CMEO Snack

Welcome to the Glow-Up* Era of MASH Management

*Modern term meaning “dramatic, positive change"

Supported by an educational grant from Novo Nordisk Inc.

CMEO Snack 2

Ditch the Guesswork: Non-Invasive Tools That Slay* Diagnosis and Monitoring

*Modern term meaning “to do something exceptionally well and with confidence"

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CMEO Snack

LEARNING OBJECTIVE

Incorporate best practices for diagnosing, staging, and monitoring disease with non-invasive tests and biomarkers

Patient Case: Mr. B

Mr. B is a 61-year-old utilities field crew chief

- Presents for a routine follow-up visit
- Feels well and has no specific complaints
- Denies fatigue, abdominal pain, pruritus, or jaundice

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History

- T2D, dyslipidemia, hypertension
- Overweight with a BMI of 29.1 kg/m^2
- Drinks an occasional glass of wine with dinner
- Current medications: metformin, valsartan, hydrochlorothiazide

- Physical exam is unremarkable

BMI = body mass index; T2D = type 2 diabetes.

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Lab Findings

- AST: 28 U/L
- ALT: 36 U/L (ALT > AST, both normal)
- ALP: 100 U/L
- Total bilirubin: 1.0 mg/dL
- Albumin: 4.0 g/dL
- Platelets: 110,000/µL
- LDL: 130 mg/dL
- HDL: 36 mg/dL
- TG: 235 mg/dL
- A1C: 7.1%

ALP = alkaline phosphatase; ALT = alanine transaminase; AST = aspartate transaminase; HDL = high-density lipoprotein; LDL = low-density lipoprotein; TG = triglycerides.

Fibrosis-4 (FIB-4) Score

FIB-4

- Predicts advanced fibrosis in the liver
  - Age (years)
  - ALT (U/L)
  - AST (U/L)
  - Platelet count (x10^9/L)

Mr. B's FIB-4 score = 2.59

Understanding the FIB-4 Score

Score <1.3 Rules out advanced fibrosis Sn: 74% Sp: 71%	Indeterminate	**Score >2.67** Predicts advanced fibrosis Sn: 33% Sp: 98%

Sn = sensitivity; Sp = specificity.

Shah AG, et al. *Clin Gastroenterol Hepatol.* 2009;7:1104-1112. Angulo P, et al. *Hepatology.* 2007;45:846-854.

Fibrosis-4 (FIB-4) Score and Abdominal Ultrasound

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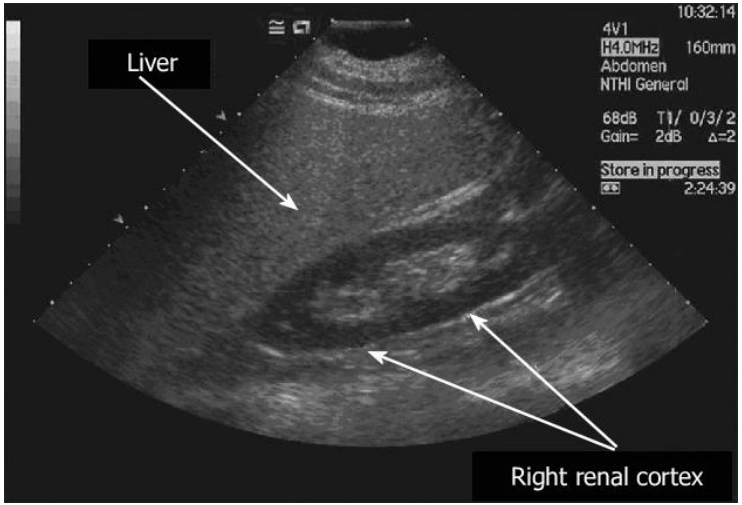


Abdominal ultrasound demonstrates hepatic steatosis without focal hepatic lesions, biliary ductal dilation, or ascites

Shah AG, et al. *Clin Gastroenterol Hepatol.* 2009;7:1104-1112. Angulo P, et al. *Hepatology.* 2007;45:846-854.

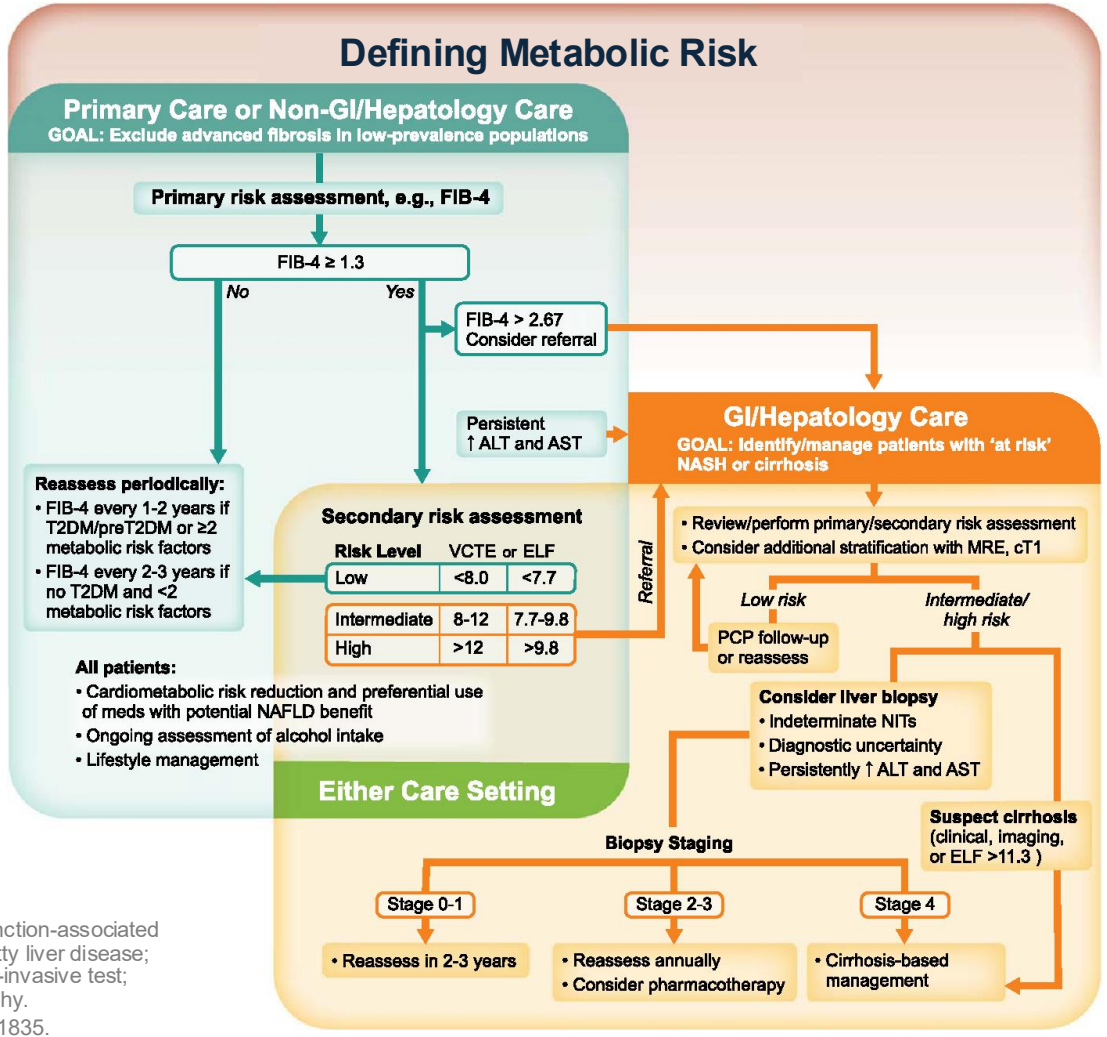
Faculty Discussion

Audience Response

What would you do next to determine if Mr. B has MASLD or MASH?

A. Liver biopsy
B. Magnetic resonance elastography (MRE)
C. Transient elastography (e.g., FibroScan)
D. Enhanced Liver Fibrosis (ELF) score
E. I don’t know

MASLD: Algorithm for Evaluation of Patients at Risk Across Practice Settings



GI = gastrointestinal; MASLD = metabolic dysfunction-associated steatotic liver disease; NAFLD = nonalcoholic fatty liver disease; NASH = nonalcoholic steatohepatitis; NIT = non-invasive test; VCTE = vibration-controlled transient elastography.

Rinella ME, et al. *Hepatology*. 2023;77(5):1797-1835.

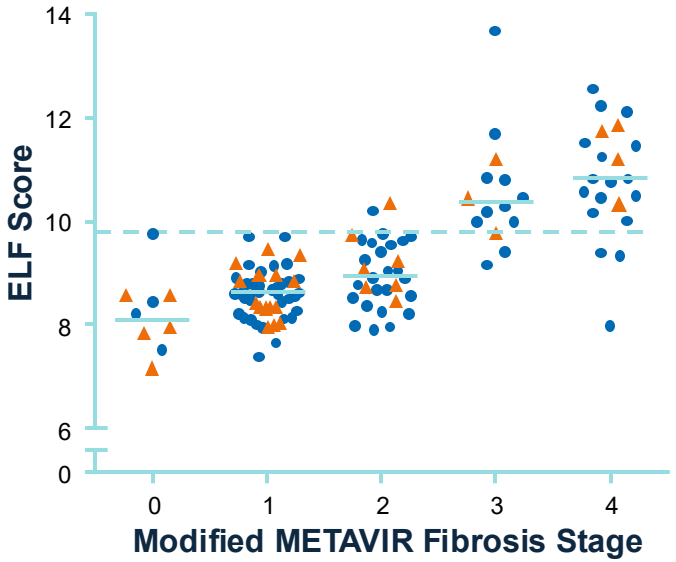
Exploring Non-invasive Tests: Enhanced Liver Fibrosis (ELF) Score

Proprietary blood test delivers information on liver fibrosis severity

Algorithm incorporates three common serum biomarkers:

- HA (hyaluronic acid)
- PIIINP (amino-terminal propeptide of type III procollagen)
- TIMP-1 (tissue inhibitor of metalloproteinase-1)

Understanding the ELF Score		
Score 7.7 Rules out fibrosis Sn: 97% Sp: 33%	**Score 9.8** Predicts fibrosis Sn: 69% Sp: 98%	**Score 11.3** Predicts cirrhosis Sn: 83% Sp: 97%



ELF ≥9.8 is associated with advanced fibrosis

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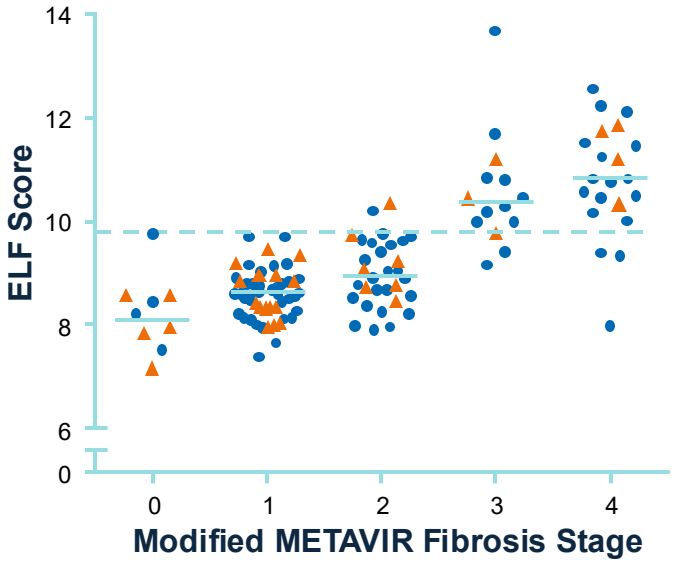

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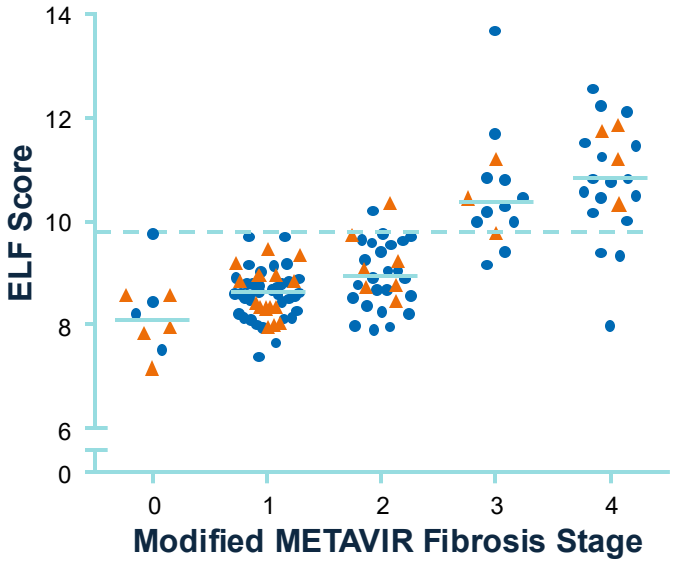

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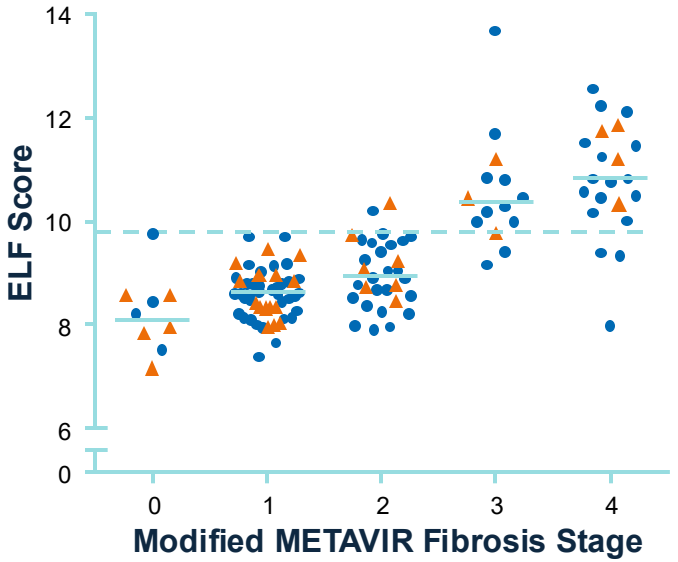

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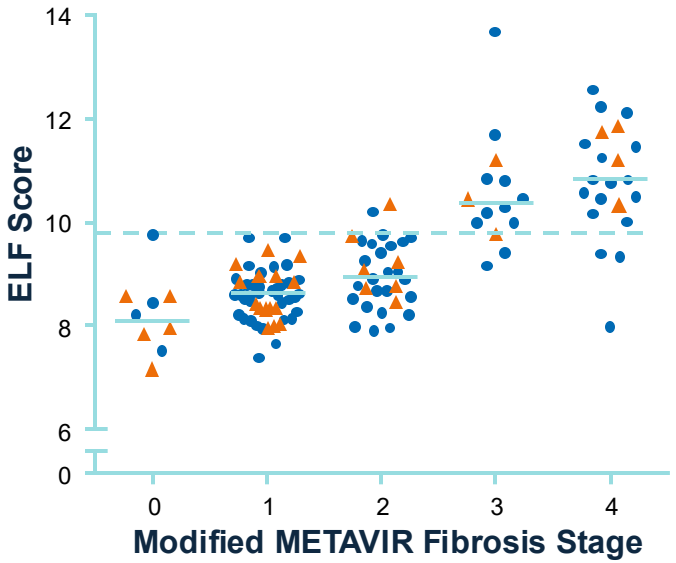

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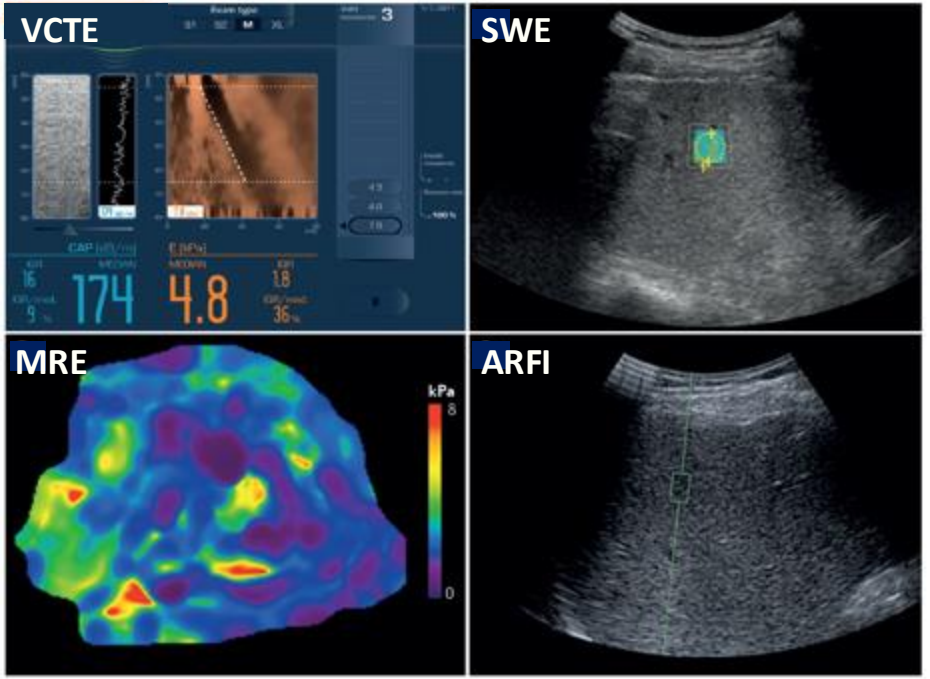
Elastography-Based Methods to Estimate Liver Stiffness

- VCTE (FibroScan) most widely used
  - ≥ 10 images are required
  - Accurate for stages F3-F4
  - Can estimate steatosis when used with CAP
- SWE/ARFI can be used to measure stiffness in a single region of interest
- MRE measures stiffness across multiple regions of interest



ARFI = acoustic radiation force impulse imaging; CAP = controlled attenuation parameter; SWE = shear wave elastography; VCTE = vibration-controlled transient elastography.

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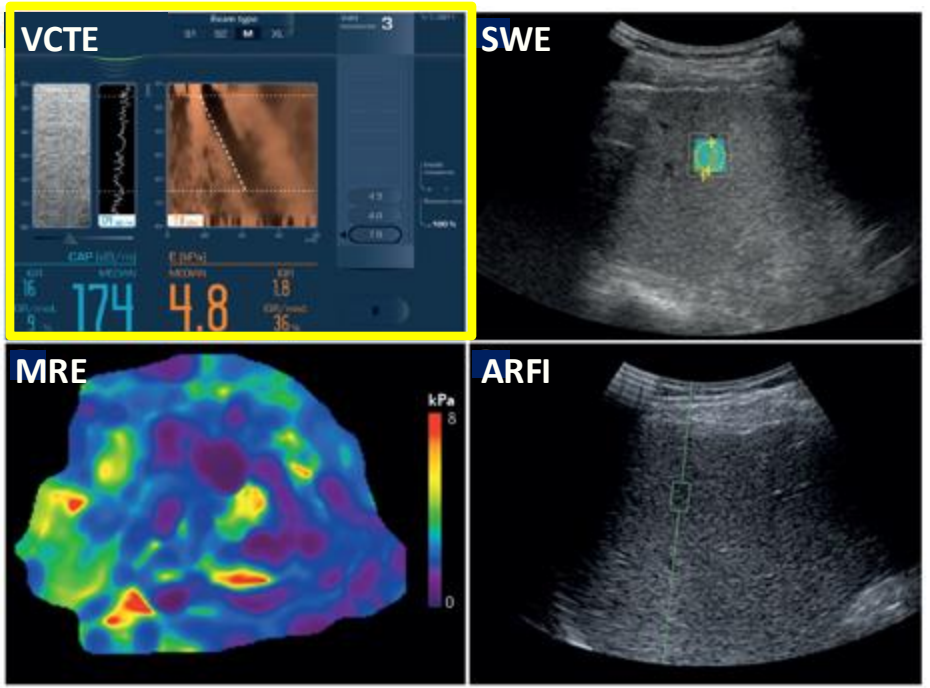

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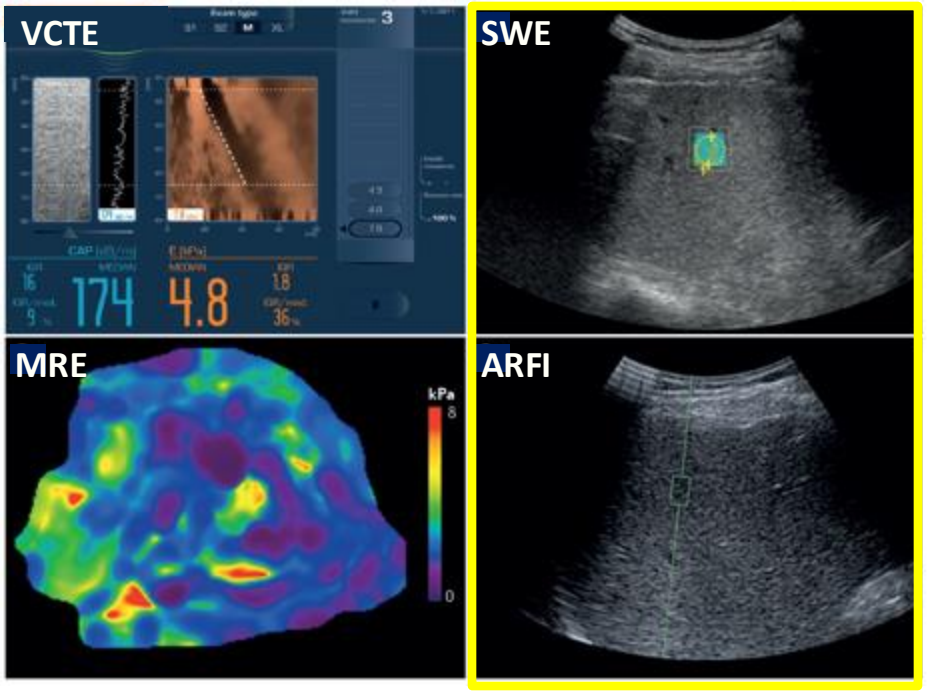

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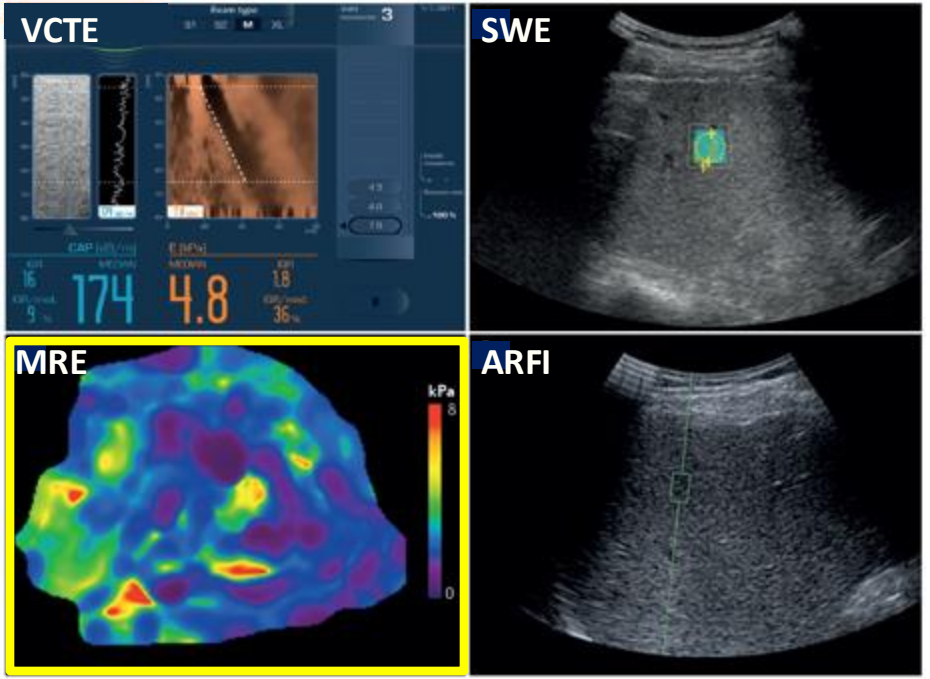

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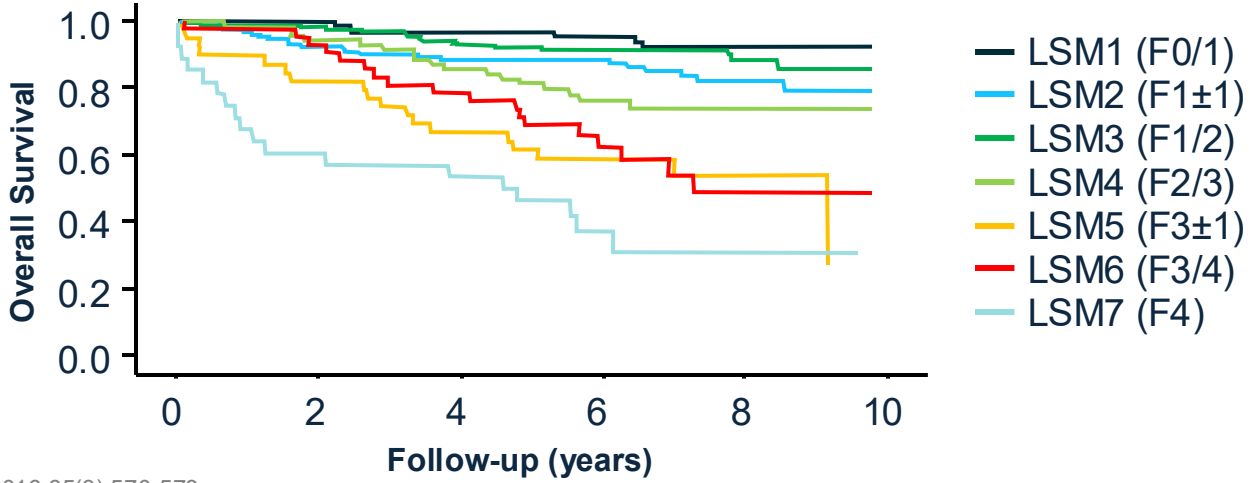
Liver Stiffness Measurement by FibroScan as a Non-invasive Biomarker of Fibrosis

A cross-sectional study of 452 patients with liver biopsy

Fibrosis classification:
(equivalence in fibrosis stage)

1 (F0/1)	2 (F1±1)	3 (F1/2)	4 (F2/3)	5 (F3±1)	6 (F3/4)	7 (F4)

Liver Stiffness Measure (LSM): 2.0 4.6 6.1 8.8 12.0 18.0 38.6 75.0 kPa



Boursier J, et al. *J Hepatol*. 2016;65(3):570-578.

Other Tests

Other Serum-based Testing (or calculation scores from lab tests)

- FibroScan AST Score (FAST)
- FIBROSpect
- ADAPT/Pro-C3
- AST/platelet ratio index
- BARD Score
- Fatty liver index
- *FibroSure*
- Hepascore
- NAFLD fibrosis score (NFS)
- NIS4
- Agile Score

Other Imaging

- 2D shear wave elastography (2D-SWE)
- Acoustic radiation force impulse (ARFI)
- Controlled attenuation parameter (CAP)
- Computed tomography (CT)
- Corrected T1 (*Liver MultiScan*)
- MRI proton density fat fraction (MRI-PDFF)
- Quantitative ultrasound (QUS)

MRI = magnetic resonance imaging.

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Key message to primary care practitioners:
Not necessarily important which test(s) you do;
what's important is that you DO SOMETHING!

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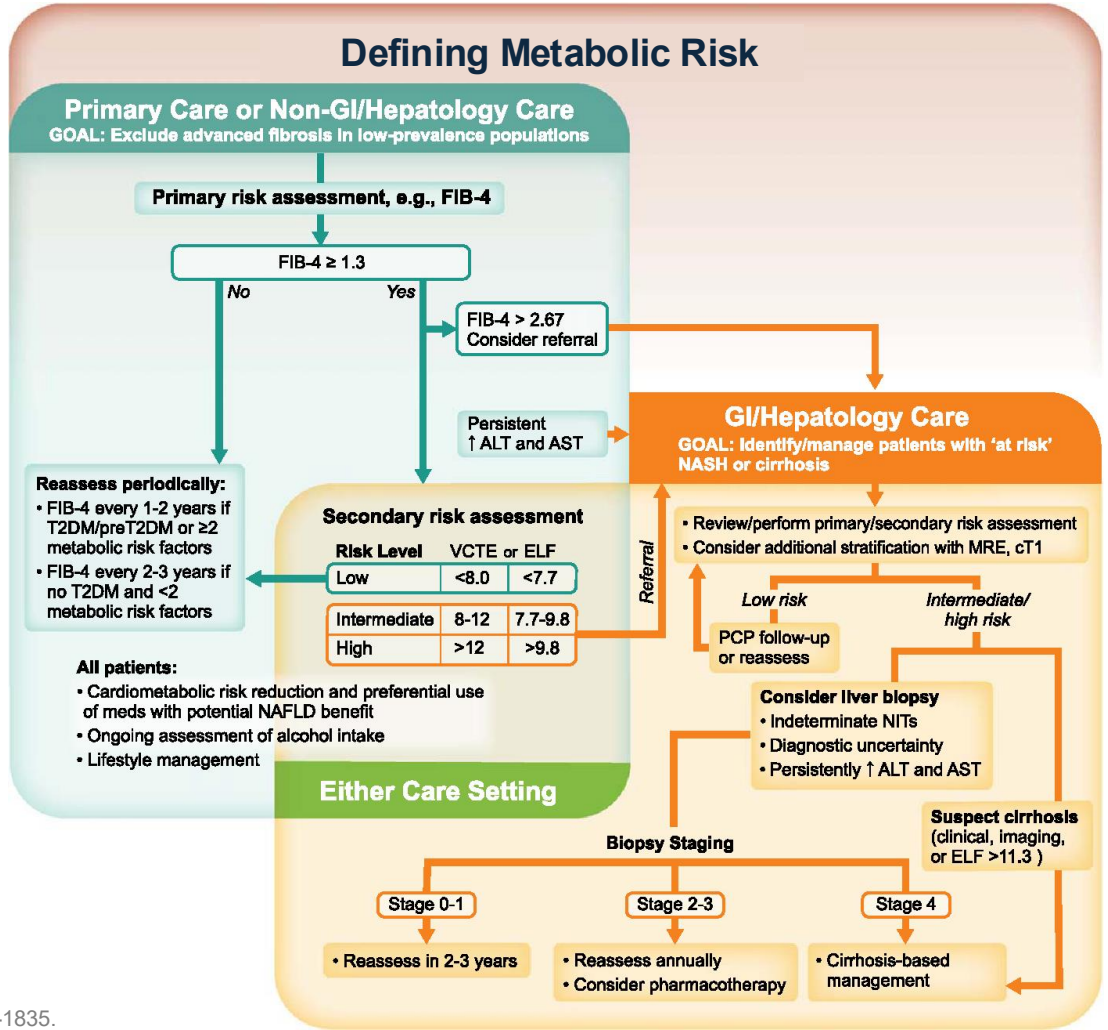
- The AASLD algorithm places Mr. B in the range suggestive of stage F2, but this reading may not be accurate
- Thus, Mr. B also had an MRE, which showed his liver stiffness measure was 4.2 kPa with a proton density fat fraction of 15% – suggestive of stage F3

Faculty Discussion

MASLD: Algorithm for Evaluation of Patients at Risk Across Practice Settings



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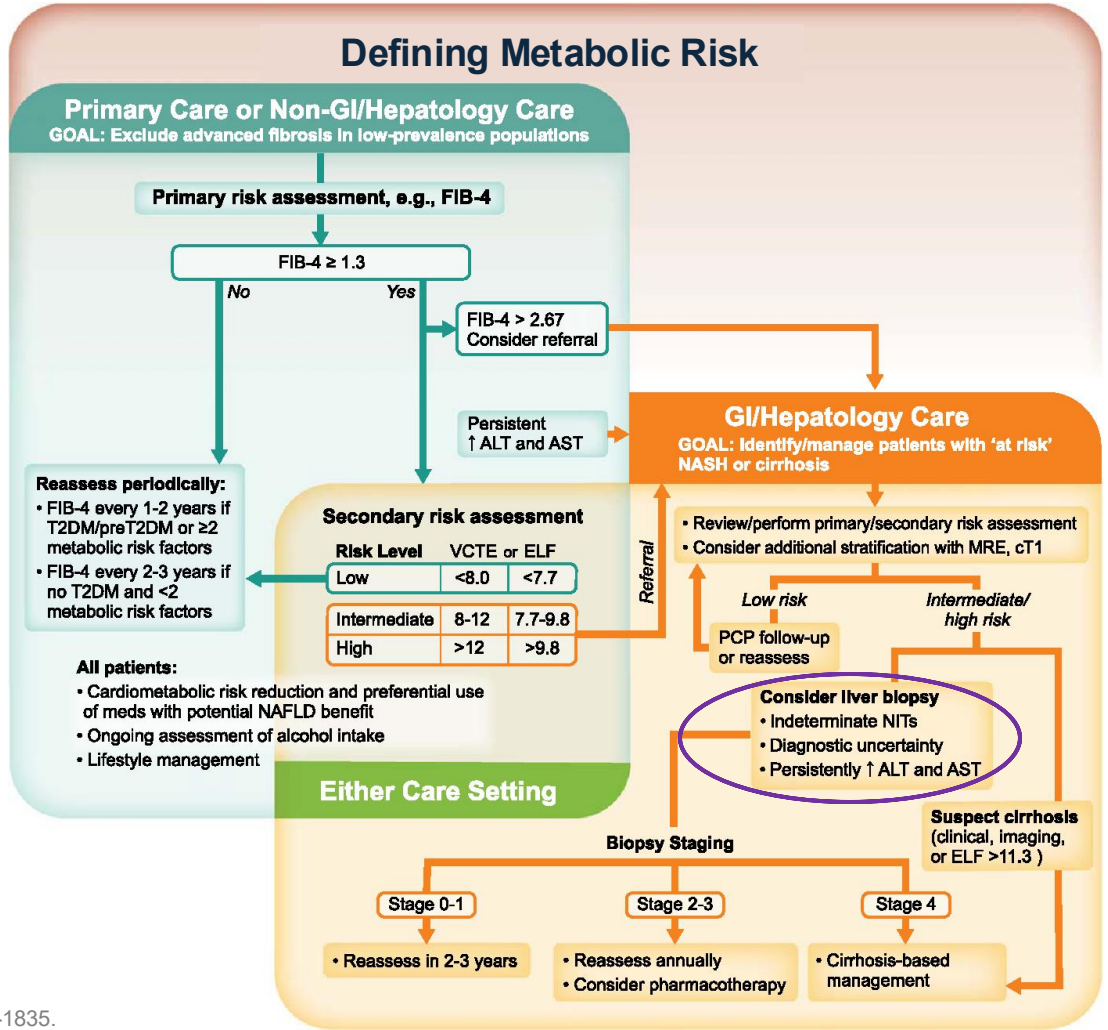

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Takeaways from this program can be implemented into your practice to improve patient care.

Over the next 3 months:

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- *Increase the percentage of patients you screen for MASLD/MASH who have type 2 diabetes mellitus and other risk factors*
- *Use non-invasive tests (NITs) to stratify risk in patients with potential MASLD/MASH (and ascertain which NITs you have in-house, through local labs, and via referrals)*

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- *Use non-invasive tests (NITs) to stratify risk in patients with potential MASLD/MASH (and ascertain which NITs you have in-house, through local labs, and via referrals)*
- *Use appropriate NITs to monitor progression of disease*

To Receive Credit

To receive CME/CE credit for this activity, participants must complete the post-test and evaluation online.

Participants will be able to download and print their certificate immediately upon completion.

CMEO Snack

Other programs in this series include:

Welcome to the Glow-Up Era of MASH Management

Spotting the Red Flags: Screening and Risk Strat Like a Pro

Welcome to the Glow-Up Era of MASH Management

What's Hot and What's Next: Mastering MASH-Specific Therapies That Deliver

Welcome to the Glow-Up Era of MASH Management

GLP-1s Got That Rizz: The Future of MASH and Metabolic Syndrome Care

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