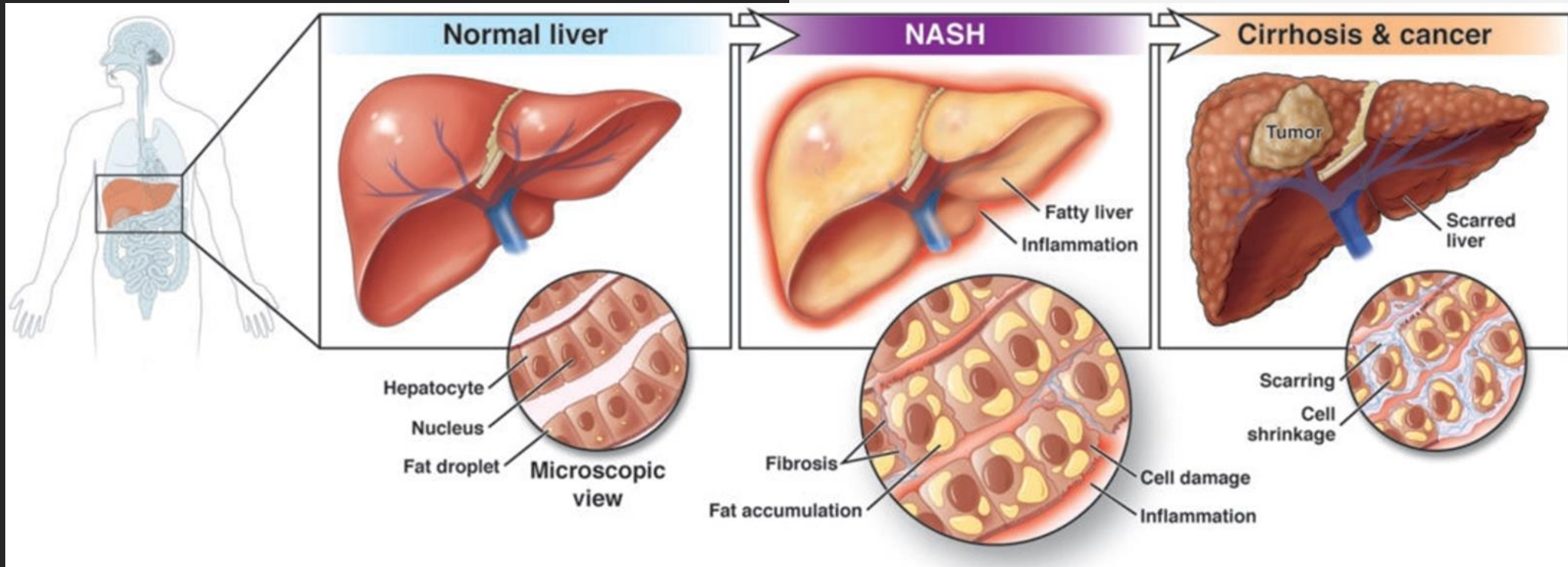


Screening for NAFLD in the Primary Care Setting

Shayla Jenkins, PGY-3

NAFLD: What is it?

- A spectrum of liver disease
- “Second hit” hypothesis



(a)

Normal

(b)

steatosis

(c)

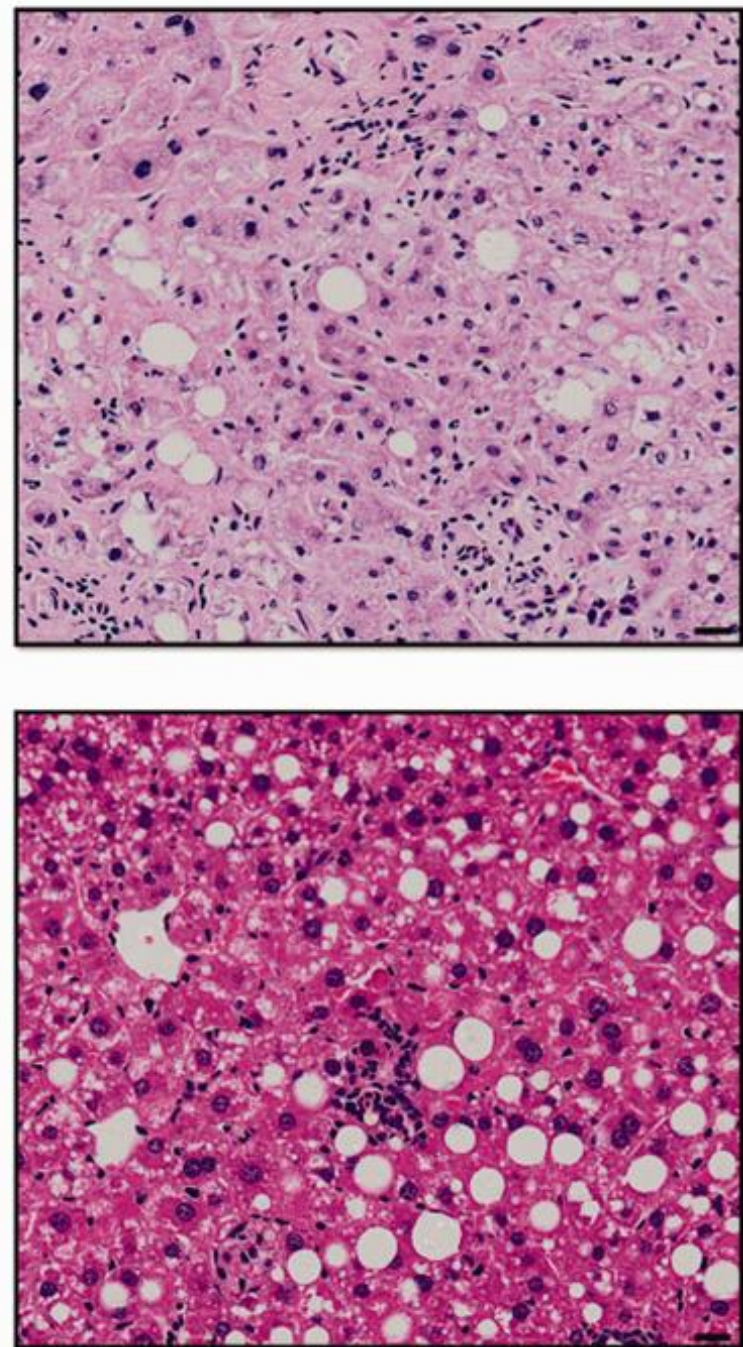
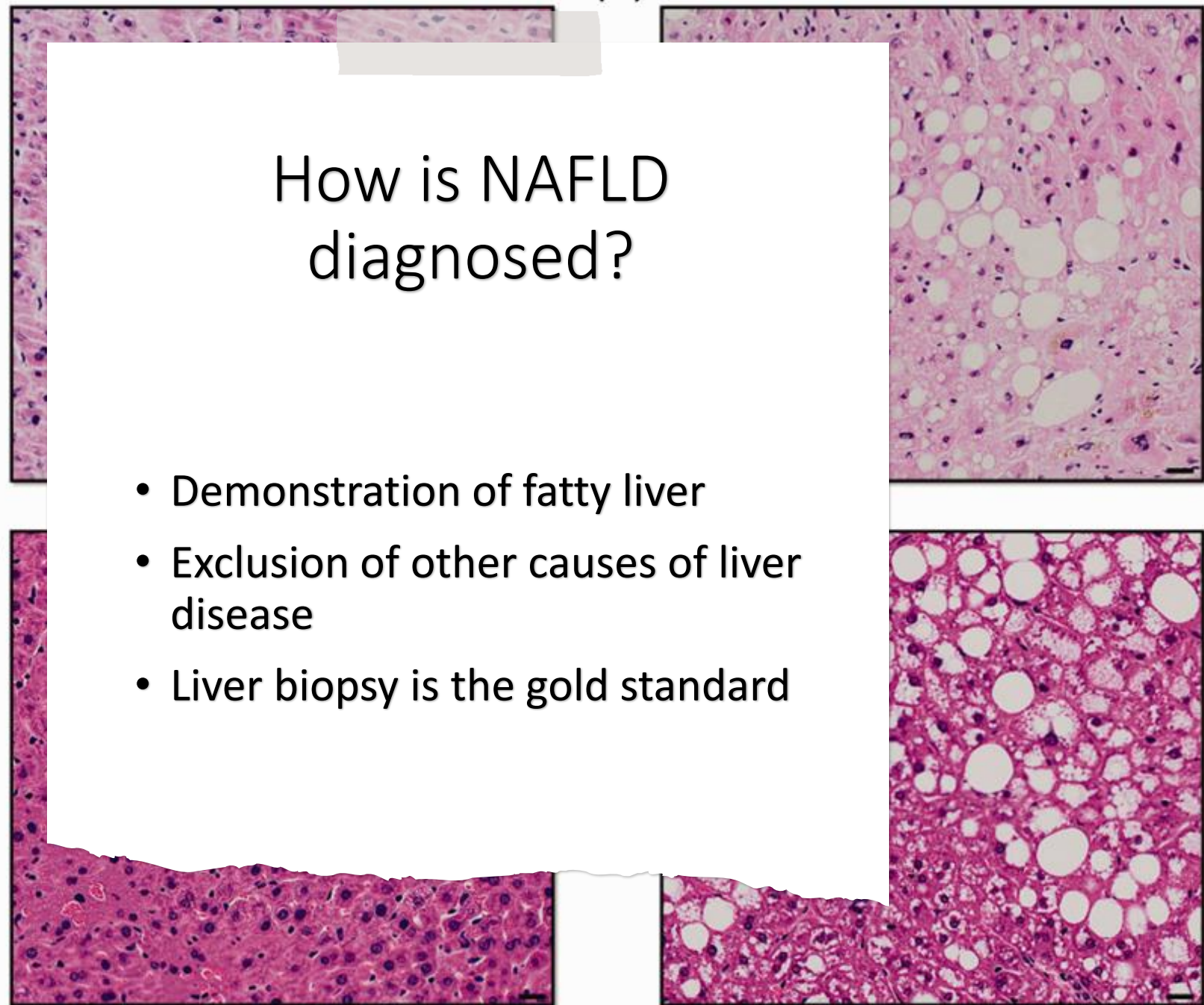
NASH

How is NAFLD diagnosed?

- Demonstration of fatty liver
- Exclusion of other causes of liver disease
- Liver biopsy is the gold standard

(d)

(f)



Screening for NAFLD: Who is most at risk?

- Diabetes and metabolic syndrome
- Age
- Sex
- Ethnicity
- Lean NAFLD
- Concomitant liver disease



NAFLD: Why does it matter?

- Asymptomatic
- Increased morbidity and mortality
- Increased medical cost to society

Current guidelines for NAFLD Screening

- Inconsistent across medical societies/organizations
- Different between adults and children

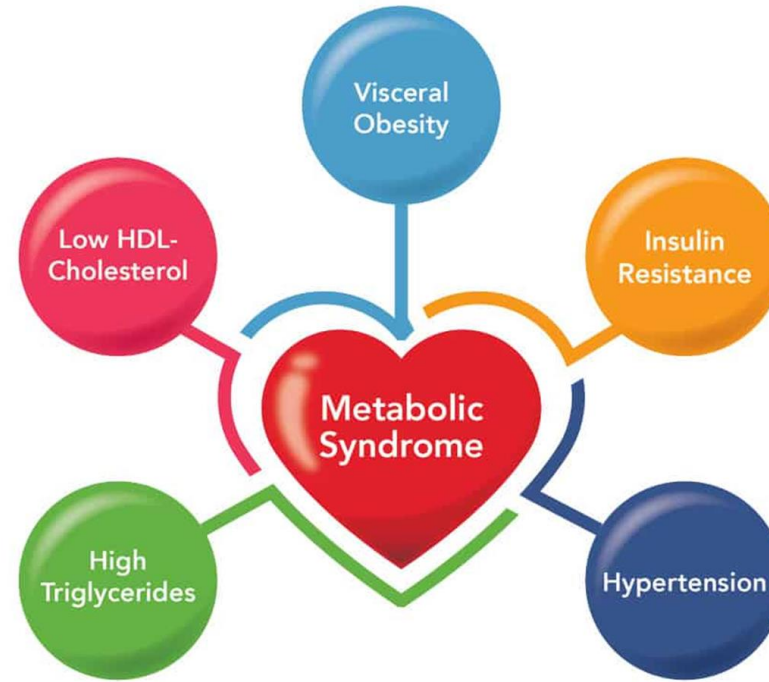


A photograph of a female doctor in a white lab coat sitting at a desk and talking to a female patient. The doctor is on the left, smiling and looking towards the patient. The patient is on the right, seen from the side, looking at the doctor. The background shows a computer monitor and some office equipment. The image has a color gradient overlay, transitioning from orange on the left to blue on the right.

NAFLD in the primary care setting

“Primary care takes up the bulk of identifying patients with diabetes, dyslipidemia, hypertension, and components of metabolic syndrome; and are the optimal providers to identify patients with NAFLD, make appropriate referrals to specialists, and arrange appropriate surveillance.” [2]

Screening high risk patients





Serologic methods for screening

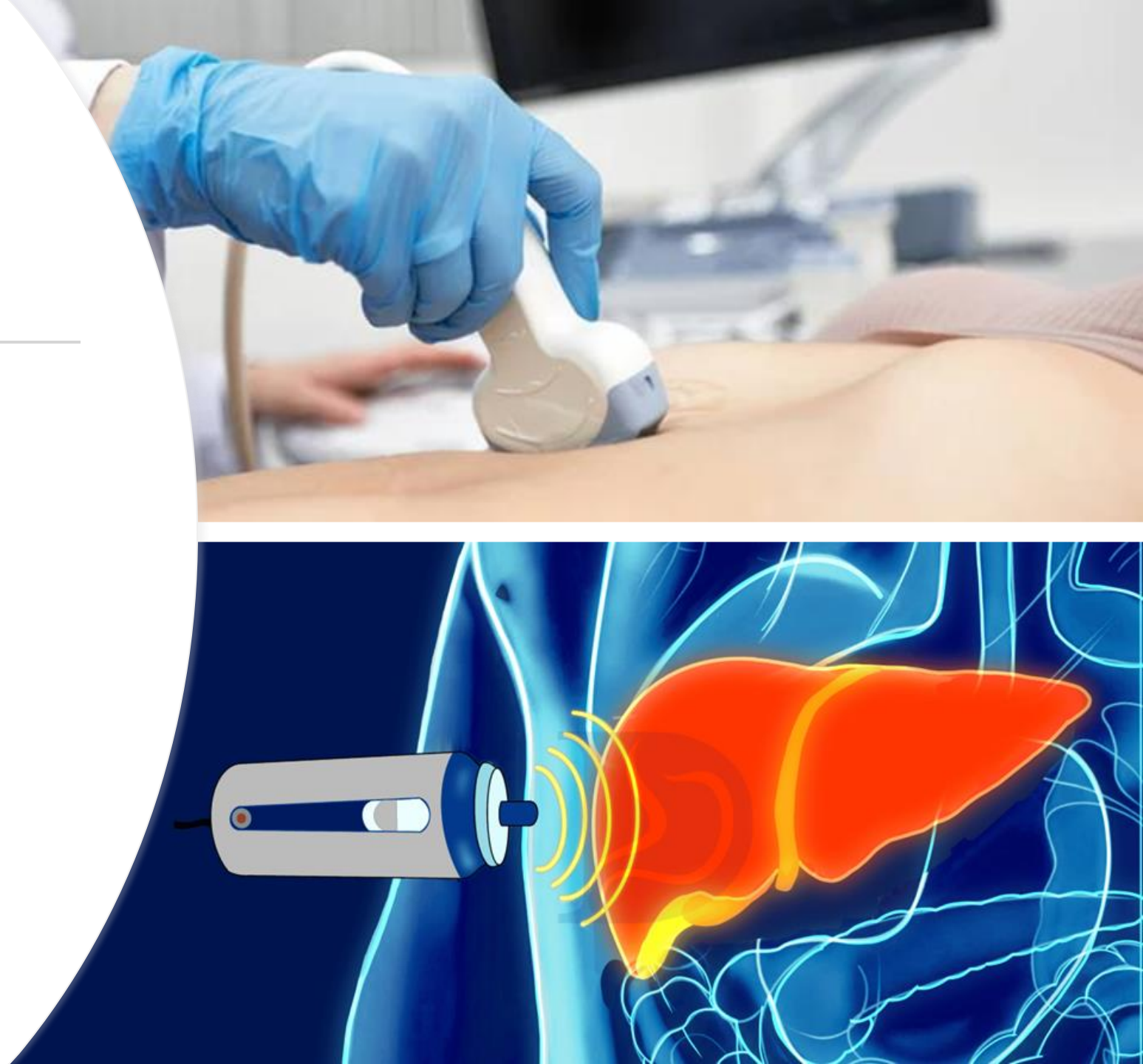
- Steatosis
 - Fatty Liver Index
 - Hepatic Steatosis Index
 - SteatoTest
- Fibrosis
 - **FIB-4 Index**
 - **NAFLD Fibrosis Score**
 - BARD Score
 - ELF
 - FibroTest

$$\text{FIB-4} = \frac{\text{Age (in years)} \times \text{AST} \left(\frac{\text{IU}}{\text{L}} \right)}{\text{Platelet} \left(10^9 / \text{L} \right) \times \sqrt{\text{ALT} \left(\frac{\text{IU}}{\text{L}} \right)}}$$

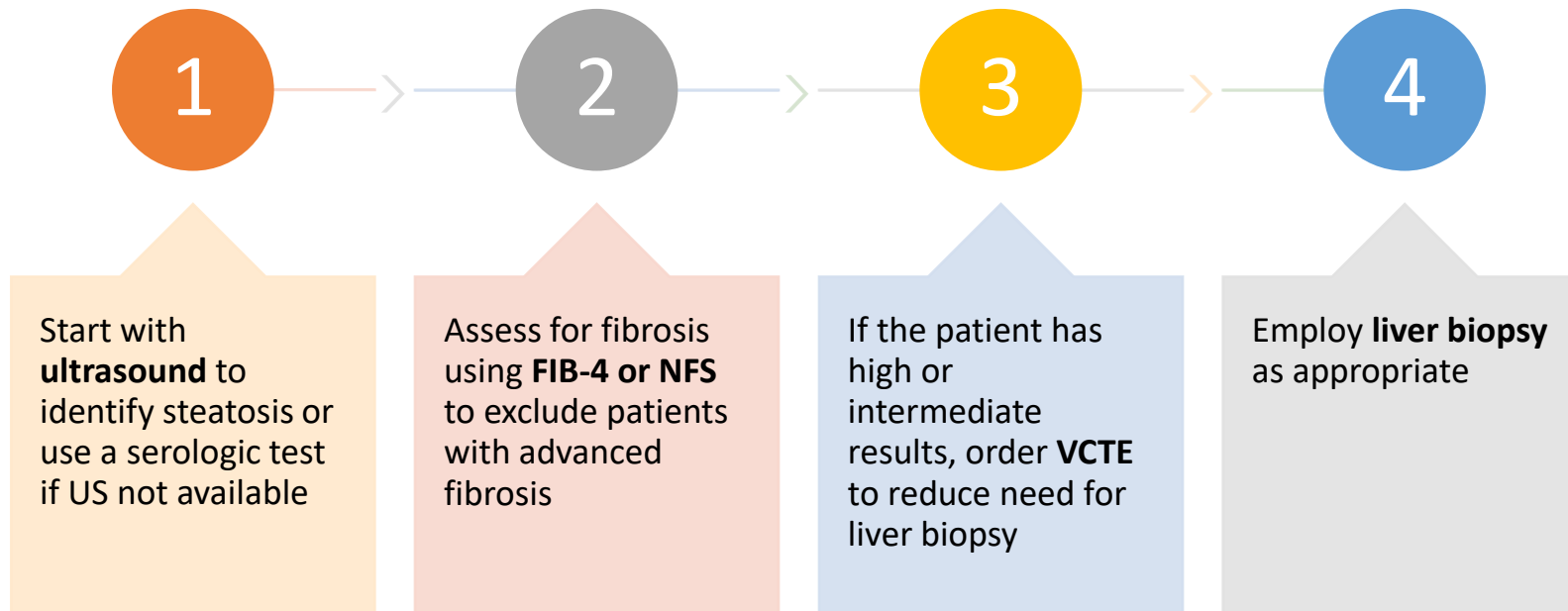
NAFLD-fibrosis score = $-1.675 + 0.037 \times \text{age (years)} + 0.094 \times \text{BMI (kg/m}^2\text{)} + 1.13 \times \text{impaired fasting glucose (IFG)/diabetes (yes=1, no=0)} + 0.99 \times \text{AST/ALT ratio} - 0.013 \times \text{platelet } (\times 10^9/\text{L}) - 0.66 \times \text{albumin (g/dL)}$

Imaging modalities for screening

- **Conventional ultrasonography**
- **Vibration-controlled transient elastography (VCTE)**
- Others:
 - MRI-PDFF
 - MRS
 - MRE
 - Shear wave elastography (SWE)



A Proposed Stepwise Algorithm



A long way to go...

Pathogenesis has not been completely elucidated

The gold standard for diagnosis is invasive

Consistent screening guidelines have not been formalized

Curative pharmacologic treatment has not been established

Cost effectiveness may be questioned



Where do we go from here?

- More information needed
- Evidence lacking
- Doctor-patient relationship
- Advocacy
- **Diet and exercise is still #1**



Society guidelines, USA



- 2012: World Gastroenterology Organization: Global guidelines on nonalcoholic fatty liver disease and nonalcoholic steatohepatitis.
- American Association of Clinical Endocrinology (AACE): Clinical practice guideline for the diagnosis and management of nonalcoholic fatty liver disease in primary care and endocrinology clinical settings (2022).
- American Gastroenterological Association (AGA): Clinical practice update on the diagnosis and management of nonalcoholic fatty liver disease (NAFLD) in lean individuals (2022).
- AGA: Clinical practice update on lifestyle modification using diet and exercise to achieve weight loss in the management of nonalcoholic fatty liver disease (2020).
- AGA: Clinical practice update on screening and surveillance for hepatocellular carcinoma in patients with nonalcoholic fatty liver disease (2020).
- American College of Radiology (ACR): ACR appropriateness criteria chronic liver disease (revised 2019).
- American Association for the Study of Liver Diseases (AASLD): The diagnosis and management of nonalcoholic fatty liver disease – practice guidance (2018).
- Expert Committee on NAFLD (ECON) and North American Society of Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN): Clinical practice guideline for the diagnosis and treatment of nonalcoholic fatty liver disease in children (2017).
- AGA: Guideline for the diagnosis and management of non-alcoholic fatty liver disease (NAFLD) (2012).

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