Liver Disease From Fibrosis to Cirrhosis

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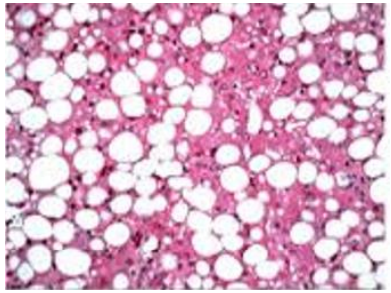
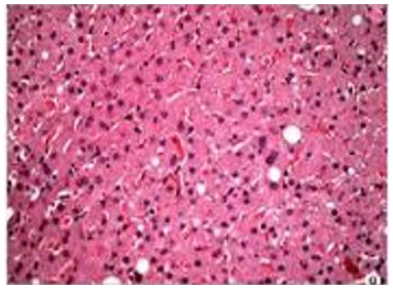
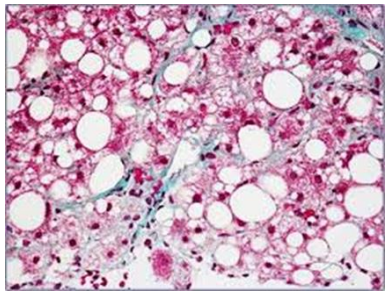
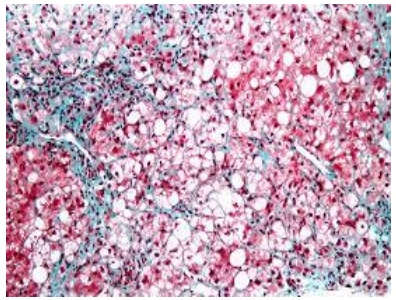
Learning Objectives

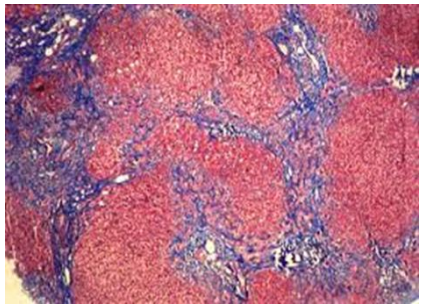
1. Describe the epidemiology of liver fibrosis and cirrhosis in the US and the high-risk South Texas population.
2. Apply a screening algorithm to identify advanced fibrosis in at-risk populations.
3. Evaluate treatment options based on fibrosis stage and reversibility.

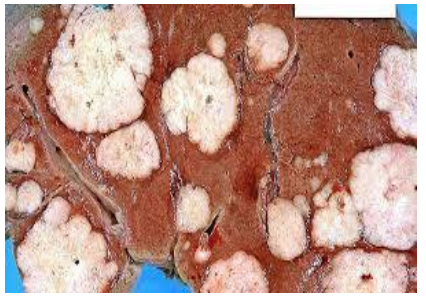


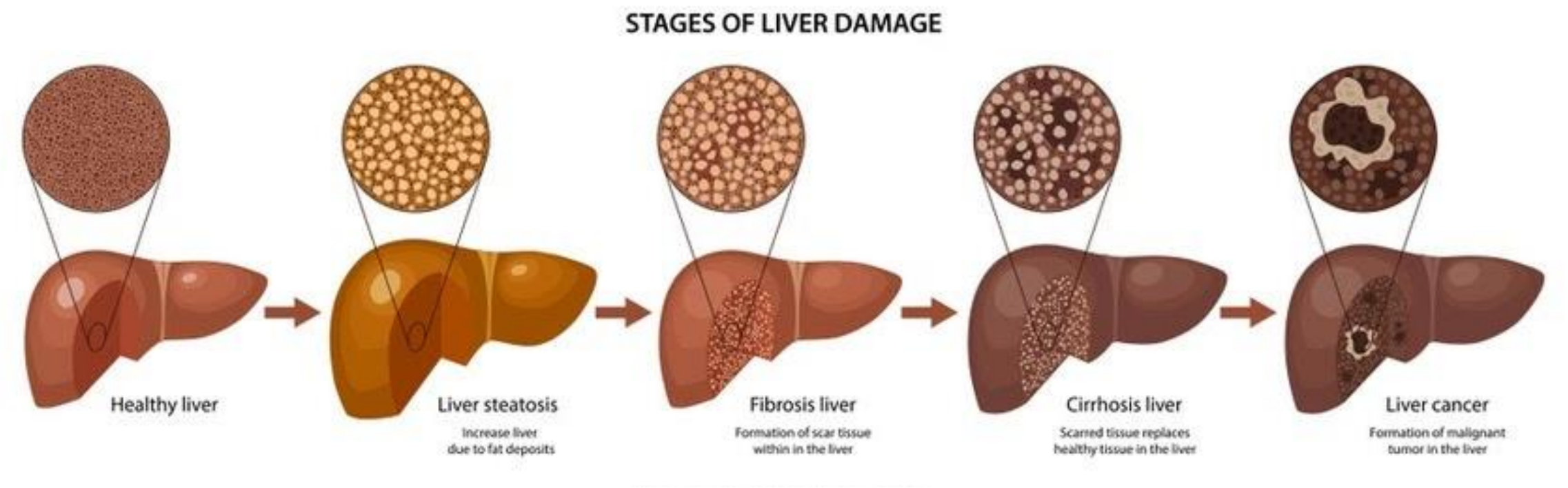






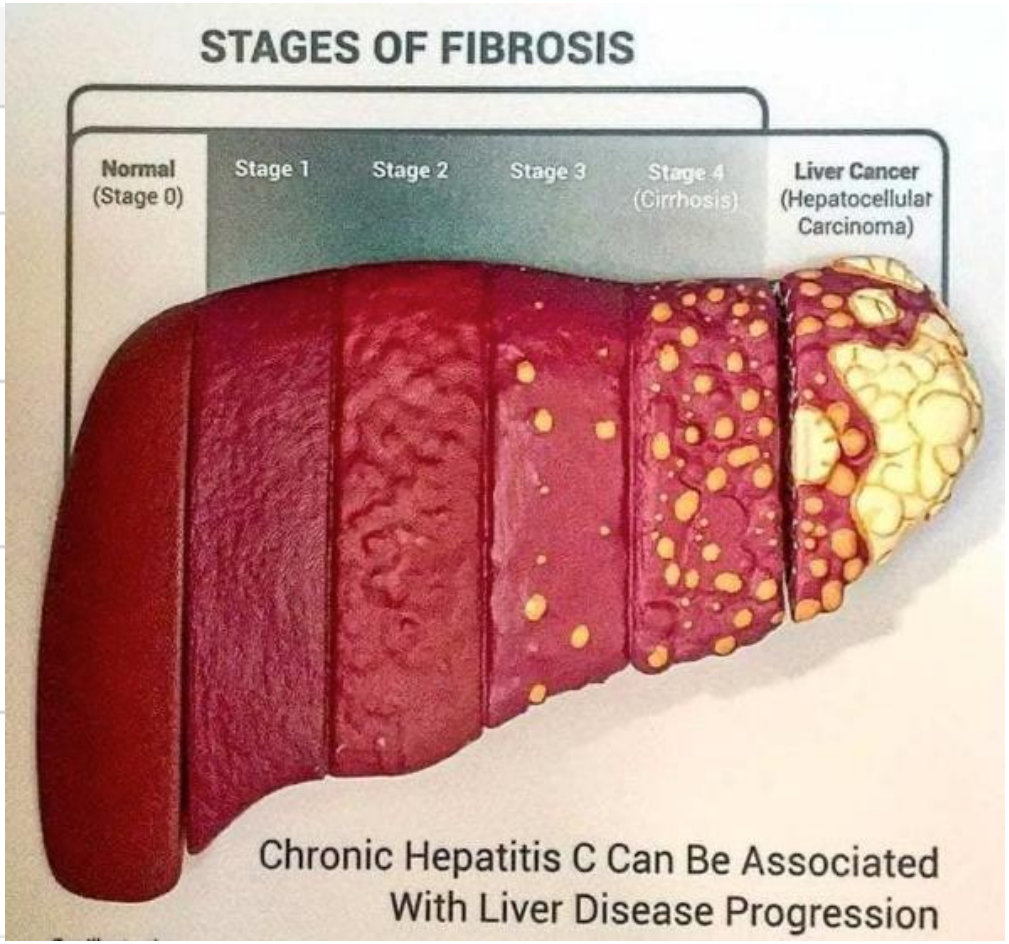





STAGES OF LIVER DAMAGE
Healthy liver
Liver steatosis
Increase liver due to fat deposits
Fibrosis liver
Formation of scar tissue within in the liver
Cirrhosis liver
Scarred tissue replaces healthy tissue in the liver
Liver cancer
Formation of malignant tumor in the liver

Stages of Liver Fibrosis

Stage	Description	Histologic Features
F0	No fibrosis	Normal liver architecture
F1	Mild fibrosis	Portal fibrosis without septa
F2	Significant fibrosis	Portal fibrosis with few septa
F3	Advanced fibrosis	Numerous septa without cirrhosis
F4	Cirrhosis	Complete architectural distortion with regenerative nodules



Critical Window for Early Detection

- Liver fibrosis is dynamic and can regress when the underlying cause is treated
  - Early fibrosis (F0-F3) is highly reversible
  - Hepatocytes regenerate
  - Fibrosis regresses through apoptosis, inactivation of hepatic stellate cells, and resorption of fibrous scarring
  - Regression is proven in HCV and HBV but there is increasing evidence of regression in MASLD/MASH
- Cirrhosis (F4) is more difficult to reverse but it is possible

Fibrosis Reversibility by Stage

Stage	Reversibility	Evidence
F0-F3 (Early Fibrosis)	✓ **Highly reversible**	Dynamic process; hepatocytes capable of regeneration
F4 (Cirrhosis)	~ **Possible but less reliable**	HCV: 43% regression post-SVR; HBV: 28-74% regression with treatment
Alcohol-related	~ **Recompensation possible**	Behavioral/pharmacotherapy reduces 180-day mortality (2.6% vs 3.9%)

Fibrosis Regression by Etiology

Etiology	Treatment	Regression Rate
Hepatitis C	DAA cure	43% no longer cirrhotic at 12 months
Hepatitis B	Tenofovir (240 weeks)	28% no longer cirrhotic
Hepatitis B	Tenofovir (long-term)	74% of 96 patients no longer cirrhotic
Decompensated HCV	SVR	~1/3 can be delisted from transplant
Decompensated HBV	Entecavir (120 weeks)	60% achieved recompensation

High Burden in South Texas Hispanics

- MASLD: 41%
- Diabetes: 40.8%
- Unaware of liver disease: 85%

Condition	Prevalence in Hispanic Adults	Relative Risk vs Non-Hispanic
MASLD	41%	1.50× higher
MASH	61%	1.42× higher
MASH + Advanced Fibrosis	27%	1.37× higher
MASH Cirrhosis	5%	—

MASLD by Hispanic Subgroup

Subgroup	MASLD Prevalence	Annual Increase
Mexican Americans	33-48%	1.9%/year
Puerto Ricans	18%	—
Dominicans	16%	—
Non-Hispanic White/Black	—	1.1%/year

South Texas Risk Factors

Risk Factor	Data
Hispanic population	Fastest-growing US demographic
Type 2 diabetes	Highest rates nationally; up to 70% have hepatic steatosis
Among cACLD patients	65.9% male, 40.8% diabetic, 81.5% obese, 67.1% hypertensive
Food insecurity	Associated with higher odds of MASLD and advanced fibrosis

Measure	Alcohol	Hepatitis C	NAFLD/MASLD
Prevalent cases (all existing cirrhosis)	~45%	41% (declining)	26%
Incident cases (newly diagnosed)	20%	Declining	**61.8%** (now #1)

Prevalance vs Incidence of Cirrhosis

Veterans Administrative Data

Etiology	Proportion
Alcohol-related	27.9%
NAFLD-related	25.9%
Hepatitis C	24.0%
HCV + Alcohol	17.4%
Other	3.7%

Alcohol Related Liver Disease

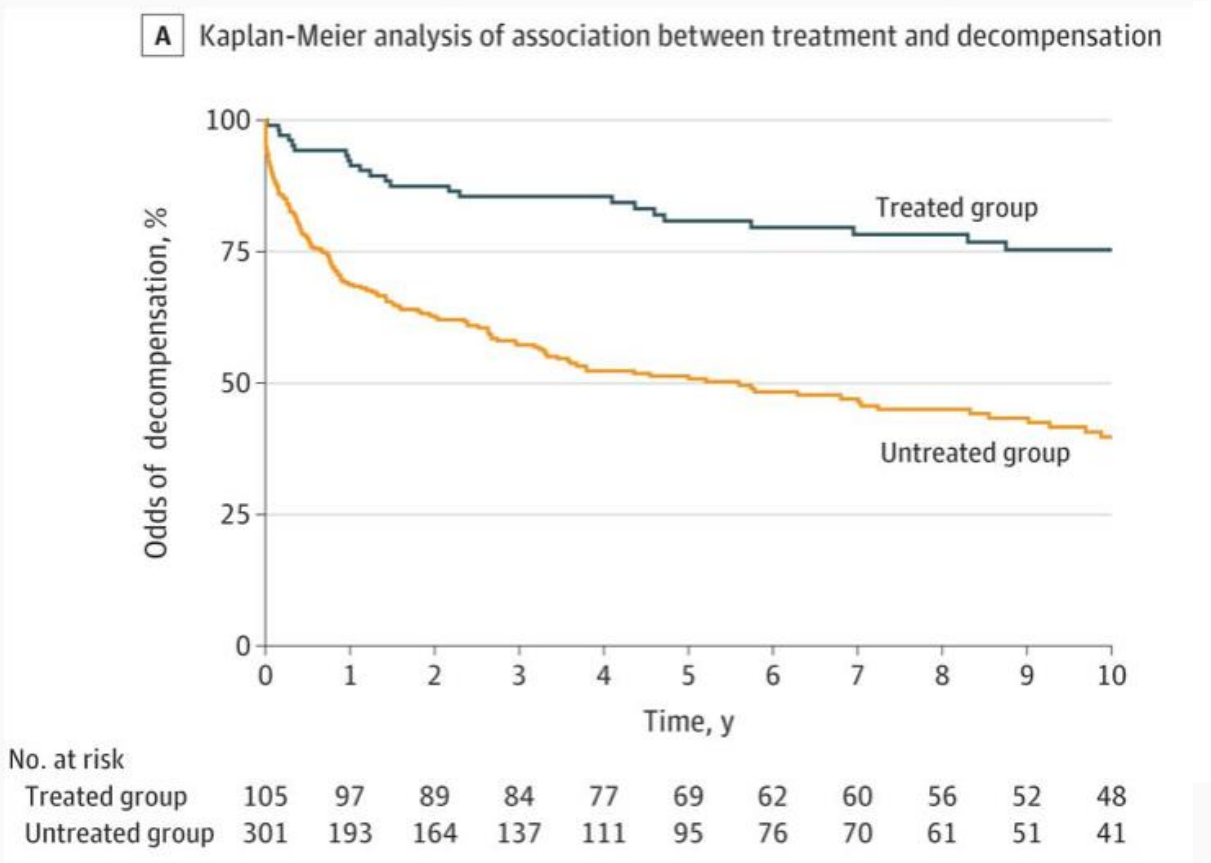
Earlier = Better

- Steatosis and early fibrosis (F0-F2)
- Advanced fibrosis/cirrhosis (F3-F4)
- Abstinence reduces:
  - Liver related mortality by 57%
  - All cause mortality by 55%
- Early abstinence within 1 month of decompensation doubles likelihood of recompensation.

- PEARL: Liver stiffness decreased quickly after stopping ETOH (2-4 weeks) due to resolution of inflammation and not true fibrosis regression.

Incidence and Implications of Abstinence-Induced Recompensation in Alcohol-Related Cirrhosis. Journal of Hepatology. 2026. Hofer BS, Tonon M, Buttler L, et al.

JAMA



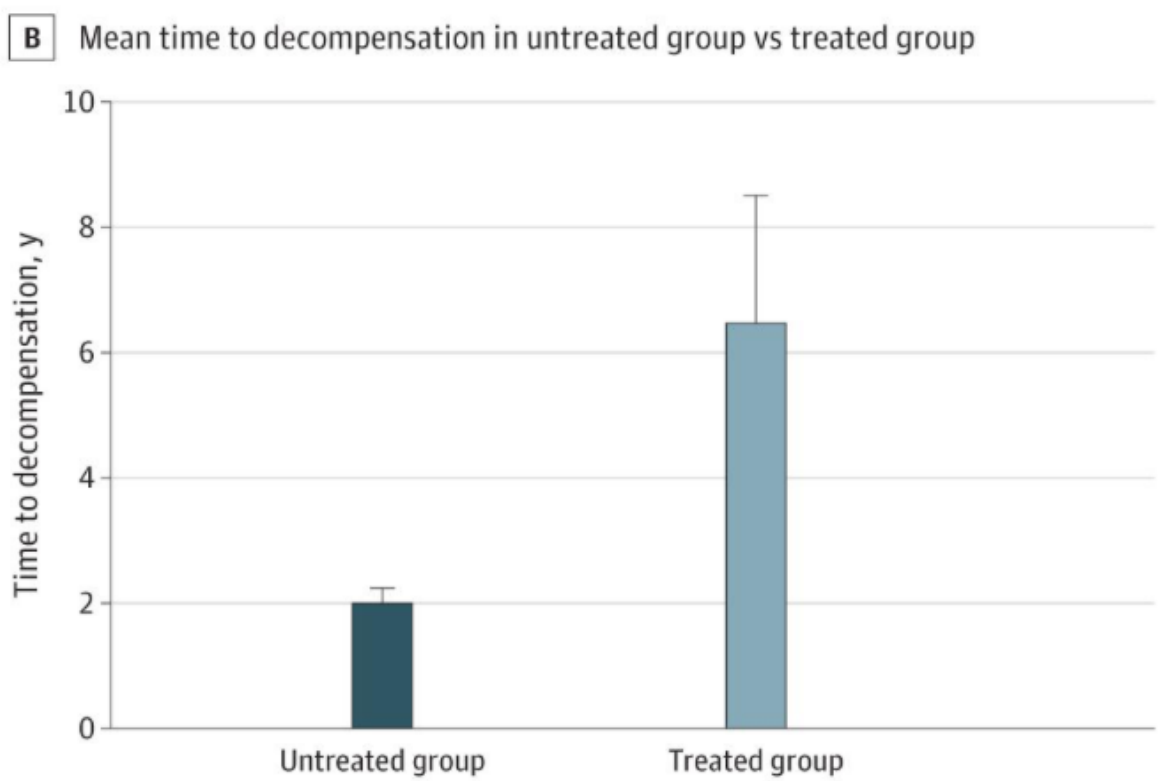
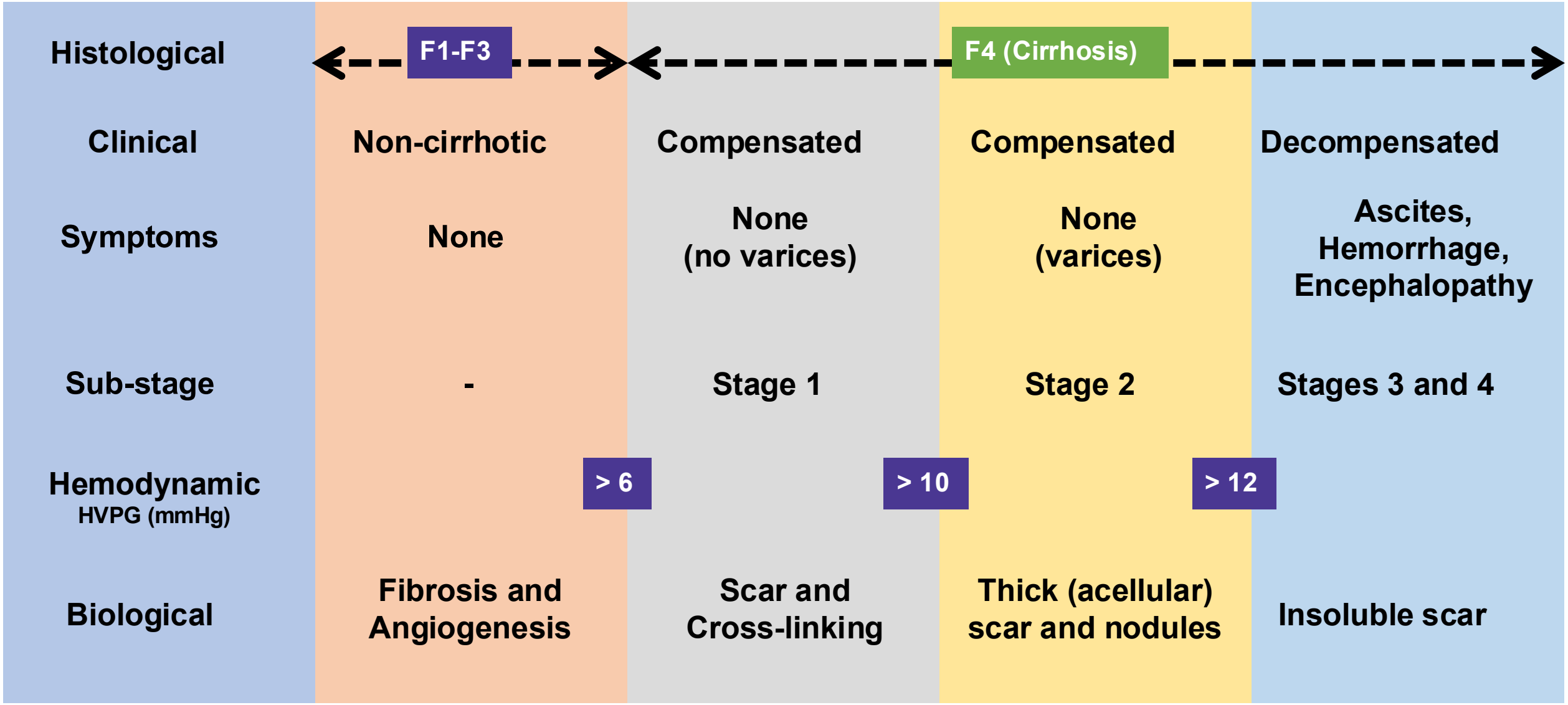


Figure 2. Association of Medical Addiction Therapy for Alcohol Use Disorder With Odds of Hepatic Decompensation Within 10 Years After Cirrhosis Diagnosis

Incidence and Progression of Alcohol-Associated Liver Disease After Medical Therapy for Alcohol Use Disorder.
JAMA Netw Open. May 1, 2022.

Disease Stage	Reversibility with Abstinence	Key Data
Steatosis (F0-F1)	✓ Fully reversible	Liver stiffness decreases within 2-4 weeks of abstinence
Fibrosis (F2-F3)	✓ Partially reversible	10-year mortality: 0% (F0-2) vs 45% (F3-4) with abstinence
Compensated Cirrhosis (F4)	~ Limited histologic reversal; clinical improvement	Abstinence reduces decompensation risk by ~25% (57% vs 83% at 3 years)
Decompensated Cirrhosis	~ Clinical recompensation possible	31% achieve recompensation; 0% liver-related deaths in abstinent recompensated patients

Cirrhosis: A Pathophysiological Classification



Garcia-Tsao G, et al. *Hepatology*. 2010; 51:1445-9.

Compensated Cirrhosis

Subtle clues may be overlooked

- Platelets <150,000
- Muscle wasting
- AST > ALT without alcohol consumption
- Liver enzymes may be normal
- Albumin <3.5 mg/dL
- Bili >1.0 – 1.2

Etiology may be remote

- Prior alcohol use
- Type 2 diabetes mellitus and obesity
- Undiagnosed HCV

Braveno VII Concept of Recompensation

- Recompensation is defined as:
  - Removal of primary factor
  - Resolution of decompensating events
  - Sustained improvement in hepatic function
- One third of decompensated HCV patients with sustained virologic response (SVR or cure) recompensate.
- 60% of patient with decompensated HBV cirrhosis who are treated for 120 weeks recompensate.
- Early ETOH abstinence (within 1 month of decompensation) doubles likelihood of recompensation.

Screening for Liver Disease During Routine Visits

Beer
(12 oz can of beer)

About 5% Alcohol

—

Table Wine
(5 oz glass of wine)

About 12% Alcohol

—

Shot of Spirits
(1.5 oz of distilled spirits)

About 40% Alcohol

Social History:

HOW OFTEN AND HOW MUCH DO YOU DRINK?

Social History

Any recent travel? Born abroad?
Have you had any blood transfusions?
Have you ever had hemodialysis?
Do you work in healthcare? Any needle sticks? Medical care in developing countries?
Any tattoos?
Any incarcerations?
Have you ever injected or snorted drugs, even once?
Any unprotected sex? Multiple sex partners?
Are you a war/Vietnam veteran?

Medication History

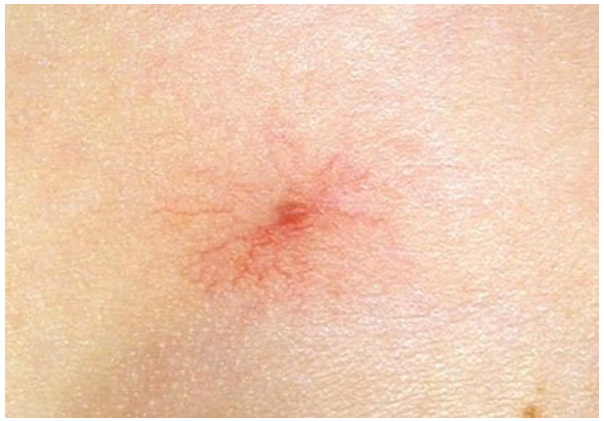
- Prescription medications
- Over the counter medications
- Herbal remedies
- Supplements
- Body building agents
- Weight loss treatments
- Vitamins

ROS/PE

NONE
Easy bruising
Sleep disruption
Poor memory or confusion
Chronic fatigue/somnolence
Abdominal pain
Lower extremity edema
Pruritus
Dark urine and pale stool
Nausea, vomiting +/- loss of appetite
Jaundice

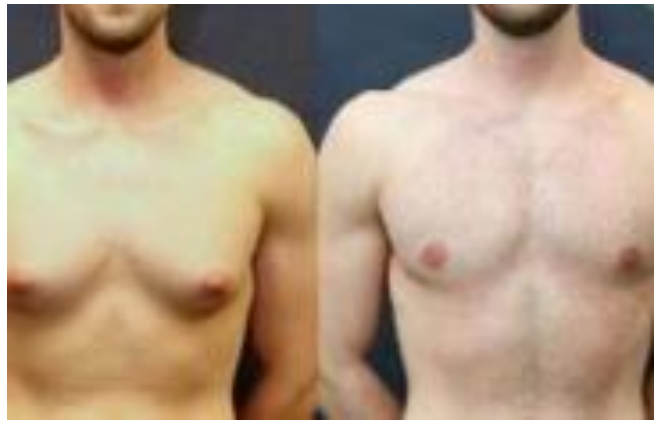
Physical Signs of Early Cirrhosis

Spider Angiomata



Terry Nails

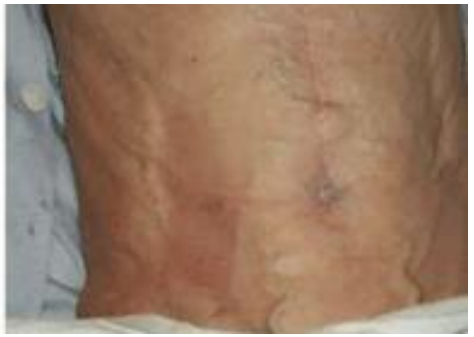
Male Gynecomastia



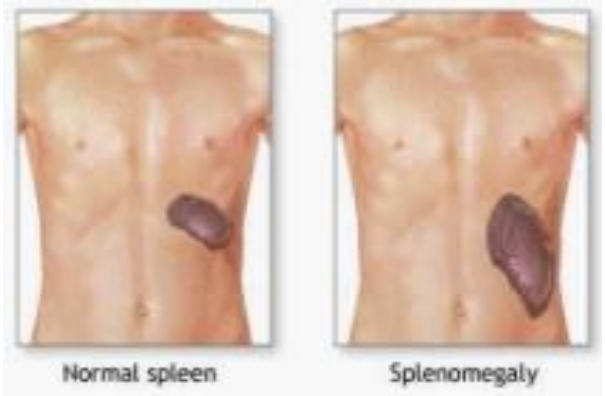
Other Signs:
Firm liver edge on palpation
Enlarged left liver lobe
Mild splenomegaly on imaging

Physical Signs of Advanced Cirrhosis

Caput Medusa

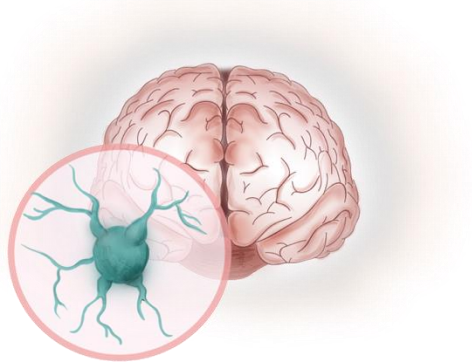


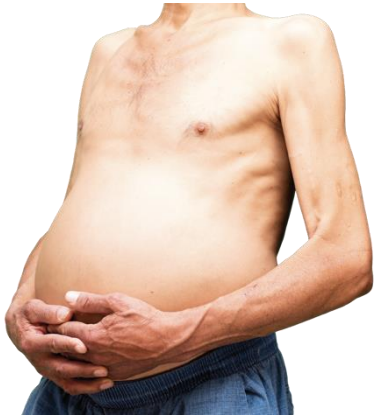
Splenomegaly



Jaundice/Scleral Icterus

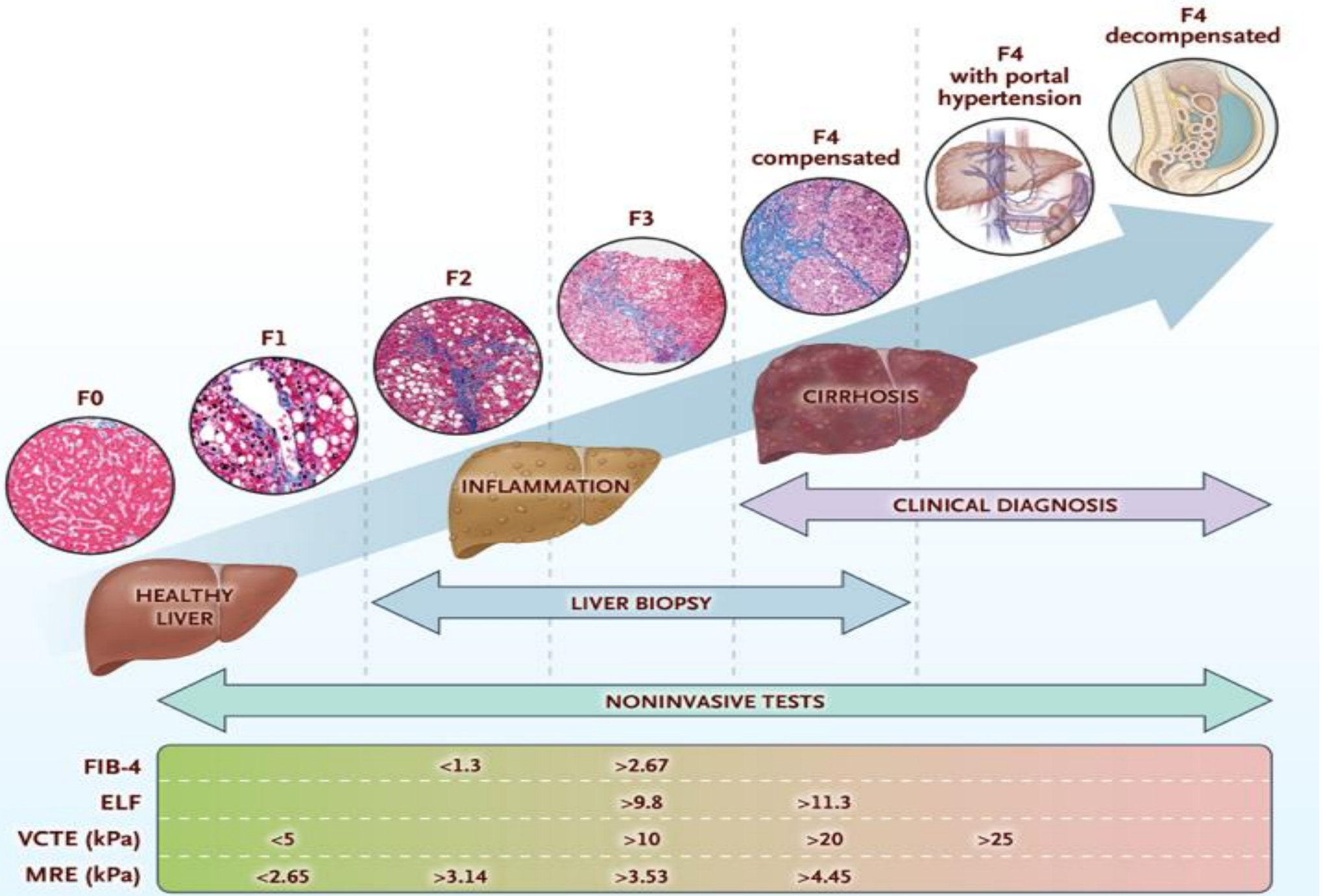
Encephalopathy





Ascites and Muscle Wasting

Non-invasive Methods to Screen for Liver Disease



NITs (Non-invasive tests) for Hepatic Fibrosis

FIB-4 Calculation: Assess Presence of Advanced Fibrosis

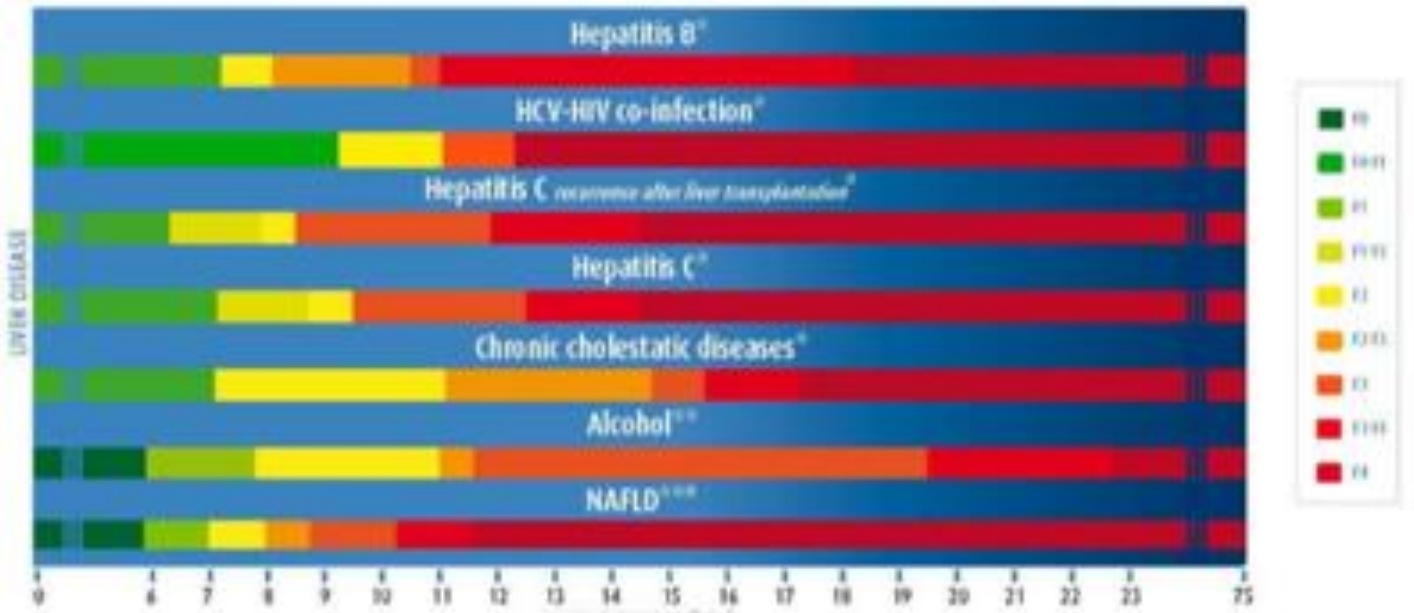
Parameter
Age
AST
ALT
Platelet count
BMI
Albumin
Impaired fasting glucose/diabetes?

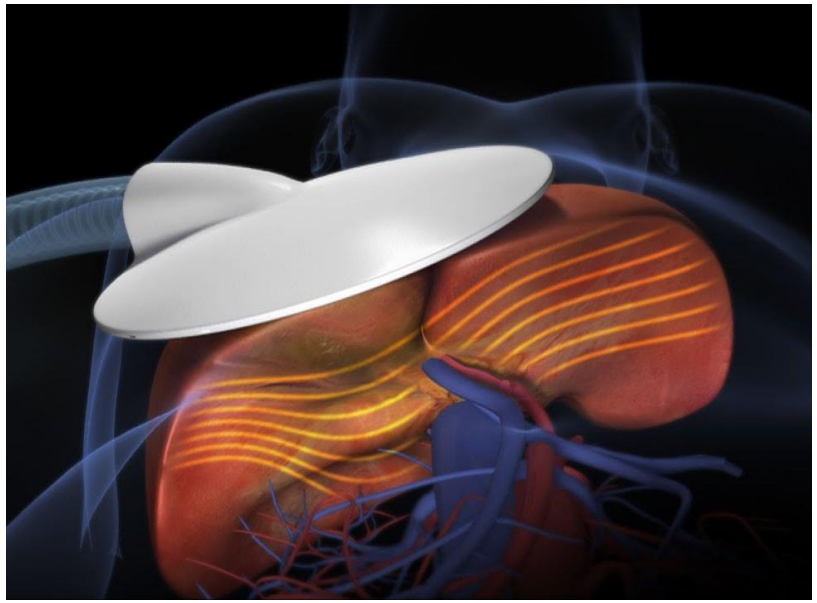
FIB-4 Score	Effect	NPV or PPV, %
< 1.3	Rules out fibrosis	95
> 3.25	Predicts fibrosis	75

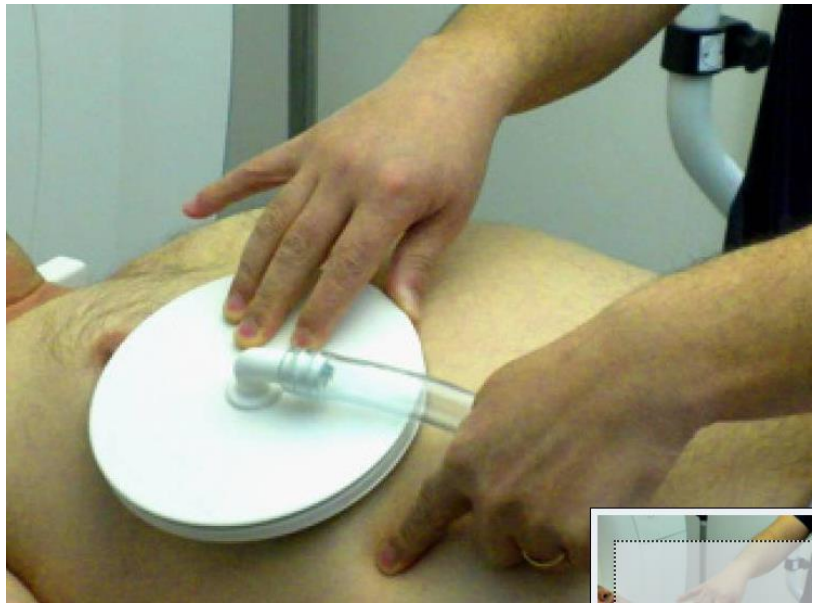
Angulo P, et al. *Hepatology*. 2007;45:846-854; Sterling RK, et al. *Hepatology*. 2006;43:1317-1325; McPherson S, et al. *Gut*. 2010;59:1265-1269.

FibroScan

- Vibration Controlled Transient Elastography (VCTE)
- Liver stiffness measured on kilopascals and correlated with fibrosis stage, F0-F4
- Controlled Attenuation Parameter (CAP)
- Steatosis measured in dB/m and correlated with steatosis grade, S0-S3







MRI elastography

- MRI imaging combined with low frequency vibrations to create a visual map, Elastogram, showing the stiffness of the liver.
  - Fat content
  - Iron content
  - Liver stiffness

FIB-4 is the first line test in primary care to identify patients who need further evaluation or should be referred to GI or hepatology

Step	Test	Result	Action
Tier 1	**FIB-4**	1.3	✓ Low risk → Primary care follow-up
		1.3–2.67	→ Proceed to Tier 2
		>2.67	⚠ High risk → Hepatology referral
Tier 2	**VCTE (FibroScan)**	8 kPa	✓ Low risk → Primary care follow-up
		8–12 kPa	Indeterminate → Consider hepatology referral
		>12 kPa	⚠ High risk → Hepatology referral
	or **ELF**	9.8	✓ Low risk → Primary care follow-up
		≥9.8	⚠ High risk → Hepatology referral

Summary

- High risk for MASLD/MASH:
  - Hispanic, metabolic syndrome, DMII (insulin)
  - Labs
    - Platelets <150,000
    - AST or ALT >Upper limits of normal
    - T bili $\geq$ 1.3
    - Low albumin
- Social History: ETOH, risk factors HCV or HBV

Summary

- Identify early liver disease: Critical Window
  - Remember NITs
  - Fib-4 calculation
  - Use the algorithm to determine next steps
- F1-F3 Highly Reversible

Summary

- F4 Fibrosis = Cirrhosis
  - Stage 1 and 2 are Compensated
  - Stage 3 and 4 are Decompensated
- Removal of primary factor
  - Stop all ETOH
  - Control Metabolic Factors
  - Cure HCV and Treat HB V

REMEMBER

- If you suspect liver disease after using the algorithm, refer the patient to gastroenterology or hepatology.

Please reach out

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  - Cell: 210.668.3405

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