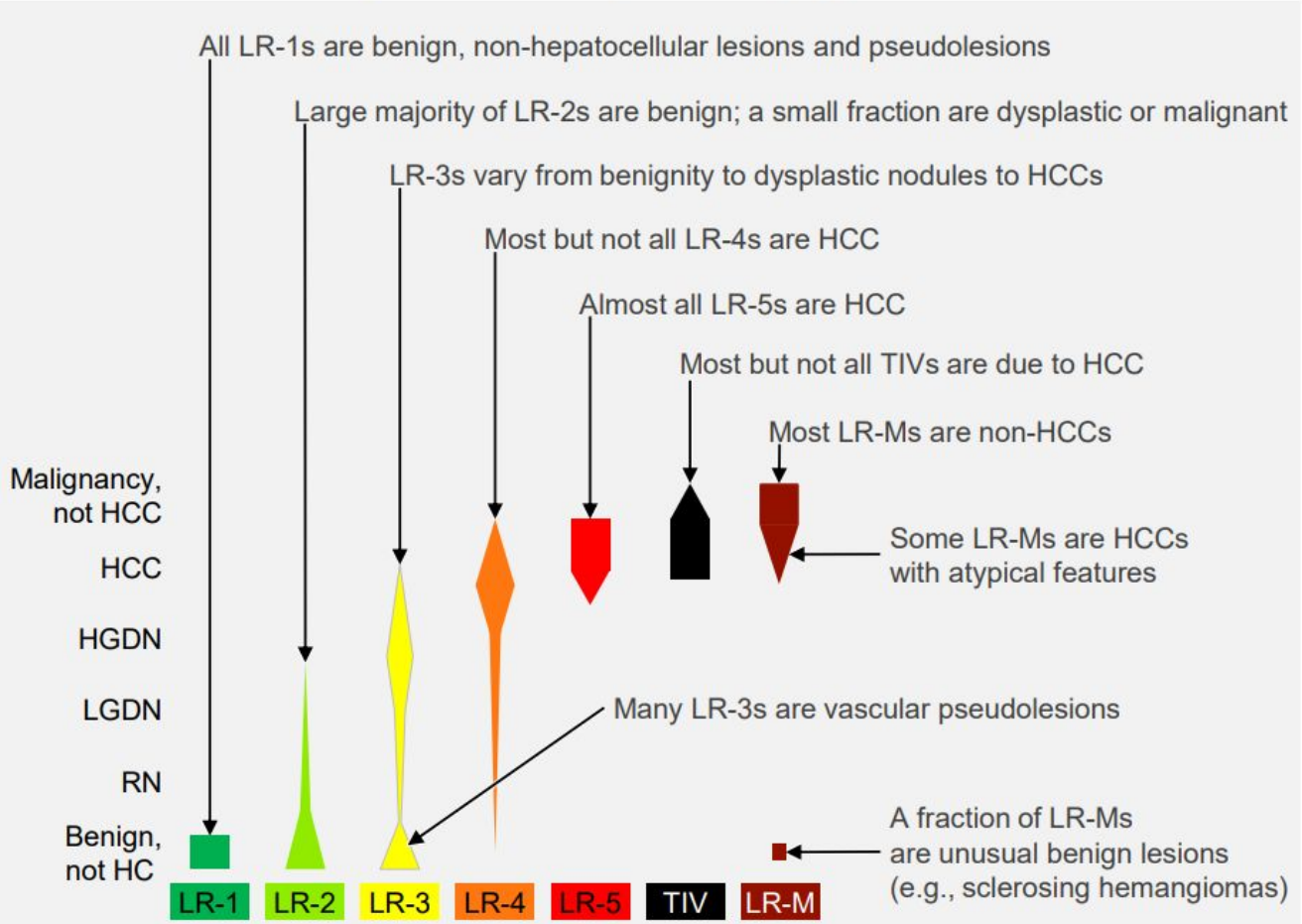
Untreated observation without pathologic proof in patient at high risk for HCC

- If cannot be categorized due to image degradation or omission → LR-NC
- If definite tumor in vein (TIV) → LR-TIV
- If definitely benign → LR-1
- If probably benign → LR-2
- If probably or definitely malignant but not HCC specific (e.g., if targetoid) → LR-M

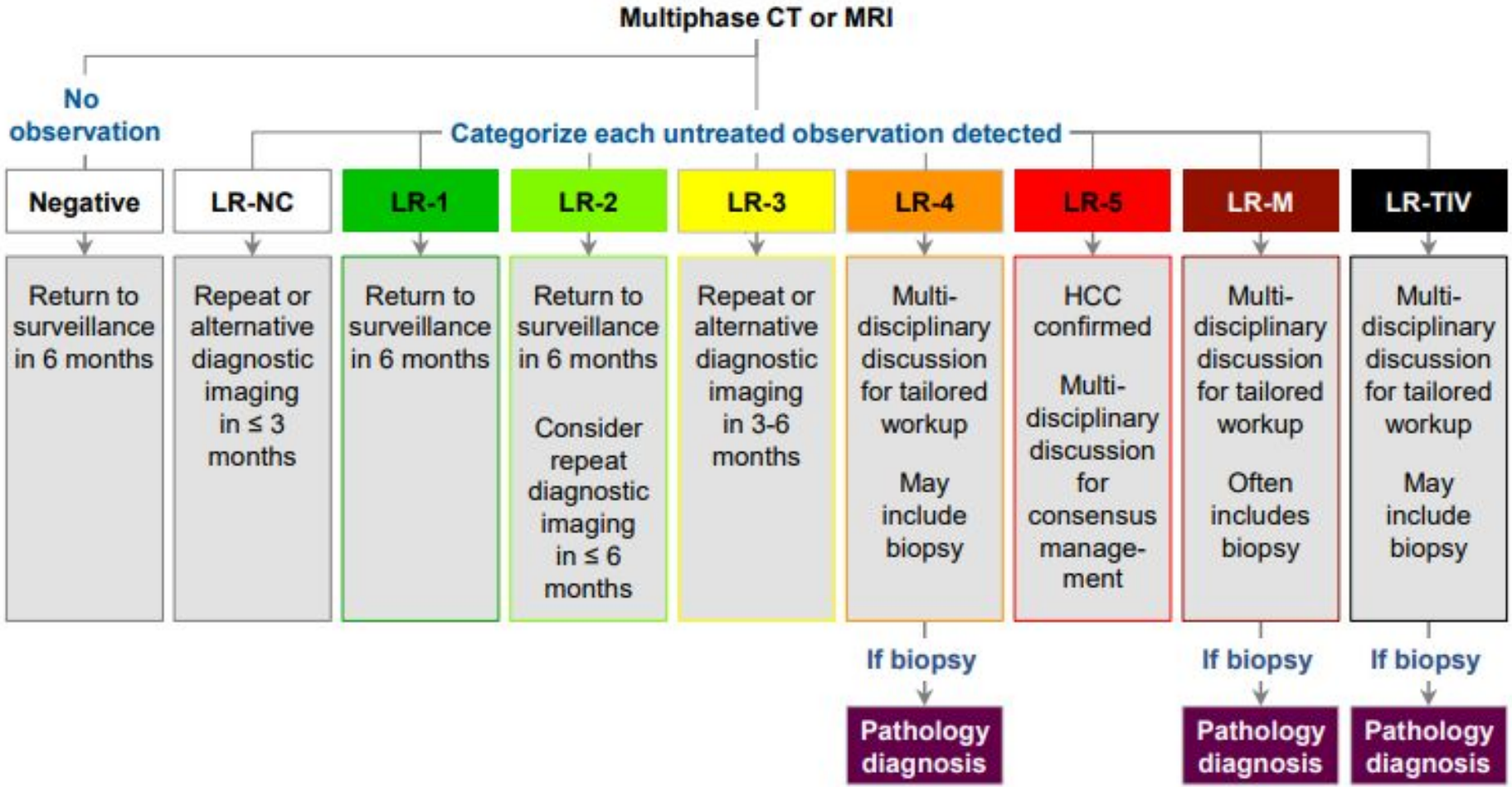
Otherwise, use CT/MRI diagnostic table below

- If intermediate probability of malignancy → LR-3
- If probably HCC → LR-4
- If definitely HCC → LR-5

What is the differential diagnosis of each diagnostic category?



HC = hepatocellular. HGDN = high=grade dysplastic nodule. LGDN = low-grade dysplastic nodule. RN = regenerative nodule


Multiphase CT or MRI
No observation
Categorize each untreated observation detected
Negative
LR-NC
LR-1
LR-2
LR-3
LR-4
LR-5
LR-M
LR-TIV
Return to surveillance in 6 months
Repeat or alternative diagnostic imaging in ≤ 3 months
Return to surveillance in 6 months
Return to surveillance in 6 months
Consider repeat diagnostic imaging in ≤ 6 months
Repeat or alternative diagnostic imaging in 3-6 months
Multi-disciplinary discussion for tailored workup
May include biopsy
HCC confirmed
Multi-disciplinary discussion for consensus manage-ment
Multi-disciplinary discussion for tailored workup
Often includes biopsy
Multi-disciplinary discussion for tailored workup
May include biopsy
If biopsy
If biopsy
If biopsy
Pathology diagnosis
Pathology diagnosis
Pathology diagnosis

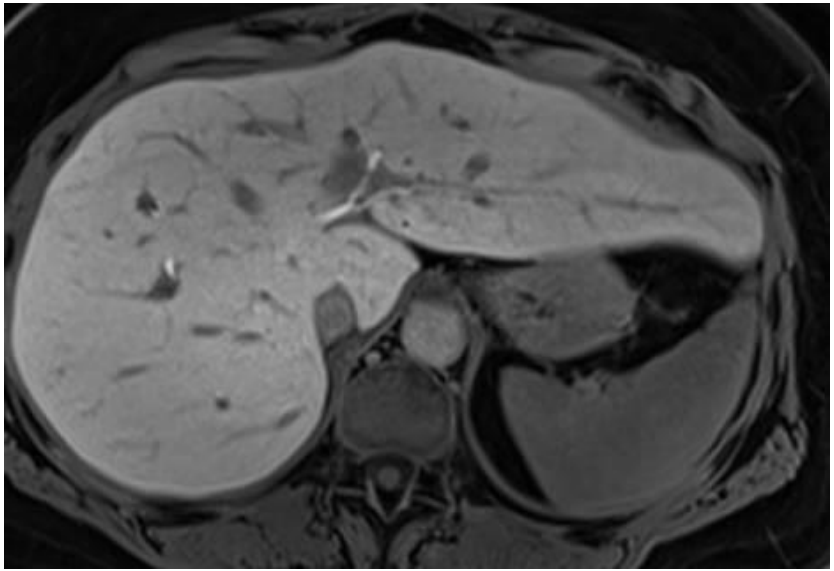
MRT tavalise kontrastainega või maksaspetsiifilisega?

- LI-RADS ei anna soovitust kummaski suunas, ütleb, et mõlemal kontrastaine tüübil on oma plussid ja miinused, otsustage ise
- Maksaspetsiifilise kontrastaine pluss on lisafaasid transitoorfaas ja hepatobiliaarne faas, mida saab kasutada lisatunnuste hindamiseks ja võimaldab koldeid kergemini leida, miinus on nõrgem arteriaalne faas, võimalikud artefaktid arteriaalses faasis, kontrasti väljapesu saab hinnata ainult vaskulaarsetes faasides
- Tavalise kontrastaine pluss on intensiivsema kontrasteerumisega arteriaalne faas, 5 min seeriat saab kasutada väljapesu hindamiseks
- Meil reaalsuses enamikul on üsna väljendunud tsirroos, maksa funktsioon langenud ja 20 min faas on alles transitoorfaas, ei ole õige hepatobiliaarne faas

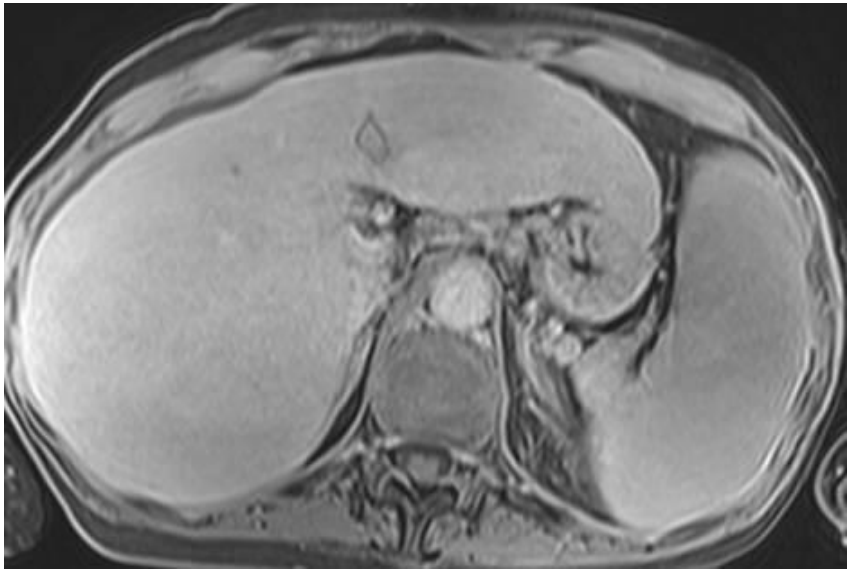
Adekvaatne Primovisti hepatobiliaarne faas

Suured veresooned peavad olema oluliselt tumedamad kui maksa parenhüüm

20 min - hea hepatobiliaarne faas



20 min - kestab alles transitoorfaas



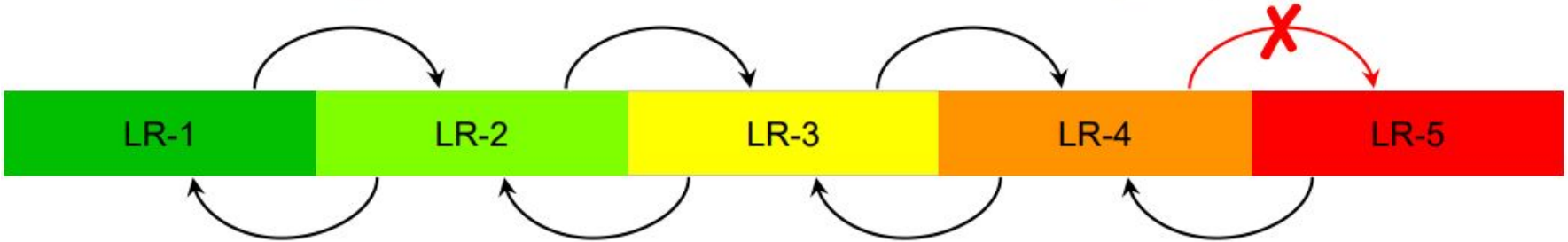
Ancillary features favoring malignancy	Ancillary features favoring benignity
Favoring malignancy in general, not HCC in particular • US visibility as discrete nodule • Subthreshold growth • Restricted diffusion • Mild-moderate T2 hyperintensity • Corona enhancement • Fat sparing in solid mass • Iron sparing in solid mass • Transitional phase hypointensity • Hepatobiliary phase hypointensity	• Size stability > 2 yrs • Size reduction • Parallels blood pool • Undistorted vessels • Iron in mass, more than liver • Marked T2 hyperintensity • Hepatobiliary phase isointensity
Favoring HCC in particular • Nonenhancing “capsule” • Nodule-in-nodule • Mosaic architecture • Blood products in mass • Fat in mass, more than adjacent liver	

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

Ancillary features may be used **at radiologist discretion** for:
Improved detection, increased confidence, or category adjustment

For **category adjustment** (upgrade or downgrade), apply ancillary features as follows:

≥ 1 AF favoring malignancy: upgrade by 1 category up to LR-4
(Absence of these AFs should not be used to downgrade)



≥ 1 AF favoring benignity: downgrade by 1 category
(Absence of these AFs should not be used to upgrade)

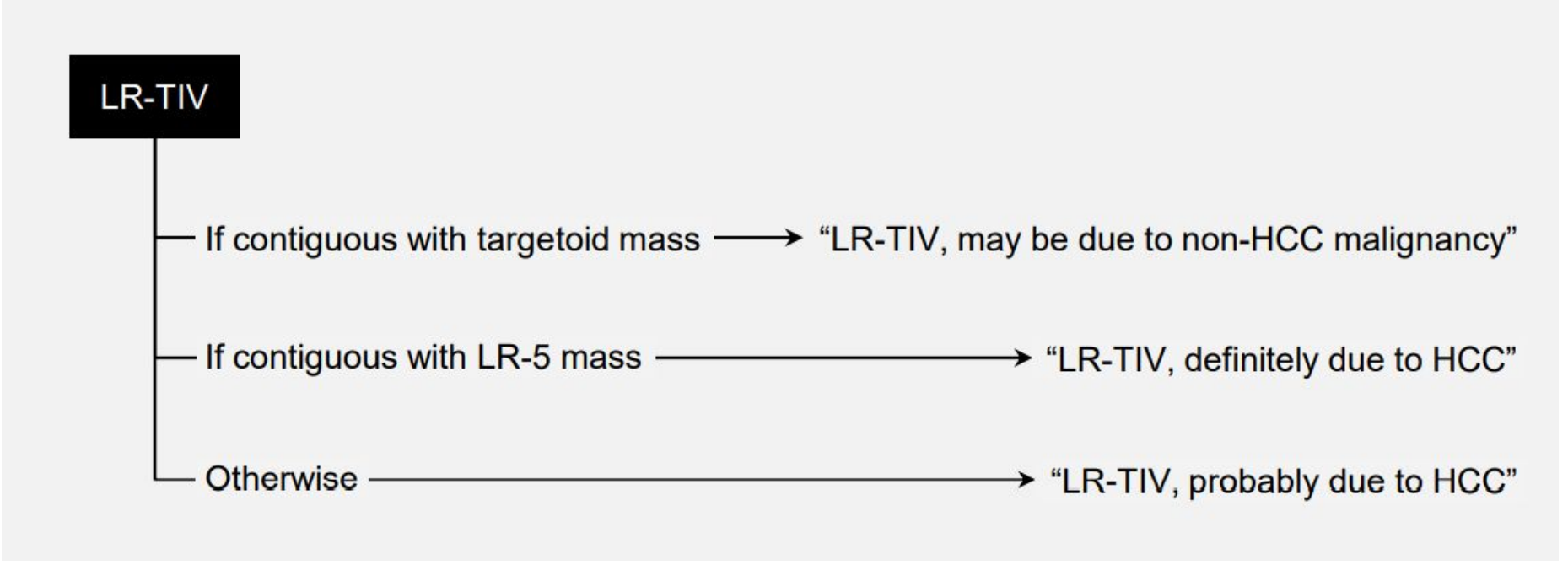
If ≥ 1 AF favoring malignancy and ≥ 1 AF favoring benignity:
Do not adjust category

Ancillary features cannot be be used to upgrade to LR-5

Tumor in vein

LR-TIV

Unequivocal enhancing soft tissue in vein, regardless of visualization of parenchymal mass



LR-TIV: Malignancy with tumor in vein (TIV)

Conceptual definition: 100% certainty there is malignancy with tumor in vein

CT/MRI criterion:

Presence of definite enhancing soft tissue in vein, regardless of visualization of parenchymal mass

Suggestive but not definitive features of tumor in vein :

- Occluded vein with ill-defined walls
- Occluded vein with restricted diffusion
- Occluded or obscured vein contiguous with malignant parenchymal mass
- Heterogeneous vein enhancement not attributable to artifact

Hint: If any of these features are present, scrutinize vein for enhancing soft tissue.

LR-M

Märkalaud tüüpi või infiltratiivne mass või muul põhjusel jätab mulje mitte-HCC maliigsest kasvajast, näiteks rohke nekroosi tõttu

LR-M: Probably or definitely malignant, not HCC specific

Conceptual definition: High probability or 100% certainty observation is malignant but features are not HCC specific

CT/MRI criteria:

OR

Targetoid mass with any of following Imaging appearance on various phases or sequences:

- Targetoid dynamic enhancement, any of following:
  - Rim APHE
  - Peripheral washout appearance
  - Delayed central enhancement
- Targetoid diffusion restriction
- Targetoid TP or HBP signal intensity

No tumor in vein
Not meeting LR-5 criteria

Nontargetoid mass with one or more of the following:

- Infiltrative appearance
- Marked diffusion restriction
- Necrosis or severe ischemia
- Other feature suggesting non-HCC malignancy (specify in report)

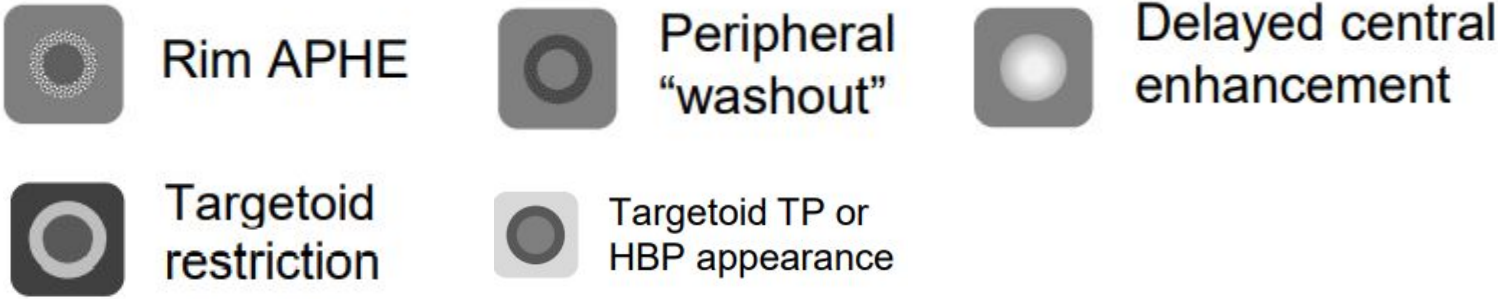
Targetoid, definition

Target-like imaging morphology. Concentric arrangement of internal components.
Likely reflects peripheral hypercellularity and central stromal fibrosis or ischemia.

Characteristic of

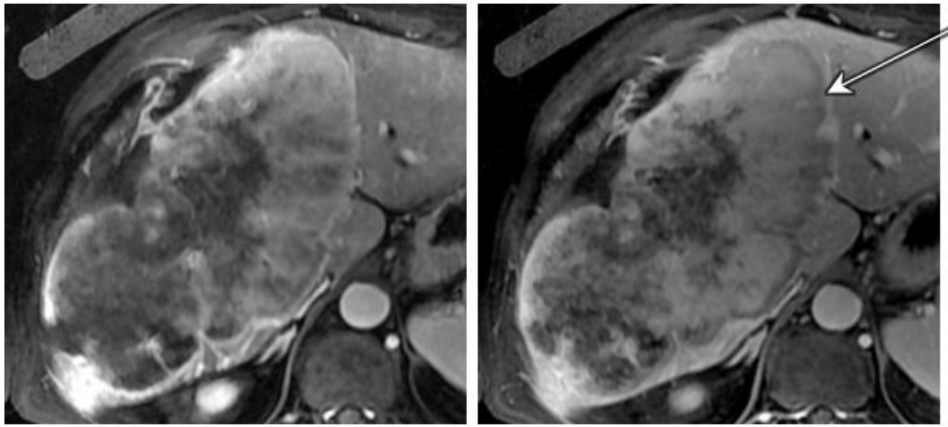
- Intrahepatic cholangiocarcinoma (iCCA)
- Combined HCC-cholangiocarcinoma (combined HCC-CCA or cHCC-CCA)
- Other non-HCC malignancies

Can be seen in HCC with atypical appearance.
Therefore, targetoid appearance suggests non-HCC malignancy but does not exclude HCC.



Arterial phase

Postarterial extracellular phase



Peripheral "washout": note that periphery becomes hypointense relative to liver

LR-M

can be categorized LR-M based on peripheral "washout" alone, regardless of other features

CT/MRI Diagnostic Table

Arterial phase hyperenhancement (APHE)		No APHE		Nonrim APHE		
Observation size (mm)		< 20	≥ 20	< 10	10-19	≥ 20
Count additional major features: • Enhancing "capsule" • Nonperipheral "washout" • Threshold growth	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

LR-4 / LR-5

Observations in this cell are categorized based on one additional major feature:
- LR-4 – if enhancing "capsule"
- LR-5 – if nonperipheral "washout" **OR** threshold growth

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

Nonrim APHE

Kontrasteerub hilisarteriaalses faasis rohkem kui maksa foon

Size

Mõõda kolde väliskontuurist väliskontuurini koos kapsliga. Ära mõõda arteriaalses faasis või difusioonikujutisel, kui mujal on ka kolle näha

Nonperipheral “washout”

Kontrasteerub vähem kui maksa foon parenhümatoosses või hilisfaasis (tavaline kontrastaine) või parenhümatoosses faasis (Primovist)

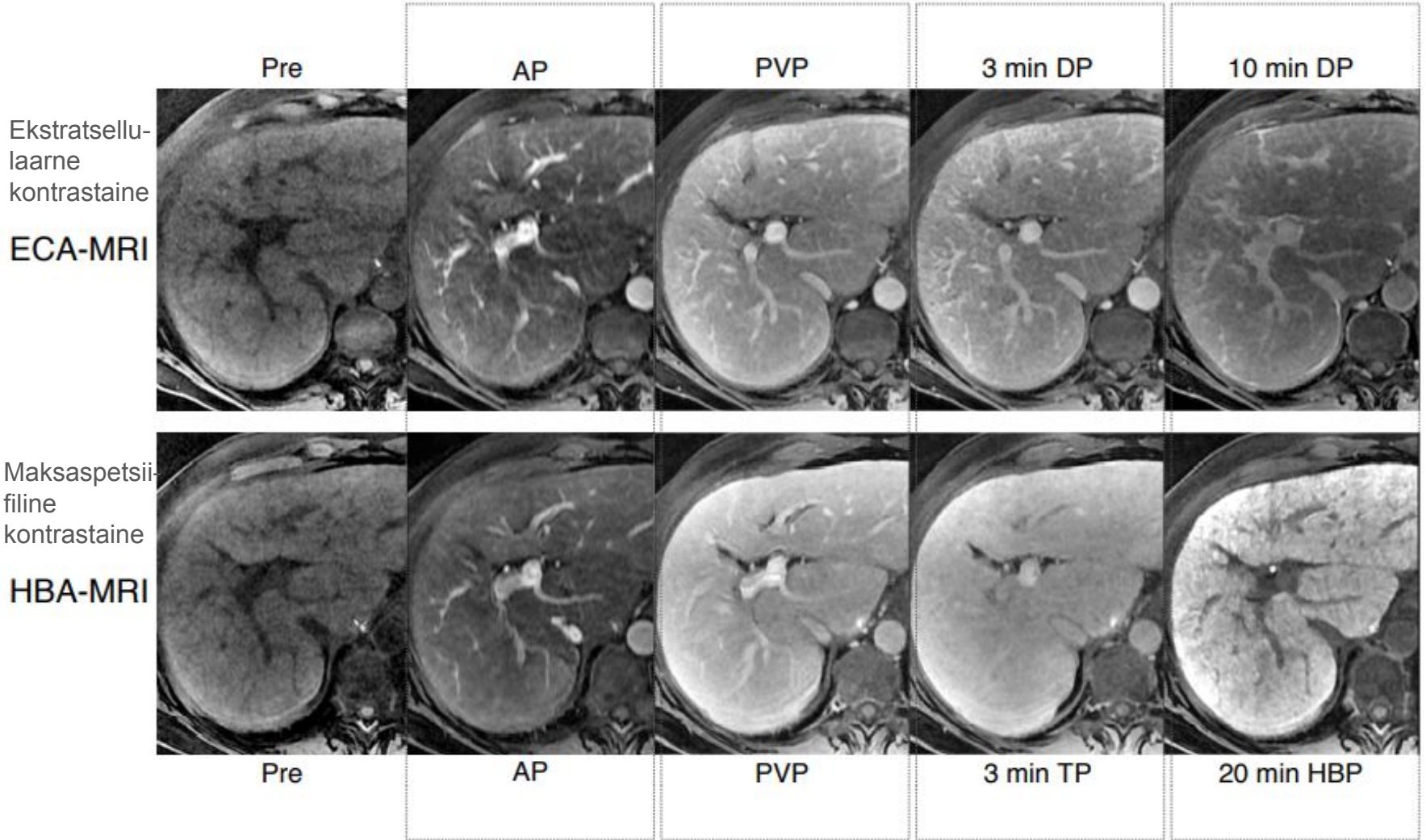
Threshold growth

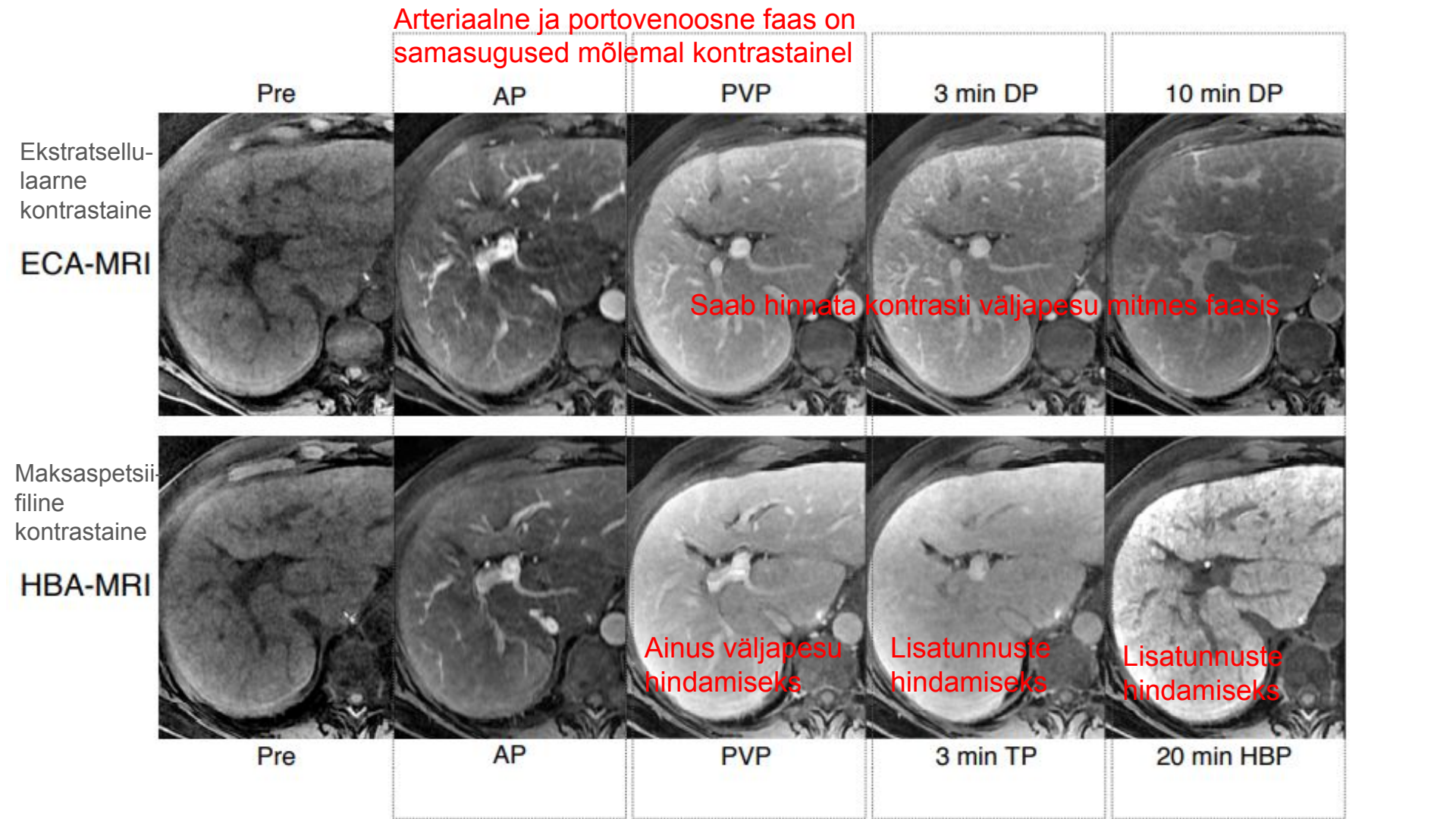
Diameetri suurenemine vähemalt 50% vähem kui 6 kuuga

Enhancing “capsule”

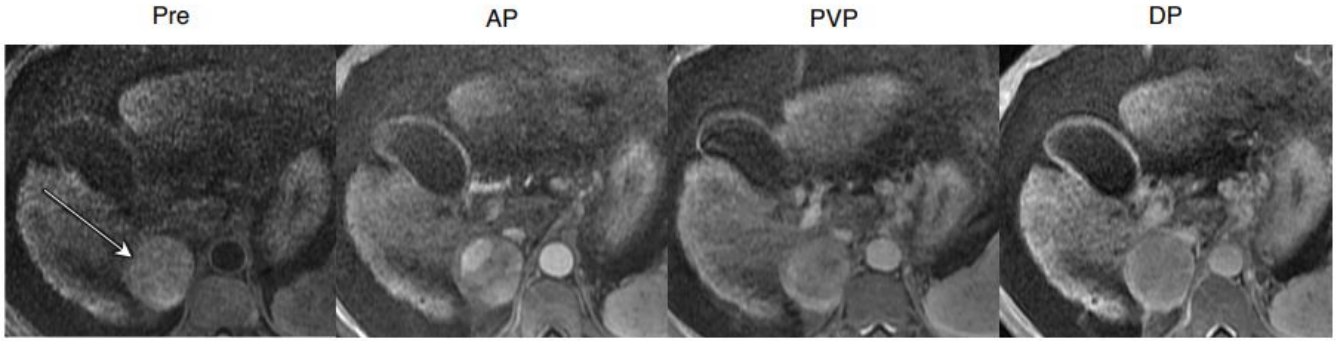
Kontrasteeruv ääris parenhümatoosses, tavalise kontrastaine hilisfaasis või Primovisti transitoorfaasis

Nonrim APHE ja Nonperipheral “washout” ei pea olema koldes täpselt samas lokalisatsioonis


Pre
AP
PVP
3 min DP
10 min DP
Ekstratsellu-
laarne
kontrastaine
ECA-MRI
Maksaspetsii-
filine
kontrastaine
HBA-MRI
Pre
AP
PVP
3 min TP
20 min HBP

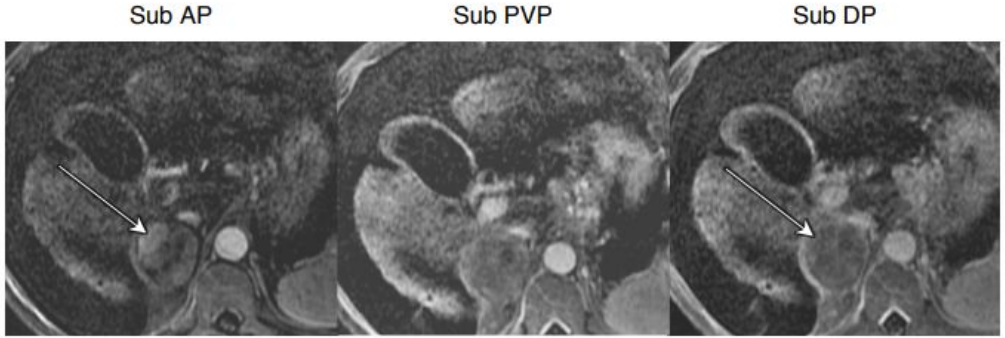

Arteriaalne ja portovenoosne faas on samasugused mõlemal kontrastainel
Pre
AP
PVP
3 min DP
10 min DP
Ekstratsellu-laarne kontrastaine
ECA-MRI
Saab hinnata kontrasti väljapesu mitmes faasis
Maksaspetsii-filine kontrastaine
HBA-MRI
Ainus väljapesu hindamiseks
Lisatunnuste hindamiseks
Lisatunnuste hindamiseks
Pre
AP
PVP
3 min TP
20 min HBP

Vaata ka subtraktsiooni seeriaid



High signal on pre

Assessment of APHE and WO is confounded by intrisically high T1 signal



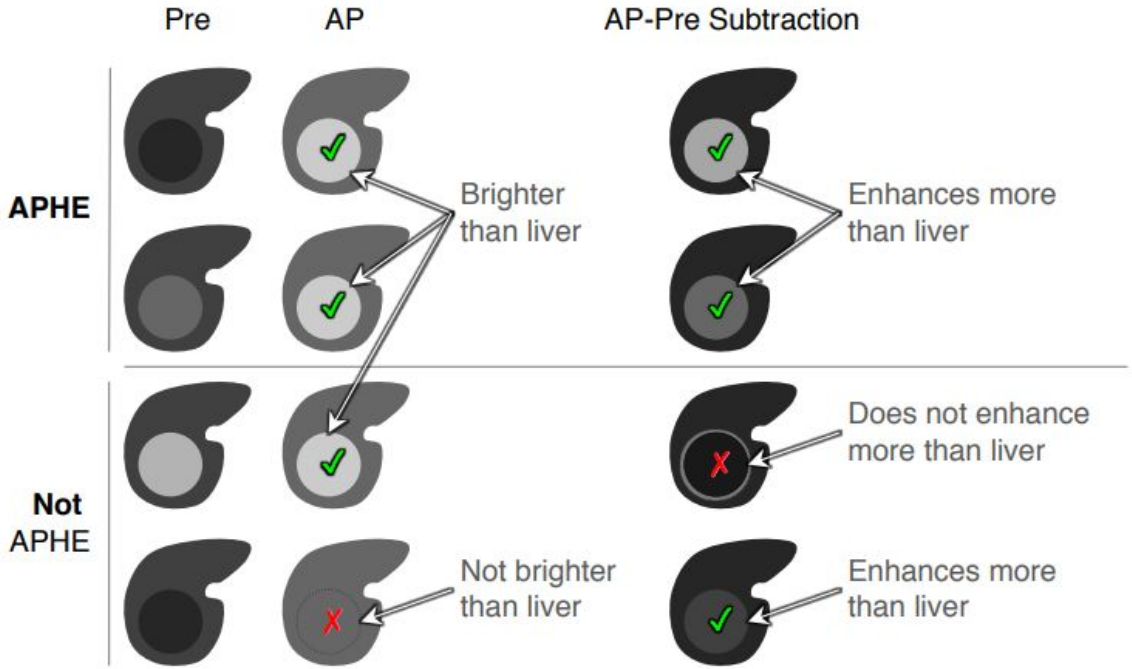
Subtractions confirm presence of APHE and DP WO

APHE is present if **BOTH** of the following are met:

- Observation in whole or in part enhances more than liver in arterial phase [a]

AND

- Enhancing part is brighter than liver in arterial phase



Nodule-like Arterial Phase Hyperenhancement (NAPH)

Definition

Nodule-like area or focus of arterial phase hyperenhancement < 10 mm, detected at contrast-enhanced CT or MRI and occult on other phases and sequences.

NAPHs < 5 mm should be categorized LR-2.

- Rationale: most tiny NAPHs are benign vascular pseudolesions

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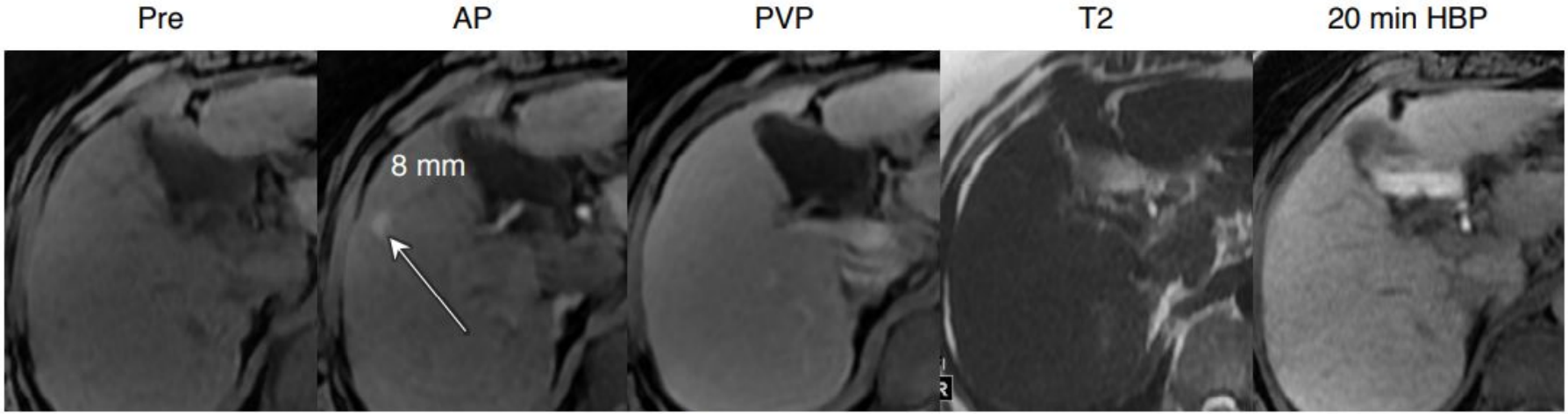
NAPHs ≥ 5 mm and < 10 mm should be categorized LR-3.

- The category may be downgraded to LR-2 if there are ancillary features favoring benignity (e.g., size reduction, size stability for ≥ 2 years, HBP isointensity) OR
- Upgraded by one category if the NAPH appears unequivocally larger on current than prior exam.



8-mm nodular area of enhancement is seen on AP only (arrow), without corresponding signal abnormality on any other sequence. This NAPH is categorized LR-3; if HBP isointensity (AF of benignity) is applied, the observation is categorized LR-2.

LR-1: Definitely Benign

Conceptual definition: 100% certainty observation is nonmalignant

Criteria: LI-RADS does not provide criteria for most entities that may be categorized LR-1, but instead provides examples

Examples:

Definite:

- Cyst (*page 15-2*)
- Hemangioma (*page 15-4*)
- Perfusion alteration (e.g., arterioportal shunt) (*page 15-25*)
- Hepatic fat deposition or sparing (*page 15-14* and *15-16*)
- Hypertrophic pseudomass (*page 15-21*)
- Confluent fibrosis or focal scar (*page 15-18* and *15-23*)

Definite spontaneous disappearance

List above not meant to be exhaustive

LR-2: Probably Benign

Conceptual definition: High probability but not 100% certainty observation is nonmalignant

Criteria: LI-RADS does not provide criteria for most entities that may be categorized LR-2, but instead provides examples

Examples:

Probable:

- Cyst (*page 15-2*)
- Hemangioma (*page 15-4*)
- Perfusion alteration (e.g., arterioportal shunt) (*page 15-25*)
- Hepatic fat deposition or sparing (*page 15-14* and *15-16*)
- Hypertrophic pseudomass (*page 15-21*)
- Confluent fibrosis or focal scar (*page 15-18* and *15-23*)

Distinctive nodule without malignant imaging features (*page 15-26*)

List above not meant to be exhaustive

LR-3: Intermediate probability of malignancy

Conceptual definition: Nonmalignant & malignant entities each have moderate probability

CT/MRI criteria:

Nonrim arterial phase hyperenhancement:

- < 20 mm with no additional major features

Arterial phase hypo- or isoenhancement:

- < 20 mm with ≤ 1 additional major feature OR
- ≥ 20 mm with no additional major features

Pathological correlation

- ~ 38% (31-45%) of LR-3 are HCC.
- ~ 40% (31-50%) of LR-3 are malignant.

Natural history 3-11% of LR-3 observations progress to LR-5 or, rarely, to LR-M by 12 months

CT/MRI Diagnostic Table

Arterial phase hyperenhancement (APHE)		No APHE		Nonrim APHE		
Observation size (mm)		< 20	≥ 20	< 10	10-19	≥ 20
Count additional major features: • Enhancing "capsule" • Nonperipheral "washout" • Threshold growth	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

LR-4 / LR-5

Observations in this cell are categorized based on one additional major feature:

- LR-4 – if enhancing "capsule"
- LR-5 – if nonperipheral "washout" **OR** threshold growth

LR-4: Probably HCC

Conceptual definition: High probability but not 100% certainty observation is HCC

CT/MRI criteria:

Nonrim arterial phase hyperenhancement:

- < 10 mm with ≥ 1 additional major feature OR
- 10-19 mm with "capsule" as the only additional major feature OR
- ≥ 20 mm with no additional major feature

Arterial phase hypo- or isoenhancement:

- < 20 mm with ≥ 2 additional major features OR
- ≥ 20 mm with ≥ 1 additional major feature

Pathological correlation

- ~ 74% (67-80%) of LR-4 are HCC
- ~ 80% (75-85%) of LR-4 are malignant.
- LR-4 does not exclude non-HCC malignancy. A small non-HCC malignancy may fail to demonstrate LR-M imaging features

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Natural history ~36-47% of LR-4 observations progress to LR-5 or, rarely, to LR-M by 12 months.

CT/MRI Diagnostic Table

Arterial phase hyperenhancement (APHE)		No APHE		Nonrim APHE		
Observation size (mm)		< 20	≥ 20	< 10	10-19	≥ 20
Count additional major features: • Enhancing "capsule" • Nonperipheral "washout" • Threshold growth	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

LR-4 / LR-5

Observations in this cell are categorized based on one additional major feature:

- LR-4 – if enhancing "capsule"
- LR-5 – if nonperipheral "washout" **OR** threshold growth

LR-5: Definitely HCC

Conceptual definition: 100% certainty observation is HCC

CT/MRI criteria:

Nonrim arterial phase hyperenhancement AND:

- 10-19 mm with nonperipheral "washout" OR
- 10-19 mm with threshold growth OR
- ≥ 20 mm with ≥ 1 additional major feature

Pathological correlation

- ~ 94% (92-96%) of LR-5 are HCC.
- ~ 97% (95-99%) of LR-5 are malignant.
- LR-5 has modest sensitivity for HCC.
- Not all HCCs can be categorized as LR-5.

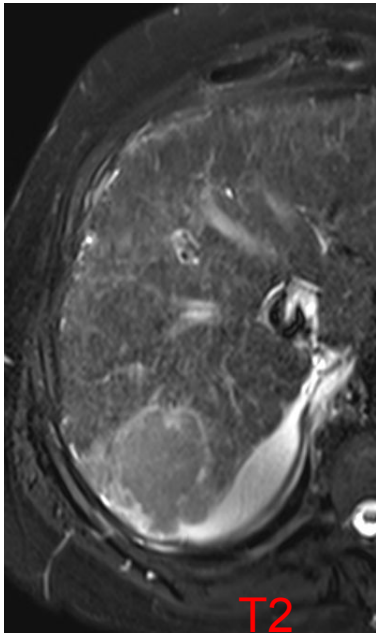
CT/MRI Diagnostic Table

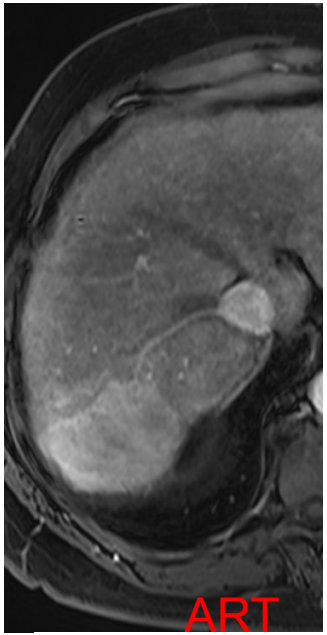
Arterial phase hyperenhancement (APHE)		No APHE		Nonrim APHE		
Observation size (mm)		< 20	≥ 20	< 10	10-19	≥ 20
Count additional major features: • Enhancing "capsule" • Nonperipheral "washout" • Threshold growth	None	LR-3	LR-3	LR-3	LR-3	LR-4
	One	LR-3	LR-4	LR-4	LR-4 / LR-5	LR-5
	≥ Two	LR-4	LR-4	LR-4	LR-5	LR-5

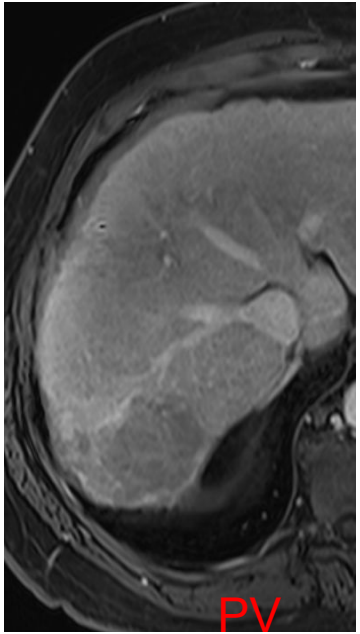
LR-4 / LR-5

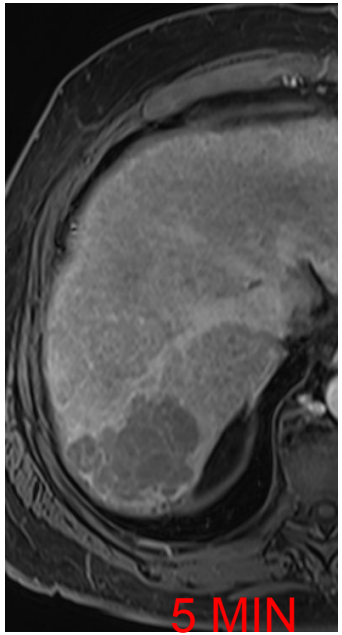
Observations in this cell are categorized based on one additional major feature:

- LR-4 – if enhancing "capsule"
- LR-5 – if nonperipheral "washout" **OR** threshold growth





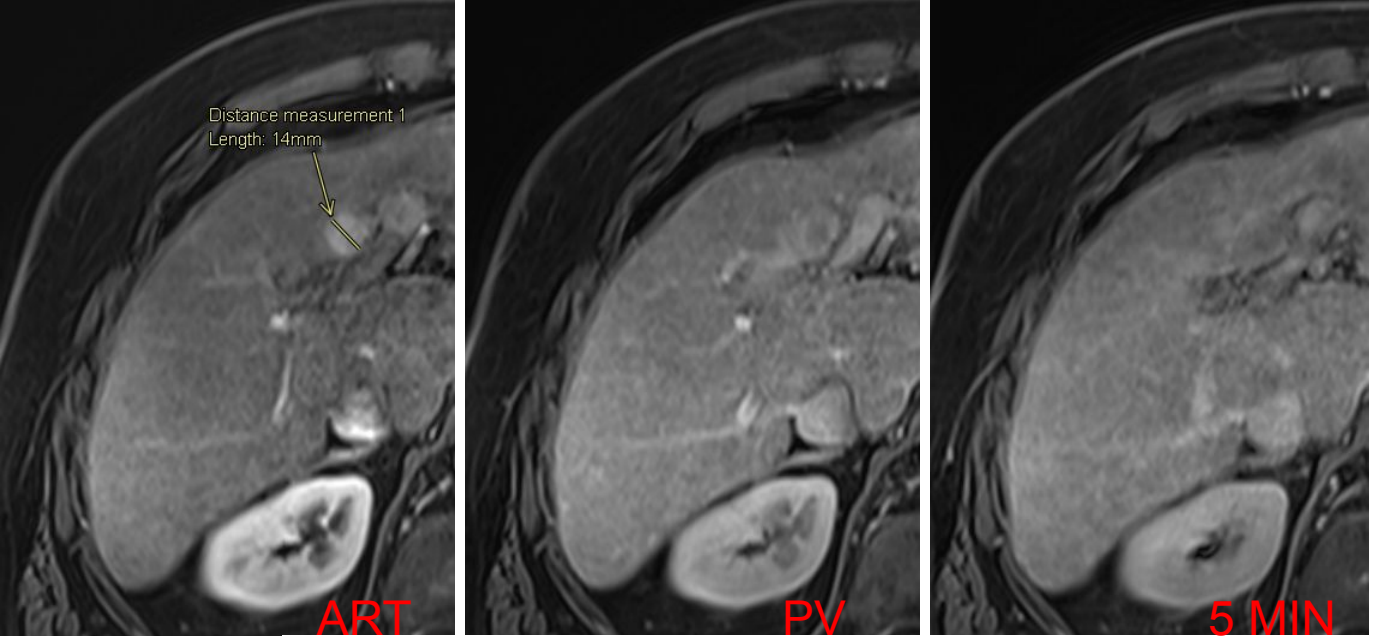




Arterial phase hyperenhancement (APHE)		No APHE		Nonrim APHE		
Observation size (mm)		< 20	≥ 20	< 10	10-19	≥ 20
Count additional major features: • Enhancing "capsule" • Nonperipheral "washout" • Threshold growth	None	LR-3	LR-3	LR-3	LR-3	LR-4
	One	LR-3	LR-4	LR-4	LR-4 / LR-5	LR-5
	≥ Two	LR-4	LR-4	LR-4	LR-5	LR-5

LR-4 / LR-5

Observations in this cell are categorized based on one additional major feature:
- LR-4 – if enhancing "capsule"
- LR-5 – if nonperipheral "washout" **OR** threshold growth



Arterial phase hyperenhancement (APHE)		No APHE		Nonrim APHE		
Observation size (mm)		< 20	≥ 20	< 10	10-19	≥ 20
Count additional major features: • Enhancing "capsule" • Nonperipheral "washout" • Threshold growth	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

LR-4 / LR-5

Observations in this cell are categorized based on one additional major feature:
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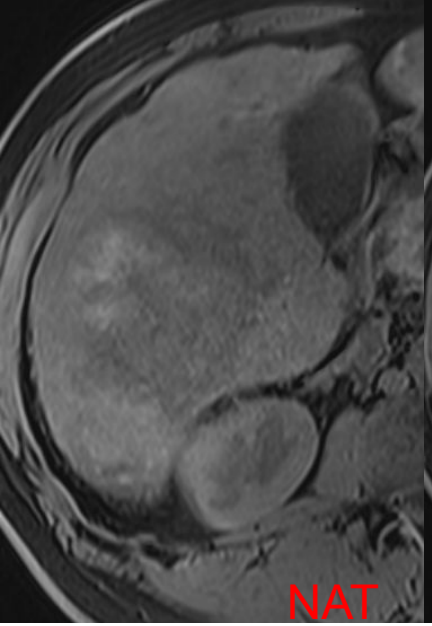
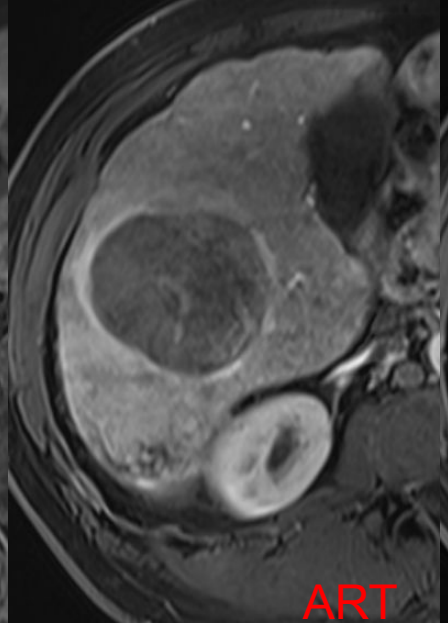
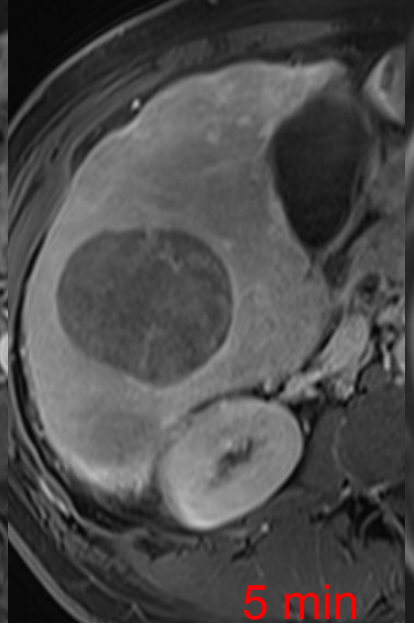
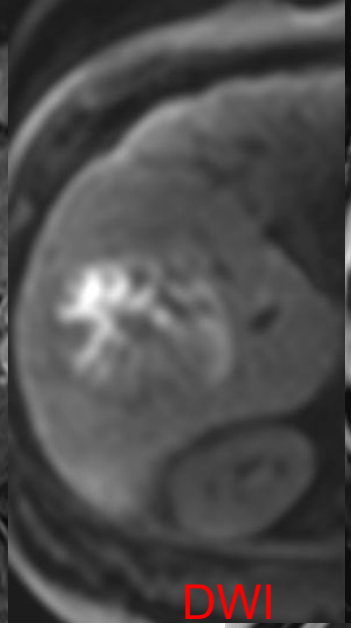
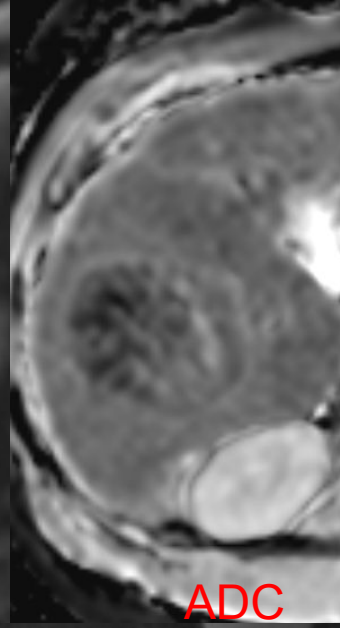






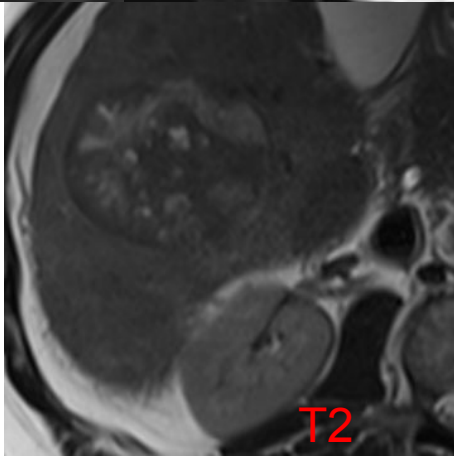




Arterial phase hyperenhancement (APHE)		No APHE		Nonrim APHE		
Observation size (mm)		< 20	≥ 20	< 10	10-19	≥ 20
Count additional major features: • Enhancing "capsule" • Nonperipheral "washout" • Threshold growth	None	LR-3	LR-3	LR-3	LR-3	LR-4
	One	LR-3	LR-4	LR-4	LR-4 / LR-5	LR-5
	≥ Two	LR-4	LR-4	LR-4	LR-5	LR-5

LR-4 / LR-5

Observations in this cell are categorized based on one additional major feature:
- LR-4 – if enhancing "capsule"
- LR-5 – if nonperipheral "washout" **OR** threshold growth



LI-RADS® CT/MRI Treatment Response: Populations

Apply in patients to assess response for path-proven or presumed (e.g. LR-4, LR-5, LR-M) malignancy after locoregional treatment:

- Locoablative **OR**
- Transcatheter **OR**
- External radiation

Locoablative therapies: radiofrequency, microwave, ethanol ablations and cryoablation.

Transcatheter therapies: bland embolization, chemoembolization with or without drug-eluting beads, and radioembolization.

Do not apply for treatment response assessment after:

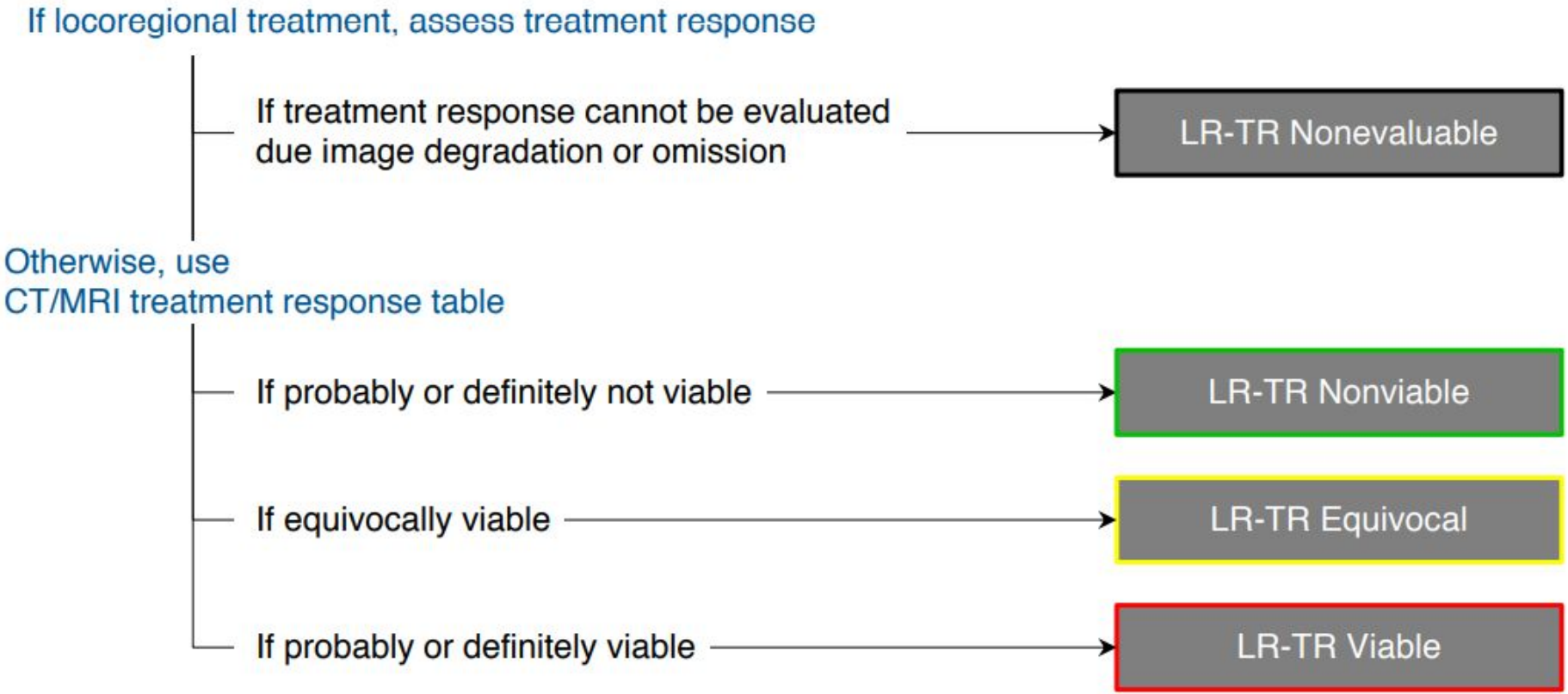
- Systemic therapy

Future versions of LI-RADS may address treatment response after systemic therapy.

Apply with caution for treatment response assessment after:

- Surgical resection
- Locoregional treatment in combination with systemic therapy

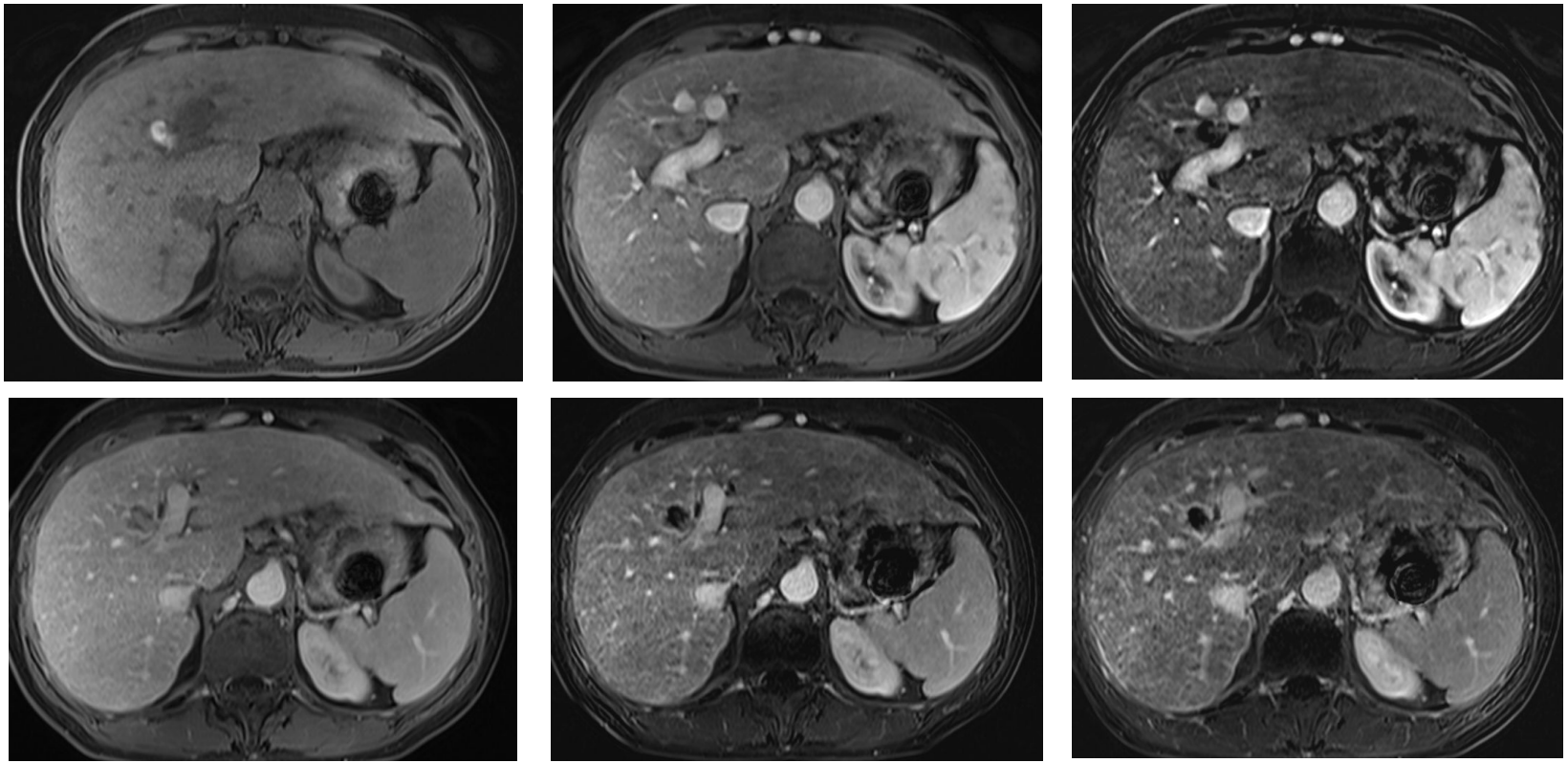
May apply with caution for postsurgical patients when assessing recurrence at the surgical margin, or in patients who undergo combined locoregional and systemic therapy.


If locoregional treatment, assess treatment response
If treatment response cannot be evaluated due image degradation or omission
LR-TR Nonevaluable
Otherwise, use CT/MRI treatment response table
If probably or definitely not viable
LR-TR Nonviable
If equivocally viable
LR-TR Equivocal
If probably or definitely viable
LR-TR Viable

Definitions of posttreatment response categories

Response Category	Criteria
LR-TR Nonviable	No lesional enhancement **OR** Treatment-specific expected enhancement pattern
LR-TR Equivocal	Enhancement atypical for treatment-specific expected enhancement pattern and not meeting criteria for probably or definitely viable.
LR-TR Viable	Nodular, mass-like, or thick irregular tissue in or along the treated lesion with any of the following: • Arterial phase hyperenhancement (APHE) **OR** • Washout appearance **OR** • Enhancement similar to pre treatment

LR5 kolde mikrolaine ablatsioon 14.03.24 TÜK



Joodiallergiat ei ole olemas

- Reaktsioonid joodi sisaldavale kontrastainele ei ole seotud joodiga
- Joodiallergiat ei ole olemas. Füsioloogilised ja ülitundlikkusreaktsioonid joodi sisaldavatele ja kontrastainetele on olemas

- Varasem hilist tüüpi ülitundlikkusreaktsioon ei suurenda varaste reaktsioonide tekke riski ja vastupidi
- Näiteks, kui pärast eelmist kontrastainega KT uuringut tekkis õhtul nahalööve, siis patsiendil ei ole selle pärast suurenenud risk anafülaksialaadseks või muuks raskeks varaseks reaktsiooniks, aga on risk sarnase nahalööbe tekkimiseks järgmisel korral