

Liver imaging at digital age

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Disclosures

- Speaker fees
 - Bracco
 - Guerbet
 - Supersonic
 - Toshiba
- Consultant
 - Guerbet
- PI of industry-based study
 - Guerbet

Imaging is digital since...

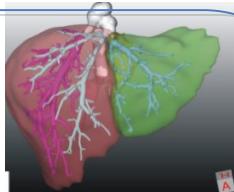


Comparison
Follow-up
Quantification

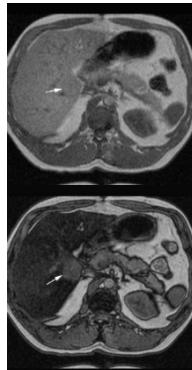
Quantitative liver imaging

Reliable

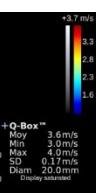
- Liver volume



- Fat quantification



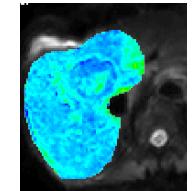
- Iron quantification



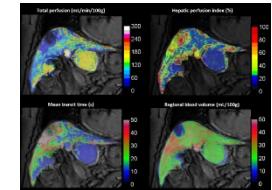
- Liver stiff

Under investigation

- Diffusion

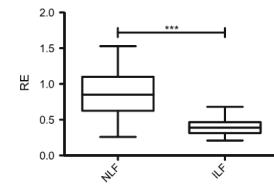


- Perfusion parameters



- Fingerprinting

- Liver function



Quantitative liver imaging

Measure

Extraction of large amount of quantitative features from medical images using data-characterisation algorithms

Radiomics

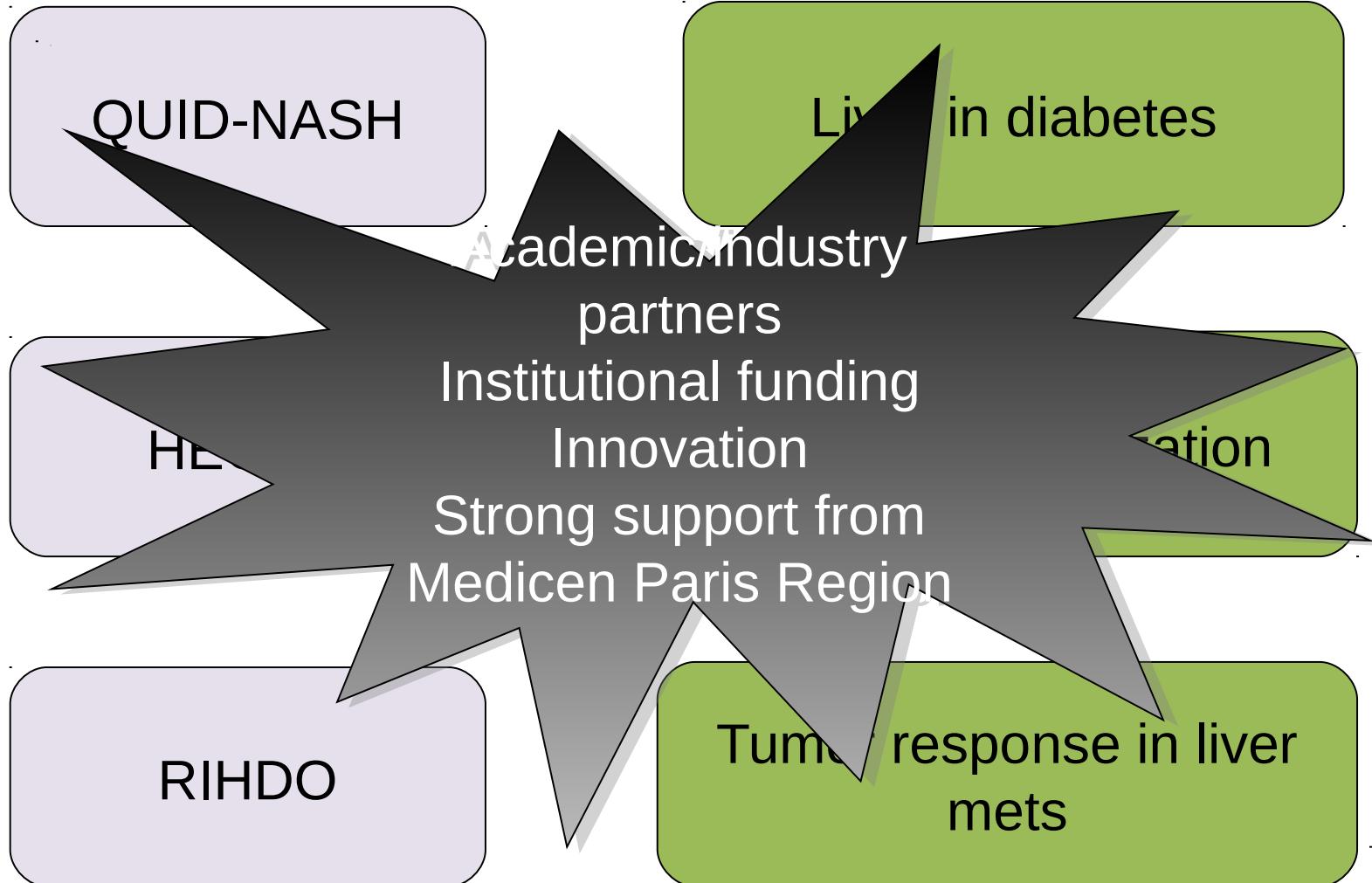
Artificial intelligence

Quantification

Interpretation

theory and development of computer systems that can perform tasks that normally require human intelligence

Liver: Three examples



Now

endocrinologist



QUID NASH

Hepatologist



6-12 months

biopsy



Hepatologist



STEP 1 (...) **STEP 3**

STEP 4

STEP 5

STEP 6

Tomorrow

endocrinologist

Virtual
liver biopsy



1-2 w.

Hepatolo

MRI



STEP 1

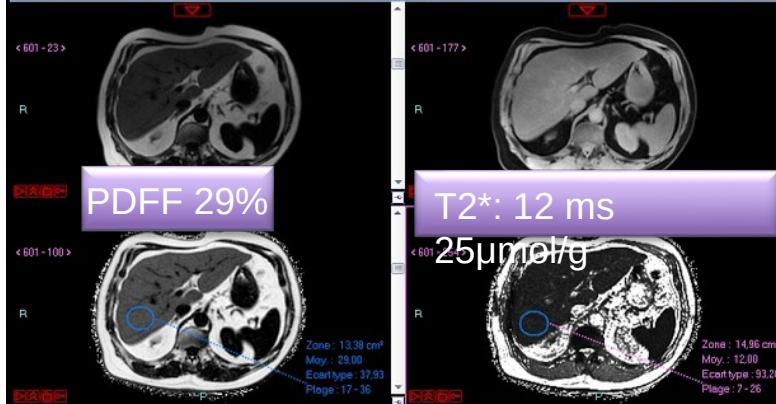
**Data
integration**

- Clinical
- Biochemical
- Omics
- Microvesicules
- Immun. cells

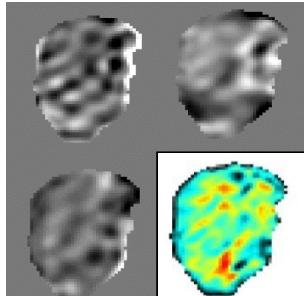
MR quantification is very good US is in progress

MRI

Fat quantification

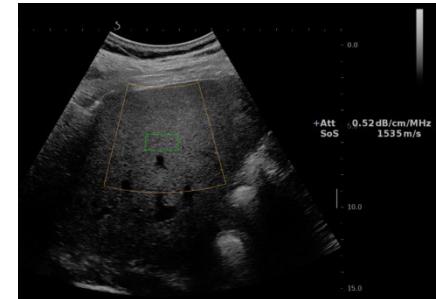


Liver stiffness

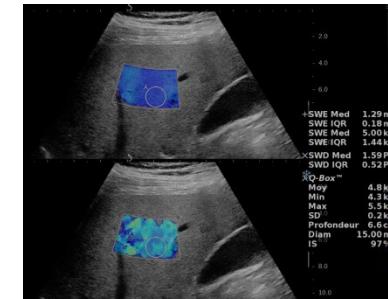


Ultrasound

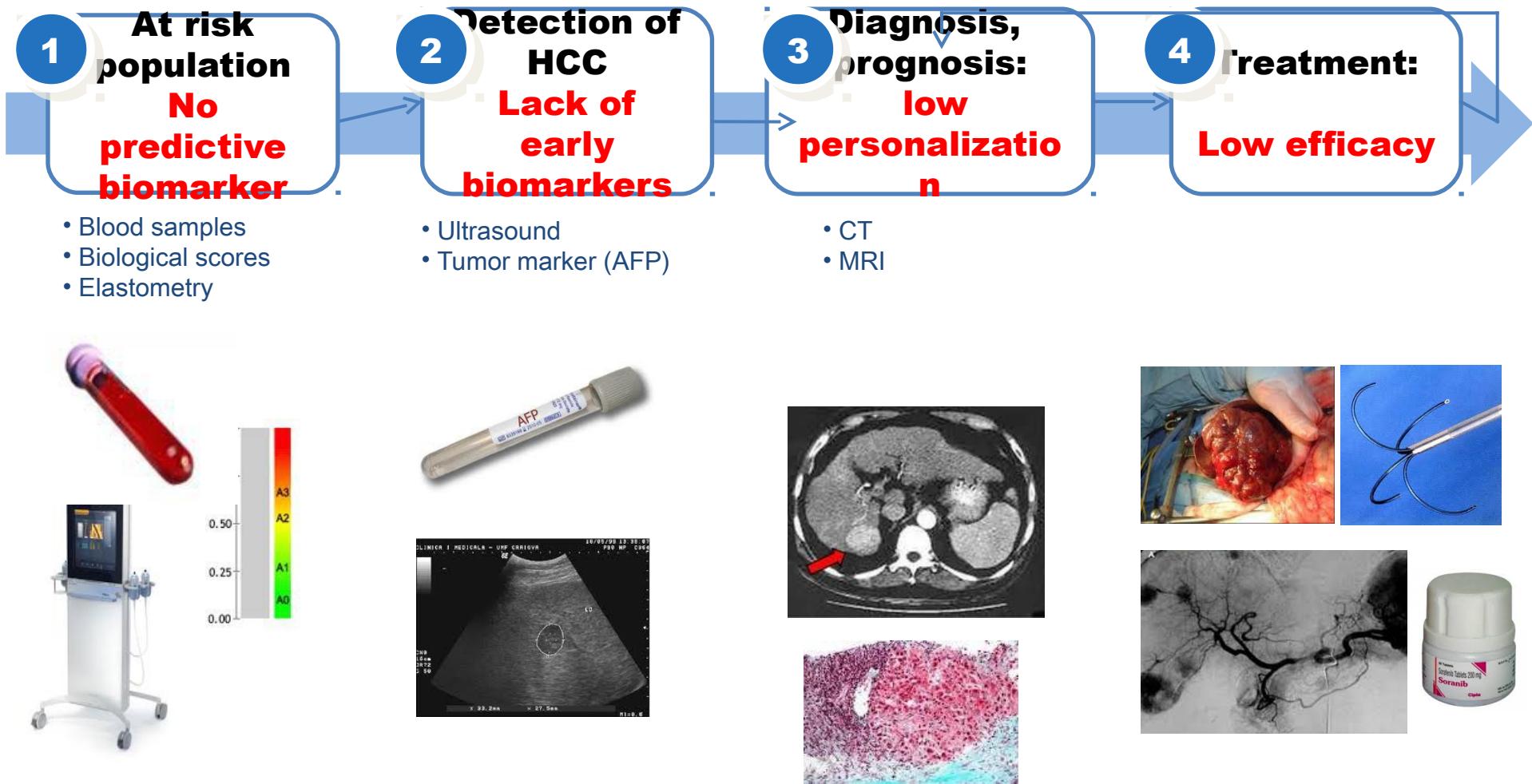
Fat quantification

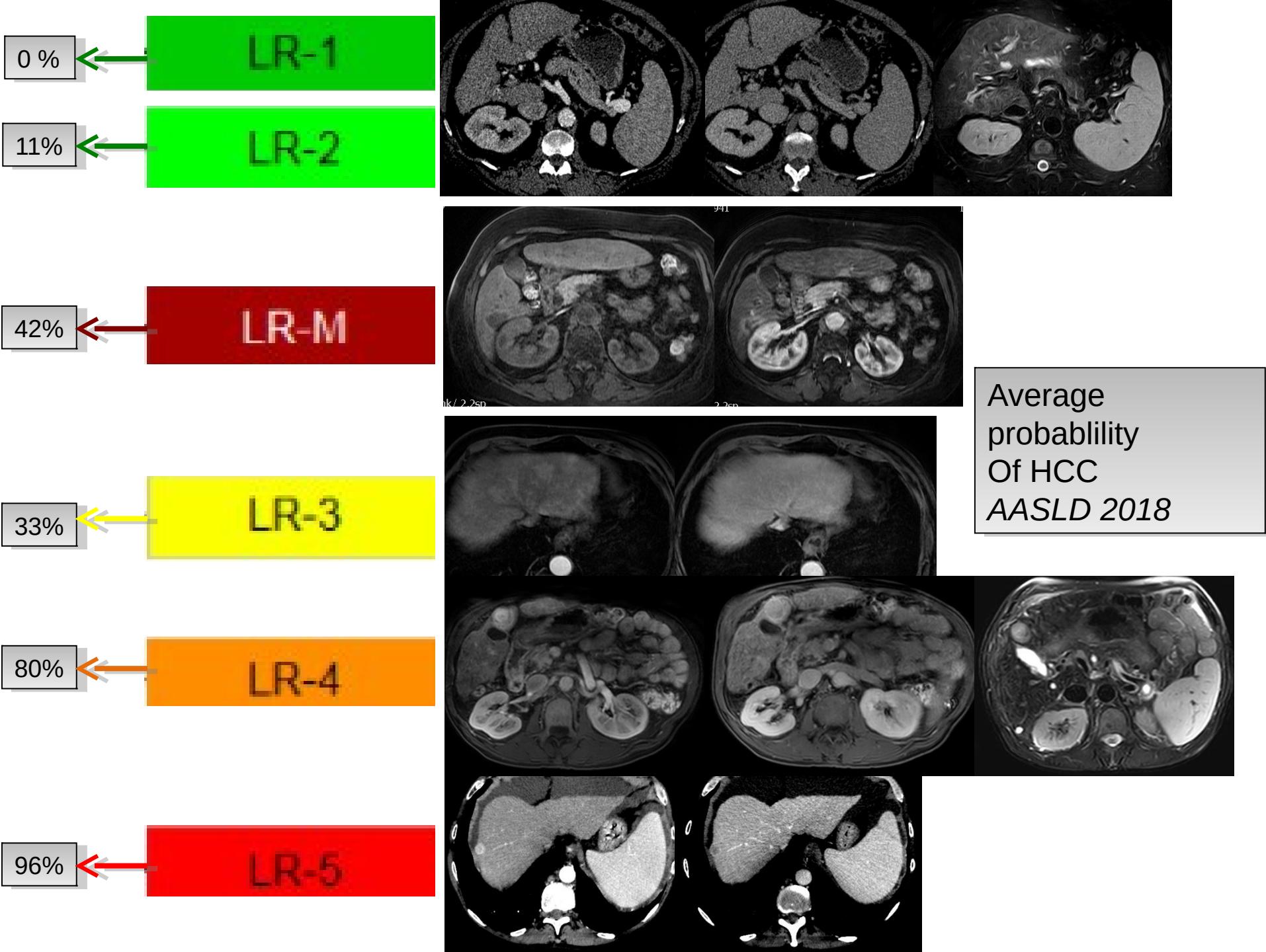


Liver stiffness



HECAM: HEpatocellular CArcinoma Multi-technological



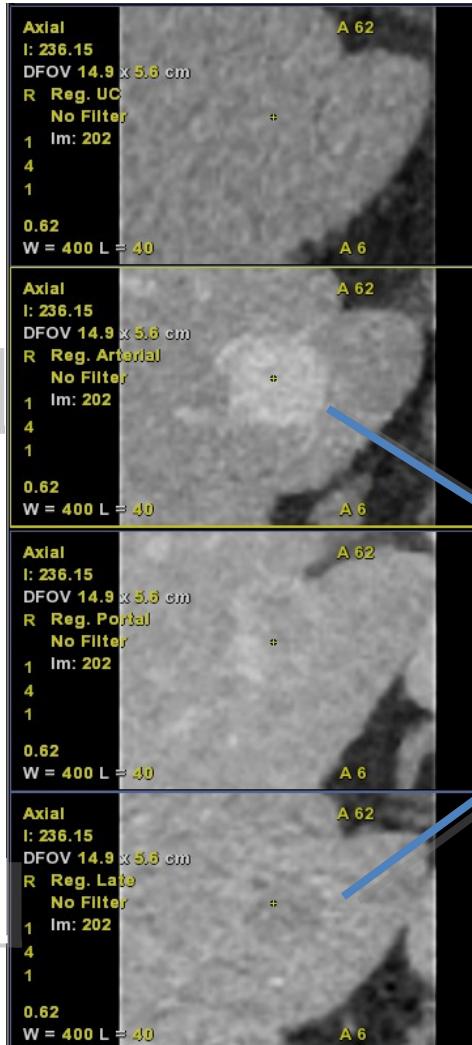


C-

arterial

portal

delayed



LI-RADS

Texte aide contextuelle : 2 lignes max

[+], [Circular], [-]

Lesion 01
Lesion 02
Lesion 03

Lesion 2

auto-scoring

LR-1 ✓ *Click to change the score*

2D max: 18mm

Please, review these automatic results:

Arterial Enhancement: Yes No N/A

Washout: Portal No N/A
 Delayed

Please, give precision to these features:

Capsule: Yes No N/A

Threshold growth: Yes No N/A

Secondary features **ADD**

VALIDATE

LI-RADS

Texte aide contextuelle : 2 lignes max

[+], [Circular], [-]

Lesion 01
Lesion 02
Lesion 03

Lesion 2

auto-scoring

LR-1 ✓ *Click on another score to select it*

LR-NC **LR-TIV**

LR-1 ✓ **LR-2**

LR-M

LR-4 **LR-5**

Delayed

Please, give precision to these features:

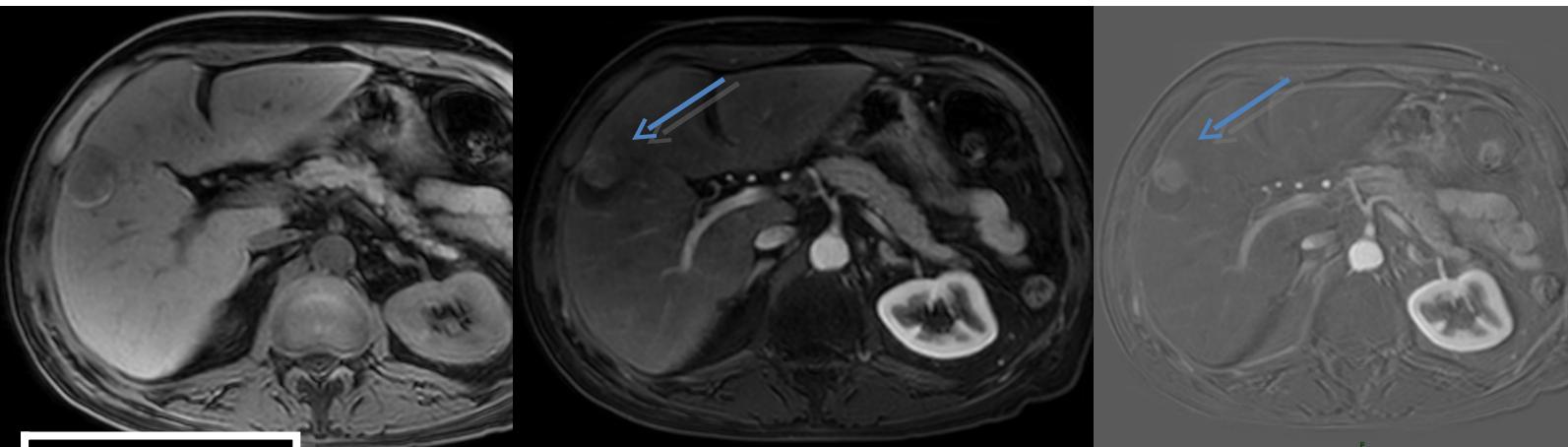
Capsule: Yes No N/A

Threshold growth: Yes No N/A

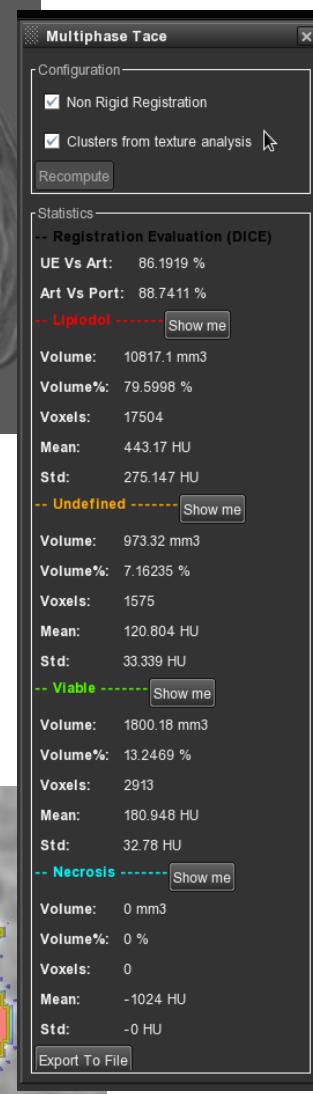
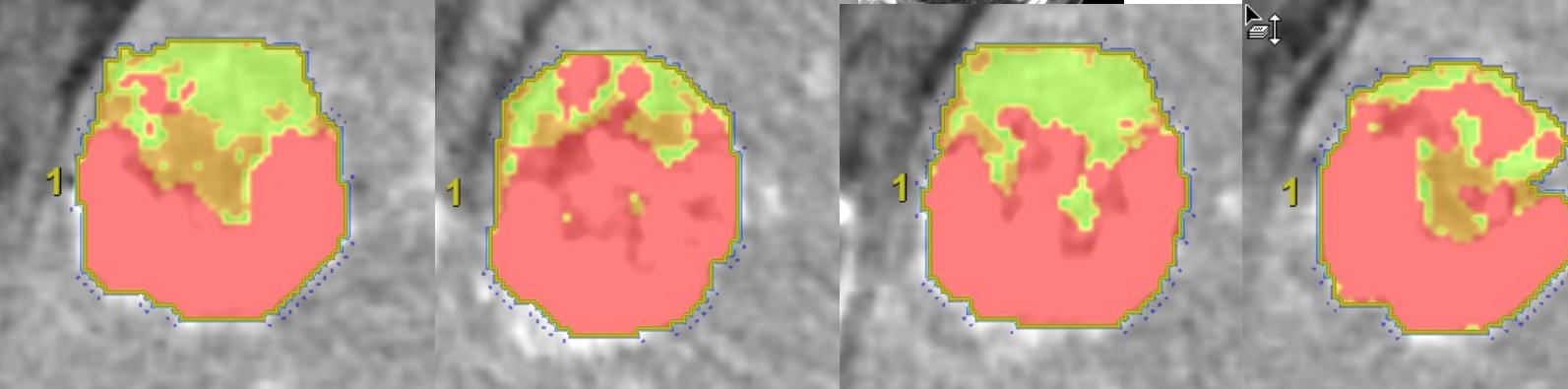
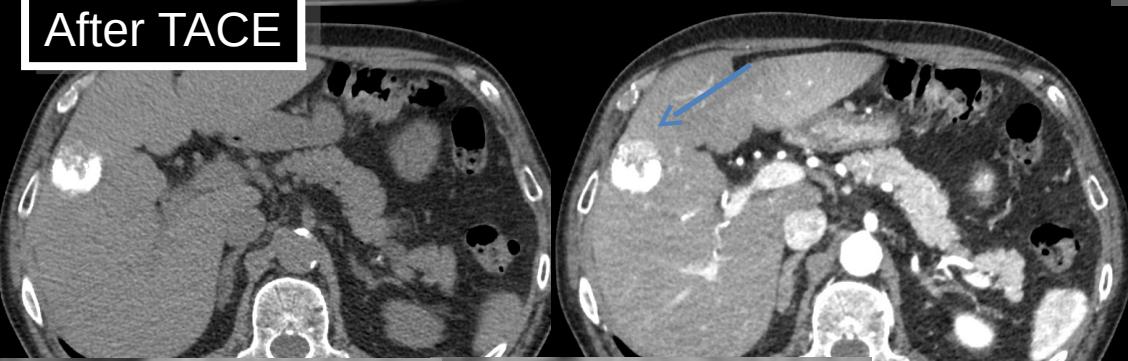
Secondary features **ADD**

VALIDATE

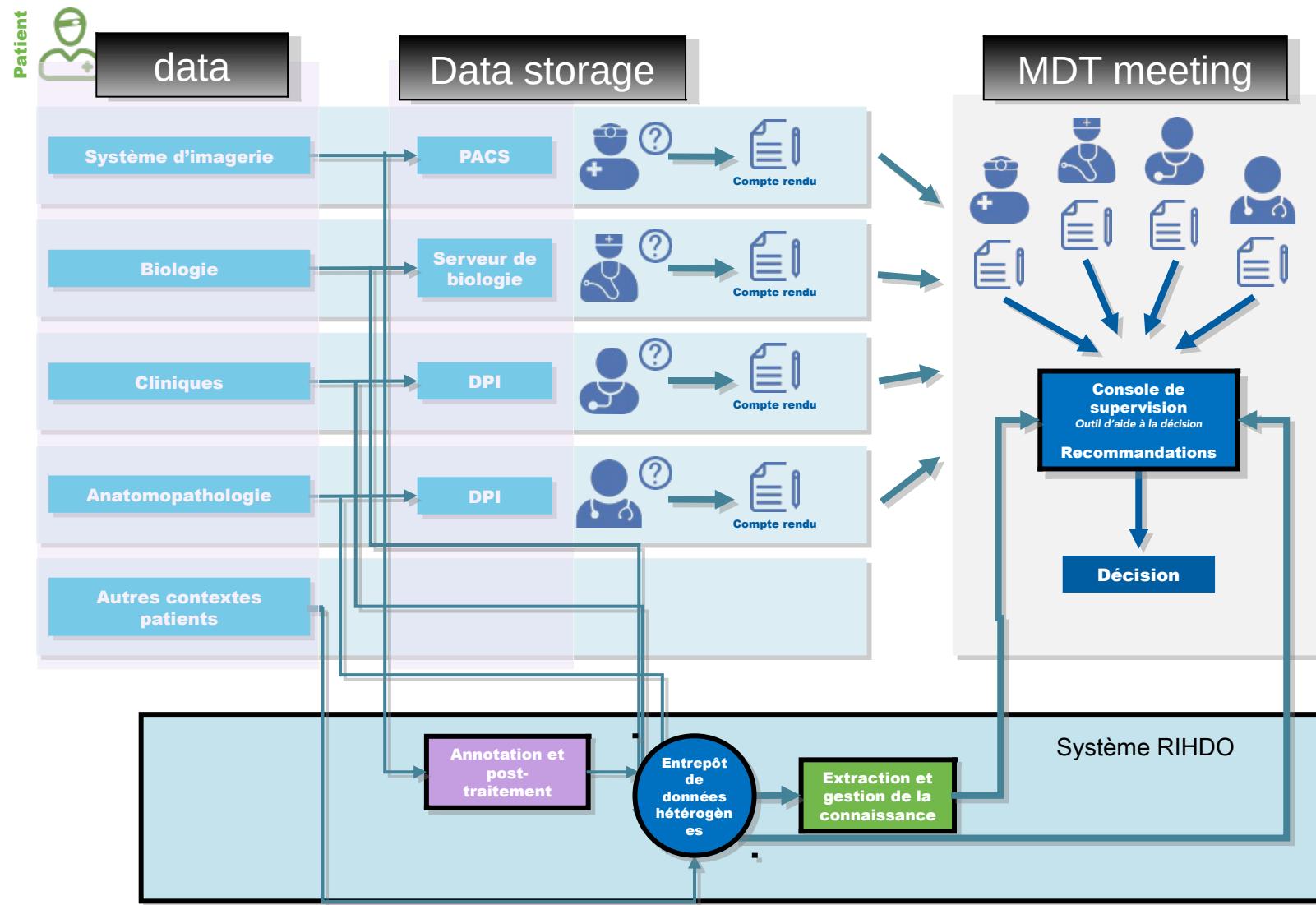
HECAM: HEpatocellular CArcinoma Multi-technological



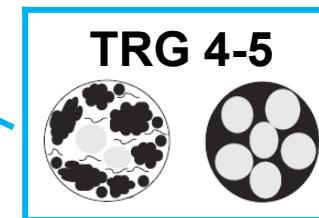
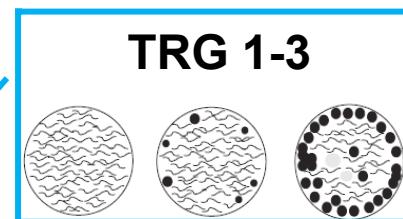
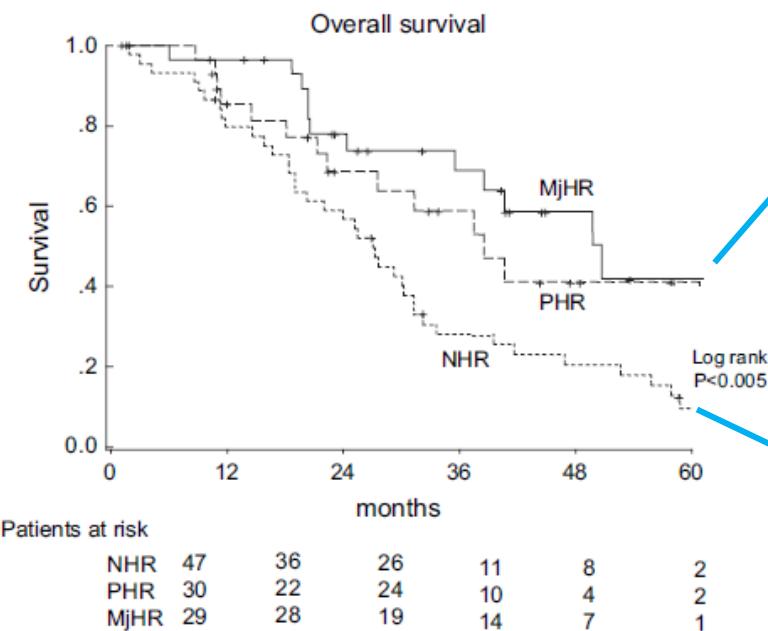
After TACE



RIHDO: Radiomic and Integration of Heterogenous Data in Oncology



RIHDO: Radiomic and Integration of Heterogenous Data in Oncology



Colorectal liver mets
Residual tumor



Conclusion

- Liver imaging is changing fast
- These changes are possible thanks to the complete digital process
- Getting a reliable measure is not a goal anymore
- New approaches use the information within the image « behind the eyes » with Radiomics and AI