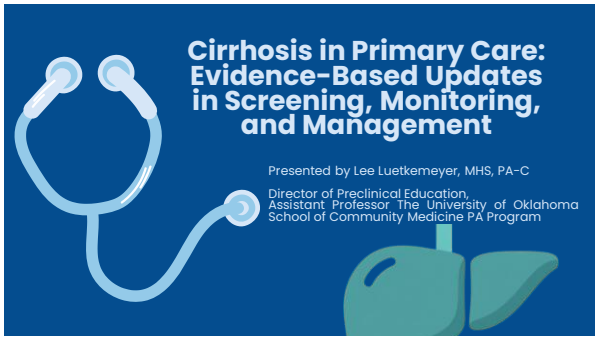


Learning Objectives

- Identify current guideline-based approaches for the **diagnosis, staging, and risk stratification** of patients with cirrhosis in the primary care setting.
- Apply updated **management strategies** for common causes of cirrhosis and cirrhosis complications, including ascites, hepatic encephalopathy, variceal bleeding prevention, and spontaneous bacterial peritonitis.
- Implement recommended **screening and preventive care** measures for patients with cirrhosis, including hepatocellular carcinoma surveillance, vaccination, nutrition, and medication safety.
- Recognize clinical features of **hepatic decompensation** and identify indications for hepatology referral and transplant evaluation.

Case Study

55-year-old woman with type 2 diabetes taking metformin, her BMI is 34

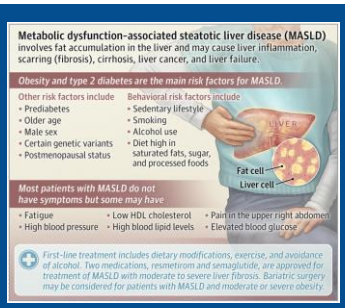
Routine labs: Hemoglobin A1C 7.8%, ALT 52, AST 48, platelets 168,000

Prior Abdominal ultrasound for gallbladder symptoms showed hepatic steatosis

Why Cirrhosis Matters in Primary Care

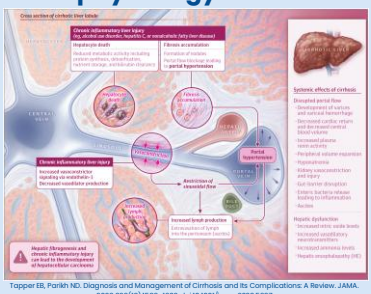
- CIRRHOSIS AFFECTS APPROXIMATELY 2.2 MILLON ADULTS IN THE US
- 9TH LEADING CAUSE OF DEATH IN OKLAHOMA
- MASLD, alcohol use disorder, and hepatitis C infection are the most common causes
- Treating the underlying cause can prevent and potentially reverse fibrosis
- Primary care is on the front lines for early detection, risk factor modification, and coordinated management with specialists

Metabolic Dysfunction Associated Steatotic Liver Disease (MASLD)



Tilg H, Petta S, Stefan N, Targher G. Metabolic dysfunction–associated steatotic liver disease in adults: a review. JAMA. 2026;335(2):163-174. doi:10.1001/jama.2025.19615

Pathophysiology of Cirrhosis



Tapper EB, Parikh ND. Diagnosis and Management of Cirrhosis and Its Complications: A Review. JAMA. 2023;329(18):1589–1602. doi:10.1001/jama.2023.5997

Who Should Be Screened?

- Type 2 diabetes (regardless of ALT)
- Obesity with metabolic syndrome
- Hepatic steatosis on any imaging
- Excess alcohol use (>14 drinks/week men, >7 women)
- Patients with history of chronic hepatitis B or C infection

Diagnosis of Cirrhosis

Step 1: Risk Stratification
Step 2: Calculate FIB-4 Index
Step 3: Elastography
Step 4: Liver Biopsy

Case Study

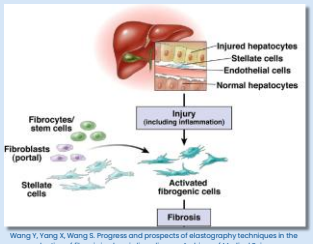
55-year-old woman with type 2 diabetes taking metformin, her BMI is 34
Routine labs: Hemoglobin A1C 7.8%, ALT 52, AST 48, platelets 168,000
Prior Abdominal ultrasound for gallbladder symptoms showed hepatic steatosis

Calculate FIB-4: Age 55, AST 48, ALT 52, Plt 168 → FIB-4 = (55 × 48) / (168 × √52) = 2640 / 1211 = 2.18 — indeterminate

She needs elastography.

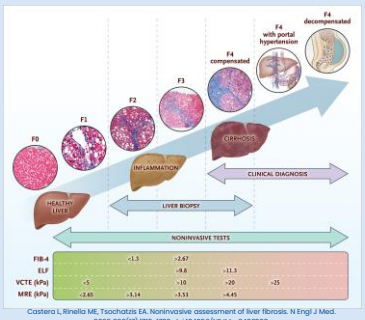
Elastography Thresholds

- **LSM <8 kPa** → Advanced fibrosis unlikely
- **LSM 8–12 kPa** → Possible advanced fibrosis (F3)
- **LSM 12–15 kPa** → Probable advanced fibrosis/early cirrhosis
- **LSM ≥15 kPa** → Cirrhosis likely (specificity ~95%)



Wang Y, Yang X, Wang S. Progress and prospects of elastography techniques in the evaluation of fibrosis in chronic liver disease. Archives of Medical Science. 2024;20(6):1784–1792. doi:10.5114/aoms/187079.

Diagnosis, Staging, & Progression of Liver Fibrosis



Castera L, Rinella ME, Tsochatzis EA. Noninvasive assessment of liver fibrosis. N Engl J Med. 2025;393(17):1715–1729. doi:10.1056/NEJMra2403308.

Monitoring & Repeat Screening

- FIB-4 <1.3: Repeat every 1–2 years if risk factors persist
- Indeterminate FIB-4 with low elastography: Repeat elastography in 1–2 years
- Post-treatment response monitoring: ≥30% reduction in liver stiffness at 1 year defines treatment response

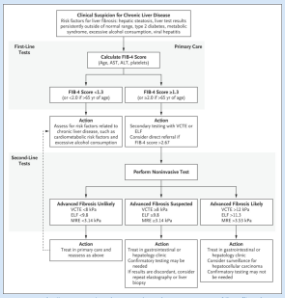
Case Study

55-year-old woman with type 2 diabetes taking metformin, her BMI is 34
Routine labs: Hemoglobin A1C 7.8%, ALT 52, AST 48, platelets 168,000
Prior Abdominal ultrasound for gallbladder symptoms showed hepatic steatosis

FIB-4: 2.18 — indeterminate

Elastography returns 14 kPa → Likely F3 fibrosis

Algorithm for Noninvasive Screening for Advanced Fibrosis in Patients with Suspected Chronic Liver Disease



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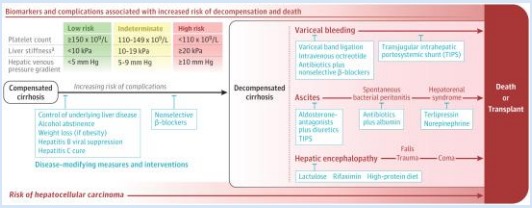
Diagnosis and Staging of Cirrhosis

Signs & Symptoms- Fatigue, spider angiomata, palmar erythema, jaundice, splenomegaly, caput medusae, asterixis, and peripheral edema, weight loss, and abdominal distension

Staging — Compensated vs Decompensated
Compensated cirrhosis is asymptomatic with preserved liver function.
Decompensated cirrhosis is defined by complications: ascites, variceal bleeding, hepatic encephalopathy, or jaundice.

Compensated vs. Decompensated Cirrhosis



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Risk Stratification in Cirrhosis

Child-Pugh Score: Assesses prognosis using five parameters — bilirubin, albumin, INR, ascites, and encephalopathy. Scores classify patients as Class A (5–6, compensated), Class B (7–9, moderate), or Class C (10–15, decompensated), guiding urgency of intervention and transplant evaluation.

MELD Score: Model for End-Stage Liver Disease uses serum creatinine, bilirubin, and INR to predict 90-day mortality. MELD ≥15 indicates significant risk and warrants hepatology referral; MELD ≥18–20 may trigger transplant evaluation discussions and signals need for specialist-led care.

Guiding Management Intensity: Risk stratification determines monitoring frequency, prophylactic interventions, and referral thresholds. Low-risk (Child-Pugh A, MELD <10) patients benefit from routine surveillance, while high-risk patients require intensified monitoring, complication prevention, and coordinated multidisciplinary care.

Surveillance

HCC Surveillance: Hepatocellular carcinoma screening with abdominal ultrasound + AFP every 6 months for all cirrhotic patients. Early detection significantly improves survival outcomes and guides timely intervention.

Variceal screening: EGD at diagnosis of cirrhosis

Recognizing decompensation: ascites, variceal bleeding, hepatic encephalopathy, jaundice

When to refer to hepatology: advanced fibrosis on elastography, any signs of decompensation, HCC detected on surveillance, liver transplant evaluation

Medication Management Pearls for Patients with Cirrhosis

- Statins are safe in compensated cirrhosis and are important for cardiovascular risk reduction.
- Metformin is safe in compensated cirrhosis
- Avoid hepatotoxic drugs. Review all medications including herbals. Minimize sedatives and nephrotoxic agents.
  - NSAIDs, ACE inhibitors, ARBs,
  - Aminoglycides, benzodiazepines, opioids
- Dose adjust hepatically metabolized drugs
  - Acetaminophen is safe if dose is ≤2 g/day.

Preventive Care

Vaccinations: Recommend Hepatitis A, B, influenza, and pneumococcal vaccines. COVID-19, Tdap/Td Shingles

Nutrition: Ensure adequate caloric (35 kcal/kg/day) and protein intake (1.2–1.5 g/kg/day) and screen regularly for malnutrition using validated tools.

Exercise: Combined aerobic + resistance training improves functional capacity and quality of life

Referral & Transplant Evaluation Indications

Hepatology Referral Criteria: Refer at new cirrhosis diagnosis, any decompensation episode (ascites, encephalopathy, variceal bleeding), or complex management needs. Early referral improves outcomes and supports coordinated specialist care.

Transplant Evaluation Triggers: MELD score ≥15, refractory complications arise, or hepatocellular carcinoma is detected.

Primary care plays a vital role in ongoing coordination, medication management, and patient support throughout the process.

Case Study

55-year-old woman with type 2 diabetes taking metformin, her BMI is 34
Routine labs: Hemoglobin A1C 7.8%, ALT 52, AST 48, platelets 168,000
Prior Abdominal ultrasound for gallbladder symptoms showed hepatic steatosis

FIB-4: 2.18 — indeterminate, Elastography returns 14 kPa → Likely F3 fibrosis

Refer to hepatology

Lifestyle counseling: Mediterranean diet, exercise, alcohol abstinence

Optimize GLP-1 RA for diabetes/obesity

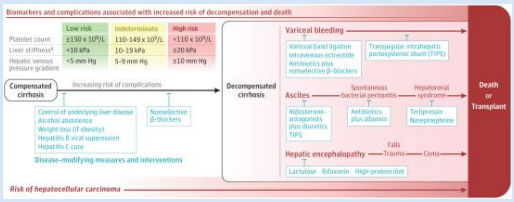
Repeat elastography in 1 year to assess response

If progresses to cirrhosis/portal hypertension: Initiate HCC surveillance, carvedilol, vaccinations

Treatment Recommendations of Metabolic Dysfunction Associated Liver Steatotic Disease (MASLD) & Metabolic Dysfunction Associated Steatohepatitis

- **Lifestyle Modifications** are the foundation of treatment
  - ≥7–10% weight loss → Improvement in steatosis, inflammation, and fibrosis
  - Mediterranean diet preferred
  - ≥150 min/week moderate-intensity exercise
  - Complete alcohol abstinence recommended
- Pharmacotherapy
  - **Resmetirom**: approved for MASH with F2-F3 fibrosis
  - **Semaglutide**: approved for MASH with F2-F3 fibrosis
    - Dual benefit addresses T2DM, MASH, obesity, cardiovascular risk

Compensated vs. Decompensated Cirrhosis



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Red Flags: When to Act Urgently

Emergent / same-day evaluation:

- Hematemesis or melena
- Acute confusion or somnolence
- Fever + ascites
- Rapidly worsening jaundice
- Acute kidney injury

Urgent hepatology referral:

- New-onset ascites
- First episode of hepatic encephalopathy
- Suspicious liver lesion on imaging
- Rising MELD score or declining synthetic function (falling albumin, rising INR/bilirubin)
- Refractory ascites despite maximal diuretic therapy

Recognizing Hepatic Decompensation

Key Clinical Signs: Jaundice (rising bilirubin), new-onset ascites, hepatic encephalopathy (confusion, asterixis), and variceal bleeding signal decompensation. Laboratory markers include rising INR, creatinine, bilirubin, and falling albumin or platelets — all indicating worsening liver function.

Escalation Criteria: Hospitalize for acute variceal hemorrhage, grade 3–4 encephalopathy, SBP, or acute kidney injury (AKI). Urgent hepatology referral is warranted for MELD score ≥15, rapid clinical deterioration, or refractory complications unresponsive to outpatient management.

Managing Ascites in Cirrhosis

Ascites results from portal hypertension and hypoalbuminemia. Diagnostic paracentesis is indicated in all new-onset ascites and suspected infection.

Salt Restriction & Diuretic Therapy
First-line management includes dietary sodium restriction (2 g/day) combined with diuretics (Spironolactone & furosemide).

Discontinue ACE inhibitors/ARBS

Referral for Large Volume Paracentesis or TIPS Refractory ascites unresponsive to maximal diuretic therapy requires referral.

Spontaneous Bacterial Peritonitis

- SBP commonly presents with fever, abdominal pain, and worsening encephalopathy in cirrhotic patients with ascites. It may be subtle — always maintain a high index of suspicion. Early recognition is critical, as delayed diagnosis significantly increases mortality risk.
- Diagnostic paracentesis is essential — a PMN count ≥250 cells/mm³ confirms SBP. Obtain ascitic fluid cultures before initiating antibiotics. Empiric therapy with IV cefotaxime or alternative third-generation cephalosporins should be started promptly. IV albumin (1.5 g/kg at diagnosis, 1 g/kg on day 3) reduces risk of renal impairment.
- Secondary prophylaxis with norfloxacin or trimethoprim-sulfamethoxazole is indicated after a first SBP episode

Hepatic Encephalopathy Management

- Identify common triggers — infection, GI bleeding, constipation, electrolyte imbalance, and medication non-compliance.
- Treatment — Lactulose & Rifaximin: Lactulose is first-line therapy; titrate dose to 2–3 soft stools per day. Rifaximin (550 mg twice daily) is added for recurrent or refractory episodes to reduce ammonia-producing gut bacteria and lower risk of recurrence.
- Conduct thorough medication reconciliation — avoid sedatives, opioids, and benzodiazepines. Ensure adequate protein intake (1.2–1.5 g/kg/day), address zinc deficiency, and coordinate with family for monitoring of cognitive and functional status.

Variceal Bleeding Prevention

- All patients with cirrhosis should undergo upper endoscopy at diagnosis to screen for varices. Compensated cirrhosis with no varices: repeat every 2–3 years. Small varices or high-risk features: repeat annually.
- Non-Selective Beta-Blockers (NSBBs) Carvedilol indicated when CSPH present or varices
- Endoscopic variceal ligation (EVL) combined with NSBBs for secondary prophylaxis after first bleed.
- Primary care supports medication adherence, monitors for side effects, and coordinates timely endoscopy follow-up and hepatology referral.

Primary Care & Hepatology Partnership

Primary Care Role

- Early detection through FIB-4 screening in at-risk populations
- Etiologic treatment: alcohol cessation support, metabolic risk factor management, antiviral therapy coordination
- HCC surveillance: ordering and tracking ultrasound + AFP every 6 months
- Medication safety: reconciliation at every visit, NSAID avoidance
- Nutrition counseling and sarcopenia prevention
- Vaccination
- Recognizing decompensation and initiating timely referral

Hepatology role

- Variceal screening and management
- Complex ascites and HE management
- TIPS evaluation
- HCC treatment coordination
- Transplant evaluation and listing

Shared responsibilities

- Ongoing monitoring of liver function (labs every 3–6 months)
- Complication management in stable patients (diuretics, lactulose, rifaximin)
- Psychosocial support, palliative care integration when appropriate

Thank You

Questions & Discussion
Contact: jessica-l-luetkemeyer@ou.edu

References

1. Tapper EB, Parikh ND. Diagnosis and Management of Cirrhosis and Its Complications: A Review. JAMA. 2023;329(18):1589–1602. doi:10.1001/jama.2023.5997
2. https://www.cdc.gov/nchs/state-stats/states/ok.html accessed 7/22/2026
3. Castera L, Rinella ME, Tsochatzis EA. Noninvasive assessment of liver fibrosis. N Engl J Med. 2025;393(17):1715-1729. doi:10.1056/NEJMra2403308.
4. Tilg H, Petta S, Stefan N, Targher G. Metabolic dysfunction–associated steatotic liver disease in adults: a review. JAMA. 2026;335(2):163-174. doi:
5. Targher G, Valenti L, Byrne CD. Metabolic Dysfunction-Associated Steatotic Liver Disease. N Engl J Med. 2025; 393 (7):683-698. DOI: 10.1056/NEJMra2412865.
6. Wang Y, Yang X, Wang S. Progress and prospects of elastography techniques in the evaluation of fibrosis in chronic liver disease. Archives of Medical Science. 2024;20(6):1784–1792. doi:10.5114/aoms/187079.
7. Ginès P, Krag A, Abraldes JG, Solà E, Fabrellas N, Kamath PS. Liver cirrhosis. Lancet. 2021 Oct 9;398(10308):1359-1376. doi: 10.1016/S0140-6736(21)01374-X. Epub 2021 Sep 17. PMID: 34543610
8. Abraldes JG, Caraceni P, Ghabril M, Garcia-Tsao G. Update in the Treatment of the Complications of Cirrhosis. Clin Gastroenterol Hepatol. 2023 Jul;21(8):2100-2109. doi: 10.1016/j.cgh.2023.03.019. Epub 2023 Mar 25. PMID: 36972759; PMCID: PMC11097249.
9. Rich NE, Villanueva A, Marrero JA, Kanwal F. AGA Clinical Practice Update on Risk Stratification and Emerging Surveillance Strategies for Hepatocellular Carcinoma: Expert Review. Gastroenterology. 2026 Jun;170(7):1606-1615. doi: 10.1053/j.gastro.2026.03.006. Epub 2026 Apr 15. PMID: 42017860; PMCID: PMC13293225.