

USPSTF New Topic Nomination – Screening for Liver Fibrosis in patients with obesity

The following is the content submitted by Avalere Health on behalf of the Liver Fibrosis Coalition to USPSTF as a New Topic Nomination on May 15, 2026. This nomination was approved and cosigned by:

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American Association for the Study of Liver Diseases
American College of Gastroenterology
American Diabetes Association
Endocrine Society
Fatty Liver Foundation
National Hispanic Medical Association
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Topic Details

Declaration of Topic Nomination and Problem Statement:

In 2020, AHRQ released a topic brief on screening for Non-Alcoholic Fatty Liver Disease (NAFLD) [1], which has since been re-termed MASLD [2]. Although NAFLD was found to meet all Evidence-based Practice Center Program selection criteria to produce an evidence report on the topic, it was not selected for a full systematic review. In its brief, the agency indicated that although NAFLD impacts millions of Americans and is likely to come before the USPSTF, there was little guidance or expert consensus on best practices for screening and treatment. Since then, a large body of evidence and society guidance has emerged on this topic [2-11].

Considering this progress, for a future USPSTF screening recommendation, we nominate the topic of clinically significant liver fibrosis among adults with obesity and at least one cardiometabolic risk factor (CMRF). Screening for liver fibrosis in people with obesity and at least one additional CMRF allows for earlier detection and interventions to decrease liver fibrosis, thereby decreasing morbidity and mortality. Steatotic liver disease (SLD) with significant fibrosis is frequently asymptomatic and undetected until advanced stages, when patients present with cirrhosis, hepatocellular carcinoma (HCC), hepatic decompensation, or require liver transplantation [2-4, 9, 10, 12-30]. Clinically significant fibrosis is defined as stage F2 or higher. Increasingly, noninvasive tests (NITs), including measures of liver stiffness, are also recognized as predictors of adverse clinical outcomes.

Specifically, people with obesity and at least one CMRF are at higher risk for metabolic dysfunction-associated SLD (MASLD). This is a silent illness that is often unnoticed until patients develop decompensated cirrhosis and which increases the risk of liver-related and cardiovascular morbidity and mortality [2-4, 9, 12-16]. Adults with obesity and additional CMRFs represent a population at particularly elevated risk of advanced fibrosis. The sequelae of advanced stage MASLD have a high fatality rate, are on the rise nationwide, and require both frequent specialized monitoring for hepatocellular carcinoma (HCC) and evaluation for liver transplantation as the definitive treatment for decompensation [31-38]. These complications are preventable. Highly effective pharmacotherapies targeting metabolic dysfunction improve outcomes of patients with MASLD. Pharmacotherapy, either alone or paired with behavioral counseling, is effective in improving outcomes of patients with MASLD.

Magnitude of the Problem:

Liver fibrosis diagnosis late in the patient journey is a public health threat. There is a lack of widespread screening utilizing new non-invasive and effective screening tests that can be used in the primary care setting to identify and prevent the progression of fibrosis, ultimately saving lives. Among U.S. adults, the

estimated prevalence of MASLD with significant fibrosis ranges from 5-7% [39-42]. Among adults with obesity and at least one CMRF, steatotic liver disease is substantially more prevalent (~50%), and a meaningful proportion develop clinically significant fibrosis [43, 44]. Overweight is defined as a body mass index (BMI) 25.0–29.9 kg/m². Obesity is clinically defined as a body mass index (BMI) ≥30 kg/m² and/or waist circumference >0.85 m for women and >0.9 m for men. In 2020, approximately 41% of U.S. adults aged ≥20 years met criteria for obesity. Cardiometabolic risk factors associated with obesity, including insulin resistance, type 2 diabetes, hyperglycemia, and dyslipidemia, are highly prevalent in this population and increase the risk of developing steatotic liver disease (SLD) [45].

In 2023, it had an age-standardized mortality rate (ASMR) of 1.2 per 100,000 persons—an increase from 0.2 per 100,000 in 2006. Additionally, the ASMR of MASLD is projected to grow to 2.2 per 100,000 by 2040 [46]. Current and projected figures exceed that for hepatitis B virus (HBV) of 0.4 per 100,000 in 2014, when the USPSTF issued a recommendation in favor of screening for the virus [46-49]. Similarly, MASLD was responsible for 222,062 years of life lost (YLL) in 2023, exceeding the 162,634 YLLs for HBV in 2014 and the 199,080 YLL for cervical cancer in 1996, the latter being when the Task Force issued a Grade A screening recommendation for sexually active women [50-52]. Importantly, MASLD is a leading and rapidly growing cause of HCC, which is the third leading cause of cancer-related death globally, constitutes approximately 75-85% of primary liver cancers. Modeling studies project that incident HCC attributable to MASLD will increase by 137% from 2015 to 2030 [53-55]. Overall, liver-related deaths attributed to MASLD have been projected to increase 178% from 2015 to 2030 without earlier detection and intervention strategies [55]. Expanding screening for liver fibrosis represents a potential opportunity to reduce mortality through earlier identification, prevention, monitoring, and treatment.

Beyond mortality, MASLD was responsible for 297,926 disability-adjusted life years (DALYs) in 2023, exceeding the 167,004 DALYs for HBV in 2020 and the 218,270 DALYs for cervical cancer in 1996 [50]. Nationwide, MASLD imposes substantial health-system burden through resource utilization for both hospitalizations and end-stage liver care. Recent inpatient data suggest that related hospitalizations are increasingly common and resource-intense [56-62]. MASLD is now the first and second commonest indication for liver transplantation among women and men, accounting for 14.7% of all liver transplants, representing a 100-fold increase in liver transplantations from 2000 to 2022 [60, 63]. Additionally, decompensated cirrhosis from MASLD is projected to increase by as much as 3.6 times from 289,200 cases in 2020 to 1,027,400 cases in 2050. [55].

Key Determinants of the Problem:

Understanding the drivers of liver disease and disease burden helps to support the rationale for targeted screening in patients with obesity. MASLD is a disease of energy surplus with impaired lipid metabolism that leads to hepatic steatosis, liver inflammation, and fibrogenesis of clinical significance. It is the hepatic manifestation of insulin resistance [64]. The population at risk for this disease is heterogeneous, with each segment targeted by an existing USPSTF Grade A/B recommendation for screening, behavioral counseling, or primary prevention [65-74]. These include individuals with components of metabolic syndrome, namely, overweight or obesity, hypertension, low levels of high-density lipoprotein, and elevated triglycerides. The strongest determinant of morbidity and mortality is the extent of liver fibrosis beyond stage 1 fibrosis (F1), which increases the risk of liver- and cardiovascular-related outcomes in a stepwise fashion as it progresses from the second through fourth—or cirrhotic—stage (i.e., F2-F4, respectively) [2, 3, 13, 41, 42, 75-92]. Since the early 2000s in the U.S., the distribution of fibrosis within

the MASLD population has skewed towards more severe disease [41, 93-95]. Adults with obesity and at least one additional CMRF represent a subgroup at elevated risk for progression to advanced fibrosis.

In the US, 54% of adults report that they consume alcohol, which is a noteworthy risk factor for liver injury, with guidance from the American Association for the Study of Liver Diseases recommending abstinence in patients with MASLD [13, 96-98]. In a society where metabolic disease is highly prevalent, alcohol is readily accessible, and the current and projected burden of MASLD with significant fibrosis is considerable, the potential for focused public health efforts to reduce this burden is high [2, 16, 99-108]. To that end, multiple professional societies have issued guidance advocating for greater case detection through primary and secondary risk assessment with non-invasive diagnostic tests in primary care and endocrinology settings [3, 4, 13, 20, 97, 106, 109, 110].

Addressing the Burden of Disease: Routine Screening

New screening methods are non-invasive and consist of laboratory tests that are routinely obtained in primary care settings, making implementation feasible and minimally burdensome for clinicians while offering substantial potential benefit to patients. Clinical guidelines from multiple professional societies, including AACE, AASLD, ADA, AGA, and EASL recommend screening with the FIB-4 index in these high-risk groups, which is calculated from patient age, liver enzymes, and platelet count, with repeat testing every 1–3 years for individuals with a FIB-4 score <1.3. Although false positives can occur, the negative predictive value of FIB-4 and other NITs is high at around 90-95%, supporting their use as an effective tool to rule out advanced fibrosis [5, 9, 11].

Patients who are considered to be at elevated risk (i.e. greater than low risk) for significant fibrosis undergo further, or secondary, risk assessment with either blood- or imaging-based NITs. Blood-based NIT include the enhanced liver fibrosis (ELF) test; imaging-based NITs include vibration-controlled transient elastography (VCTE), magnetic resonance elastography (MRE), and shear wave elastography (SWE) [111-132]. These tests are prognostic and have largely replaced liver biopsy for routine risk assessment, reducing harms associated with screening. While NITs differ in their diagnostic performance and efforts are ongoing to address current limitations, the sensitivities and specificities of various tests performed in isolation or in combination is comparable to other screening tests with USPSTF Grade A and Grade B recommendations (data not yet published) [52, 68, 70, 122, 133-251]. Additionally, ongoing developments of additional diagnostic algorithms are expected to address current limitations and further improve diagnostic accuracy. Modeling studies have found that, compared with standard of care, screening at-risk patients with NITs increases the likelihood of diagnosing advanced fibrosis by more than 30%. Screening is also associated with a greater than 30% reduction in false-positive results, thereby decreasing unnecessary referrals [252, 253]. Importantly, communicating elevated risk based on fibrosis screening results motivates lifestyle modification in the form of reduced alcohol intake, abstinence, improved nutrition, increased exercise, and weight loss, all of which can reduce the risk of progressive liver injury, may lead to regression of fibrosis, and further supports the preventive objectives of other USPSTF recommendations [97, 106, 121, 243, 254-264].

Considering the burden of disease, systematic screening of the adult population with obesity, and at least one CMRF is sorely needed to detect clinically significant fibrotic liver disease in its pre-clinical stages, when the prognosis is better. MASLD is often unrecognized by providers in general and in primary care specifically, and when recognized, many diagnoses are made in late-stage disease, when patients are more likely to present with HCC or hepatic decompensation [17, 53, 265]. Because several CMRFs that

define the population at risk already carry a USPSTF Grade A or Grade B recommendation for screening and counseling in adults, integrating screening for liver injury from MASLD into existing preventive care workflows is a pragmatic potential extension, provided the screening tests demonstrate adequate accuracy and that screening and downstream treatment confers a net benefit [27-31, 71, 266]. By focusing screening on individuals at high risk for MASLD and adverse liver outcomes, such as those with obesity and at least one CMRF, early treatment to prevent MASLD progression may also reduce the risk of cardiovascular disease and other comorbidities associated with obesity and MASLD.

Early case detection among adults with obesity and CMRFs can be operationalized as a sequential, NIT strategy. Primary risk assessment in primary care or endocrinology identifies patients warranting further testing. This initial step typically uses a simple blood-based index, namely, the Fibrosis-4 Index (FIB-4), [267-278].

Addressing the Burden of Disease: Therapeutic options after case detection

Following the identification of clinically significant fibrosis through screening, existing treatments focus on a series of therapeutic goals which are associated with improving clinical outcomes and reducing morbidity and mortality. Currently, the therapeutic goal is to achieve fibrosis regression and histological resolution of steatohepatitis, as this is a key determinant of clinical outcomes across the spectrum of fibrotic liver disease. Depending on specific non-invasive tests (NITs) for screening and monitoring, various studies have demonstrated that treatments can improve these intermediate outcomes, while separate studies further demonstrate that improved NITs are associated with reduced morbidity and mortality [256, 279-292]. Studies have also demonstrated correlations between improved fibrosis and both morbidity and mortality benefits [282, 284]. Importantly, while liver biopsy was historically required for definitive diagnosis and a key source of potential harm, it is now infrequently performed in this context, which is a key determinant of safety for the screened population (additional data on biopsy rates to be published soon) [293-297]. Following diagnosis, lifestyle modification, pharmacotherapy, and bariatric surgery can improve either fibrosis or clinical outcomes, with more definitive evidence to date available for the former [282, 284, 292, 298-301]. The most compelling efficacy data comes from Phase 3 trials for resmetirom, semaglutide, and tirzepatide. When paired with lifestyle modification; these drugs offer acceptable safety profiles. Resmetirom and semaglutide were conditionally approved by the FDA in 2024 and 2025 (with tirzepatide still pending approval), to treat non-cirrhotic metabolic dysfunction-associated steatohepatitis with clinically significant fibrosis, with longer-term approvals conditional on longer-term clinical outcomes expected to be published in 2029 [302-304]. Additional studies are underway to investigate various emerging therapies, several of which may offer pleiotropic benefits for the liver and for underlying risk factors (i.e., excess weight, poor glycemic control).

Concluding remarks

Screening for liver fibrosis allows for earlier detection and interventions to decrease fibrosis, therefore decreasing morbidity and mortality. The underdiagnosis of significant fibrotic liver disease in patients with MASLD may contribute to substantial morbidity and mortality and limits opportunities for early effective intervention, including progression to cirrhosis, HCC, hepatic decompensation, and increased all-cause mortality. A pragmatic, sequential noninvasive screening pathway in primary care and specialized settings can identify adults with obesity and CMRFs at elevated risk of significant liver disease before progression to clinical decompensation, using diagnostic tests that are more reliable than commonly adopted aminotransferases [267-278]. Emerging evidence suggests that communicating individualized fibrosis results can increase patient motivation to adopt healthful lifestyle modifications that reduce the risk of liver

disease progression, including lifestyle modifications that may be synergistic with existing USPSTF recommendations. Given the high and rising burden of this disease, the feasibility of integrating liver risk assessment into current preventive workflows, and the availability of safe and effective interventions, evaluating the net benefit of screening for fibrotic liver disease in this population at risk aligns with the task force's prevention priorities for high-burden chronic disease.

Support

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Rationale for Topic

- ✓ **Screening**

Primary Care Relevance

- ✓ **Provided in the primary care setting**

Public Health Importance

Hepatic fibrosis is a silent, progressive disease often undetected until late-stage outcomes such as cirrhosis, HCC, or hepatic decompensation [2-4, 9, 10, 12-19]. These outcomes have high fatality, require frequent specialized monitoring, markedly increase the need for transplantation, and are rising nationwide [31-38]. Key determinants include components of metabolic syndrome, with unhealthy alcohol use increasing the risk of disease progression. Adults with obesity and at least one CMRF are at a particularly elevated risk for significant fibrosis.

Among U.S. adults, the estimated prevalence of MASLD with significant fibrosis ranges from 5-7% [39-42]. In 2023, it had an ASMR of 1.2 per 100,000 persons—up from 0.2 per 100,000 in 2006—and is projected at 2.2 per 100,000 for 2040 [46]. Current and projected figures exceed those for HBV of 0.4 per 100,000 in 2014, when the USPSTF issued a Grade B recommendation for the virus [46-49]. MASLD was responsible for 222,062 YLL in 2023, exceeding the 162,634 YLLs for HBV in 2014 and the 199,080 YLL for cervical cancer in 1996, the latter being when the USPSTF issued a Grade A screening recommendation for sexually active women [50-52]. Beyond mortality, MASLD accounted for 297,926 DALYs in 2023, exceeding 167,004 DALYs for HBV in 2020 and 218,270 DALYs for cervical cancer in 1996 [50]. Nationwide, MASLD imposes substantial health-system burden through hospitalizations and end-stage liver care; recent inpatient data indicate rising, resource-intense hospitalizations, and MASLD is now the first and second commonest indication for liver transplantation among women and men [50, 56-63].

Usual care does not include routine screening for significant liver fibrosis based on cardiometabolic risk. Many patients with MASLD have normal aminotransferases, creating false reassurance and leading clinicians to prematurely and incorrectly rule out significant fibrosis [267-278]. Consequently, compared with systematic screening in this higher-risk population, cases today are reasonably expected to be detected at advanced, symptomatic stages, where more severe fibrosis increases the risk liver-related morbidity and mortality and is associated with poorer cardiovascular outcomes [2, 3, 13, 41, 42, 75-92].

A preventive screening service to identify hepatic fibrosis has clear potential to reduce this burden. With early detection, lifestyle modification and pharmacotherapy have the potential to resolve steatohepatitis,

reverse fibrosis, and improve modifiable risk factors for disease progression [20, 22, 23, 49, 305-313]. This approach also helps patients meet secondary therapeutic objectives by effectively managing cardiometabolic risk. Finally, screening for fibrotic liver disease motivates patients to adopt healthier behaviors—improved nutrition, physical activity, weight loss, and reduced alcohol intake—making screening a powerful adjunct to therapies. [256-262, 285, 300, 314-317]. Considering this, the potential for a preventive screening service to reduce the burden of this disease is high [97, 106, 121, 254, 255, 257-261, 266, 315].

Potential Impact

Screening for liver fibrosis allows for earlier detection and interventions to decrease fibrosis, therefore decreasing morbidity and mortality. NITs can detect silent disease with comparable accuracy for diseases with Grade A/B recommendations [52, 68, 70, 122, 133-251]. Earlier detection enables therapy to reverse fibrosis, while allowing proper monitoring for management [282, 284]. This includes pharmacotherapies with benefits for diseases targeted by USPSTF, offering synergies [66-70, 72-74, 257-262, 266, 316, 318-330]. Relying only on these existing recommendations to address liver fibrosis, however, is insufficient; liver disease often progresses unmonitored, as reflected by the rising burden of disease. A USPSTF recommendation for liver fibrosis would harmonize practice with guidelines, clarify appropriate screening tactics, and yield public health net benefit.

Supporting Documentation

The supporting documentation is grouped into two sections: A) References for MASLD Topic Nomination Submission and B) Additional MASLD Supporting Evidence.

A) References for MASLD Topic Nomination Submission

1. Gean, E.H., M. Paynter, R., Armstrong, C., Topic Brief: Screening and Treating Non-Alcoholic Fatty Liver Disease. 2020, Effective Health Care Program - AHRQ.
2. Rinella, M.E., et al., A multisociety Delphi consensus statement on new fatty liver disease nomenclature. *Hepatology*, 2023. 78(6): p. 1966-1986.
3. EASL-EASD-EASO Clinical Practice Guidelines on the management of metabolic dysfunction-associated steatotic liver disease (MASLD). *J Hepatol*, 2024. 81(3): p. 492-542.
4. Cusi, K., et al., American Association of Clinical Endocrinology Clinical Practice Guideline for the Diagnosis and Management of Nonalcoholic Fatty Liver Disease in Primary Care and Endocrinology Clinical Settings: Co-Sponsored by the American Association for the Study of Liver Diseases (AASLD). *Endocr Pract*, 2022. 28(5): p. 528-562.
5. EASL Clinical Practice Guidelines on non-invasive tests for evaluation of liver disease severity and prognosis - 2021 update. *J Hepatol*, 2021. 75(3): p. 659-689.
6. Kanwal, F., et al., Clinical Care Pathway for the Risk Stratification and Management of Patients With Nonalcoholic Fatty Liver Disease. *Gastroenterology*, 2021. 161(5): p. 1657-1669.
7. Wattacheril, J.J., et al., AGA Clinical Practice Update on the Role of Noninvasive Biomarkers in the Evaluation and Management of Nonalcoholic Fatty Liver Disease: Expert Review. *Gastroenterology*, 2023. 165(4): p. 1080-1088.
8. Chew, N.W.S., et al., Cardiovascular-Liver-Metabolic Health: Recommendations in Screening, Diagnosis, and Management of Metabolic Dysfunction-Associated Steatotic Liver Disease in Cardiovascular Disease via Modified Delphi Approach. *Circulation*, 2025. 151(1): p. 98-119.
9. Cusi, K., et al., Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) in People With Diabetes: The Need for Screening and Early Intervention. A Consensus Report of the American Diabetes Association. *Diabetes Care*, 2025. 48(7): p. 1057-1082.

10. Duell, P.B., et al., Nonalcoholic Fatty Liver Disease and Cardiovascular Risk: A Scientific Statement From the American Heart Association. *Arterioscler Thromb Vasc Biol*, 2022. 42(6): p. e168-e185.
11. Sterling, R.K., et al., AASLD Practice Guideline on imaging-based noninvasive liver disease assessment of hepatic fibrosis and steatosis. *Hepatology*, 2025. 81(2): p. 672-724.
12. Feldstein, A.E., Alkhouri, N., Jakhete, N., Jesudian, A., Kwo, P., Likhitsup, A. Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD). 2024; Available from: <https://gi.org/topics/steatotic-liver-disease-masld/>.
13. Rinella, M.E., et al., AASLD Practice Guidance on the clinical assessment and management of nonalcoholic fatty liver disease. *Hepatology*, 2023. 77(5): p. 1797-1835.
14. Le, P., et al., Estimated Burden of Metabolic Dysfunction-Associated Steatotic Liver Disease in US Adults, 2020 to 2050. *JAMA Netw Open*, 2025. 8(1): p. e2454707.
15. de Avila, L., et al., Nonalcoholic Fatty Liver Disease Is Independently Associated With Higher All-Cause and Cause-Specific Mortality. *Clinical Gastroenterology and Hepatology*, 2023. 21(10): p. 2588-2596.e3.
16. van Kleef, L.A., R.J. de Knegt, and W.P. Brouwer, Metabolic dysfunction-associated fatty liver disease and excessive alcohol consumption are both independent risk factors for mortality. *Hepatology*, 2023. 77(3): p. 942-948.
17. Rodriguez, L.A., et al., Discrepancy in Metabolic Dysfunction-Associated Steatotic Liver Disease Prevalence in a Large Northern California Cohort. *Gastro Hep Adv*, 2025. 4(5): p. 100630.
18. Zhang, X., et al., Prevalence and factors associated with NAFLD detected by vibration controlled transient elastography among US adults: Results from NHANES 2017-2018. *PLoS One*, 2021. 16(6): p. e0252164.
19. Qiu, S., et al., Trends in Hepatocellular Carcinoma Mortality Rates in the US and Projections Through 2040. *JAMA Netw Open*, 2024. 7(11): p. e2445525.
20. Crabb, D.W., et al., Diagnosis and Treatment of Alcohol-Associated Liver Diseases: 2019 Practice Guidance From the American Association for the Study of Liver Diseases. *Hepatology*, 2020. 71(1): p. 306-333.
21. Bertha, M., G. Choi, and J. Mellinger, Diagnosis and Treatment of Alcohol-Associated Liver Disease: A Patient-Friendly Summary of the 2019 AASLD Guidelines. *Clin Liver Dis (Hoboken)*, 2021. 17(6): p. 418-423.
22. Jophlin, L.L., et al., ACG Clinical Guideline: Alcohol-Associated Liver Disease. *Am J Gastroenterol*, 2024. 119(1): p. 30-54.
23. EASL Clinical Practice Guidelines: Management of alcohol-related liver disease. *J Hepatol*, 2018. 69(1): p. 154-181.
24. Arab, J.P., et al., Metabolic dysfunction and alcohol-related liver disease (MetALD): Position statement by an expert panel on alcohol-related liver disease. *J Hepatol*, 2025. 82(4): p. 744-756.
25. Julien, J., et al., Projected prevalence and mortality associated with alcohol-related liver disease in the USA, 2019-40: a modelling study. *Lancet Public Health*, 2020. 5(6): p. e316-e323.
26. Zhang, X., et al., Association of life's essential 8 with mortalities in patients with alcohol-related liver disease. *BMC Gastroenterol*, 2024. 24(1): p. 326.
27. Lo, C.H., et al., Rural-Urban Disparities in Mortality Related to Alcohol-Associated Liver Disease by Race/Ethnicity in the United States From 1999 to 2022. *Dig Dis Sci*, 2025. 70(7): p. 2303-2310.
28. Sethi, V., et al., Trends in Hospitalizations and Liver Transplants Associated With Alcohol-Induced Liver Disease. *Jama*, 2025. 333(4): p. 345-347.
29. Pan, C.W., et al., Alcohol-Associated Liver Disease Mortality. *JAMA Netw Open*, 2025. 8(6): p. e2514857.
30. Shah, N.D., et al., Alcohol-Related Liver Disease Is Rarely Detected at Early Stages Compared With Liver Diseases of Other Etiologies Worldwide. *Clin Gastroenterol Hepatol*, 2019. 17(11): p. 2320-2329.e12.
31. Tapper, E.B. and N.D. Parikh, Mortality due to cirrhosis and liver cancer in the United States, 1999-2016: observational study. *Bmj*, 2018. 362: p. k2817.

32. Scaglione, S., et al., The Epidemiology of Cirrhosis in the United States: A Population-based Study. *J Clin Gastroenterol*, 2015. 49(8): p. 690-6.
33. Abboud, Y., et al., Hepatocellular Carcinoma Incidence and Mortality in the USA by Sex, Age, and Race: A Nationwide Analysis of Two Decades. *J Clin Transl Hepatol*, 2024. 12(2): p. 172-181.
34. Nagesh, V.K., et al., Trends and Disparities in Liver Transplantation in the United States: A Nationwide Analysis of Demographic, Clinical, and Socioeconomic Factors (2016-2021). *Med Sci (Basel)*, 2025. 13(2).
35. Lee, B.P., et al., National Trends and Long-term Outcomes of Liver Transplant for Alcohol-Associated Liver Disease in the United States. *JAMA Intern Med*, 2019. 179(3): p. 340-348.
36. Thompson, J.A., N. Martinson, and M. Martinson, Mortality and costs associated with alcoholic hepatitis: A claims analysis of a commercially insured population. *Alcohol*, 2018. 71: p. 57-63.
37. Mathur, A.K., et al., Variation in access to the liver transplant waiting list in the United States. *Transplantation*, 2014. 98(1): p. 94-9.
38. Philip, G., et al., Alcohol-associated Liver Disease Is Now the Most Common Indication for Liver Transplant Waitlisting Among Young American Adults. *Transplantation*, 2022. 106(10): p. 2000-2005.
39. Hansen, C.D., et al., Prevalence, severity and determinants of steatotic liver disease among individuals with metabolic and alcohol risk from the community. *J Hepatol*, 2025.
40. Estes, C., et al., Modeling NAFLD disease burden in China, France, Germany, Italy, Japan, Spain, United Kingdom, and United States for the period 2016-2030. *J Hepatol*, 2018. 69(4): p. 896-904.
41. Kim, D., et al., Current burden of steatotic liver disease and fibrosis among adults in the United States, 2017-2023. *Clin Mol Hepatol*, 2025. 31(2): p. 382-393.
42. Kalligeros, M., et al., Prevalence of Steatotic Liver Disease (MASLD, MetALD, and ALD) in the United States: NHANES 2017-2020. *Clin Gastroenterol Hepatol*, 2024. 22(6): p. 1330-1332.e4.
43. Yang, A.H., et al., Prevalence of steatotic liver disease, advanced fibrosis and cirrhosis among community-dwelling overweight and obese individuals in the USA. *Gut*, 2024. 73(12): p. 2045-2053.
44. Unalp-Arida, A. and C.E. Ruhl, Prevalence of metabolic dysfunction-associated steatotic liver disease and fibrosis defined by liver elastography in the United States using National Health and Nutrition Examination Survey 2017-March 2020 and August 2021-August 2023 data. *Hepatology*, 2024.
45. Nadolsky, K., et al., American Association of Clinical Endocrinology Consensus Statement: Algorithm for the Evaluation and Treatment of Adults with Obesity/Adiposity-Based Chronic Disease – 2025 Update. *Endocrine Practice*, 2025. 31(11): p. 1351-1394.
46. Zhang, X., et al., Projected Trends in Metabolic Dysfunction-Associated Steatotic Liver Disease Mortality Through 2040. *JAMA Netw Open*, 2025. 8(6): p. e2516367.
47. Centers for Disease Control and Prevention. Hepatitis B Virus – Reduce Deaths. 2025; Available from: <https://www.cdc.gov/hepatitis/php/npr-2025/hep-b-reduce-deaths.html>.
48. Chou, R., et al., Screening for Hepatitis B Virus Infection in Nonpregnant Adolescents and Adults: Systematic Review to Update the 2004 U.S. Preventive Services Task Force Recommendation. 2014, Agency for Healthcare Research and Quality (US), Rockville (MD).
49. LeFevre, M.L., Screening for hepatitis B virus infection in nonpregnant adolescents and adults: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*, 2014. 161(1): p. 58-66.
50. Institute for Health Metrics and Evaluation (IHME). Global Burden of Disease Study Results Tool. [cited 2025 December 15]; Available from: <https://vizhub.healthdata.org/gbd-compare/>.
51. US Preventive Services Task Force. Cervical Cancer: Screening, 1996. 1996; Available from: <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/cervical-cancer-screening-1996>.
52. US Preventive Services Task Force, Screening for Cervical Cancer: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2018. 320(7): p. 674-686.

53. Eskridge, W., et al., Metabolic Dysfunction-Associated Steatotic Liver Disease and Metabolic Dysfunction-Associated Steatohepatitis: The Patient and Physician Perspective. *J Clin Med*, 2023. 12(19).
54. Mauro, E., et al., Hepatocellular carcinoma: Epidemiology, diagnosis and treatment. *JHEP Rep*, 2025. 7(12): p. 101571.
55. Estes, C., et al., Modeling the epidemic of nonalcoholic fatty liver disease demonstrates an exponential increase in burden of disease. *Hepatology*, 2018. 67(1): p. 123-133.
56. Adejumo, A.C., et al., Prevalence, trends, outcomes, and disparities in hospitalizations for nonalcoholic fatty liver disease in the United States. *Ann Gastroenterol*, 2019. 32(5): p. 504-513.
57. Hirode, G., S. Saab, and R.J. Wong, Trends in the Burden of Chronic Liver Disease Among Hospitalized US Adults. *JAMA Netw Open*, 2020. 3(4): p. e201997.
58. Zou, B., et al., A Nationwide Study of Inpatient Admissions, Mortality, and Costs for Patients with Cirrhosis from 2005 to 2015 in the USA. *Dig Dis Sci*, 2020. 65(5): p. 1520-1528.
59. Paik, J.M., et al., Non-alcoholic fatty liver disease is associated with greater risk of 30-day hospital readmission in the United States (U.S.). *Ann Hepatol*, 2023. 28(4): p. 101108.
60. Ajayi, T., et al., Surging Liver Transplantation for Nonalcoholic Steatohepatitis from 2000-2022: A National Database Study. *South Med J*, 2024. 117(6): p. 302-310.
61. Kwong, A.J., et al., OPTN/SRTR 2022 Annual Data Report: Liver. *Am J Transplant*, 2024. 24(2s1): p. S176-s265.
62. Kwong, A.J., et al., OPTN/SRTR 2023 Annual Data Report: Liver. *Am J Transplant*, 2025. 25(2s1): p. S193-s287.
63. Owringi, S., et al., Meta-Analysis: Global Prevalence and Mortality of Cirrhosis in Metabolic Dysfunction-Associated Steatotic Liver Disease. *Aliment Pharmacol Ther*, 2025. 61(3): p. 433-443.
64. Fouda, S., et al., Pathobiology of Metabolic-Associated Fatty Liver Disease. *Endocrinology and Metabolism Clinics of North America*, 2023. 52(3): p. 405-416.
65. Curry, S.J., et al., Behavioral Weight Loss Interventions to Prevent Obesity-Related Morbidity and Mortality in Adults: US Preventive Services Task Force Recommendation Statement. *Jama*, 2018. 320(11): p. 1163-1171.
66. US Preventive Services Task Force, Behavioral Weight Loss Interventions to Prevent Obesity-Related Morbidity and Mortality in Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2018. 320(11): p. 1163-1171.
67. Guirguis-Blake, J.M., et al., Screening for Hypertension in Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*, 2021. 325(16): p. 1657-1669.
68. US Preventive Services Task Force, Screening for Hypertension in Adults: US Preventive Services Task Force Reaffirmation Recommendation Statement. *JAMA*, 2021. 325(16): p. 1650-1656.
69. Jonas, D.E., et al., Screening for Prediabetes and Type 2 Diabetes: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*, 2021. 326(8): p. 744-760.
70. US Preventive Services Task Force, Screening for Prediabetes and Type 2 Diabetes: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2021. 326(8): p. 736-743.
71. Mangione, C.M., et al., Statin Use for the Primary Prevention of Cardiovascular Disease in Adults: US Preventive Services Task Force Recommendation Statement. *Jama*, 2022. 328(8): p. 746-753.
72. LeBlanc, E.S., et al., Behavioral and Pharmacotherapy Weight Loss Interventions to Prevent Obesity-Related Morbidity and Mortality in Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*, 2018. 320(11): p. 1172-1191.
73. US Preventive Services Task Force, Behavioral Counseling Interventions to Promote a Healthy Diet and Physical Activity for Cardiovascular Disease Prevention in Adults With Cardiovascular Risk Factors: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2020. 324(20): p. 2069-2075.

74. O'Connor, E.A., et al., Behavioral Counseling to Promote a Healthy Diet and Physical Activity for Cardiovascular Disease Prevention in Adults With Cardiovascular Risk Factors: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*, 2020. 324(20): p. 2076-2094.
75. Kaya, E., et al., Body mass index and diabetes predict severity of liver fibrosis across the spectrum of steatotic liver disease. *Annals of Hepatology*, 2025. 30(1): p. 101907.
76. Hagström, H., et al., Fibrosis stage but not NASH predicts mortality and time to development of severe liver disease in biopsy-proven NAFLD. *J Hepatol*, 2017. 67(6): p. 1265-1273.
77. Ekstedt, M., et al., Fibrosis stage is the strongest predictor for disease-specific mortality in NAFLD after up to 33 years of follow-up. *Hepatology*, 2015. 61(5): p. 1547-54.
78. Dulai, P.S., et al., Increased risk of mortality by fibrosis stage in nonalcoholic fatty liver disease: Systematic review and meta-analysis. *Hepatology*, 2017. 65(5): p. 1557-1565.
79. Ng, C.H., et al., Mortality Outcomes by Fibrosis Stage in Nonalcoholic Fatty Liver Disease: A Systematic Review and Meta-analysis. *Clin Gastroenterol Hepatol*, 2023. 21(4): p. 931-939.e5.
80. Yeung, M.W., et al., Advanced liver fibrosis but not steatosis is independently associated with albuminuria in Chinese patients with type 2 diabetes. *J Hepatol*, 2017.
81. Ciardullo, S., et al., Liver fibrosis assessed by transient elastography is independently associated with albuminuria in the general United States population. *Dig Liver Dis*, 2021. 53(7): p. 866-872.
82. Vilar-Gomez, E., et al., Fibrosis Severity as a Determinant of Cause-Specific Mortality in Patients With Advanced Nonalcoholic Fatty Liver Disease: A Multi-National Cohort Study. *Gastroenterology*, 2018. 155(2): p. 443-457.e17.
83. Angulo, P., et al., Liver Fibrosis, but No Other Histologic Features, Is Associated With Long-term Outcomes of Patients With Nonalcoholic Fatty Liver Disease. *Gastroenterology*, 2015. 149(2): p. 389-97.e10.
84. Sanyal, A.J., et al., Prospective Study of Outcomes in Adults with Nonalcoholic Fatty Liver Disease. *N Engl J Med*, 2021. 385(17): p. 1559-1569.
85. Simon, T.G., et al., Mortality in biopsy-confirmed nonalcoholic fatty liver disease: results from a nationwide cohort. *Gut*, 2021. 70(7): p. 1375-1382.
86. Simon, T.G., et al., Non-alcoholic fatty liver disease and incident major adverse cardiovascular events: results from a nationwide histology cohort. *Gut*, 2022. 71(9): p. 1867-1875.
87. Henson, J.B., et al., Advanced fibrosis is associated with incident cardiovascular disease in patients with non-alcoholic fatty liver disease. *Aliment Pharmacol Ther*, 2020. 51(7): p. 728-736.
88. Simon, T.G., et al., Cancer Risk in Patients With Biopsy-Confirmed Nonalcoholic Fatty Liver Disease: A Population-Based Cohort Study. *Hepatology*, 2021. 74(5): p. 2410-2423.
89. Mantovani, A., et al., Nonalcoholic fatty liver disease increases risk of incident chronic kidney disease: A systematic review and meta-analysis. *Metabolism*, 2018. 79: p. 64-76.
90. Jung, C.Y., et al., Advanced liver fibrosis measured by transient elastography predicts chronic kidney disease development in individuals with non-alcoholic fatty liver disease. *Diabetologia*, 2022. 65(3): p. 518-527.
91. Saito, H., et al., High FIB4 index is an independent risk factor of diabetic kidney disease in type 2 diabetes. *Sci Rep*, 2021. 11(1): p. 11753.
92. Villarroel, C., et al., Advanced Fibrosis in Metabolic Dysfunction-Associated Steatotic Liver Disease Is Independently Associated With Reduced Renal Function. *Gastro Hep Adv*, 2024. 3(1): p. 122-127.
93. Bril, F., et al., Prevalence of MASLD in People With Diabetes Has Decreased in the US, but Rates of Liver Fibrosis Are Still on the Rise. *J Endocr Soc*, 2025. 9(8): p. bvaf110.
94. Kabbany, M.N., et al., Prevalence of Nonalcoholic Steatohepatitis-Associated Cirrhosis in the United States: An Analysis of National Health and Nutrition Examination Survey Data. *Am J Gastroenterol*, 2017. 112(4): p. 581-587.
95. Kim, D., et al., Race/ethnicity-based temporal changes in prevalence of NAFLD-related advanced fibrosis in the United States, 2005-2016. *Hepatol Int*, 2019. 13(2): p. 205-213.
96. Slater, M.E., Alpert, H.R., Surveillance Report #120 APPARENT PER CAPITA ALCOHOL CONSUMPTION: NATIONAL, STATE, AND REGIONAL TRENDS, 1977–2021. National Institute on Alcohol Abuse and Alcoholism, 2023.

97. Ajmera, V., et al., Among Patients With Nonalcoholic Fatty Liver Disease, Modest Alcohol Use Is Associated With Less Improvement in Histologic Steatosis and Steatohepatitis. *Clin Gastroenterol Hepatol*, 2018. 16(9): p. 1511-1520.e5.
98. (CDC), C.f.D.C. Data on Excessive Alcohol Use. 2024; Available from: <https://www.cdc.gov/alcohol/excessive-drinking-data/index.html>.
99. Centers for Disease Control and Prevention. Data on Excessive Alcohol Use. 2024; Available from: <https://www.cdc.gov/alcohol/excessive-drinking-data/index.html>.
100. O'Hearn, M., et al., Trends and Disparities in Cardiometabolic Health Among U.S. Adults, 1999-2018. *J Am Coll Cardiol*, 2022. 80(2): p. 138-151.
101. Araújo, J., J. Cai, and J. Stevens, Prevalence of Optimal Metabolic Health in American Adults: National Health and Nutrition Examination Survey 2009-2016. *Metab Syndr Relat Disord*, 2019. 17(1): p. 46-52.
102. Substance Abuse and Mental Health Services Administration (SAMHSA). 2022 National Survey on Drug Use and Health. 2022; Available from: <https://www.samhsa.gov/data/sites/default/files/reports/rpt42728/NSDUHDetailedTabs2022/NSDUHDetailedTabs2022/NSDUHDetTabsSect2pe2022.htm>.
103. Grant, B.F., et al., Epidemiology of DSM-5 Alcohol Use Disorder: Results From the National Epidemiologic Survey on Alcohol and Related Conditions III. *JAMA Psychiatry*, 2015. 72(8): p. 757-66.
104. Thakral, N., S. Deutsch-Link, and A.K. Singal, Therapeutic Pipeline in Alcohol-Associated Liver Disease. *Semin Liver Dis*, 2023. 43(1): p. 60-76.
105. Ritchie, H., Roser, M. Alcohol Consumption. 2024; Available from: <https://ourworldindata.org/alcohol-consumption>.
106. Marti-Aguado, D., et al., Low-to-moderate alcohol consumption is associated with increased fibrosis in individuals with metabolic dysfunction-associated steatotic liver disease. *J Hepatol*, 2024. 81(6): p. 930-940.
107. Åberg, F., et al., Risks of Light and Moderate Alcohol Use in Fatty Liver Disease: Follow-Up of Population Cohorts. *Hepatology*, 2020. 71(3): p. 835-848.
108. Xu, H.Q., et al., Effects of alcohol consumption on viral hepatitis B and C. *World J Clin Cases*, 2021. 9(33): p. 10052-10063.
109. Inan-Eroglu, E., et al., Joint associations of adiposity and alcohol consumption with liver disease-related morbidity and mortality risk: findings from the UK Biobank. *Eur J Clin Nutr*, 2022. 76(1): p. 74-83.
110. Åberg, F., et al., Alcohol consumption and metabolic syndrome: Clinical and epidemiological impact on liver disease. *J Hepatol*, 2023. 78(1): p. 191-206.
111. Israelsen, M., et al., Non-invasive tests for alcohol-associated liver disease. *Hepatology*, 2024. 80(6): p. 1390-1407.
112. Chrostek, L., et al., Noninvasive Indirect Markers of Liver Fibrosis in Alcoholics. *Biomed Res Int*, 2019. 2019: p. 3646975.
113. Thiele, M., et al., Accuracy of the Enhanced Liver Fibrosis Test vs FibroTest, Elastography, and Indirect Markers in Detection of Advanced Fibrosis in Patients With Alcoholic Liver Disease. *Gastroenterology*, 2018. 154(5): p. 1369-1379.
114. Cioarca-Nedelcu, R., et al., Serum biomarkers predictive of cirrhosis in alcoholic liver disease as an alternative to ARFI-SW elastography. *Eur Rev Med Pharmacol Sci*, 2023. 27(12): p. 5590-5595.
115. Roh, Y.H., et al., Role of FIB-4 for reassessment of hepatic fibrosis burden in referral center. *Sci Rep*, 2021. 11(1): p. 13616.
116. Connoley, D., et al., The Enhanced Liver Fibrosis test maintains its diagnostic and prognostic performance in alcohol-related liver disease: a cohort study. *BMC Gastroenterol*, 2021. 21(1): p. 268.
117. Hung, A., et al., Enhanced liver fibrosis test facilitates stratification of people with alcohol use disorder in primary care. *BMJ Open Gastroenterol*, 2025. 12(1).

118. Legros, L., et al., Transient Elastography Accurately Screens for Compensated Advanced Chronic Liver Disease in Patients With Ongoing or Recent Alcohol Withdrawal. *Clin Gastroenterol Hepatol*, 2022. 20(7): p. 1542-1552.e6.
119. Karrer, A., et al., Screening for compensated advanced chronic liver disease using transient elastography in outpatient addiction clinics. *Alcohol Clin Exp Res (Hoboken)*, 2024. 48(12): p. 2303-2309.
120. Thiele, M., et al., Transient and 2-Dimensional Shear-Wave Elastography Provide Comparable Assessment of Alcoholic Liver Fibrosis and Cirrhosis. *Gastroenterology*, 2016. 150(1): p. 123-33.
121. Rutledge, S.M., et al., Transient Elastography Increases Readiness for Change in Inpatients With Alcohol Use Disorder: The ELISA Pilot Study. *Addict Biol*, 2025. 30(6): p. e70043.
122. Kjaergaard, M., et al., Using the ELF test, FIB-4 and NAFLD fibrosis score to screen the population for liver disease. *J Hepatol*, 2023. 79(2): p. 277-286.
123. Nahon, P., et al., Assessment of liver fibrosis using transient elastography in patients with alcoholic liver disease. *J Hepatol*, 2008. 49(6): p. 1062-8.
124. Janssens, F., et al., Can transient elastography replace liver histology for determination of advanced fibrosis in alcoholic patients: a real-life study. *J Clin Gastroenterol*, 2010. 44(8): p. 575-82.
125. Voican, C.S., et al., Transient elastography alone and in combination with FibroTest(®) for the diagnosis of hepatic fibrosis in alcoholic liver disease. *Liver Int*, 2017. 37(11): p. 1697-1705.
126. Nguyen-Khac, E., et al., Assessment of asymptomatic liver fibrosis in alcoholic patients using fibroscan: prospective comparison with seven non-invasive laboratory tests. *Aliment Pharmacol Ther*, 2008. 28(10): p. 1188-98.
127. Fernandez, M., et al., Transient elastography using Fibroscan is the most reliable noninvasive method for the diagnosis of advanced fibrosis and cirrhosis in alcoholic liver disease. *Eur J Gastroenterol Hepatol*, 2015. 27(9): p. 1074-9.
128. Boursier, J., et al., The combination of a blood test and Fibroscan improves the non-invasive diagnosis of liver fibrosis. *Liver Int*, 2009. 29(10): p. 1507-15.
129. Mueller, S., et al., Increased liver stiffness in alcoholic liver disease: differentiating fibrosis from steatohepatitis. *World J Gastroenterol*, 2010. 16(8): p. 966-72.
130. Naveau, S., et al., Diagnostic and prognostic values of noninvasive biomarkers of fibrosis in patients with alcoholic liver disease. *Hepatology*, 2009. 49(1): p. 97-105.
131. Houston, K., et al., Referral to hepatology is lower in patients with excessive alcohol use who have mental health disorders despite a high fibrosis-4 index. *Alcohol Clin Exp Res (Hoboken)*, 2024. 48(10): p. 1898-1904.
132. Vuppalanchi, R., et al., Performance characteristics of vibration-controlled transient elastography for evaluation of nonalcoholic fatty liver disease. *Hepatology*, 2018. 67(1): p. 134-144.
133. Alkhouri, N., et al., ALADDIN: A Machine Learning Approach to Enhance the Prediction of Significant Fibrosis or Higher in Metabolic Dysfunction-Associated Steatotic Liver Disease. *Am J Gastroenterol*, 2026. 121(2): p. 362-374.
134. Argalia, G., et al., Comparison of point shear wave elastography and transient elastography in the evaluation of patients with NAFLD. *Radiol Med*, 2022. 127(5): p. 571-576.
135. Aykut, U.E., et al., A comparison of FibroMeter™ NAFLD Score, NAFLD fibrosis score, and transient elastography as noninvasive diagnostic tools for hepatic fibrosis in patients with biopsy-proven non-alcoholic fatty liver disease. *Scand J Gastroenterol*, 2014. 49(11): p. 1343-8.
136. Biberici Keskin, E. and G. Coban, Evaluation of Liver Biopsy Findings and Comparison with Noninvasive Fibrosis Scores in Patients with Non-Alcoholic Steatohepatitis. *Medeni Med J*, 2019. 34(4): p. 354-359.
137. Blomdahl, J., et al., Proteomic signatures for fibrosis in MASLD: a biopsy-proven dual-cohort study. *Scand J Gastroenterol*, 2025. 60(6): p. 597-605.
138. Bril, F., et al., Assessing strategies to target screening for advanced liver fibrosis among overweight and obese patients. *Metab Target Organ Damage*, 2022. 2.
139. Bril, F., et al., Use of Plasma Fragments of Propeptides of Type III, V, and VI Procollagen for the Detection of Liver Fibrosis in Type 2 Diabetes. *Diabetes Care*, 2019. 42(7): p. 1348-1351.

140. Cannella, R., et al., Performance of ultrasound-guided attenuation parameter and 2D shear wave elastography in patients with metabolic dysfunction-associated steatotic liver disease. *Eur Radiol*, 2025. 35(4): p. 2339-2350.
141. Cardoso, A.C., et al., The performance of M and XL probes of FibroScan for the diagnosis of steatosis and fibrosis on a Brazilian nonalcoholic fatty liver disease cohort. *Eur J Gastroenterol Hepatol*, 2020. 32(2): p. 231-238.
142. Cassinotto, C., et al., Liver stiffness in nonalcoholic fatty liver disease: A comparison of supersonic shear imaging, FibroScan, and ARFI with liver biopsy. *Hepatology*, 2016. 63(6): p. 1817-27.
143. Castera, L., et al., Prospective head-to-head comparison of non-invasive scores for diagnosis of fibrotic MASH in patients with type 2 diabetes. *J Hepatol*, 2024. 81(2): p. 195-206.
144. Chan, W.K., N.R. Nik Mustapha, and S. Mahadeva, A novel 2-step approach combining the NAFLD fibrosis score and liver stiffness measurement for predicting advanced fibrosis. *Hepatol Int*, 2015. 9(4): p. 594-602.
145. Chimoriya, R., et al., Application and Diagnostic Performance of Two-Dimensional Shear Wave Elastography and Liver Fibrosis Scores in Adults with Class 3 Obesity. *Nutrients*, 2023. 16(1).
146. Cox, B., et al., Comparing the performance of Fibrosis-4 and Non-Alcoholic Fatty Liver Disease Fibrosis Score with transient elastography scores of people with non-alcoholic fatty liver disease. *Can Liver J*, 2021. 4(3): p. 275-282.
147. Cui, J., et al., Magnetic resonance elastography is superior to acoustic radiation force impulse for the Diagnosis of fibrosis in patients with biopsy-proven nonalcoholic fatty liver disease: A prospective study. *Hepatology*, 2016. 63(2): p. 453-61.
148. Eddowes, P.J., et al., Accuracy of FibroScan Controlled Attenuation Parameter and Liver Stiffness Measurement in Assessing Steatosis and Fibrosis in Patients With Nonalcoholic Fatty Liver Disease. *Gastroenterology*, 2019. 156(6): p. 1717-1730.
149. Ergelen, R., et al., Comparison of Doppler ultrasound and transient elastography in the diagnosis of significant fibrosis in patients with nonalcoholic steatohepatitis. *Abdom Radiol (NY)*, 2016. 41(8): p. 1505-10.
150. Ergelen, R., et al., Measurements of serum procollagen-III peptide and M30 do not improve the diagnostic accuracy of transient elastography for the detection of hepatic fibrosis in patients with nonalcoholic fatty liver disease. *Eur J Gastroenterol Hepatol*, 2015. 27(6): p. 667-71.
151. Erhardttsen, E., et al., Determining a healthy reference range and factors potentially influencing PRO-C3 - A biomarker of liver fibrosis. *JHEP Rep*, 2021. 3(4): p. 100317.
152. Forlano, R., et al., Derivation and validation of the BIMAST score for predicting the presence of fibrosis due to Metabolic dysfunction-associated steatotic liver disease among diabetic patients in the community. *PLoS One*, 2024. 19(9): p. e0307500.
153. Forlano, R., et al., A prospective study on the prevalence of MASLD in people with type-2 diabetes in the community. Cost effectiveness of screening strategies. *Liver Int*, 2024. 44(1): p. 61-71.
154. Furlan, A., et al., Comparison of 2D Shear Wave Elastography, Transient Elastography, and MR Elastography for the Diagnosis of Fibrosis in Patients With Nonalcoholic Fatty Liver Disease. *AJR Am J Roentgenol*, 2020. 214(1): p. W20-w26.
155. Gaia, S., et al., Reliability of transient elastography for the detection of fibrosis in non-alcoholic fatty liver disease and chronic viral hepatitis. *J Hepatol*, 2011. 54(1): p. 64-71.
156. Hegmar, H., et al., Performance of novel collagen turnover biomarkers to detect increased liver stiffness in MASLD. *J Intern Med*, 2024. 296(2): p. 177-186.
157. Hong, S., et al., Golgi protein 73: charting new territories in diagnosing significant fibrosis in MASLD: a prospective cross-sectional study. *Front Endocrinol (Lausanne)*, 2024. 15: p. 1506953.
158. Imajo, K., et al., Direct Comparison of US and MR Elastography for Staging Liver Fibrosis in Patients With Nonalcoholic Fatty Liver Disease. *Clin Gastroenterol Hepatol*, 2022. 20(4): p. 908-917.e11.
159. Imajo, K., et al., Magnetic Resonance Imaging More Accurately Classifies Steatosis and Fibrosis in Patients With Nonalcoholic Fatty Liver Disease Than Transient Elastography. *Gastroenterology*, 2016. 150(3): p. 626-637.e7.

160. Inada, K., et al., Validation of magnetic resonance elastography plus fibrosis-4 for significant fibrosis in nonalcoholic fatty liver disease. *J Gastroenterol Hepatol*, 2022. 37(9): p. 1726-1731.
161. Inadomi, C., et al., Accuracy of the Enhanced Liver Fibrosis test, and combination of the Enhanced Liver Fibrosis and non-invasive tests for the diagnosis of advanced liver fibrosis in patients with non-alcoholic fatty liver disease. *Hepatol Res*, 2020. 50(6): p. 682-692.
162. Ishiba, H., et al., Accuracy of type IV collagen 7S versus Enhanced Liver Fibrosis score for diagnosing fibrosis in patients with metabolic dysfunction-associated steatotic liver disease. *Hepatol Commun*, 2025. 9(1).
163. Ito, T., et al., Poor Diagnostic Efficacy of Noninvasive Tests for Advanced Fibrosis in Obese or Younger Than 60 Diabetic NAFLD patients. *Clin Gastroenterol Hepatol*, 2023. 21(4): p. 1013-1022.e6.
164. Jafarov, F., et al., The diagnostic utility of fibrosis-4 or nonalcoholic fatty liver disease fibrosis score combined with liver stiffness measurement by fibroscan in assessment of advanced liver fibrosis: a biopsy-proven nonalcoholic fatty liver disease study. *Eur J Gastroenterol Hepatol*, 2020. 32(5): p. 642-649.
165. Jang, S.Y., et al., Aspartate aminotransferase-to-platelet ratio index outperforms Fibrosis-4 in 2843 Korean patients with metabolic dysfunction-associated steatotic liver disease. *Hepatol Res*, 2025. 55(4): p. 479-491.
166. Jang, J.K., et al., Two-dimensional Shear-Wave Elastography and US Attenuation Imaging for Nonalcoholic Steatohepatitis Diagnosis: A Cross-sectional, Multicenter Study. *Radiology*, 2022. 305(1): p. 118-126.
167. Jung, J., et al., MRE combined with FIB-4 (MEFIB) index in detection of candidates for pharmacological treatment of NASH-related fibrosis. *Gut*, 2021. 70(10): p. 1946-1953.
168. Karlas, T., et al., Non-invasive assessment of hepatic steatosis in patients with NAFLD using controlled attenuation parameter and 1H-MR spectroscopy. *PLoS One*, 2014. 9(3): p. e91987.
169. Kim, B.K., et al., Head-to-head comparison between MEFIB, MAST, and FAST for detecting stage 2 fibrosis or higher among patients with NAFLD. *J Hepatol*, 2022. 77(6): p. 1482-1490.
170. Kim, J.W., et al., Ultrasonographic index for the diagnosis of non-alcoholic steatohepatitis in patients with non-alcoholic fatty liver disease. *Quant Imaging Med Surg*, 2022. 12(3): p. 1815-1829.
171. Kobayashi, T., et al., Diagnostic performance of two-dimensional shear wave elastography and attenuation imaging for fibrosis and steatosis assessment in chronic liver disease. *J Med Ultrason* (2001), 2025. 52(1): p. 95-103.
172. Köylü, B., et al., Predicting Fibrosis Stage in MASH: The Role of Total Metabolic Syndrome Score and MMP-1. *Medicina (Kaunas)*, 2025. 61(6).
173. Kumar, R., et al., Liver stiffness measurements in patients with different stages of nonalcoholic fatty liver disease: diagnostic performance and clinicopathological correlation. *Dig Dis Sci*, 2013. 58(1): p. 265-74.
174. Kuroda, H., et al., Two-dimensional shear wave elastography and ultrasound-guided attenuation parameter for progressive non-alcoholic steatohepatitis. *PLoS One*, 2021. 16(4): p. e0249493.
175. Lee, D.H., et al., Accuracy of Two-Dimensional Shear Wave Elastography and Attenuation Imaging for Evaluation of Patients With Nonalcoholic Steatohepatitis. *Clin Gastroenterol Hepatol*, 2021. 19(4): p. 797-805.e7.
176. Lee, Y.K., et al., Combi-Elastography versus Transient Elastography for Assessing the Histological Severity of Metabolic Dysfunction-Associated Steatotic Liver Disease. *Gut Liver*, 2024. 18(6): p. 1048-1059.
177. Lee, Y.S., et al., Multiparametric MR Is a Valuable Modality for Evaluating Disease Severity of Nonalcoholic Fatty Liver Disease. *Clin Transl Gastroenterol*, 2020. 11(4): p. e00157.
178. Lee, M.S., et al., Prospective comparison among transient elastography, supersonic shear imaging, and ARFI imaging for predicting fibrosis in nonalcoholic fatty liver disease. *PLoS One*, 2017. 12(11): p. e0188321.
179. Lee, D.H., et al., A sequential approach using the age-adjusted fibrosis-4 index and vibration-controlled transient elastography to detect advanced fibrosis in Korean patients with non-alcoholic fatty liver disease. *Aliment Pharmacol Ther*, 2022. 55(8): p. 994-1007.

180. Leong, W.L., et al., Comparing point shear wave elastography (ElastPQ) and transient elastography for diagnosis of fibrosis stage in non-alcoholic fatty liver disease. *J Gastroenterol Hepatol*, 2020. 35(1): p. 135-141.
181. Li, G., et al., Diagnostic and prognostic performance of the SAFE score in non-alcoholic fatty liver disease. *Liver Int*, 2024. 44(1): p. 15-26.
182. Li, M., et al., The steatosis-associated fibrosis estimator (SAFE) outperformed the FIB-4 score in screening the population for liver disease. *Ann Hepatol*, 2024. 29(5): p. 101516.
183. Liguori, A., et al., Liver Elastography for Liver Fibrosis Stratification: A Comparison of Three Techniques in a Biopsy-Controlled MASLD Cohort. *Biomedicines*, 2025. 13(1).
184. Liguori, A., et al., Multiparametric ultrasound for non-invasive assessment of liver steatosis, fibrosis, and inflammation in metabolic dysfunction-associated steatotic liver disease. *World J Gastroenterol*, 2025. 31(25): p. 105518.
185. Liu, M., et al., Development and Validation of a Machine Learning-based Model for Prediction of Liver Fibrosis and MASH. *J Clin Gastroenterol*, 2025.
186. Long, L., et al., Development and validation of a scoring system to predict MASLD patients with significant hepatic fibrosis. *Scientific Reports*, 2025. 15(1): p. 9639.
187. Loomba, R., et al., Magnetic resonance elastography predicts advanced fibrosis in patients with nonalcoholic fatty liver disease: a prospective study. *Hepatology*, 2014. 60(6): p. 1920-8.
188. Mahadeva, S., et al., Performance of transient elastography (TE) and factors associated with discordance in non-alcoholic fatty liver disease. *J Dig Dis*, 2013. 14(11): p. 604-10.
189. Mikolasevic, I., et al., Accuracy of Controlled Attenuation Parameter and Liver Stiffness Measurement in Patients with Non-alcoholic Fatty Liver Disease. *Ultrasound Med Biol*, 2021. 47(3): p. 428-437.
190. Mikolasevic, I., et al., The Accuracy of Serum Biomarkers in the Diagnosis of Steatosis, Fibrosis, and Inflammation in Patients with Nonalcoholic Fatty Liver Disease in Comparison to a Liver Biopsy. *Medicina (Kaunas)*, 2022. 58(2).
191. Myers, R.P., et al., Feasibility and diagnostic performance of the FibroScan XL probe for liver stiffness measurement in overweight and obese patients. *Hepatology*, 2012. 55(1): p. 199-208.
192. Nogami, A., et al., Diagnostic comparison of vibration-controlled transient elastography and MRI techniques in overweight and obese patients with NAFLD. *Sci Rep*, 2022. 12(1): p. 21925.
193. Nones, R.B., C.P. Ivantes, and M.L.A. Pedroso, Can FIB4 and NAFLD fibrosis scores help endocrinologists refer patients with non-alcoholic fat liver disease to a hepatologist? *Arch Endocrinol Metab*, 2017. 61(3): p. 276-281.
194. Nouredin, M., et al., Increased accuracy in identifying NAFLD with advanced fibrosis and cirrhosis: independent validation of the Agile 3+ and 4 scores. *Hepatol Commun*, 2023. 7(5).
195. Ochi, H., et al., Real-time tissue elastography for evaluation of hepatic fibrosis and portal hypertension in nonalcoholic fatty liver diseases. *Hepatology*, 2012. 56(4): p. 1271-8.
196. Oeda, S., et al., Accuracy of liver stiffness measurement and controlled attenuation parameter using FibroScan® M/XL probes to diagnose liver fibrosis and steatosis in patients with nonalcoholic fatty liver disease: a multicenter prospective study. *J Gastroenterol*, 2020. 55(4): p. 428-440.
197. Oeda, S., et al., Validation of the utility of Agile scores to identify advanced fibrosis and cirrhosis in Japanese patients with nonalcoholic fatty liver disease. *Hepatol Res*, 2023. 53(6): p. 489-496.
198. Okajima, A., et al., Liver stiffness measurement to platelet ratio index predicts the stage of liver fibrosis in non-alcoholic fatty liver disease. *Hepatol Res*, 2017. 47(8): p. 721-730.
199. Papatheodoridi, M., et al., Agile scores in MASLD and ALD: External validation and their utility in clinical algorithms. *J Hepatol*, 2024. 81(4): p. 590-599.
200. Park, C.C., et al., Magnetic Resonance Elastography vs Transient Elastography in Detection of Fibrosis and Noninvasive Measurement of Steatosis in Patients With Biopsy-Proven Nonalcoholic Fatty Liver Disease. *Gastroenterology*, 2017. 152(3): p. 598-607.e2.
201. Petta, S., et al., Improved noninvasive prediction of liver fibrosis by liver stiffness measurement in patients with nonalcoholic fatty liver disease accounting for controlled attenuation parameter values. *Hepatology*, 2017. 65(4): p. 1145-1155.

202. Petta, S., et al., Reliability of liver stiffness measurement in non-alcoholic fatty liver disease: the effects of body mass index. *Aliment Pharmacol Ther*, 2011. 33(12): p. 1350-60.
203. Petta, S., et al., The severity of steatosis influences liver stiffness measurement in patients with nonalcoholic fatty liver disease. *Hepatology*, 2015. 62(4): p. 1101-10.
204. Podrug, K., et al., Diagnostic Performance of 2-D Shear-Wave Elastography with Propagation Maps and Attenuation Imaging in Patients with Non-Alcoholic Fatty Liver Disease. *Ultrasound Med Biol*, 2021. 47(8): p. 2128-2137.
205. Prasoppokakorn, T., et al., Validation model of fibrosis-8 index score to predict significant fibrosis among patients with nonalcoholic fatty liver disease. *World J Gastroenterol*, 2022. 28(15): p. 1563-1573.
206. Qu, Y., et al., Diagnostic Performance of FibroTouch Ultrasound Attenuation Parameter and Liver Stiffness Measurement in Assessing Hepatic Steatosis and Fibrosis in Patients With Nonalcoholic Fatty Liver Disease. *Clin Transl Gastroenterol*, 2021. 12(4): p. e00323.
207. Roccarina, D., et al., Comparison of point-shear wave elastography (ElastPQ) and transient elastography (FibroScan) for liver fibrosis staging in patients with non-alcoholic fatty liver disease. *Liver Int*, 2022. 42(10): p. 2195-2203.
208. Rosso, C., et al., Cytokeratin 18-Aspartate396 apoptotic fragment for fibrosis detection in patients with non-alcoholic fatty liver disease and chronic viral hepatitis. *Dig Liver Dis*, 2016. 48(1): p. 55-61.
209. Sanyal, A.J., et al., Diagnostic performance of circulating biomarkers for non-alcoholic steatohepatitis. *Nat Med*, 2023. 29(10): p. 2656-2664.
210. Sanyal, A.J., et al., Enhanced diagnosis of advanced fibrosis and cirrhosis in individuals with NAFLD using FibroScan-based Agile scores. *J Hepatol*, 2023. 78(2): p. 247-259.
211. Sharpton, S.R., et al., Diagnostic accuracy of two-dimensional shear wave elastography and transient elastography in nonalcoholic fatty liver disease. *Therap Adv Gastroenterol*, 2021. 14: p. 17562848211050436.
212. Sheikh, M.Y., et al., Accuracy of Velacur in Assessing MASLD and MASH Patients Using Biopsy as the Gold Standard. *Diagnostics (Basel)*, 2025. 15(5).
213. Shukla, A., et al., Simple biochemical parameters and a novel score correlate with absence of fibrosis in patients with nonalcoholic fatty liver disease. *Indian J Gastroenterol*, 2015. 34(4): p. 281-5.
214. Siddiqui, M.S., et al., Vibration-Controlled Transient Elastography to Assess Fibrosis and Steatosis in Patients With Nonalcoholic Fatty Liver Disease. *Clin Gastroenterol Hepatol*, 2019. 17(1): p. 156-163.e2.
215. Staufer, K., et al., Evaluation and comparison of six noninvasive tests for prediction of significant or advanced fibrosis in nonalcoholic fatty liver disease. *United European Gastroenterol J*, 2019. 7(8): p. 1113-1123.
216. Sugimoto, K., et al., US Markers and Necroinflammation, Steatosis, and Fibrosis in Metabolic Dysfunction-associated Steatotic Liver Disease: The iLEAD Study. *Radiology*, 2024. 312(2): p. e233377.
217. Takeuchi, H., et al., Liver fibrosis: noninvasive assessment using supersonic shear imaging and FIB4 index in patients with non-alcoholic fatty liver disease. *J Med Ultrason* (2001), 2018. 45(2): p. 243-249.
218. Tamaki, N., et al., Magnetic resonance elastography plus Fibrosis-4 versus FibroScan-aspartate aminotransferase in detection of candidates for pharmacological treatment of NASH-related fibrosis. *Hepatology*, 2022. 75(3): p. 661-672.
219. Tang, L.J., et al., N-terminal propeptide of type 3 collagen-based sequential algorithm can identify high-risk steatohepatitis and fibrosis in MAFLD. *Hepatol Int*, 2023. 17(1): p. 190-201.
220. Taru, M.G., et al., FAST and Agile-the MASLD drift: Validation of Agile 3+, Agile 4 and FAST scores in 246 biopsy-proven NAFLD patients meeting MASLD criteria of prevalent caucasian origin. *PLoS One*, 2024. 19(5): p. e0303971.
221. Thanapirom, K., et al., Non-invasive tests for liver fibrosis assessment in patients with chronic liver diseases: a prospective study. *Sci Rep*, 2022. 12(1): p. 4913.

222. Tincopa, M.A., et al., Disparities in screening and risk stratification for Hispanic adults with metabolic dysfunction-associated steatotic liver disease. *Hepatology*, 2025. 81(6): p. 1792-1804.
223. Tomeno, W., et al., Distribution of liver stiffness in non-alcoholic fatty liver disease with higher fibrosis-4 index than low cut-off index. *J Gastroenterol Hepatol*, 2019. 34(8): p. 1411-1416.
224. Torkzaban, M., et al., Diagnostic Performance of Quantitative Ultrasound Parameters in Non-alcoholic Fatty Liver Disease. *Acad Radiol*, 2024. 31(1): p. 199-211.
225. Vidal-Trécan, T., et al., Effectiveness of Six International Guidelines Using Fibrosis-4 and FibroScan for Risk Stratification of Metabolic Dysfunction-associated Steatotic Liver Disease in Type 2 Diabetes. *Clin Gastroenterol Hepatol*, 2025. 23(12): p. 2176-2186.e2.
226. Wakabayashi, S.I., et al., AI-Based Platelet-Independent Noninvasive Test for Liver Fibrosis in MASLD Patients. *JGH Open*, 2025. 9(4): p. e70150.
227. Wang, T.J., et al., EUS-guided shear wave elastography for fibrosis screening in patients with obesity and metabolic dysfunction-associated steatotic liver disease: a pilot study (with video). *Gastrointest Endosc*, 2025. 101(2): p. 456-462.e1.
228. Wei, X., et al., Inflammation activity affects liver stiffness measurement by magnetic resonance elastography in MASLD. *Dig Liver Dis*, 2024. 56(10): p. 1715-1720.
229. Wong, V.W., et al., Diagnosis of fibrosis and cirrhosis using liver stiffness measurement in nonalcoholic fatty liver disease. *Hepatology*, 2010. 51(2): p. 454-62.
230. Wong, V.W., et al., Liver stiffness measurement using XL probe in patients with nonalcoholic fatty liver disease. *Am J Gastroenterol*, 2012. 107(12): p. 1862-71.
231. Yoneda, M., et al., Noninvasive assessment of liver fibrosis by measurement of stiffness in patients with nonalcoholic fatty liver disease (NAFLD). *Dig Liver Dis*, 2008. 40(5): p. 371-8.
232. Younossi, Z.M., et al., Clinical profiles and mortality rates are similar for metabolic dysfunction-associated steatotic liver disease and non-alcoholic fatty liver disease. *J Hepatol*, 2024. 80(5): p. 694-701.
233. Younossi, Z.M., et al., The combination of the enhanced liver fibrosis and FIB-4 scores to determine significant fibrosis in patients with nonalcoholic fatty liver disease. *Aliment Pharmacol Ther*, 2023. 57(12): p. 1417-1422.
234. Zambrano-Huaila, R., et al., Diagnostic performance of three non-invasive fibrosis scores (Hepamet, FIB-4, NAFLD fibrosis score) in NAFLD patients from a mixed Latin American population. *Ann Hepatol*, 2020. 19(6): p. 622-626.
235. Zhang, F., et al., Association of Non-Invasive Markers with Significant Fibrosis in Patients with Nonalcoholic Fatty Liver Disease: A Cross-Sectional Study. *Diabetes Metab Syndr Obes*, 2023. 16: p. 2255-2268.
236. Zhang, Y.N., et al., Comparative diagnostic performance of ultrasound shear wave elastography and magnetic resonance elastography for classifying fibrosis stage in adults with biopsy-proven nonalcoholic fatty liver disease. *Eur Radiol*, 2022. 32(4): p. 2457-2469.
237. Zhou, J., et al., Diagnosis of steatohepatitis and fibrosis in biopsy-proven nonalcoholic fatty liver diseases: including two-dimension real-time shear wave elastography and noninvasive fibrotic biomarker scores. *Quant Imaging Med Surg*, 2022. 12(3): p. 1800-1814.
238. US Preventive Services Task Force, et al., Screening for Colorectal Cancer: US Preventive Services Task Force Recommendation Statement. *Jama*, 2021. 325(19): p. 1965-1977.
239. US Preventive Services Task Force, Screening for Hepatitis B Virus Infection in Adolescents and Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2020. 324(23): p. 2415-2422.
240. US Preventive Services Task Force, Screening for HIV Infection: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2019. 321(23): p. 2326-2336.
241. US Preventive Services Task Force, Screening for Syphilis Infection During Pregnancy: US Preventive Services Task Force Reaffirmation Recommendation Statement. *JAMA*, 2025. 333(22): p. 2006-2012.
242. US Preventive Services Task Force, Screening for Syphilis Infection in Nonpregnant Adolescents and Adults: US Preventive Services Task Force Reaffirmation Recommendation Statement. *JAMA*, 2022. 328(12): p. 1243-1249.

243. US Preventive Services Task Force, Screening and Behavioral Counseling Interventions to Reduce Unhealthy Alcohol Use in Adolescents and Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2018. 320(18): p. 1899-1909.
244. US Preventive Services Task Force, Screening for Abdominal Aortic Aneurysm: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2019. 322(22): p. 2211-2218.
245. US Preventive Services Task Force, Screening for Asymptomatic Bacteriuria in Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2019. 322(12): p. 1188-1194.
246. US Preventive Services Task Force, Screening for Breast Cancer: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2024. 331(22): p. 1918-1930.
247. US Preventive Services Task Force, Screening for Hepatitis C Virus Infection in Adolescents and Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2020. 323(10): p. 970-975.
248. US Preventive Services Task Force, Screening for Hypertensive Disorders of Pregnancy: US Preventive Services Task Force Final Recommendation Statement. *JAMA*, 2023. 330(11): p. 1074-1082.
249. US Preventive Services Task Force, Screening for Latent Tuberculosis Infection in Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2023. 329(17): p. 1487-1494.
250. US Preventive Services Task Force, Screening for Lung Cancer: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2021. 325(10): p. 962-970.
251. US Preventive Services Task Force, Screening for Osteoporosis to Prevent Fractures: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2025. 333(6): p. 498-508.
252. Younossi, Z.M., et al., Economic evaluation of non-invasive test pathways for high-risk metabolic dysfunction-associated steatotic liver disease (MASLD) in the United Kingdom (UK). *Ann Hepatol*, 2025. 30(2): p. 101789.
253. Srivastava, A., et al., Cost-comparison analysis of FIB-4, ELF and fibroscan in community pathways for non-alcoholic fatty liver disease. *BMC Gastroenterol*, 2019. 19(1): p. 122.
254. Orgill, A., et al., Early detection of liver disease in patients with alcohol use disorder improves long-term abstinence. *Alcohol Alcohol*, 2024. 59(6).
255. Avitabile, E., et al., Liver fibrosis screening increases alcohol abstinence. *JHEP Rep*, 2024. 6(10): p. 101165.
256. Kjaergaard, M., et al., Screening for Fibrosis Promotes Lifestyle Changes: A Prospective Cohort Study in 4796 Individuals. *Clin Gastroenterol Hepatol*, 2024. 22(5): p. 1037-1047.e9.
257. Glass, L.M., et al., Total body weight loss of $\geq 10\%$ is associated with improved hepatic fibrosis in patients with nonalcoholic steatohepatitis. *Dig Dis Sci*, 2015. 60(4): p. 1024-30.
258. Promrat, K., et al., Randomized controlled trial testing the effects of weight loss on nonalcoholic steatohepatitis. *Hepatology*, 2010. 51(1): p. 121-9.
259. Kim, D., et al., Physical Activity, Measured Objectively, Is Associated With Lower Mortality in Patients With Nonalcoholic Fatty Liver Disease. *Clin Gastroenterol Hepatol*, 2021. 19(6): p. 1240-1247.e5.
260. Henry, A., et al., Vigorous physical activity provides protection against all-cause deaths among adults patients with nonalcoholic fatty liver disease (NAFLD). *Aliment Pharmacol Ther*, 2023. 57(6): p. 709-722.
261. Babu, A.F., et al., Positive Effects of Exercise Intervention without Weight Loss and Dietary Changes in NAFLD-Related Clinical Parameters: A Systematic Review and Meta-Analysis. *Nutrients*, 2021. 13(9).
262. Vilar-Gomez, E., et al., Significant Dose-Response Association of Physical Activity and Diet Quality With Mortality in Adults With Suspected NAFLD in a Population Study. *Am J Gastroenterol*, 2023. 118(9): p. 1576-1591.
263. Addolorato, G., et al., Effectiveness and safety of baclofen for maintenance of alcohol abstinence in alcohol-dependent patients with liver cirrhosis: randomised, double-blind controlled study. *Lancet*, 2007. 370(9603): p. 1915-22.

264. O'Connor, E.A., et al., Screening and Behavioral Counseling Interventions to Reduce Unhealthy Alcohol Use in Adolescents and Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*, 2018. 320(18): p. 1910-1928.
265. Saeed, N., et al., Primary care and referring physician perspectives on non-alcoholic fatty liver disease management: a nationwide survey. *Therap Adv Gastroenterol*, 2021. 14: p. 17562848211042200.
266. National Diabetes Statistics Report. August 13, 2025]; Available from: <https://www.cdc.gov/diabetes/php/data-research/index.html>.
267. Patel, P.J., et al., Underappreciation of non-alcoholic fatty liver disease by primary care clinicians: limited awareness of surrogate markers of fibrosis. *Intern Med J*, 2018. 48(2): p. 144-151.
268. Blais, P., et al., Nonalcoholic fatty liver disease is underrecognized in the primary care setting. *Am J Gastroenterol*, 2015. 110(1): p. 10-4.
269. Lominadze, Z. and E.R. Kallwitz, Misconception: You Can't Have Liver Disease With Normal Liver Chemistries. *Clin Liver Dis (Hoboken)*, 2018. 12(4): p. 96-99.
270. Gawrieh, S., et al., Histologic Findings of Advanced Fibrosis and Cirrhosis in Patients With Nonalcoholic Fatty Liver Disease Who Have Normal Aminotransferase Levels. *Am J Gastroenterol*, 2019. 114(10): p. 1626-1635.
271. Fracanzani, A.L., et al., Risk of severe liver disease in nonalcoholic fatty liver disease with normal aminotransferase levels: a role for insulin resistance and diabetes. *Hepatology*, 2008. 48(3): p. 792-8.
272. Elangovan, H., et al., Nonalcoholic Fatty Liver Disease: Interface Between Primary Care and Hepatology Clinics. *Hepatol Commun*, 2020. 4(4): p. 518-526.
273. Condon, S., et al., ALT poorly predicts Nonalcoholic Fatty Liver Disease (NAFLD) and liver fibrosis as determined by vibration-controlled transient elastography in adult National Health and Nutrition Examination Survey 2017-2018. *Am J Med Sci*, 2024. 367(5): p. 310-322.
274. Neuschwander-Tetri, B.A., et al., Clinical, laboratory and histological associations in adults with nonalcoholic fatty liver disease. *Hepatology*, 2010. 52(3): p. 913-24.
275. Verma, S., et al., Predictive value of ALT levels for non-alcoholic steatohepatitis (NASH) and advanced fibrosis in non-alcoholic fatty liver disease (NAFLD). *Liver Int*, 2013. 33(9): p. 1398-405.
276. Sung, K.C., et al., Utility of ALT Concentration in Men and Women with Nonalcoholic Fatty Liver Disease: Cohort Study. *J Clin Med*, 2019. 8(4).
277. Lomonaco, R., et al., Advanced Liver Fibrosis Is Common in Patients With Type 2 Diabetes Followed in the Outpatient Setting: The Need for Systematic Screening. *Diabetes Care*, 2021. 44(2): p. 399-406.
278. Browning, J.D., et al., Prevalence of hepatic steatosis in an urban population in the United States: impact of ethnicity. *Hepatology*, 2004. 40(6): p. 1387-95.
279. Anstee, Q.M., et al., Prognostic utility of Fibrosis-4 Index for risk of subsequent liver and cardiovascular events, and all-cause mortality in individuals with obesity and/or type 2 diabetes: a longitudinal cohort study. *Lancet Reg Health Eur*, 2024. 36: p. 100780.
280. Gbadamosi, S.O., et al., Association of Index and Changes in Fibrosis-4 Score With Outcomes in Metabolic Dysfunction-Associated Steatohepatitis. *Gastro Hep Adv*, 2025. 4(7): p. 100666.
281. Sanyal, A.J., et al., Cirrhosis regression is associated with improved clinical outcomes in patients with nonalcoholic steatohepatitis. *Hepatology*, 2022. 75(5): p. 1235-1246.
282. Sanyal, A.J., et al., Phase 3 Trial of Semaglutide in Metabolic Dysfunction-Associated Steatohepatitis. *N Engl J Med*, 2025. 392(21): p. 2089-2099.
283. Petta, S., et al., Monitoring Occurrence of Liver-Related Events and Survival by Transient Elastography in Patients With Nonalcoholic Fatty Liver Disease and Compensated Advanced Chronic Liver Disease. *Clin Gastroenterol Hepatol*, 2021. 19(4): p. 806-815.e5.
284. Harrison, S.A., et al., A Phase 3, Randomized, Controlled Trial of Resmetirom in NASH with Liver Fibrosis. *N Engl J Med*, 2024. 390(6): p. 497-509.
285. Carrieri, P., et al., Knowledge of liver fibrosis stage among adults with NAFLD/NASH improves adherence to lifestyle changes. *Liver Int*, 2022. 42(5): p. 984-994.
286. Ratziu, V.e.a., Topline Results From the REVERSE Trial of Obeticholic Acid in Patients With Compensated Cirrhosis Due to Nonalcoholic Steatohepatitis, in AASLD The Liver Meeting. 2023.

287. Younossi, Z.M., et al., Obeticholic acid for the treatment of non-alcoholic steatohepatitis: interim analysis from a multicentre, randomised, placebo-controlled phase 3 trial. *Lancet*, 2019. 394(10215): p. 2184-2196.
288. Cholaneril, G., et al., Longitudinal changes in fibrosis markers are associated with risk of cirrhosis and hepatocellular carcinoma in non-alcoholic fatty liver disease. *J Hepatol*, 2023. 78(3): p. 493-500.
289. Gawrieh, S., et al., Increases and decreases in liver stiffness measurement are independently associated with the risk of liver-related events in NAFLD. *J Hepatol*, 2024. 81(4): p. 600-608.
290. Lin, H., et al., Vibration-Controlled Transient Elastography Scores to Predict Liver-Related Events in Steatotic Liver Disease. *Jama*, 2024. 331(15): p. 1287-1297.
291. Gidener, T., et al., Change in serial liver stiffness measurement by magnetic resonance elastography and outcomes in NAFLD. *Hepatology*, 2023. 77(1): p. 268-274.
292. Lassailly, G., et al., Resolution of Metabolic Dysfunction-associated Steatohepatitis With No Worsening of Fibrosis After Bariatric Surgery Improves 15-year Survival: A Prospective Cohort Study. *Clin Gastroenterol Hepatol*, 2025. 23(9): p. 1567-1576.e9.
293. Caussy, C., et al., Screening for Metabolic Dysfunction–Associated Steatotic Liver Disease–Related Advanced Fibrosis in Diabetology: A Prospective Multicenter Study. *Diabetes Care*, 2025. 48(6): p. 877-886.
294. Lavian, J.D., et al., Safety of percutaneous versus transjugular liver biopsy: A propensity score matched analysis. *European Journal of Radiology*, 2020. 133.
295. Myers, R.P., A. Fong, and A.A.M. Shaheen, Utilization rates, complications and costs of percutaneous liver biopsy: a population-based study including 4275 biopsies. *Liver International*, 2008. 28(5): p. 705-712.
296. Midia, M., et al., Predictors of bleeding complications following percutaneous image-guided liver biopsy: a scoping review. *Diagn Interv Radiol*, 2019. 25(1): p. 71-80.
297. Thomaides-Brears, H.B., et al., Incidence of Complications from Percutaneous Biopsy in Chronic Liver Disease: A Systematic Review and Meta-Analysis. *Dig Dis Sci*, 2022. 67(7): p. 3366-3394.
298. Phase 3 ESSENCE Trial: Semaglutide in Metabolic Dysfunction-Associated Steatohepatitis. *Gastroenterol Hepatol (N Y)*, 2024. 20(12 Suppl 11): p. 6-7.
299. Verrastro, O., et al., Bariatric-metabolic surgery versus lifestyle intervention plus best medical care in non-alcoholic steatohepatitis (BRAVES): a multicentre, open-label, randomised trial. *Lancet*, 2023. 401(10390): p. 1786-1797.
300. Curci, R., et al., Leisure-Time Physical Activity in Subjects with Metabolic-Dysfunction-Associated Steatotic Liver Disease: An All-Cause Mortality Study. *J Clin Med*, 2024. 13(13).
301. Zhou, X.D., et al., Long-term liver-related outcomes and liver stiffness progression of statin usage in steatotic liver disease. *Gut*, 2024. 73(11): p. 1883-1892.
302. NCT04822181. Research Study on Whether Semaglutide Works in People With Non-alcoholic Steatohepatitis (NASH) (ESSENCE). Available from: <https://clinicaltrials.gov/study/NCT04822181>.
303. NCT03900429. A Phase 3 Study to Evaluate the Efficacy and Safety of MGL-3196 (Resmetirom) in Patients With NASH and Fibrosis (MAESTRO-NASH). Available from: <https://clinicaltrials.gov/study/NCT03900429>.
304. NCT04951219, A Phase 3 Study to Evaluate Safety and Biomarkers of Resmetirom (MGL-3196) in Patients With Non-alcoholic Fatty Liver Disease (NAFLD), MAESTRO-NAFLD-Open-Label-Extension (MAESTRO-NAFLD-OLE).
305. Addolorato, G., et al., Effectiveness and safety of baclofen for maintenance of alcohol abstinence in alcohol-dependent patients with liver cirrhosis: randomised, double-blind controlled study. *The Lancet*, 2007. 370(9603): p. 1915-1922.
306. Mosoni, C., et al., Baclofen for the Treatment of Alcohol Use Disorder in Patients With Liver Cirrhosis: 10 Years After the First Evidence. *Front Psychiatry*, 2018. 9: p. 474.
307. Barrault, C., et al., One year of baclofen in 100 patients with or without cirrhosis: a French real-life experience. *European Journal of Gastroenterology & Hepatology*, 2017. 29(10).
308. Morley, K.C., et al., Baclofen in the treatment of alcohol dependence with or without liver disease: multisite, randomised, double-blind, placebo-controlled trial. *The British Journal of Psychiatry*, 2018. 212(6): p. 362-369.

309. Owens, L., et al., A prospective cohort study examining the effectiveness of baclofen in the maintenance of abstinence in alcohol use disorder patients attending a joint liver and alcohol treatment clinic. *Alcohol*, 2017. 62: p. 11-15.
310. Vannier, A.G.L., et al., Incidence and Progression of Alcohol-Associated Liver Disease After Medical Therapy for Alcohol Use Disorder. *JAMA Netw Open*, 2022. 5(5): p. e2213014.
311. Hendershot, C.S., et al., Once-Weekly Semaglutide in Adults With Alcohol Use Disorder: A Randomized Clinical Trial. *JAMA Psychiatry*, 2025. 82(4): p. 395-405.
312. Wang, W., et al., Associations of semaglutide with incidence and recurrence of alcohol use disorder in real-world population. *Nature Communications*, 2024. 15(1): p. 4548.
313. Lähteenvuo, M., et al., Repurposing Semaglutide and Liraglutide for Alcohol Use Disorder. *JAMA Psychiatry*, 2025. 82(1): p. 94-98.
314. Kim, D., et al., Types of Physical Activity in Nonalcoholic Fatty Liver Disease and All-Cause and Cardiovascular Mortality. *J Clin Med*, 2023. 12(5).
315. Vilar-Gomez, E., et al., Weight Loss Through Lifestyle Modification Significantly Reduces Features of Nonalcoholic Steatohepatitis. *Gastroenterology*, 2015. 149(2): p. 367-78.e5; quiz e14-5.
316. Brunner, K.T., et al., Nonalcoholic Fatty Liver Disease and Obesity Treatment. *Curr Obes Rep*, 2019. 8(3): p. 220-228.
317. Hallsworth, K. and L.A. Adams, Lifestyle modification in NAFLD/NASH: Facts and figures. *JHEP Rep*, 2019. 1(6): p. 468-479.
318. Chou, R., et al., Statin Use for the Primary Prevention of Cardiovascular Disease in Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*, 2022. 328(8): p. 754-771.
319. US Preventive Services Task Force, Statin Use for the Primary Prevention of Cardiovascular Disease in Adults: US Preventive Services Task Force Recommendation Statement. *JAMA*, 2022. 328(8): p. 746-753.
320. Novo Nordisk, WEGOVY (semaglutide) [label]. 2025.
321. Eli Lilly and Company, ZEPBOUND® (tirzepatide) [label]. 2025.
322. Bliddal, H., et al., Once-Weekly Semaglutide in Persons with Obesity and Knee Osteoarthritis. *N Engl J Med*, 2024. 391(17): p. 1573-1583.
323. Borlaug, B.A., et al., Semaglutide and Exercise Function in Obesity-Related HFpEF: Insights From the STEP-HFpEF Program. *JACC Heart Fail*, 2025. 13(11): p. 102660.
324. Davies, M., et al., Semaglutide 2·4 mg once a week in adults with overweight or obesity, and type 2 diabetes (STEP 2): a randomised, double-blind, double-dummy, placebo-controlled, phase 3 trial. *Lancet*, 2021. 397(10278): p. 971-984.
325. Garvey, W.T., et al., Two-year effects of semaglutide in adults with overweight or obesity: the STEP 5 trial. *Nat Med*, 2022. 28(10): p. 2083-2091.
326. Kosiborod, M.N., et al., Semaglutide in Patients with Obesity-Related Heart Failure and Type 2 Diabetes. *N Engl J Med*, 2024. 390(15): p. 1394-1407.
327. Rubino, D., et al., Effect of Continued Weekly Subcutaneous Semaglutide vs Placebo on Weight Loss Maintenance in Adults With Overweight or Obesity: The STEP 4 Randomized Clinical Trial. *Jama*, 2021. 325(14): p. 1414-1425.
328. Rubino, D.M., et al., Effect of Weekly Subcutaneous Semaglutide vs Daily Liraglutide on Body Weight in Adults With Overweight or Obesity Without Diabetes: The STEP 8 Randomized Clinical Trial. *Jama*, 2022. 327(2): p. 138-150.
329. Wadden, T.A., et al., Effect of Subcutaneous Semaglutide vs Placebo as an Adjunct to Intensive Behavioral Therapy on Body Weight in Adults With Overweight or Obesity: The STEP 3 Randomized Clinical Trial. *Jama*, 2021. 325(14): p. 1403-1413.
330. Wharton, S., et al., Once-weekly semaglutide 72 mg in adults with obesity (STEP UP): a randomised, controlled, phase 3b trial. *The Lancet Diabetes & Endocrinology*, 2025. 13(11): p. 949-963.

B) Additional MASLD Supporting Evidence

1. Ajmera, V., Kim, B.K., Yang, K., et al., Liver stiffness on magnetic resonance elastography and the MEFIB index and liver-related outcomes in nonalcoholic fatty liver disease: a systematic review and meta-analysis of individual participants. *Gastroenterology*, 2022. 163(4): p. 1079-1089.e1075.
2. Allen, A.M., Kim, W.R., Carrieri, P., et al., Population perspectives on benefits and harms of screening for metabolic dysfunction-associated steatotic liver disease. *Hepatology*, 9900.
3. Almeida, A.M., Rocha, H.A.L., Araújo, D.A.B.S., de Barros Silva, P.G., de Melo Filho, L.P., de Oliveira Borges, G.C., Development and validation of a video-assisted liver biopsy technique using a minimally-invasive device. *BMC Gastroenterology*, 2023. 23(1): p. 120.
4. Aminian, A., Aljabri, A., Wang, S., et al., Long-term liver outcomes after metabolic surgery in compensated cirrhosis due to metabolic dysfunction-associated steatohepatitis. *Nature Medicine*, 2025. 31(3): p. 988-995.
5. Aminian, A., Al-Kurd, A., Wilson, R., et al., Association of bariatric surgery with major adverse liver and cardiovascular outcomes in patients with biopsy-proven nonalcoholic steatohepatitis. *JAMA*, 2021. 326(20): p. 2031-2042.
6. Anstee, Q.M., Lawitz, E.J., Alkhouri, N., et al., Noninvasive tests accurately identify advanced fibrosis due to NASH: baseline data from the STELLAR trials. *Hepatology*, 2019. 70(5): p. 1521-1530.
7. Arruda do Espirito Santo, P., Meine, G.C., Nau, A.L., et al., Endoscopic ultrasound-guided versus percutaneous liver biopsy: a systematic review and meta-analysis of randomized controlled trials. *Endoscopy*, 2024.
8. Baran, B., Kale, S., Patil, P., et al., Endoscopic ultrasound-guided parenchymal liver biopsy: a systematic review and meta-analysis. *Surgical Endoscopy*, 2021. 35(10): p. 5546-5557.
9. Barbois, S., Arvieux, C., Leroy, V., Reche, F., Stürm, N., Borel, A.-L., Benefit-risk of intraoperative liver biopsy during bariatric surgery: review and perspectives. *Surgery for Obesity and Related Diseases*, 2017. 13(10): p. 1780-1786.
10. Caussy, C., Alquraish, M.H., Nguyen, P., et al., Optimal threshold of controlled attenuation parameter with MRI-PDFF as the gold standard for the detection of hepatic steatosis. *Hepatology*, 2018. 67(4): p. 1348-1359.
11. Chang, M., Chang, D., Kodali, S., et al., Degree of discordance between FIB-4 and transient elastography: an application of current guidelines on general population cohort. *Clinical Gastroenterology and Hepatology*, 2024. 22(7): p. 1453-1461.e2.
12. Charlton, M.R., Burns, J.M., Pedersen, R.A., Watt, K.D., Heimbach, J.K., Dierkhising, R.A., Frequency and outcomes of liver transplantation for nonalcoholic steatohepatitis in the United States. *Gastroenterology*, 2011. 141(4): p. 1249-1253.
13. Chen, K., Sng, W.K., Quah, J.H., et al., Clinical spectrum of non-alcoholic fatty liver disease in patients with diabetes mellitus. *PLoS One*, 2020. 15(8): p. e0236977.
14. Diehl, D.L., Sangwan, V., Johal, A.S., Khara, H.S., Confer, B., Comparing a 19-gauge fine-needle biopsy needle with a 22-gauge fine-needle biopsy needle for EUS-guided liver biopsy sampling: a prospective randomized study. *Gastrointestinal Endoscopy*, 2024. 99(6): p. 931-937.
15. Gadour, E., Awad, A., Hassan, Z., Shrwani, K.J., Miutescu, B., Okasha, H.H., Diagnostic and therapeutic role of endoscopic ultrasound in liver diseases: a systematic review and meta-analysis. *World Journal of Gastroenterology*, 2024. 30(7): p. 742-758.
16. Gbadamosi, S.O., Evans, K.A., Brady, B.L., Hoovler, A., Noninvasive tests and diagnostic pathways to MASH diagnosis in the United States: a retrospective observational study. *Journal of Medical Economics*, 2025. 28(1): p. 314-322.
17. Genua, I., Cusi, K., Pharmacological approaches to nonalcoholic fatty liver disease: current and future therapies. *Diabetes Spectrum*, 2024. 37(1): p. 48-58.

18. Gerhardt, F., Petroff, D., Blank, V., et al., Biopsy rate and nonalcoholic steatohepatitis (NASH) in patients with nonalcoholic fatty liver disease (NAFLD). *Scandinavian Journal of Gastroenterology*, 2020. 55(6): p. 607-711.
19. Gips, J.R., Yanek, L., Wu, J., Hamilton, J.P., Woreta, T.A., Clark, J.M., Clinical cohort of nonalcoholic fatty liver disease in a primary care setting. *Journal of Family Medicine and Primary Care*, 2024. 13(8): p. 2958-2963.
20. Giri, S., Agrawal, D., Gopan, A., Varghese, J., Tripathy, T., Diagnostic outcome and safety of plugged liver biopsy in high-risk patients: a systematic review and meta-analysis. *Acta Radiologica*, 2023. 64(5): p. 1775-1782.
21. Golabi, P., Paik, J.M., Kumar, A., et al., Nonalcoholic fatty liver disease (NAFLD) and associated mortality in individuals with type 2 diabetes, pre-diabetes, metabolically unhealthy, and metabolically healthy individuals in the United States. *Metabolism: Clinical and Experimental*, 2023. 146: p. 155642.
22. Harrison, S.A., Gawrieh, S., Roberts, K., et al., Prospective evaluation of the prevalence of non-alcoholic fatty liver disease and steatohepatitis in a large middle-aged US cohort. *Journal of Hepatology*, 2021. 75(2): p. 284-291.
23. Johansen, S., Åberg, F., Tsochatzis, E.A., Krag, A., Screening for advanced steatotic liver disease. *The Lancet Gastroenterology & Hepatology*, 2025. 10(9): p. 842-854.
24. Kalambokis, G., Manousou, P., Vibhakorn, S., et al., Transjugular liver biopsy—indications, adequacy, quality of specimens, and complications—a systematic review. *Journal of Hepatology*, 2007. 47(2): p. 284-294.
25. Komolafe, O., Buzzetti, E., Linden, A., et al., Nutritional supplementation for nonalcohol-related fatty liver disease: a network meta-analysis. *Cochrane Database of Systematic Reviews*, 2021. 7(7): p. CD013157.
26. Koutoukidis, D.A., Morris, E., Henry, J.A., et al., What proportion of people have a follow-up biopsy in randomized trials of treatments for non-alcoholic steatohepatitis?: a systematic review and meta-analysis. *PLoS One*, 2021. 16(4): p. e0250385.
27. Kugelmas, M., Nouredin, M., Gunn, N., et al., The use of current knowledge and non-invasive testing modalities for predicting at-risk non-alcoholic steatohepatitis and assessing fibrosis. *Liver International*, 2023. 43(5): p. 964-974.
28. McCarty, T.R., Bazarbashi, A.N., Njei, B., Ryou, M., Aslanian, H.R., Muniraj, T., Endoscopic ultrasound-guided, percutaneous, and transjugular liver biopsy: a comparative systematic review and meta-analysis. *Clinical Endoscopy*, 2020. 53(5): p. 583-593.
29. Morisaka, H., Motosugi, U., Ichikawa, S., et al., Magnetic resonance elastography is as accurate as liver biopsy for liver fibrosis staging. *Journal of Magnetic Resonance Imaging*, 2018. 47(5): p. 1268-1275.
30. Nascimbeni, F., Lebray, P., Fedchuk, L., et al., Significant variations in elastometry measurements made within short-term in patients with chronic liver diseases. *Clinical Gastroenterology and Hepatology*, 2015. 13(4): p. 763-771.e766.
31. Paik, A., Henry, L., de Avila, L., et al., Food swamps and food deserts impact on metabolic dysfunction-associated steatotic liver disease mortality in US counties. *Clinical Gastroenterology and Hepatology*, 2025. 23(6): p. 997-1007.e1005.
32. Paik, J.M., Duong, S., Zelber-Sagi, S., Lazarus, J.V., Henry, L., Younossi, Z.M., Food insecurity, low household income, and low education level increase the risk of having metabolic dysfunction-associated fatty liver disease among adolescents in the United States. *The American Journal of Gastroenterology*, 2024. 119(6): p. 1089-1101.

33. Paik, J.M., Hobbs, K., Gupta, A., Alkalbani, R.J., Reyes, M.A., Younossi, Z.M., Prevalence of MASLD, Met-ALD, and ALD and associated fibrosis among US adults: insights from NHANES 2017 to 2023. *Journal of Clinical Gastroenterology*, 2025.
34. Quek, J., Chan, K.E., Wong, Z.Y., et al., Global prevalence of non-alcoholic fatty liver disease and non-alcoholic steatohepatitis in the overweight and obese population: a systematic review and meta-analysis. *The Lancet Gastroenterology & Hepatology*, 2023. 8(1): p. 20-30.
35. Runge, J.H., Bohte, A.E., Verheij, J., et al., Comparison of interobserver agreement of magnetic resonance elastography with histopathological staging of liver fibrosis. *Abdominal Imaging*, 2014. 39(2): p. 283-290.
36. Sharma, A., Godina Leiva, E., Kalavalapalli, S., et al., Obesity increases the risk of hepatic fibrosis in young adults with type 2 diabetes mellitus: the need to screen. *Obesity*, 2024. 32(10): p. 1967-1974.
37. Silva, M.A., Hegab, B., Hyde, C., Guo, B., Buckels, J.A.C., Mirza, D.F., Needle track seeding following biopsy of liver lesions in the diagnosis of hepatocellular cancer: a systematic review and meta-analysis. *Gut*, 2008. 57(11): p. 1592-1596.
38. Simon, T.G., Roelstraete, B., Hagstrom, H., et al., Progression of non-alcoholic fatty liver disease and long-term outcomes: a nationwide paired liver biopsy cohort study. *Journal of Hepatology*, 2023. 79(6): p. 1366-1373.
39. Singal, A.K., Hasanin, M., Kaif, M., Wiesner, R., Kuo, Y.F., Nonalcoholic steatohepatitis is the most rapidly growing indication for simultaneous liver kidney transplantation in the United States. *Transplantation*, 2016. 100(3): p. 607-612.
40. Tian, G., Kong, D., Jiang, T., Li, L., Complications after percutaneous ultrasound-guided liver biopsy: a systematic review and meta-analysis of a population of more than 12,000 patients from 51 cohort studies. *Journal of Ultrasound in Medicine*, 2020. 39(7): p. 1355-1365.
41. Tincopa, M.A., Loomba, R., Non-invasive diagnosis and monitoring of non-alcoholic fatty liver disease and non-alcoholic steatohepatitis. *The Lancet Gastroenterology & Hepatology*, 2023. 8(7): p. 660-670.
42. Truong, E., Alnimer, L., Gornbein, J.A., et al., Agile 3+ and 4 scores accurately predict major adverse liver outcomes, liver transplant, progression of MELD score, the development of hepatocellular carcinoma, and death in NAFLD. *Digestive Diseases and Sciences*, 2025.
43. Truong, E., Gornbein, J.A., Yang, J.D., et al., MRI-AST (MAST) score accurately predicts major adverse liver outcome, hepatocellular carcinoma, liver transplant, and liver-related death. *Clinical Gastroenterology and Hepatology*, 2023. 21(10): p. 2570-2577.e2571.
44. Wong, V.W., Irls, M., Wong, G.L., et al., Unified interpretation of liver stiffness measurement by M and XL probes in non-alcoholic fatty liver disease. *Gut*, 2019. 68(11): p. 2057-2064.
45. Yip, T.C.-F., Lee, H.W., Lin, H., et al., Prognostic performance of the two-step clinical care pathway in metabolic dysfunction-associated steatotic liver disease. *Journal of Hepatology*, 2025. 83(2): p. 304-314.
46. Yip, T.C.-F., Lyu, F., Lin, H., et al., Non-invasive biomarkers for liver inflammation in non-alcoholic fatty liver disease: present and future. *Clinical and Molecular Hepatology*, 2023. 29(Suppl): p. S171-S183.
47. Younossi, Z.M., Alqahtani, S.A., Alswat, K., et al., Global survey of stigma among physicians and patients with nonalcoholic fatty liver disease. *Journal of Hepatology*, 2024. 80(3): p. 419-430.
48. Younossi, Z.M., Paik, J.M., Henry, L., et al., The growing economic and clinical burden of nonalcoholic steatohepatitis (NASH) in the United States. *Journal of Clinical and Experimental Hepatology*, 2023. 13(3): p. 454-467.
49. Younossi, Z.M., Stepanova, M., Al Shabeeb, R., et al., The changing epidemiology of adult liver transplantation in the United States in 2013–2022: the dominance of metabolic dysfunction-

associated steatotic liver disease and alcohol-associated liver disease. *Hepatology Communications*, 2024. 8(1).

50. Younossi, Z.M., Zelber-Sagi, S., Kuglema, C., et al., Association of food insecurity with MASLD prevalence and liver-related mortality. *Journal of Hepatology*, 2025. 82(2): p. 203-210.
51. Zeng, K., Jiang, Z., Yang, J., Chen, K., Lu, Q., Role of endoscopic ultrasound-guided liver biopsy: a meta-analysis. *Scandinavian Journal of Gastroenterology*, 2022. 57(5): p. 545-557.
52. Zhong, C., Jin, J., Wang, X., Huang, Y., Yan, D., Wang, W., Effects of different recovery positions on the postpercutaneous liver biopsy complications: a meta-analysis. *Frontiers in Surgery*, 2021. 8: p. 707945.