Fatty Liver Disease and HIV: What the HIV Clinician Needs to Know

The webinar will begin at

1:00 PM (ET); 12:00 PM (CT); 11:00 AM (MT); 10:00 AM (PT)

Completing the Webinar Check-in Form ensures that your evaluation form will be activated in your IAS–USA account under "My Activities." **You must be preregistered and confirmed in the IAS–USA system by 4:00 PM PT on Monday, May 25, 2020, to be eligible to claim credits or a certificate.**

IAS–USA
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Evaluations, and information on how to claim CME, pharmacy, nursing, or pharmacotherapy credits, and certificate of participation, will be **emailed by 5 PM PT tomorrow.**

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The Cases on the Web (COW) Board is a select group of experts in the management of HIV and other viral infections. Dedicated to teaching practitioners who are actively involved in medical care for people with HIV or other viral infections, the COW Board ensures that the program remains a relevant and useful educational tool for the IAS–USA audience.

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HIV Infection and the Kidney in 2020
Christina M. Wyatt, MD
Tuesday, June 23, 2020

HIV 101: Fundamentals of HIV Infection and Applications of Antiretroviral Therapy
Michael S. Saag, MD
Rajesh T. Gandhi, MD
Tuesday, June 30, 2020

Weigh Gain: A Growing Issue in Antiretroviral Therapy
John R. Koethe, MD
Tuesday, July 21, 2020

Physical Function and Frailty in HIV: What Does It Mean, How Do We Measure It, Why Should We Care, and What Can We Do?
Kristine M. Erlandson, MD MS
Tuesday, July 28, 2020

Management and Prevention of HIV Infection Among Transgender Adults
Asa E. Radix, MD
Tuesday, August 18, 2020

Liver Transplant Among People With HIV
Christine M. Durand, MD
Tuesday, August 25, 2020

PEP to PrEP Transitions: Evidence and Innovations
Douglas S. Krakower, MD
Tuesday, October 13, 2020

4-PART Webinar Series on Pain and Addiction:

PART 1—Chronic Pain in People With HIV: An Evidence-Based, Practical
Jessica Merlin, MD, PhD, MBA
Tuesday, September 1, 2020

PART 2—Medical Cannabis in People With HIV: What's the Evidence?
Jessica Merlin, MD, PhD, MBA
Tuesday, October 6, 2020

PART 3—Opioid Use and HIV/Hepatitis C Made Easy: A Practical Implementation of the Evidence
R. Douglas Bruce, MD, MA, MSc
Tuesday, November 3, 2020

PART 4—More Than One Problem: Mental Illness as a Contributing Factor of Pain and Substance Use in People With HIV
R. Douglas Bruce, MD, MA, MSc
Tuesday, December 1, 2020

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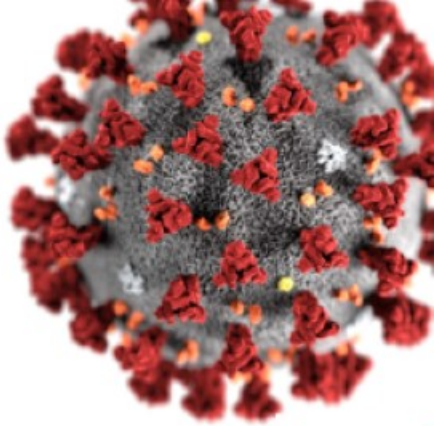

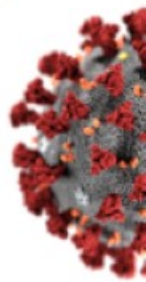

COVID-19: What We Know Today That We Didn't Know Yesterday and Other Scientific Conversations

An IAS–USA roundtable series that will go over updates regarding COVID-19

Paul A. Volberding, MD
George Rutherford, MD
Early June
TBD

Jeanne M. Marrazzo, MD
Judith S. Currier, MD
Wednesday, June 17
4:00 PM – 5:00 PM PT

More details will be release on https://www.iasusa.org/

IAS–USA VIRTUAL Update on HIV: A Focus on Antiretroviral Therapy, New ART Drugs and Strategies, and the Intersection of COVID-19 and HIV

West Coast
Monday, June 29
10:00 AM - 3:15 PM PT

To register, visit https://www.iasusa.org/

IAS–USA VIRTUAL Update on HIV: A Focus on Antiretroviral Therapy, New ART Drugs and Strategies, and the Intersection of COVID-19 and HIV

West Coast

Monday, June 29
10:00 AM - 3:15 PM PT

East Coast

Tuesday, July 14
10:00 AM - 2:50 PM PT

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IAS–USA VIRTUAL Update on HIV: A Focus on Antiretroviral Therapy, New ART Drugs and Strategies, and the Intersection of COVID-19 and HIV

West Coast
Monday, June 29
10:00 AM - 3:15 PM PT

East Coast
Tuesday, July 14
10:00 AM - 2:50 PM PT

Midwest
Thursday, July 30
10:00 AM - 2:45 PM PT

To register, visit https://www.iasusa.org/

Fatty Liver Disease and HIV: What the HIV Clinician Needs to Know

Jennifer C. Price, MD, PhD
Associate Professor of Medicine
University of California San Francisco
San Francisco, CA

Dr Price has received grant support from Gilead Sciences, Inc and Merck, and served on advisory boards for Theratechnologies. Her spouse has held stock options for Bristol-Myers Squibb, Johnson and Johnson, Merck, and Abbvie. (Updated 05/26/20)

Planner/Reviewer Financial Disclosures:
Planner/Reviewer 1 has no relevant financial affiliations to disclose. (Updated 05/26/20)
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- Poll questions
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  - Choose your response from the POLL, *not* in the CHAT box.
  - Responses will be displayed after the poll closes.

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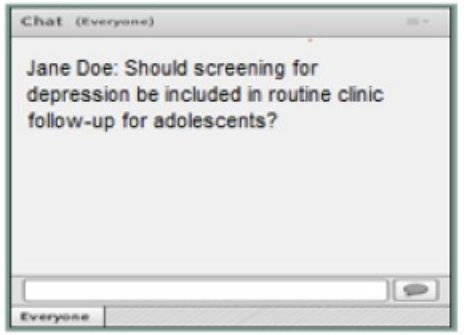

Poll 1

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10. Asia/Australia
11. Africa
12. Other

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Learning Objectives

Upon completion of this webinar, learners will be able to:

- **Recognize the clinical and histologic spectrum of nonalcoholic fatty liver disease (NAFLD)**
- **Identify which persons living with HIV are most likely to have NAFLD**
- **Describe the work-up for patients with suspected NAFLD**
- **Identify the non-pharmacologic management of NAFLD**

Nonalcoholic Fatty Liver Disease (NAFLD)

- Fatty liver (hepatic steatosis) without excessive alcohol or other cause of liver disease
  - >14 drinks/wk in women, >21 drinks/wk in men

Chalasani N, Hepatology, 2017.

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Medications	Other Conditions
• Tamoxifen	• Wilson's disease
• Corticosteroids	• Hepatitis C Virus (genotype 3)
• Methotrexate	• TPN
• Amiodarone	• Abetalipoproteinemia
• Valproate	• Inborn errors of metabolism

Chalasani N, Hepatology, 2017.

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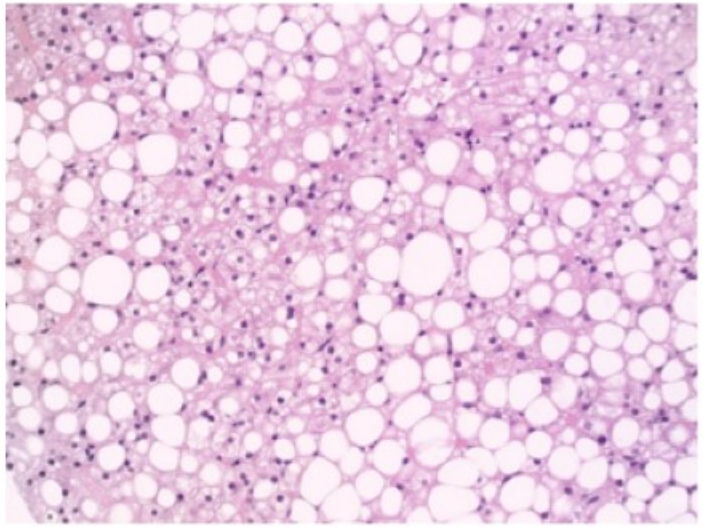
- Primary-NAFLD versus HIV-associated NAFLD

Chalasani N, Hepatology, 2017.

NAFLD: Definitions

- Nonalcoholic fatty liver (NAFL) aka simple steatosis
  - Steatosis without hepatocellular injury



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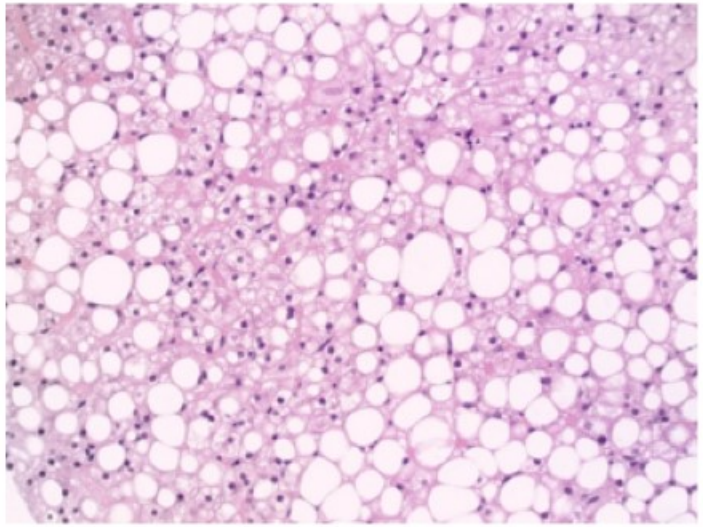
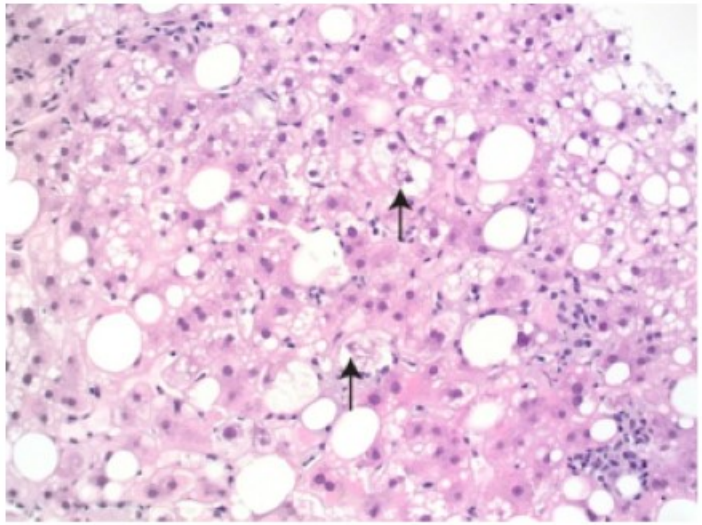
- Nonalcoholic steatohepatitis (NASH)
  - Steatosis + inflammation with hepatocyte injury with/without fibrosis





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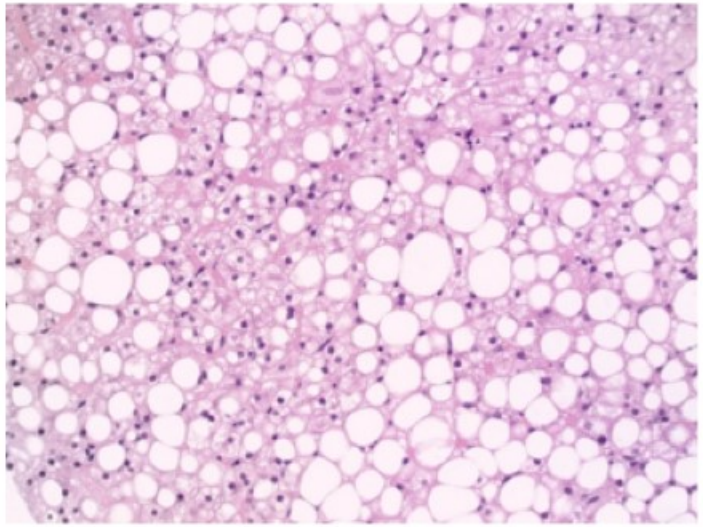
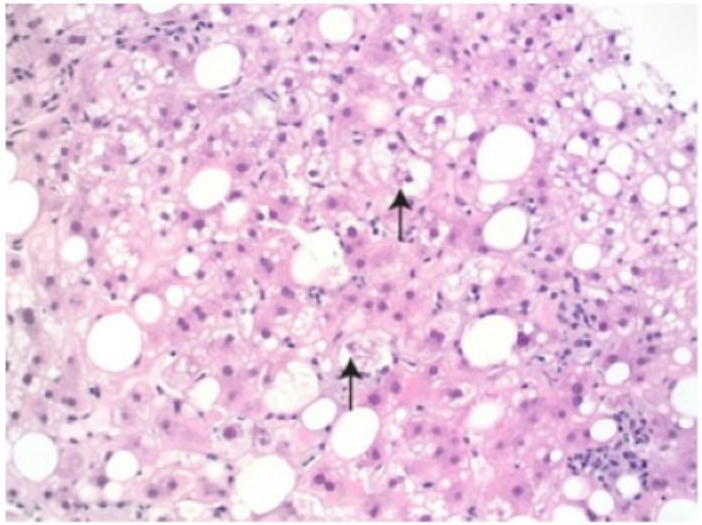
- Nonalcoholic steatohepatitis (NASH)
  - Steatosis + inflammation with hepatocyte injury with/without fibrosis
- Advanced fibrosis
  - Bridging fibrosis or cirrhosis (≥F3)





NAFLD Risk Factors

- **Obesity/central adiposity**
- **Type 2 diabetes**
- **Dyslipidemia**
- **Metabolic syndrome**
- Race and ethnicity
- Hereditary/genetic (for example *PNPLA3)*
- Sex
- Age

Chalasani N, Hepatology, 2017.

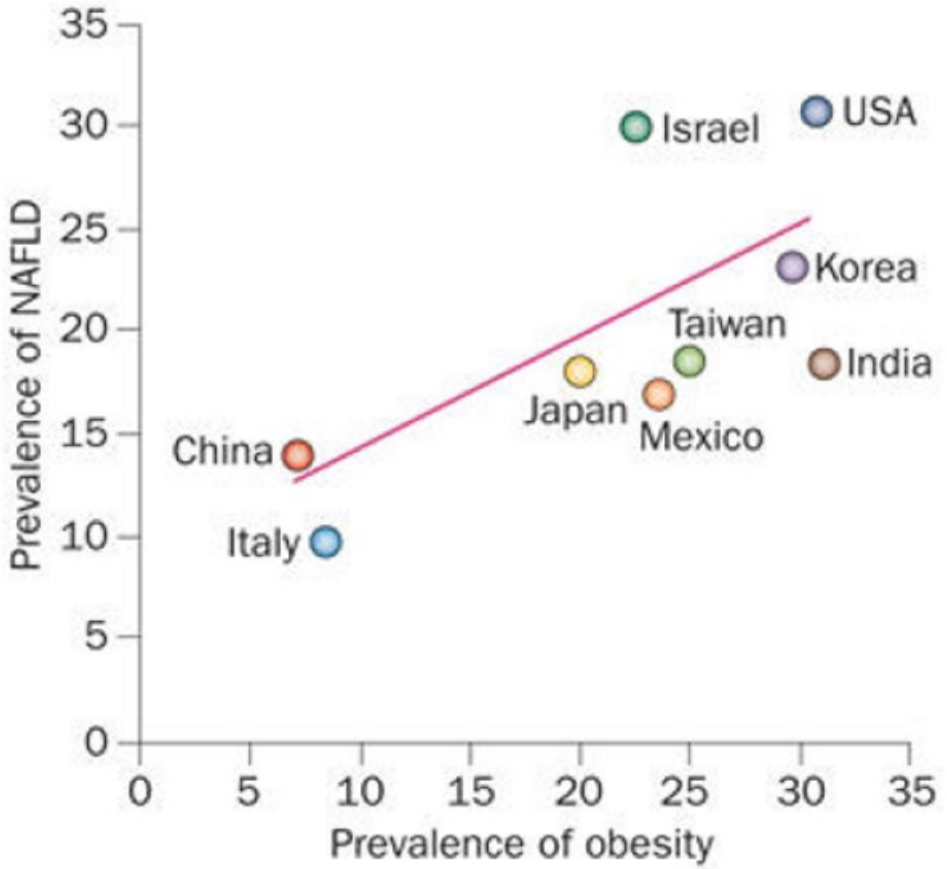
Audience Response Question #1

What is the estimated prevalence of NAFLD in the general US population?

1. 5%
2. 15%
3. 30%
4. 50%

Global Prevalence of NAFLD

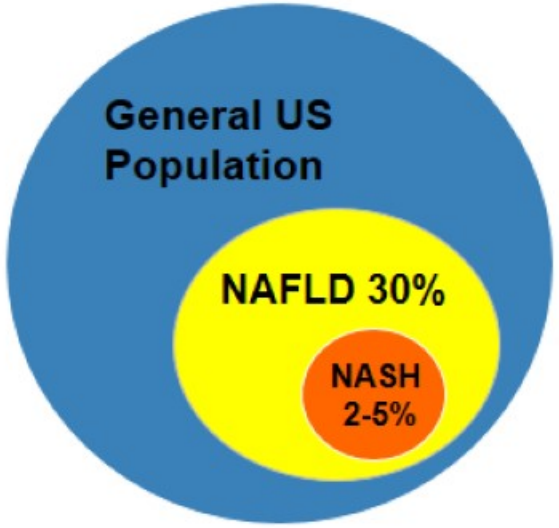
- Estimated global NAFLD prevalence: 25%
- Prevalence in US pop:
  - NAFLD: 30%
  - NASH: 2-5%
- Prevalence varies:
  - Population studied
  - Method used to assess NAFLD



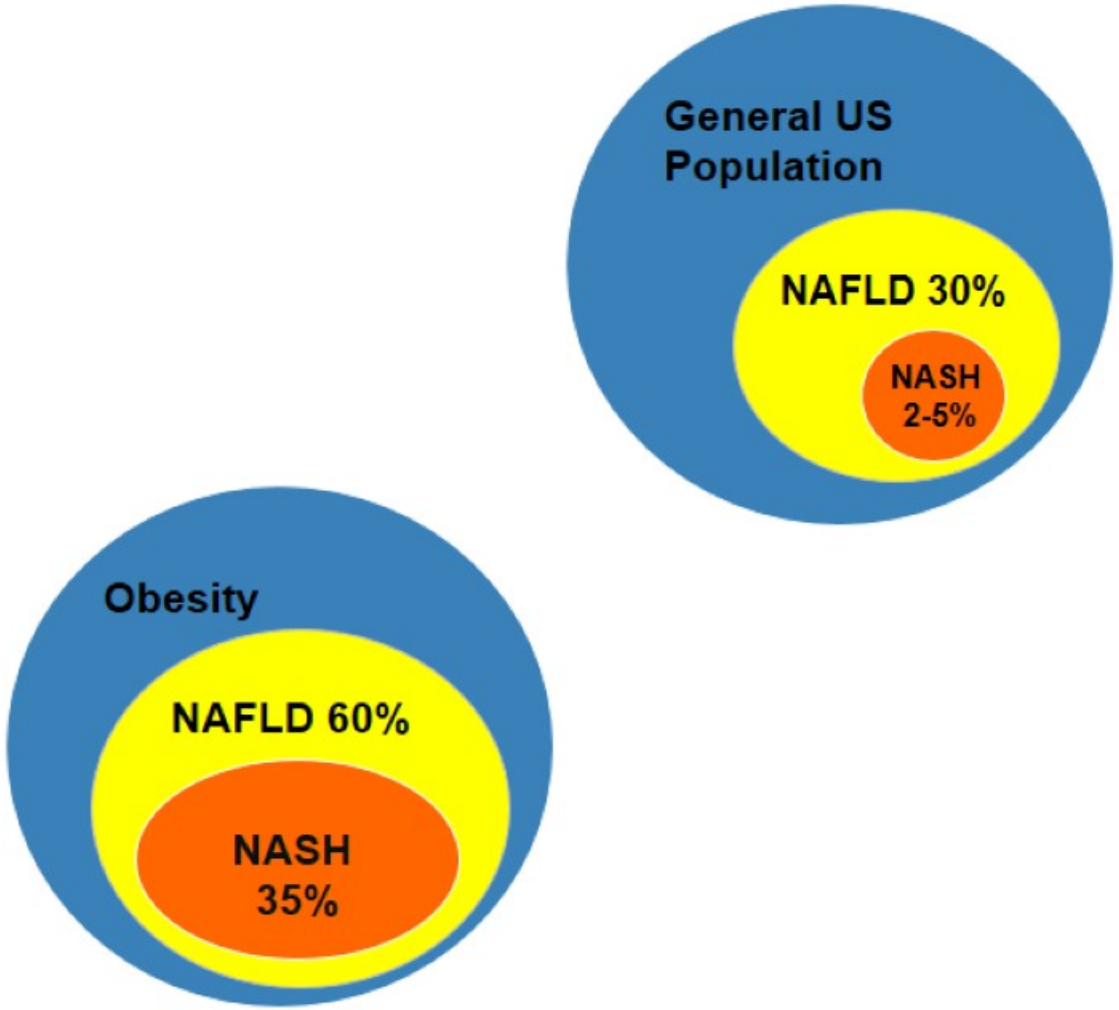
BMI ≥30 except in Asian countries BMI ≥25

Younossi Z, Gastroenteroly, 2016. Lazo M, Semin Liver Dis, 2008.
Loomba R, Nat Rev Gastroenterol Hepatol, 2013.

NAFLD prevalence varies by group studied



NAFLD prevalence varies by group studied



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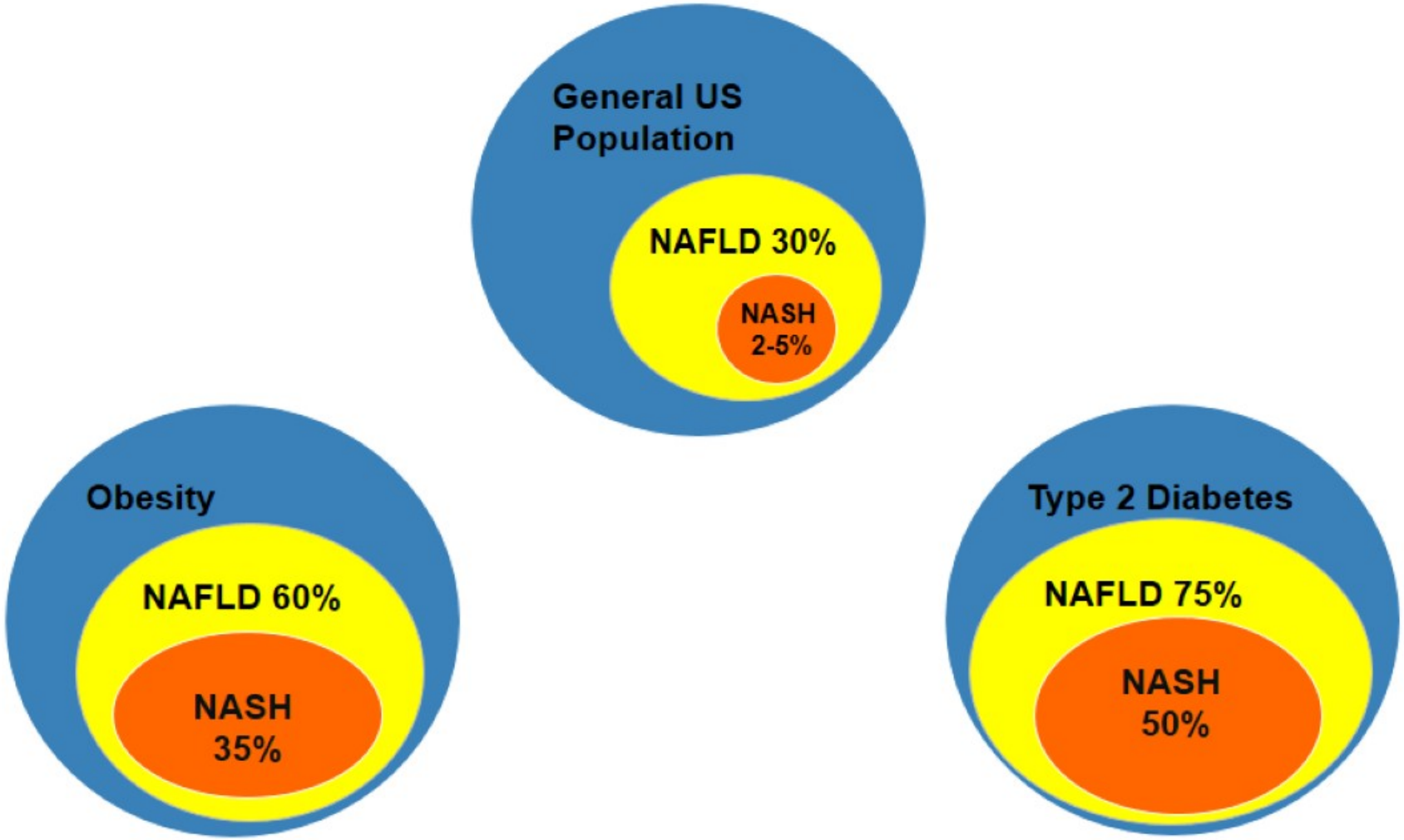

NAFLD Presentation

- Majority are asymptomatic
  - Fatigue is common

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  - Elevated liver enzymes
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NAFLD Presentation

- Majority are asymptomatic
  - Fatigue is common
- Often detected incidentally
  - Elevated liver enzymes
  - Fatty infiltrate or hepatomegaly incidentally noted on abdominal imaging
- Liver enzymes are often normal
  - Not sensitive for NAFLD
  - Correlate poorly with histologic severity

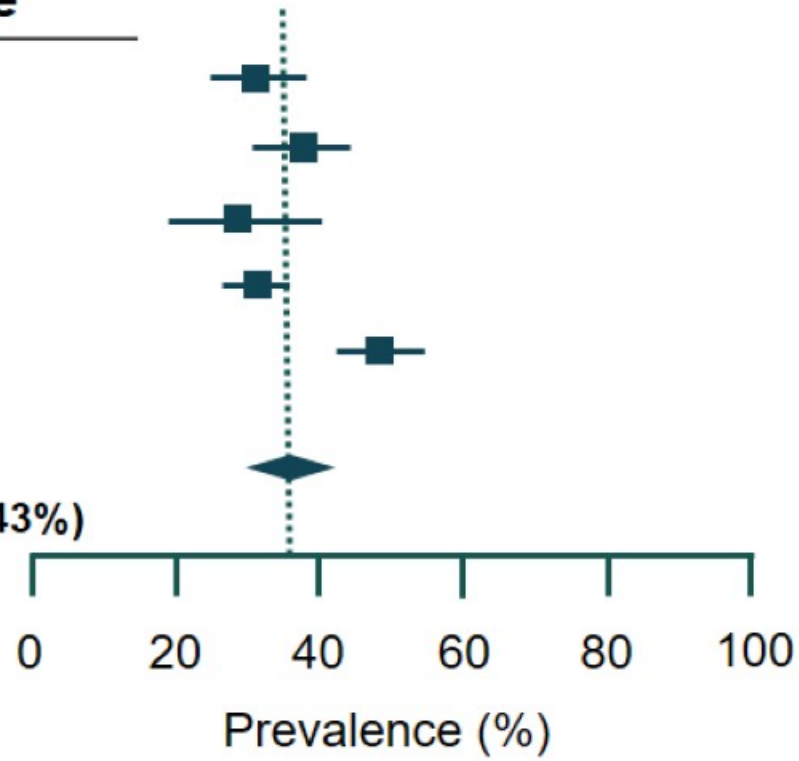
NAFLD prevalence in HIV infection

Study (year)	Country	Number of subjects	Steatosis assessment	Prevalence of NAFLD
Hadigan, C (2007)	USA	33	MR spectroscopy	42%
Moreno-Torres, A (2007)	Spain	29	MR spectroscopy	58%
Mohammed, SS (2007)	Canada	26	Liver biopsy	45%
Guaraldi, G (2008)	Italy	225	CT	37%
Crum-Cianflone, P (2009)	USA	216	Ultrasound	31%
Ingiliz, P (2009)	France	30	Liver biopsy	60%
Nishijima, T (2014)	Japan	435	Ultrasound	31%
Price, JC (2014)	USA	465*	CT	13%
Macias, J (2014)	Spain	505*	CAP**	40%
Lui, G (2016)	Japan	80	MR spectroscopy	29%
Lombardi, R (2016)	Greece	125	Ultrasound	55%
Vuille-Lessard, E (2016)	Canada	300	CAP	48%
Price, JC (2017)	USA	122	MR spectroscopy	28%
Kirkegaard-Klitbo, DM (2020)	Denmark	453	CT	9%

*Includes HIV + HCV or HBV; **CAP= controlled attenuation parameter, obtained with Fibroscan

NAFLD prevalence in HIV infection

Study	Prevalence
Crum-Cianflone (U/S)	31%
Guaraldi (CT)	37%
Lui (MRS)	29%
Nishijima (U/S)	31%
Vuille-Lessard (CAP)	48%
Random Effects Model N=1256	**35% (95%CI 29-43%)**



Maurice J, AIDS, 2017.

Primary NAFLD vs HIV-associated NAFLD

	Primary NAFLD	HIV-associated NAFLD
NAFLD Prevalence	~30%, varies by study	Similarly high, HIV not independent risk factor

Factors associated with NAFLD in PLWH

Variable	Mean Difference (MD) or Odds Ratio (OR) (95% CI)	P-value
BMI	MD 2.9 (2.4 to 3.7)	p<0.001
Waist circumference	MD 8.0 (5.5 to 10.6)	p<0.001
Type 2 diabetes	OR 1.6 (1.1 to 2.4)	p=0.02
Fasting glucose	MD 0.4 (0.2 to 0.7)	p<0.001
Hypertension	OR 1.8 (1.3 to 2.4)	p=0.001
Triglycerides	MD 62 (24 to 99)	p=0.001
Total cholesterol	MD 6.2 (0.9 to 11.5)	p=0.02
HDL	MD -4.2 (-6.8 to -1.6)	p=0.002
LDL	MD 5.8 (2.0 to 9.6)	p=0.003

6 studies in HIV-monoinfected patients with sufficient data to include in risk factor meta-analysis

Maurice J, AIDS, 2017.

Factors associated with NAFLD in PLWH

Variable	Mean Difference (MD) or Odds Ratio (OR) (95% CI)	P-value
Suppressed HIV viral load	OR 1.1 (0.8 to 1.6)	p=0.41
Duration of HIV infection	MD 0.6 (-0.7 to 1.8)	p=0.39
Duration of HAART	MD -15 (-33 to 3.5)	p=0.11
CD4 count	**MD 55 (12 to 98)**	**p=0.01**
CD4 nadir	MD -11 (-41 to 20)	p=0.50

- Higher CD4 count associated with NAFLD
  - Well-treated HIV+ patients may have higher risk
  - Age and HAART exposure not associated
  - Insufficient data to meta-analyze exposure by drug class
- Study by Guaraldi found association with cumulative NRTI exposure (may have included D-drug exposure)

Maurice J, AIDS, 2017.

Factors associated with NAFLD in PLWH

Factors associated with NAFLD in HIV+ men in MACS (N=465)

	Fatty Liver OR*	p
Abdominal VAT (per 10 cm^2)	1.1 (1.0, 1.1)	<0.01
PNPLA3 (rs738409) non-CC	**3.3 (1.7, 6.6)**	**<0.01**
ALT >40 U/L	2.5 (1.2, 5.4)	0.02
HOMA-IR ≥4.9	2.5 (1.2, 5.2)	0.01
Cumulative dideoxynucleoside (per 5 year exposure)**	**1.4 (1.1, 2.0)**	**0.02**

*Also adjusted for age, MACS site, HCV status, and raced

**Dideoxynucleoside= didanosine, zidovudine, stavudine, or zalcitabine

Price JC, Am J Gastoenterol, 2014.

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Association of 2 SNPs in PNPLA3 in HIV-monoinfected adults with elevated liver enzymes (N=62)

	NASH OR (versus nonspecific changes)	p
PNPLA3 (rs738409) non-C	**3.9 (1.6, 9.3)**	**0.003**
PNPLA3 (rs2281135) non-G	**3.9 (1.5, 10.1)**	**0.004**

Price JC, Am J Gastoenterol, 2014. Morse CG, Clin Infect Dis, 2015.

Primary NAFLD vs HIV-associated NAFLD

- PLWH with biopsy-confirmed NAFLD had lower BMI and were more physically active compared to HIV-

TABLE 7. Anthropometry and Body Composition

	HIV-Negative (n = 24)	HIV-Positive (n = 25)	*P*
BMI (kg/m^2)	30.2 ± 1.0	26.3 ± 0.5	0.001
Weight (kg)	93.4 ± 3.7	82.6 ± 1.9	0.012
Height (cm)	175.7 ± 2.0	177.3 ± 1.4	0.510
Waist circumference (cm)	99.1 ± 2.5	94.0 ± 1.7	0.103
WHR	0.95 ± 0.01	0.95 ± 0.01	0.403
Normal: <0.90			
AMA (cm^2)	46.1 ± 3.4	54.8 ± 4.2	0.115
BIA fat mass (%)	22.7 ± 1.2	19.4 ± 0.9	0.026
Low: 6% to 10%			
Optimal: 11% to 17%			
Moderate: 18% to 20%			
Overweight: 20.1% to 24.9%			
Obesity: >25%			
Lipodystrophy score (Range: 1 [very mild] to 8)	N/A	6.0	N/A

Results are reported as mean ± SEM.
N/A indicates not available.

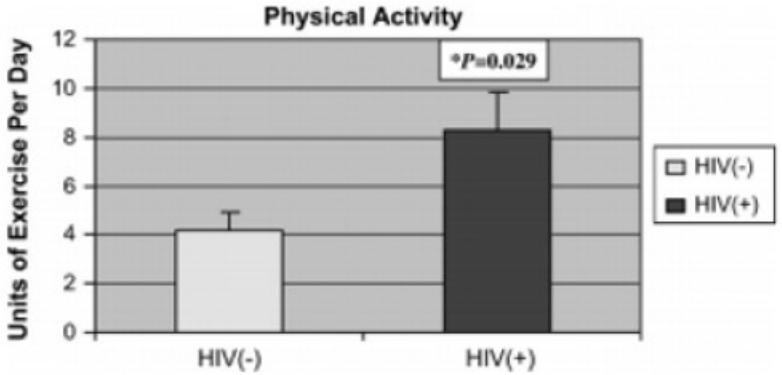
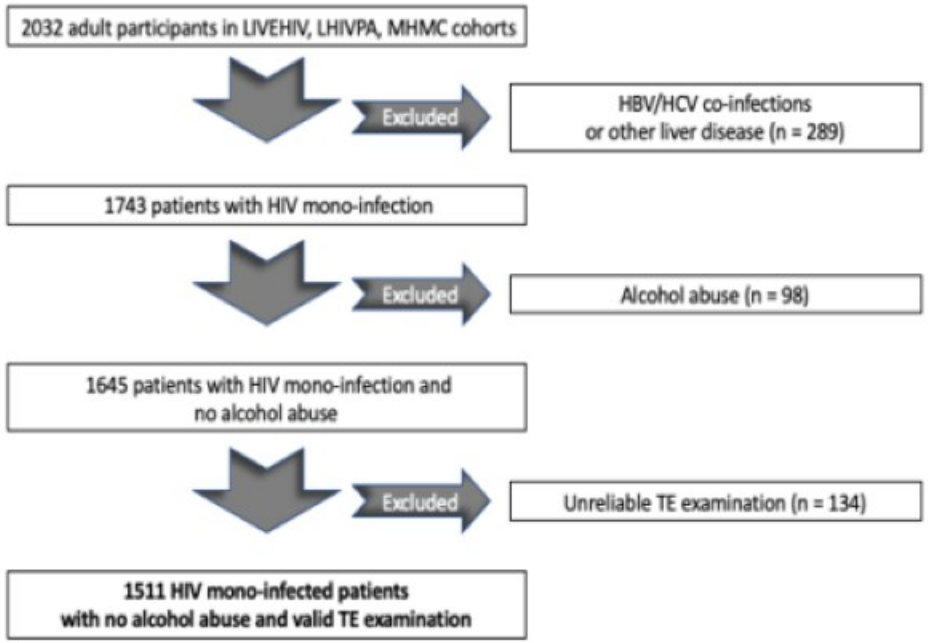


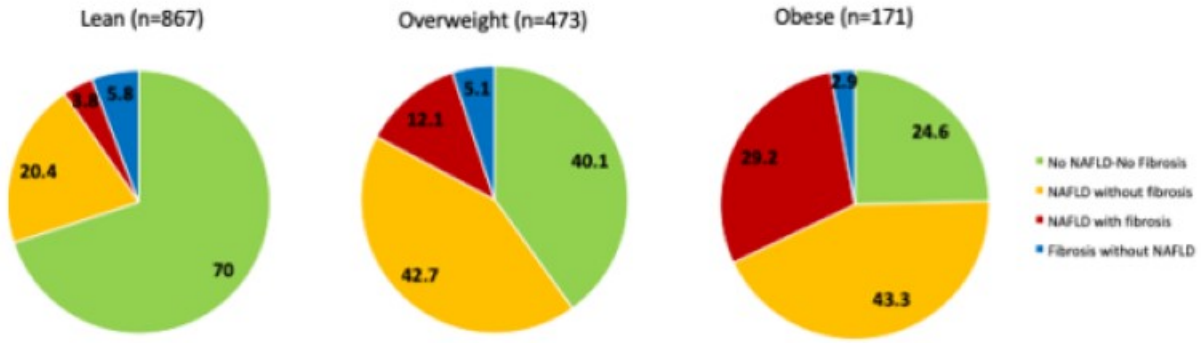
FIGURE 1. Physical activity was measured in units of exercise per day in male HIV-negative and HIV-positive liver biopsy–proven patients with NAFLD and was significantly different between the 2 groups.

Mohammed SS, JAIDS, 2007.

Prevalence of “Lean” NAFLD among PLWH

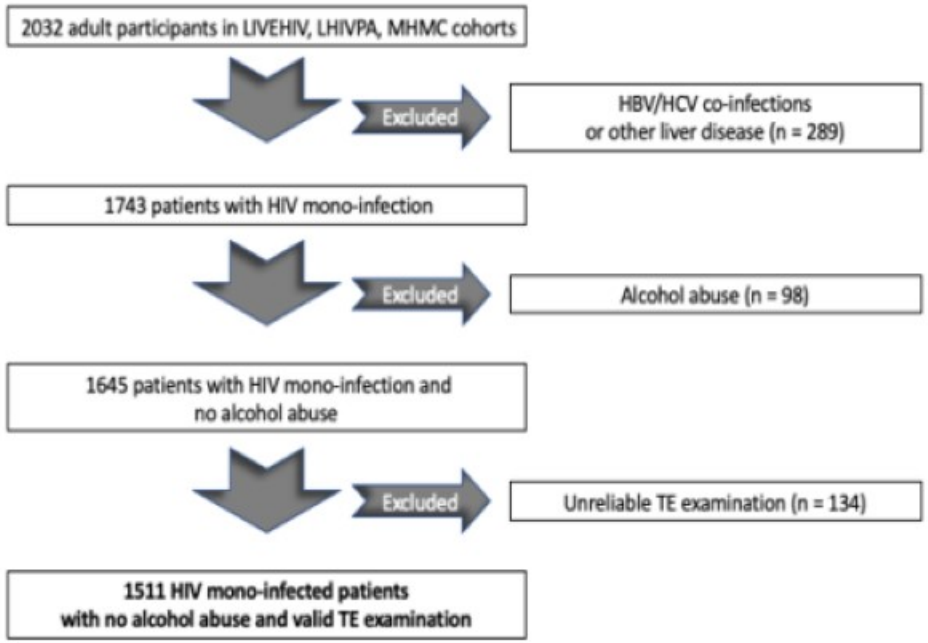


- Lean (BMI<25kg/m^2): 57%
- Overweight (BMI 25-30kg/m^2): 31%
- Obese (BMI≥30 kg/m^2): 11%

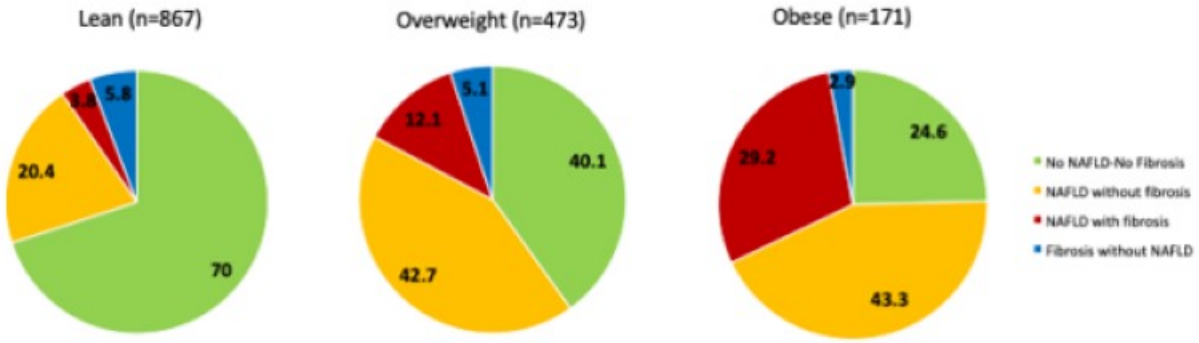


Cervo A, Clin Infect Dis, 2020.

Prevalence of "Lean" NAFLD among PLWH



- Lean (BMI<25kg/m^2): 57%
  - 24% with NAFLD
- Overweight (BMI 25-30kg/m^2): 31%
  - 55% with NAFLD
- Obese (BMI≥30 kg/m^2): 11%
  - 73% with NAFLD



Cervo A, Clin Infect Dis, 2020.

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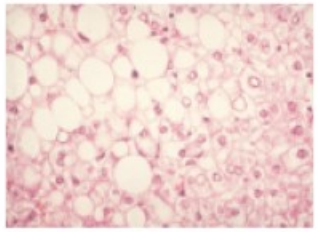
Histologic Spectrum of NAFLD

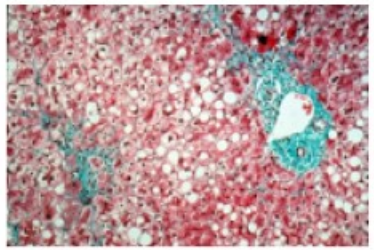
NAFLD

70-75% | 25-30%

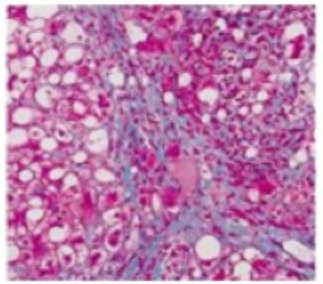
NAFL → NASH → Fibrosis → Cirrhosis

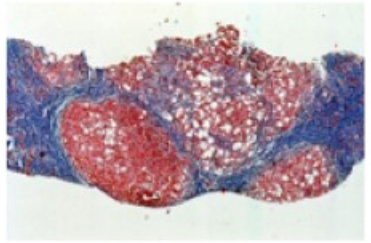


Fat



Fat
Ballooned liver cells
Inflammatory cells
± Fibrosis





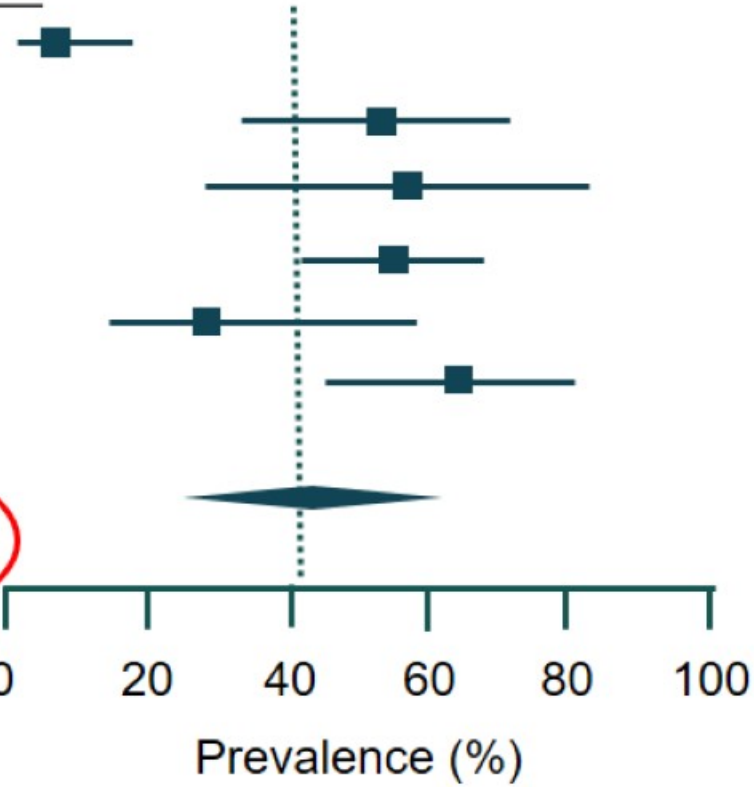
Stage 4 fibrosis
Regenerative nodules
± Fat

→ Portal Hypertension
Liver Failure
HCC

Singh S, Clin Gastroenterol Hepatol, 2015.

NASH prevalence in HIV infection

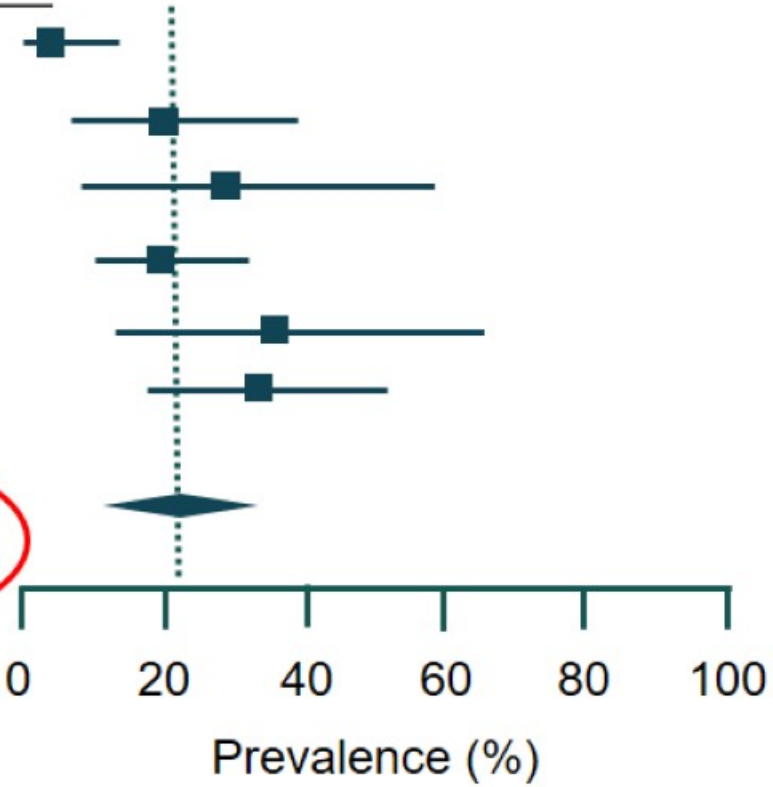
Study	Prevalence
Crum-Cianflone (N=55)	7.3%
Ingiliz (N=30)	53%
Lemoine (N=14)	57%
Morse (N=62)	55%
Sterling (N=14)	29%
Vodkin (N=21)	64%
Random Effects Model N=208	**42% (95%CI 22-66%)**



Maurice J, AIDS, 2017.

Fibrosis prevalence in HIV infection (F2)

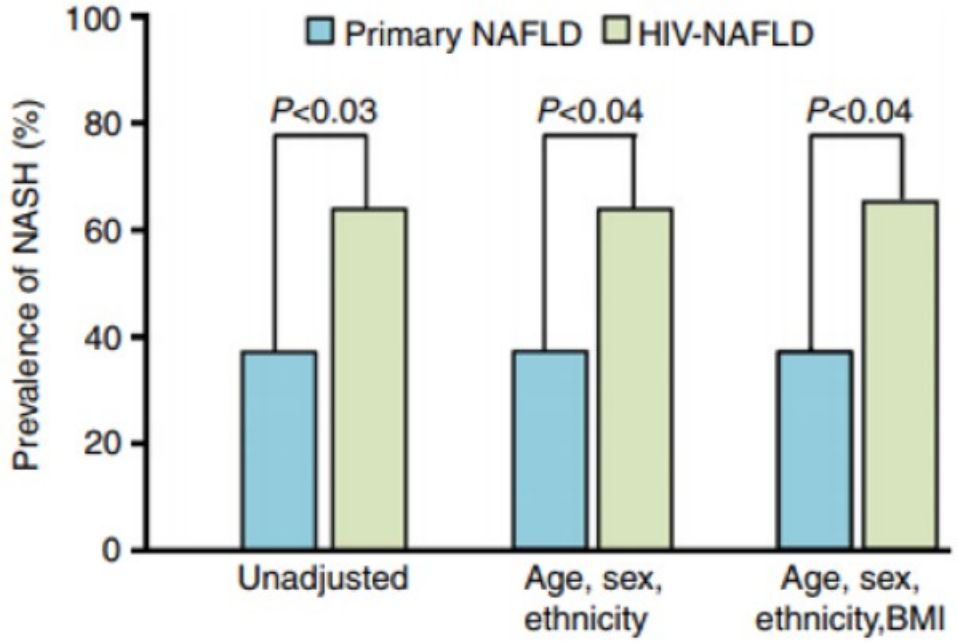
Study	Prevalence
Crum-Cianflone (N=55)	3.6%
Ingiliz (N=30)	20%
Lemoine (N=14)	29%
Morse (N=62)	19%
Sterling (N=14)	36%
Vodkin (N=21)	33%
Random Effects Model N=208	**22% (95%CI 13-34%)**



Maurice J, AIDS, 2017.

Primary NAFLD vs HIV-associated NAFLD

- Case-control study of HIV+ patients with biopsy-proven NAFLD (N=33) and age-sex-matched HIV- controls with biopsy-proven NAFLD (N=33)



Prevalence of NASH:
64% in HIV+
36% in HIV-

Vodkin I, Aliment Pharmacol Ther, 2015.

Primary NAFLD vs HIV-associated NAFLD

	Primary NAFLD	HIV-associated NAFLD
NAFLD Prevalence	~30%, varies by study	Similarly high, HIV not independent risk factor
NAFLD Risk Factors	Obesity, type 2 diabetes, dyslipidemia, metabolic syndrome, hereditary/genetic	Obesity, type 2 diabetes, dyslipidemia, metabolic syndrome, hereditary/genetic
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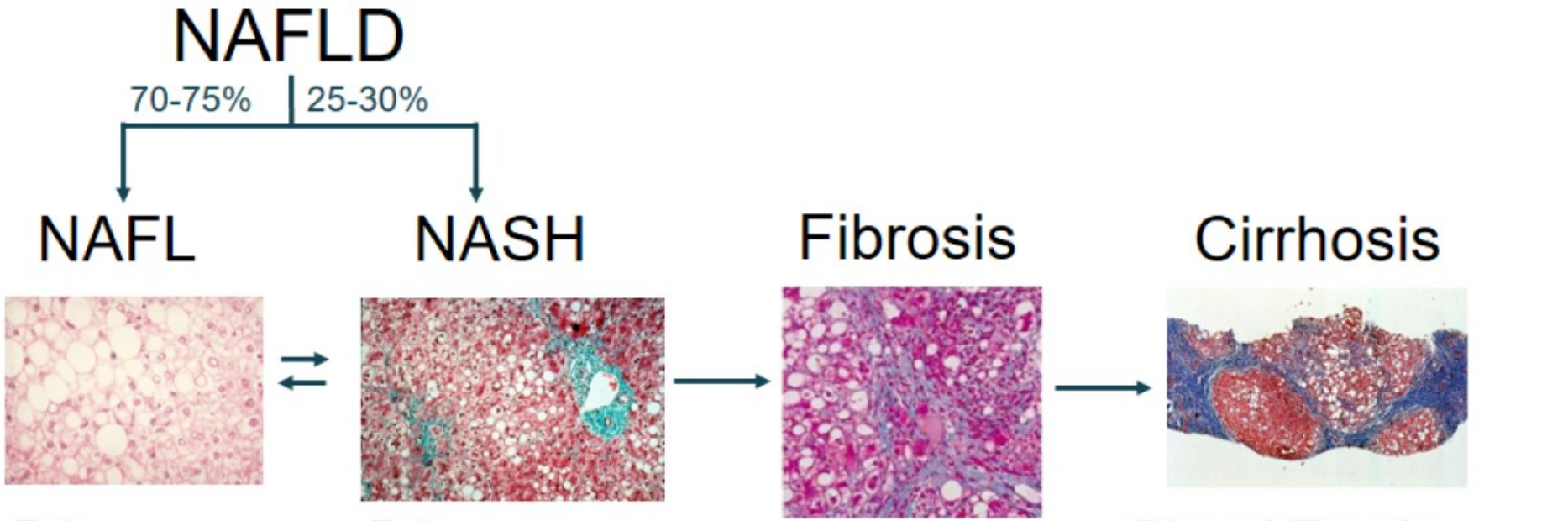
Natural history of NAFLD



Singh S, Clin Gastroenterol Hepatol, 2015.

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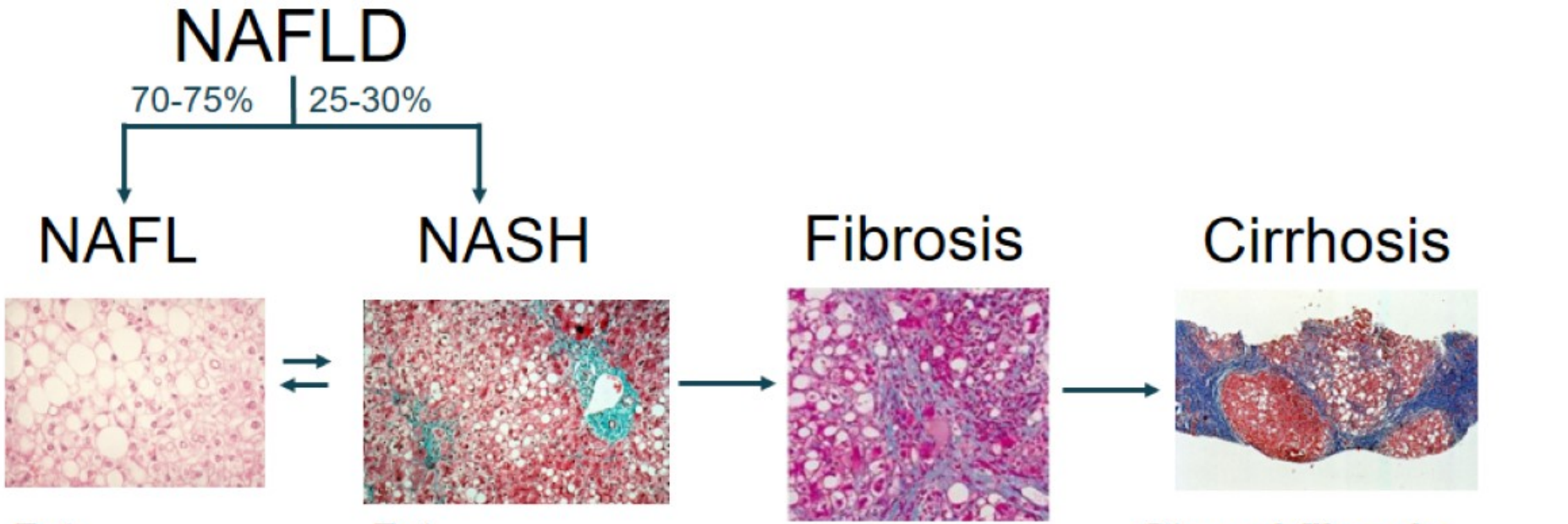


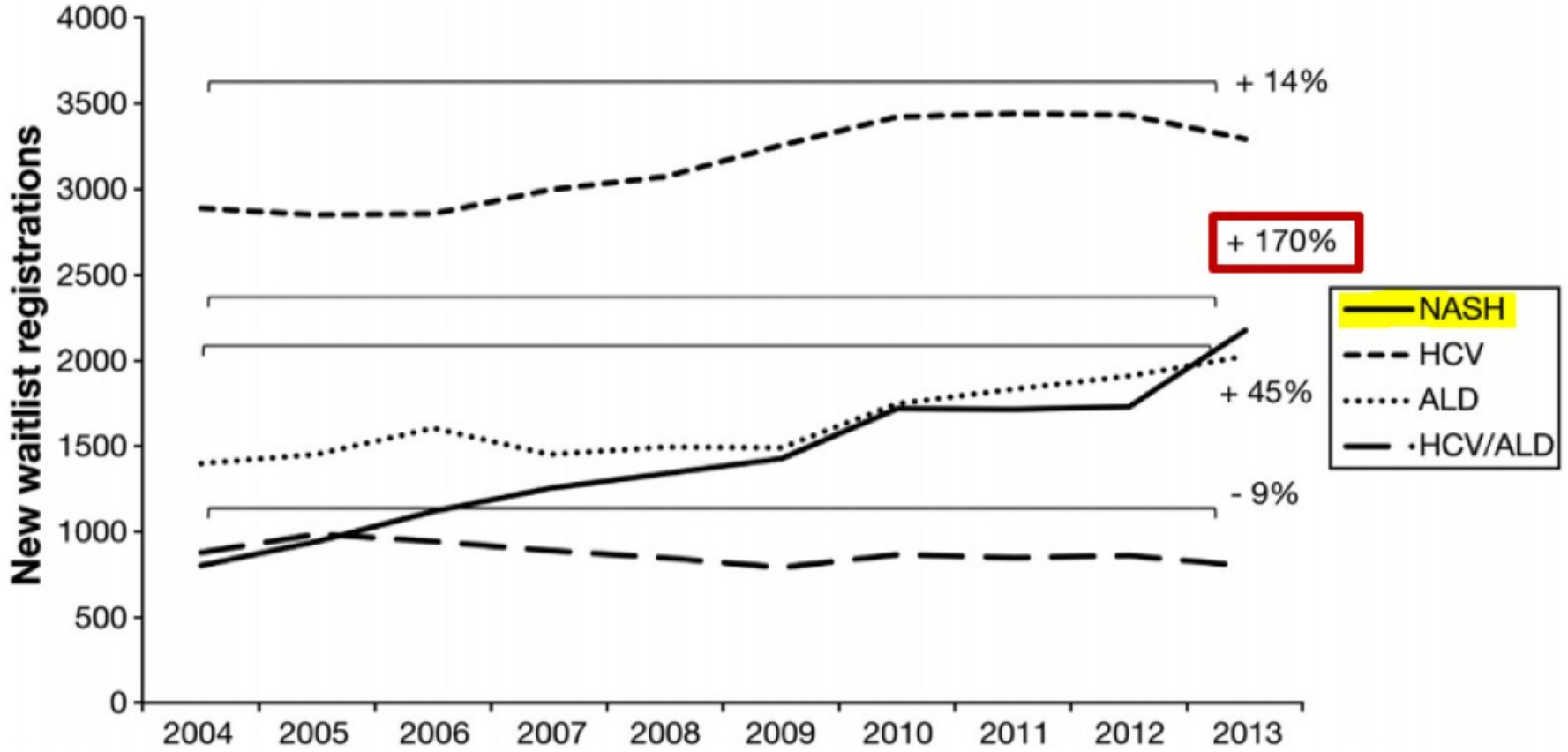
NAFL: fibrosis progression in 39%; 0.07 stages/yr; 1 stage in 14.3 yrs
NASH: fibrosis progression in 35%; 0.14 stages/yr; 1 stage in 7.1 yrs

Portal Hypertension
Liver Failure
HCC

Singh S, Clin Gastroenterol Hepatol, 2015.

Natural history of NAFLD

- NASH is rising as an indication for liver transplant; now #2 behind HCV

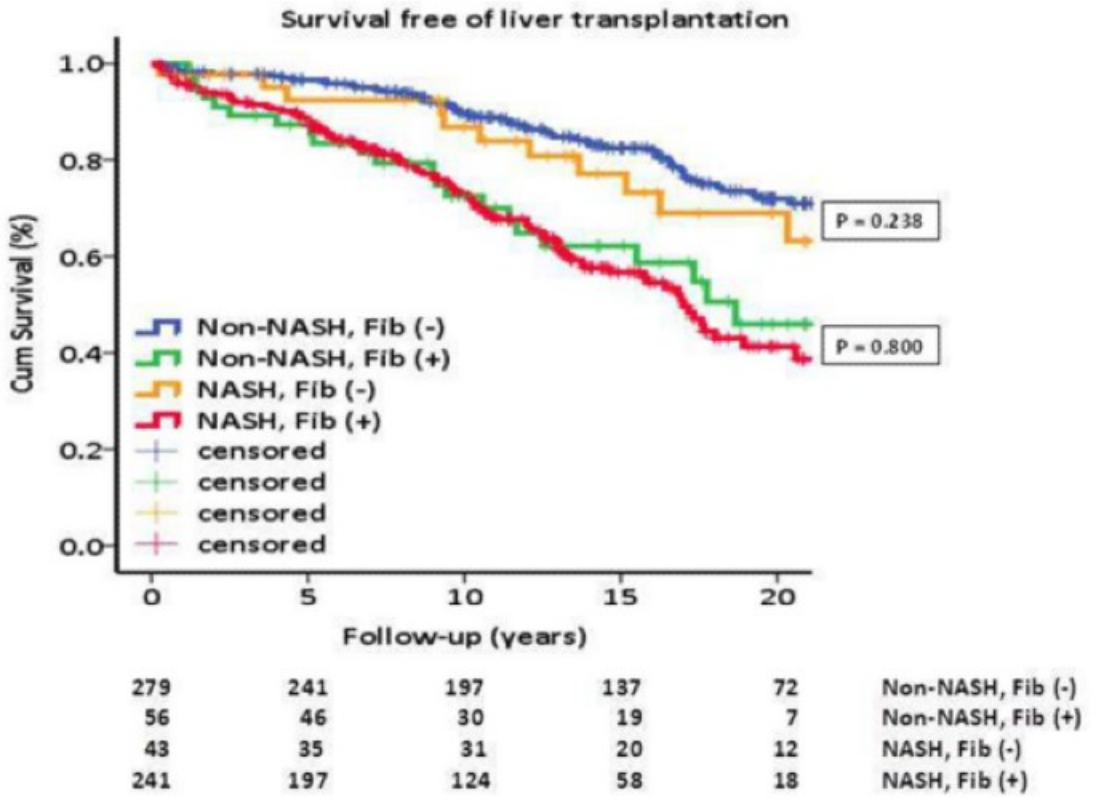


Wong RJ, Gastroenterology, 2015.

Natural history of NAFLD

- Liver fibrosis is the strongest predictor of adverse outcomes in NAFLD

- 619 patients
- Median f/u 12.6 yrs
- 193 (33%) death or liver transplant



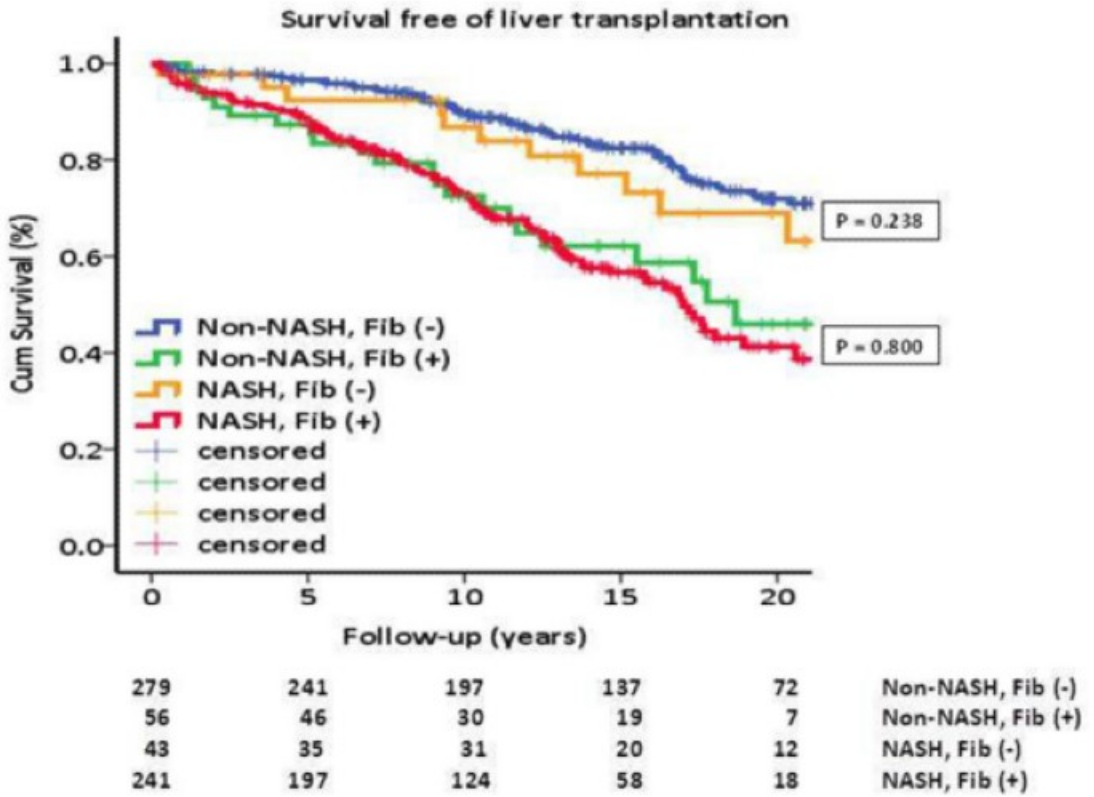
Angulo P, Gastroenterology, 2015.

Natural history of NAFLD

- Liver fibrosis is the strongest predictor of adverse outcomes in NAFLD

- 619 patients
- Median f/u 12.6 yrs
- 193 (33%) death or liver transplant

Patients with Fibrosis, regardless of NASH, had shorter survival times than without fibrosis



Angulo P, Gastroenterology, 2015.

Natural history of NAFLD

- Meta-analysis of 5 cohort studies with N = 1495 pts with NAFLD followed for 17,452 pt-yrs

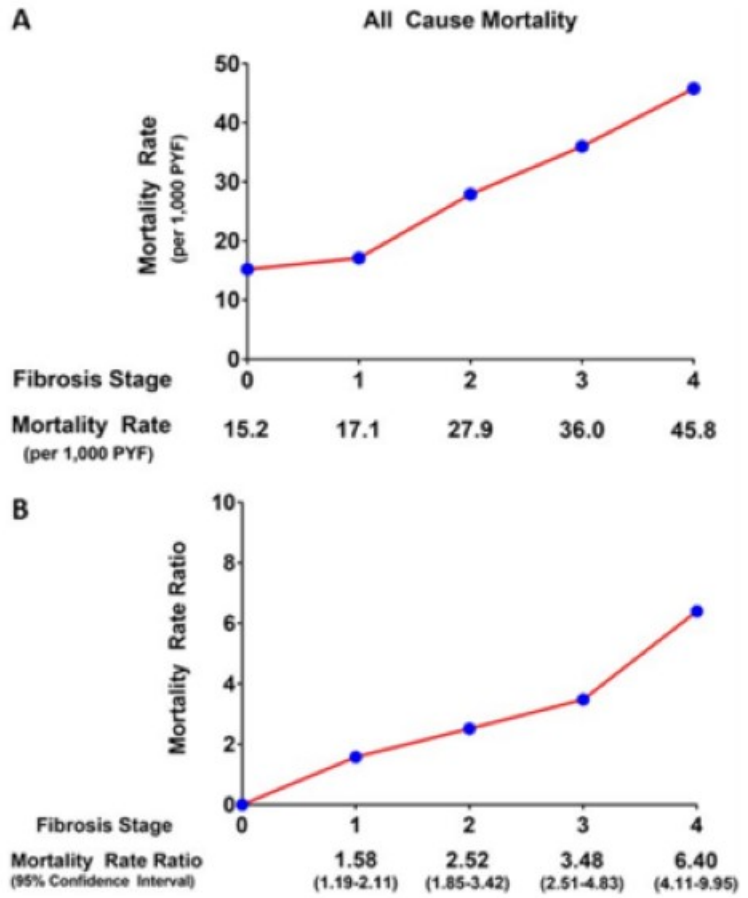


FIG. 2. Fibrosis stage–specific all-cause mortality rate and MRR. (A) Crude all-cause mortality rate by fibrosis stage. (B) All-cause MRR with 95% CIs by fibrosis stage.

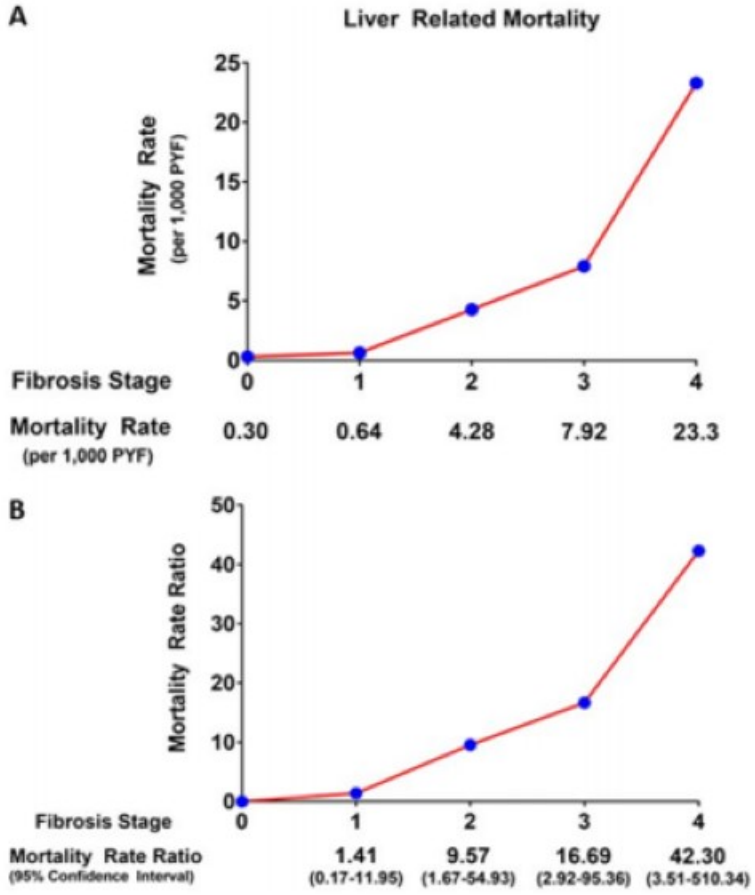
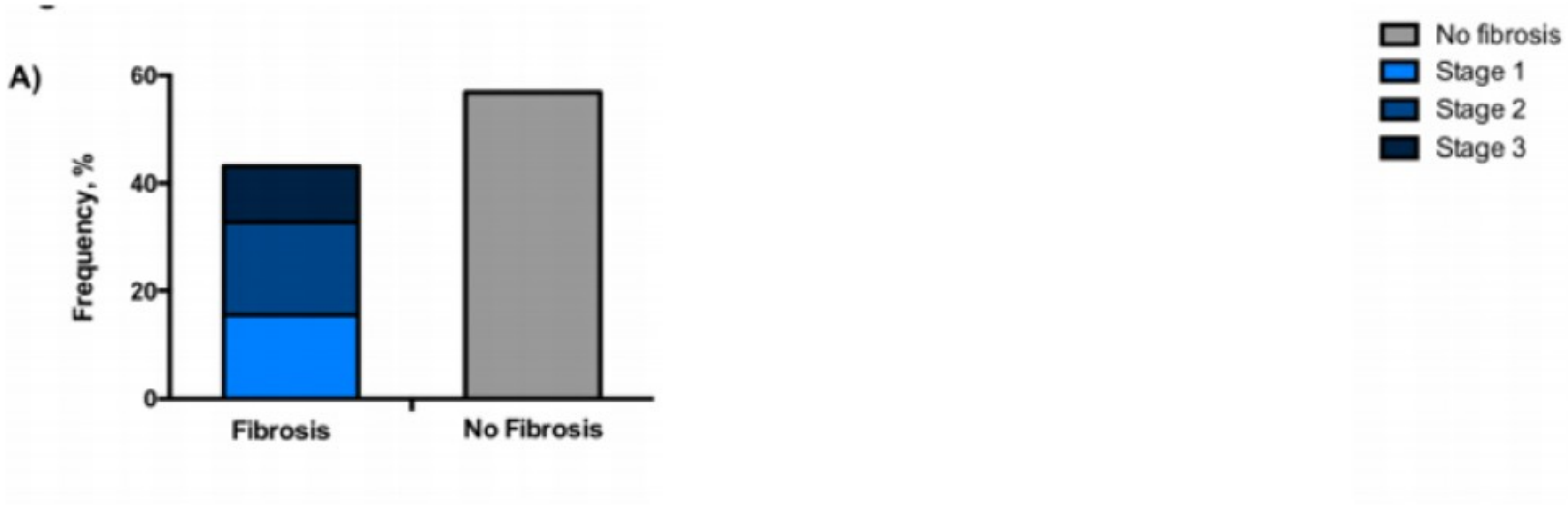


FIG. 4. Fibrosis stage–specific liver-related mortality rate and MRR. (A) Crude liver-related mortality rate by fibrosis stage. (B) Liver-related MRR with 95% CIs by fibrosis stage.

Dulai PS, Hepatology, 2017.

Natural history of NAFLD in PLWH

- 61 participants with HIV-associated NAFLD in RCT of tesamorelin or placebo
- 43% with fibrosis on baseline biopsy



Fourman LT, Clin Infect Dis, 2020.

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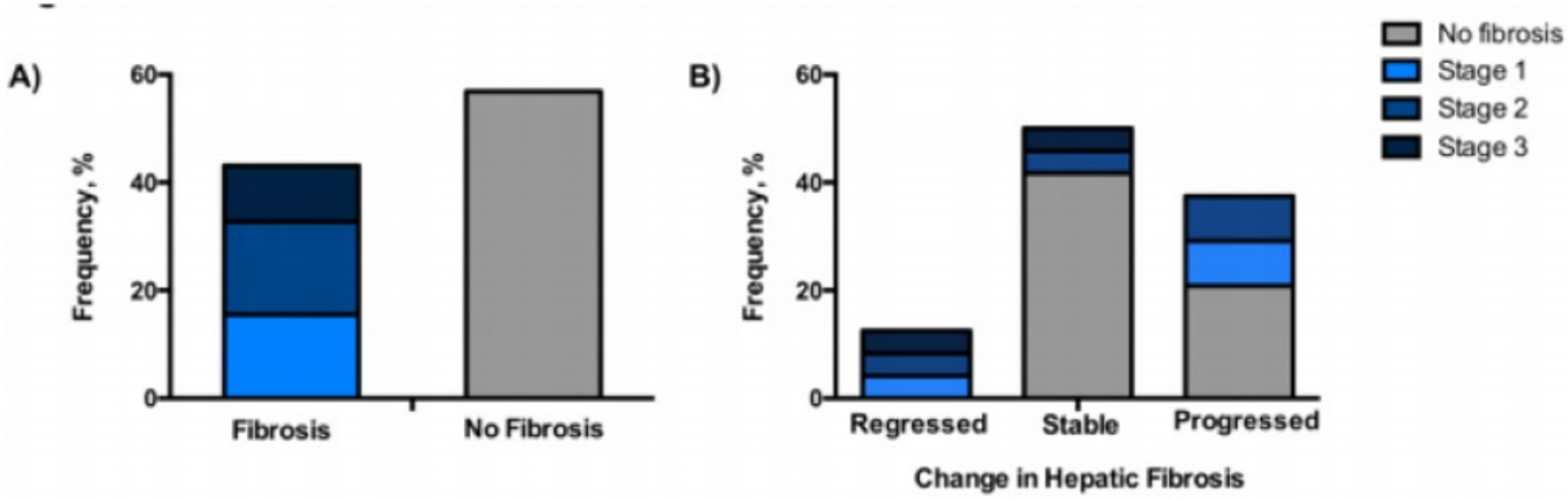


- 24 placebo-treated participants with paired biopsies
  - 38% had fibrosis progression over 12 months
  - Higher visceral fat at baseline increased odds of fibrosis progression by 37% (OR 1.37, 95% CI 1.03,2.07)

Fourman LT, Clin Infect Dis, 2020.

Pathogenesis of NAFLD in PLWH

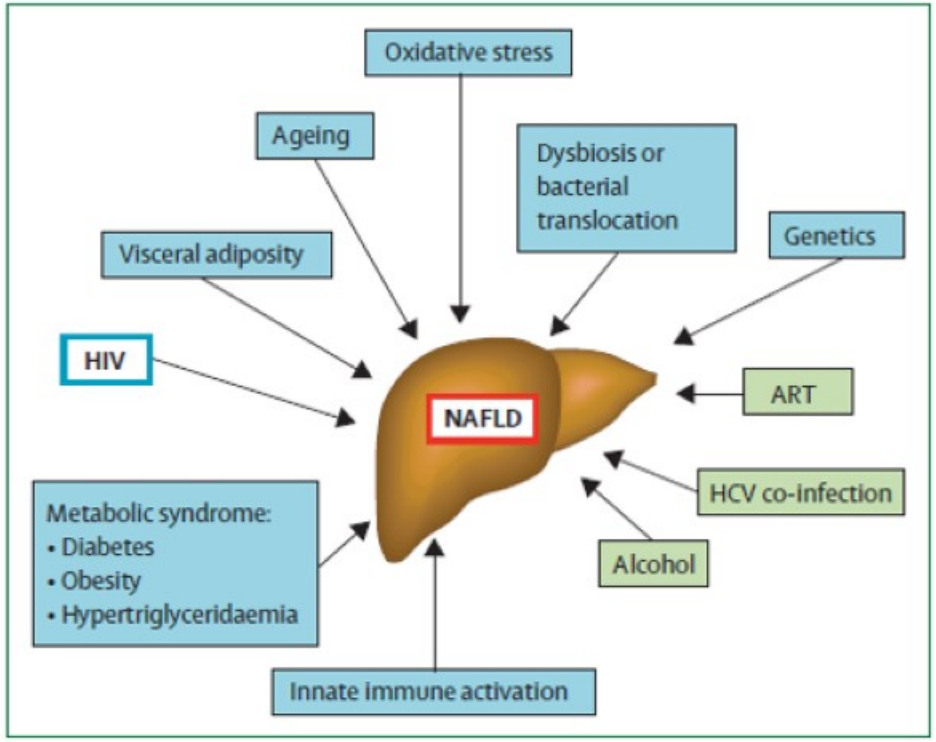


Figure 1: **Diagram of the multifactorial pathogenesis of NAFLD in patients with HIV**

Blue indicates primary causes and green indicates secondary causes. ART=antiretroviral therapy. HCV=hepatitis C virus. NAFLD=non-alcoholic fatty liver disease.

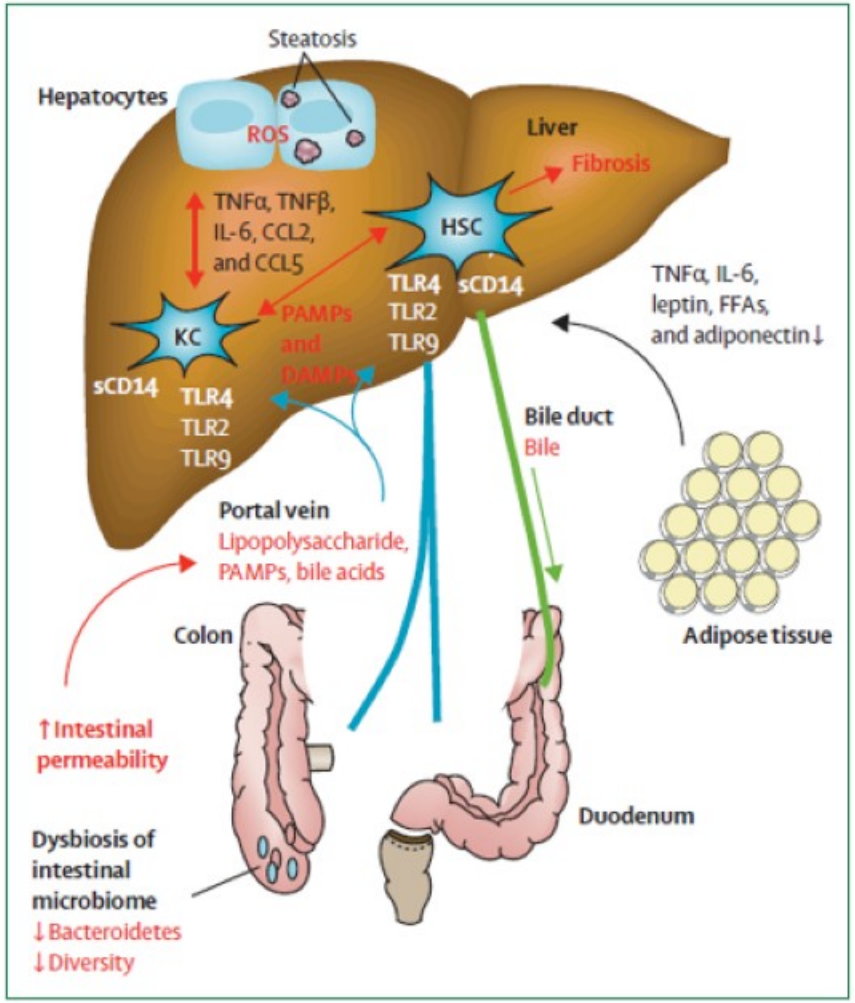


Figure 2: **The gut–liver axis in the pathogenesis of non-alcoholic fatty liver disease**

Verna EC, Lancet GH, 2017.

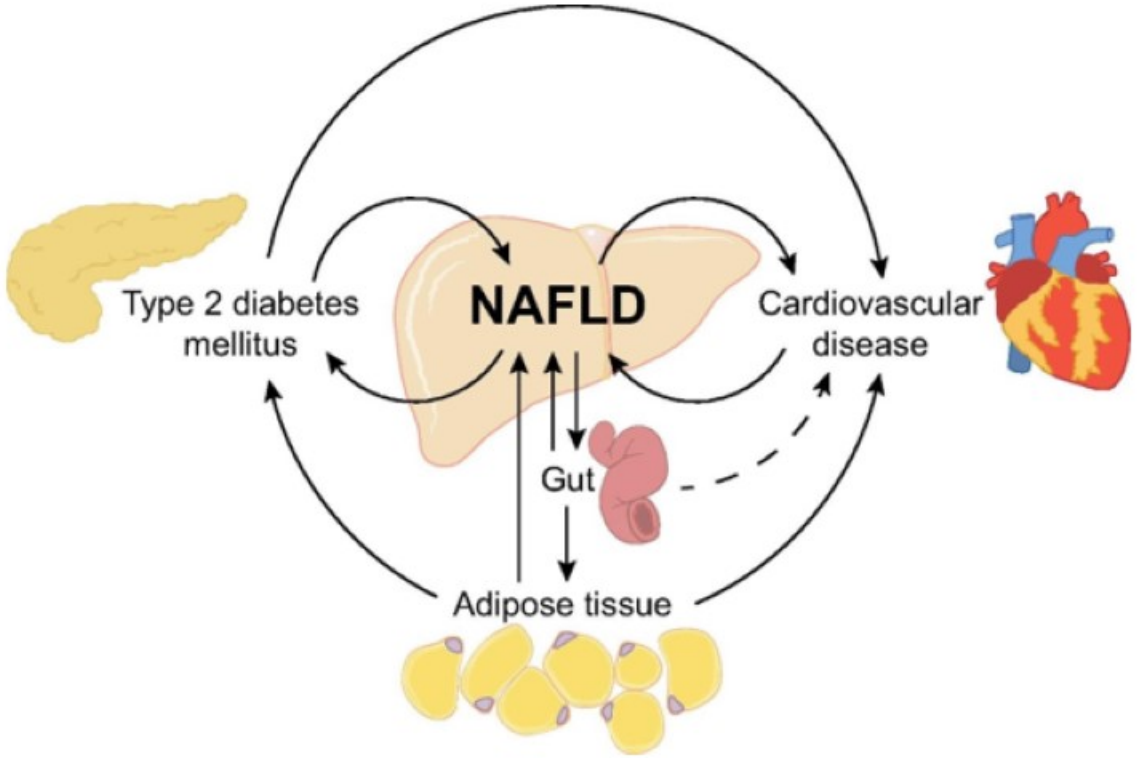
Audience Response Question #2

What is the leading cause of death in patients with NAFLD?

1. Malignancy
2. Cardiovascular disease
3. Liver disease
4. End-stage renal disease

Cardiovascular disease in NAFLD

- Cardiovascular disease is the #1 cause of death in patients with NAFLD (Malignancy #2, Liver #3)
- NAFLD is *independently* associated with subclinical and clinical CVD



Francque SM, J Hepatol, 2016. Vanni E, Semin Liver Dis, 2015.

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Fibrosis Progression	35-40% progress 1 stage in 7 yrs for NASH	??
Long-term outcomes	Increased CVD risk Increased liver-related and all-cause morality	Emerging evidence of independent a/w CVD, scant data on long-term outcomes

NAFLD Diagnostic Criteria

- Diagnostic criteria
  - Hepatic steatosis on imaging or liver biopsy
  - No “significant” alcohol intake
  - Absence of other causes of liver disease
  - No medications known to cause hepatic steatosis

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  - No “significant” alcohol intake
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NAFLD is a diagnosis of exclusion

Evaluation of Suspected NAFLD

- Liver tests
- Abdominal ultrasound
- Other serologic evaluation:
  - HBsAg, sAb, cAb
  - HCV Ab
  - [AMA, IgM (for PBC)]
  - ASMA, ANA, IgG
  - A1AT phenotype
  - Iron, Tsat, ferritin
  - Ceruloplasmin age < 45
  - HAV Ab (for vaccination status)

Audience Response Question #3

How can you distinguish between NAFL and NASH?

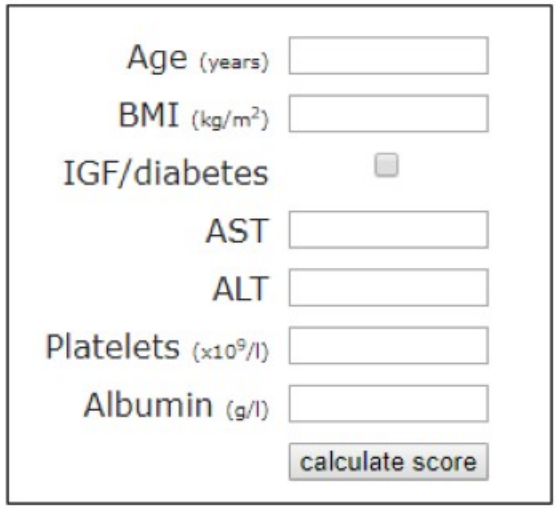
1. Fibroscan
2. MR Elastography
3. Liver Biopsy

Diagnosis and Staging of NAFL vs NASH

Liver biopsy is the only method to reliably distinguish between NAFL and NASH

Serum markers of fibrosis in NAFLD

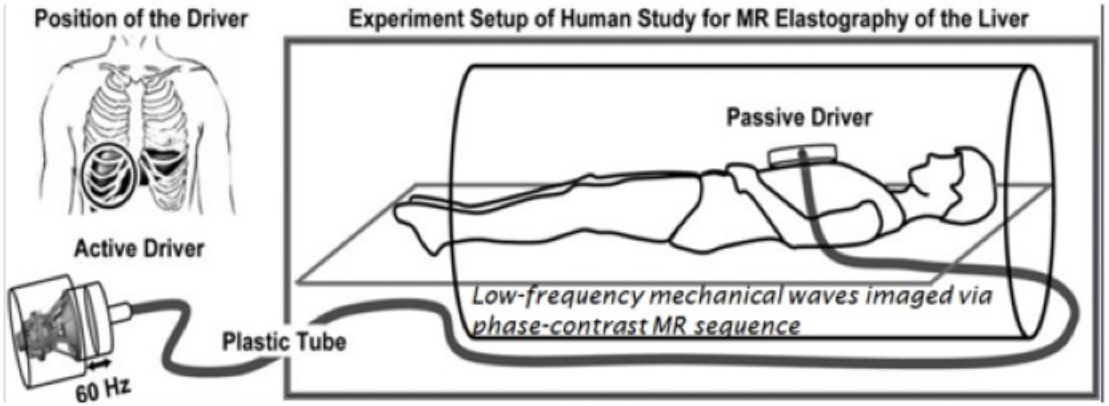
- AST:ALT ratio AST/ALT
- AST-to-plt ratio index (APRI) $\frac{\text{AST/ upper limit of nl}}{\text{Platelet count } (10^9/L)} \times 100$
- FIB-4 $\frac{\text{Age (years)} \times \text{AST}}{\text{Platelet count } (10^9/L) \times \sqrt{\text{ALT}}}$
- NAFLD fibrosis score nafldscore.com

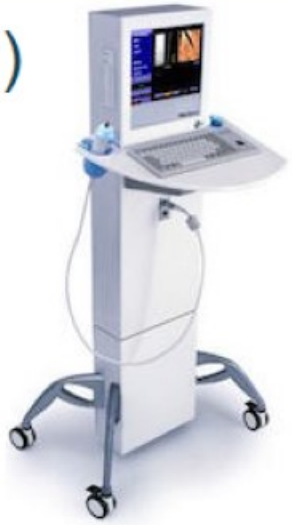


Giannini E, Arch Intern Med, 2003. Wai CT, Hepatology, 2003. Sterling RK, Hepatology, 2006. Angulo P, Hepatology, 2007.

Non-invasive imaging of fibrosis in NAFLD

- Vibration controlled transient elastography (VCTE)
- Magnetic resonance elastography (MRE)



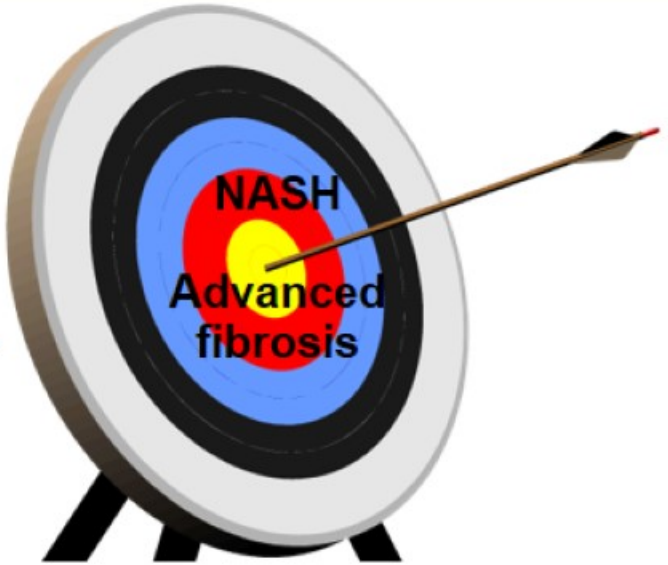


Fibrosis test	AUROC ≥F2 HIV- (N=104)	AUROC ≥F2 HIV+ (N=59)
VCTE	0.86 (0.77-0.95)	0.93 (0.85-0.99)
MRE	0.89 (0.83-0.96)	

Park CC, Gastroenterology, 2017. Morse CG, AIDS, 2015.

Indications for Liver Biopsy

- Suspicious for NASH
  - Significant liver enzyme elevation
  - Diabetes
- Suspicious for advanced fibrosis or cirrhosis
  - Thrombocytopenia
  - Imaging (e.g., splenomegaly)
  - Noninvasive assessment: FIB-4, Fibroscan
  - Diabetes
  - Older age
- Unable to rule out other diseases



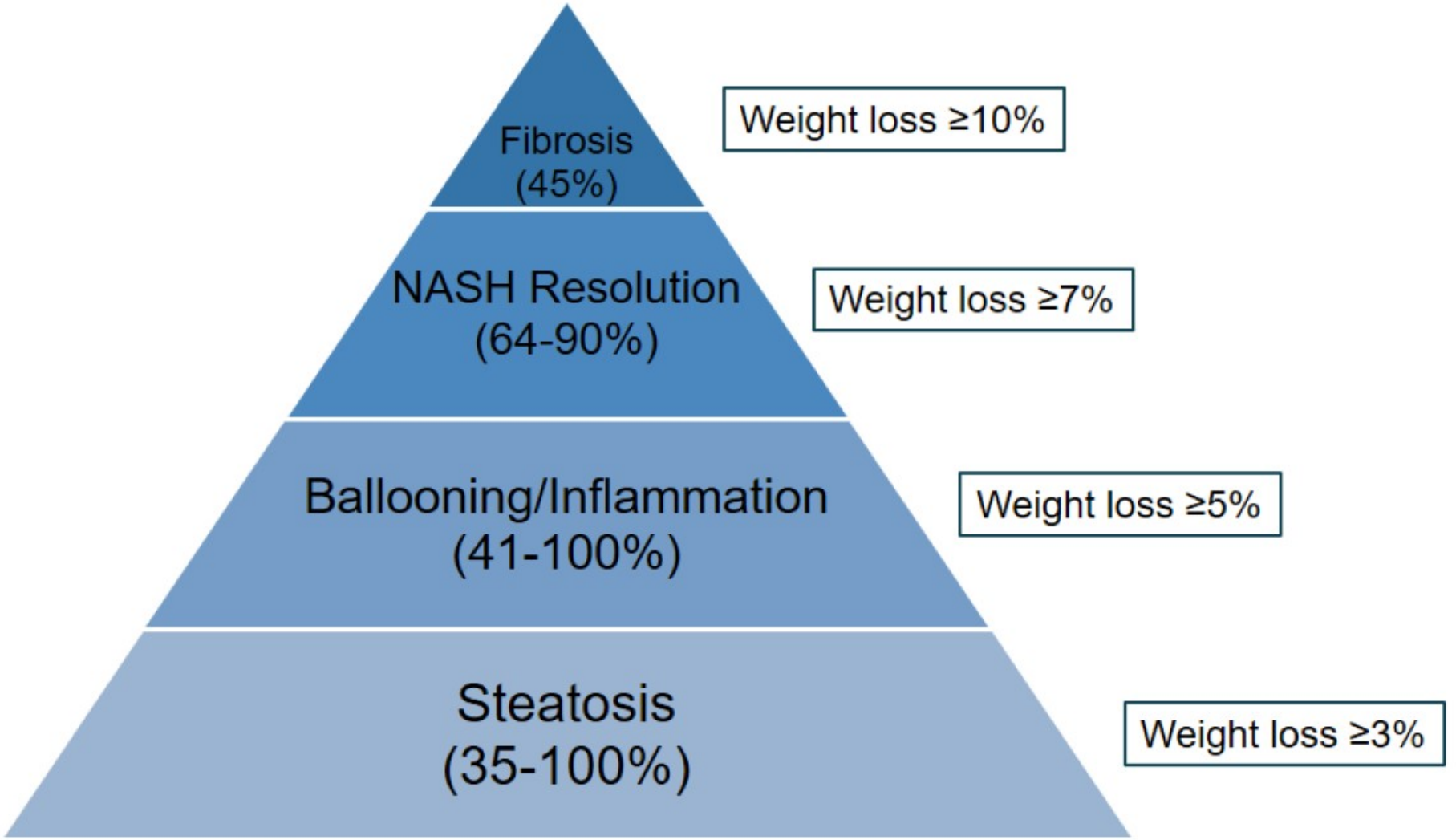
Chalassani N, Hepatology, 2012. Chalassani N, Hepatology, 2017.

Weight loss and NAFLD

- Diet and exercise combination is best
- Avoid fructose-sweetened beverages, added sugars
- Loss of >7-10% weight improves NASH + fibrosis
- Exercise alone reduces liver fat
  - Aerobic >150-250 min/week
  - Resistance training 45 min/day for 3 days/week

Harrison S, Hepatology, 2009. Promrat K, Hepatology, 2010. Vilar-Gomez E, Gastro, 2015.
Chalasani N, Hepatology, 2012

Weight loss impact on NAFLD



Treatment of Metabolic Syndrome in NAFLD

- Statins
  - **Safe for use in NAFLD**
  - Potential benefits of NAFLD/liver enzyme improvement and reduced risk of liver death or HCC
    - Not proven in randomized controlled trials for NAFLD treatment

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- Statins
  - **Safe for use in NAFLD**
  - Potential benefits of NAFLD/liver enzyme improvement and reduced risk of liver death or HCC
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- Metformin
  - **Safe for use in NAFLD**
  - Some studies show improvement in liver biopsy and liver enzymes
    - Not proven in randomized controlled trials for NAFLD treatment

Summary of NAFLD in PLWH

- NAFLD is common in PLWH
  - Prevalence is likely to increase with aging HIV+ population

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  - Main risk factors are metabolic, genetic/hereditary

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- NAFLD is common in PLWH
  - Prevalence is likely to increase with aging HIV+ population
- Similarities with primary NAFLD
  - Main risk factors are metabolic, genetic/hereditary
- Differences from primary NAFLD
  - At higher risk for “lean” NAFLD
  - Steatogenic and fibrotic effects of HIV/ART likely impact the natural history: potentially more NASH and fibrosis

Summary of NAFLD in PLWH

- NAFLD is an umbrella term that encompasses the full spectrum of disease
  - NASH >>> NAFL has risk of progression to cirrhosis
  - Biopsy is needed to distinguish NASH vs NAFL

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Summary of NAFLD in PLWH

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  - NASH >>> NAFL has risk of progression to cirrhosis
  - Biopsy is needed to distinguish NASH vs NAFL
- Management hinges weight loss, exercise, avoiding added carbohydrates, and metabolic syndrome control
- Key knowledge gaps exist in HIV-associated NAFLD
  - Rate of and risk factors for fibrosis progression
  - Long-term outcomes
  - Pharmacologic management

Posttest Question #1

What is the estimated prevalence of NAFLD in the general US population?

1. 5%
2. 15%
3. 30%
4. 50%

Posttest Question #2

What is the leading cause of death in patients with NAFLD?

1. Malignancy
2. Cardiovascular disease
3. Liver disease
4. End-stage renal disease

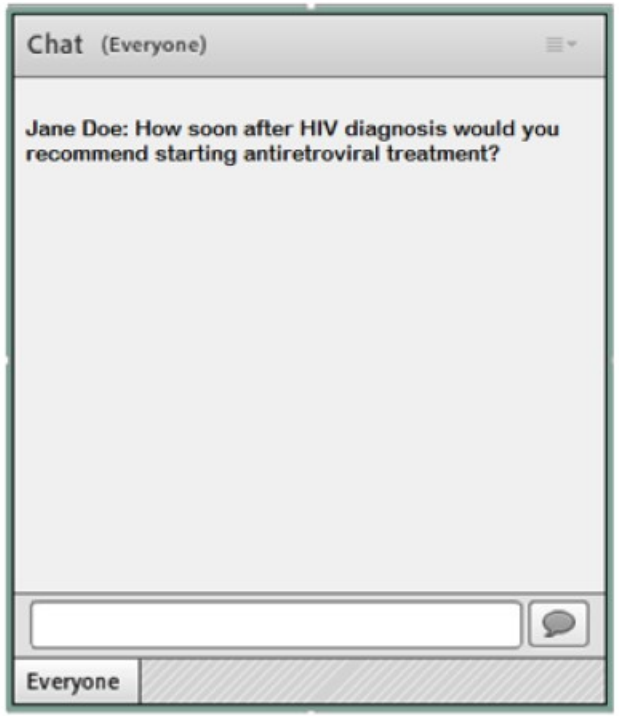
Posttest Question #3

How can you distinguish between NAFL and NASH?

1. Fibroscan
2. MR Elastography
3. Liver Biopsy

QUESTION-AND-ANSWER SESSION

Please type your questions into the CHAT BOX.



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CME credit cannot be claimed for **both** the live and on-demand versions of the same webinar.

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IAS–USA VIRTUAL Update on HIV: A Focus on Antiretroviral Therapy, New ART Drugs and Strategies, and the Intersection of COVID-19 and HIV

West Coast
Monday, June 29
10:00 AM - 3:15 PM PT

To register, visit https://www.iasusa.org/

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Midwest
Thursday, July 30
10:00 AM - 2:45 PM PT

To register, visit https://www.iasusa.org/

IAS–USA
International Antiviral Society–USA

SAVE THE DATE

COVID-19: What We Know Today That We Didn't Know Yesterday and Other Scientific Conversations

An IAS–USA roundtable series that will go over updates regarding COVID-19


Paul A. Volberding, MD
George Rutherford, MD
Early June
TBD


Jeanne M. Marrazzo, MD
Judith S. Currier, MD
Wednesday, June 17
4:00 PM – 5:00 PM PT

More details will be release on https://www.iasusa.org/

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UPCOMING WEBINARS

Register Now!

https://www.iasusa.org/activities/webinars/upcoming-webinars/

HIV Infection and the Kidney in 2020
Christina M. Wyatt, MD
Tuesday, June 23, 2020

HIV 101: Fundamentals of HIV Infection and Applications of Antiretroviral Therapy
Michael S. Saag, MD
Rajesh T. Gandhi, MD
Tuesday, June 30, 2020

Weigh Gain: A Growing Issue in Antiretroviral Therapy
John R. Koethe, MD
Tuesday, July 21, 2020

Physical Function and Frailty in HIV: What Does It Mean, How Do We Measure It, Why Should We Care, and What Can We Do?
Kristine M. Erlandson, MD MS
Tuesday, July 28, 2020

Management and Prevention of HIV Infection Among Transgender Adults
Asa E. Radix, MD
Tuesday, August 18, 2020

Liver Transplant Among People With HIV
Christine M. Durand, MD
Tuesday, August 25, 2020

PEP to PrEP Transitions: Evidence and Innovations
Douglas S. Krakower, MD
Tuesday, October 13, 2020

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Tuesday, October 13, 2020

4-PART Webinar Series on Pain and Addiction:

PART 1—Chronic Pain in People With HIV: An Evidence-Based, Practical
Jessica Merlin, MD, PhD, MBA
Tuesday, September 1, 2020

PART 2—Medical Cannabis in People With HIV: What's the Evidence?
Jessica Merlin, MD, PhD, MBA
Tuesday, October 6, 2020

PART 3—Opioid Use and HIV/Hepatitis C Made Easy: A Practical Implementation of the Evidence
R. Douglas Bruce, MD, MA, MSc
Tuesday, November 3, 2020

PART 4—More Than One Problem: Mental Illness as a Contributing Factor of Pain and Substance Use in People With HIV
R. Douglas Bruce, MD, MA, MSc
Tuesday, December 1, 2020

Thank You

- To our presenter, Dr Jennifer C. Price, MD
- To the audience for your participation
- To the heroic medical community working 24/7 in untenable environments and situations in response to the COVID-19 pandemic