FP Essentials
Call for Authors – May 2025

Hepatitis

We are seeking an author or author group to write an edition of *FP Essentials* on the topic of hepatitis. This edition will cover four topics:

1. Metabolic Dysfunction-Associated Steatohepatitis
2. Viral Hepatitis
3. Substance-Induced Hepatitis
4. Less Common Causes of Hepatitis

The main text of the manuscript should be approximately 10,000 words in length, divided into four sections of approximately 2,500 words each, plus an abstract of approximately 200 words for each section. In addition, there should be key practice recommendations, a maximum of 15 tables/figures total, and up to 200 references to provide support for all recommendations and factual statements in the manuscript. References must be numbered sequentially by section, with each new section starting over at "1."

This edition should focus on what is new in each topic and should answer the key questions listed for each section. Each section should begin with an illustrative case, similar to the examples provided, with modifications to emphasize key points; each case should have a conclusion that demonstrates resolution of the clinical situation. The references provided here include information that should be considered in preparation of this edition of *FP Essentials*. However, these should be used only as a starting point in identifying the most current guidelines and references to include in the edition.

Needs Assessment

Hepatitis presents a complex challenge for family physicians, requiring expertise in its diverse causes, diagnosis, and management. Metabolic dysfunction-associated steatohepatitis is increasingly prevalent due to rising obesity and metabolic syndrome, necessitating early intervention. Viral hepatitis remains a significant public health concern, with evolving screening, vaccination, and treatment strategies. Substance-induced hepatitis, including alcohol-related and drug-induced liver injury, requires a high index of suspicion and patient education on risk factors. Less common causes, such as hemochromatosis, autoimmune hepatitis, and Wilson disease, demand timely recognition to prevent severe liver damage. This monograph will provide family physicians with practical, up-to-date information to enhance early detection, guide management decisions, and improve outcomes in patients with hepatitis.

Section 1: Metabolic Dysfunction-Associated Steatohepatitis

Example Case

RG is a 45-year-old with persistently elevated liver enzymes who reports mild fatigue and malaise. Other health issues include prediabetes and obstructive sleep apnea. RG does not use alcohol. Their body mass index is 34 kg/m^2, but the physical exam is otherwise unremarkable. Aminotransferase and alkaline phosphatase levels are two to three times the upper limit of normal. Serum albumin and bilirubin levels are normal. Ultrasound shows a hyperechoic texture suggestive of diffuse fatty infiltration.

Key Questions to Consider

Overview

- What are metabolic dysfunction-associated steatotic liver disease (MASLD) and metabolic dysfunction-associated steatohepatitis (MASH)? How do these compare to nonalcoholic fatty liver disease/nonalcoholic steatohepatitis? Why was the terminology changed? What is their relationship with metabolic syndrome?
- How common are these conditions? What is the current trend? Why is their incidence increasing?

Risk Factors and Presentation

- What are the risk factors for MASLD? How do lifestyle factors contribute?
- How do MASLD and MASH usually present?
- What is the differential diagnosis?

Diagnosis

- What are the diagnostic criteria for MASLD and MASH?
- What is the recommended diagnostic workup for patients suspected of having MASLD? What laboratory and imaging tests are recommended? What is the role of ultrasound, including point-of-care ultrasound?
- What are the roles of clinical prediction tools such as the fibrosis-4 index and noninvasive imaging techniques such as serologic tests (eg, FibroSure) and vibration-controlled transient elastography (eg, FibroScan) for identifying and staging hepatic fibrosis? What are the costs and availability of such tests? *Avoid overlap with Section 2.*
- What are the indications for liver biopsy?

Treatment

- What lifestyle interventions and general measures are recommended for patients with MASLD and MASH? What is the most effective strategy? To what degree are these conditions reversible?
- How effective is weight loss for managing MASLD and MASH? What are the indications for weight loss medications and bariatric surgery for patients with these conditions? Do incretin-based medications (ie, glucagon-like peptide-1 receptor agonists) have metabolic benefits for MASLD and MASH beyond weight loss? *Limit discussion of these interventions to MASLD/MASH. A separate issue of* FP Essentials *will be devoted to Obesity Management.*
- What novel pharmacologic interventions are available for patients with MASLD and MASH? What are the roles of glucagon-like peptide-1 receptor agonists, vitamin E and pioglitazone in patients with and without diabetes? What is resmetirom? What are its indications, and how effective is it?

- What laboratory and other monitoring is recommended for patients with MASLD and MASH? How frequently should such monitoring be done?

Prognosis

- What comorbidities and complications are associated with MASLD?
- What is the risk of developing MASH, hepatic fibrosis, and cirrhosis following a diagnosis of MASLD? What is the risk of MASH-related hepatocellular carcinoma? What factors increase or decrease the risk of disease progression?
- What is the prognosis of MASLD and MASH with and without treatment?

Initial References to Consider

- Israelsen M, Francque S, Tsochatzis EA, et al. Steatotic liver disease. *Lancet*. 2024;404(10464):1761-1778.
- Rinella ME, Neuschwander-Tetri BA, Siddiqui MS, et al. AASLD Practice Guidance on the clinical assessment and management of nonalcoholic fatty liver disease. *Hepatology*. 2023;77(5):1797-1835.
- Rinella ME, Lazarus JV, Ratziu V, et al. A multisociety Delphi consensus statement on new fatty liver disease nomenclature. *Hepatology*. 2023;78(6):1966-1986.
- European Association for the Study of the Liver (EASL); European Association for the Study of Diabetes (EASD); European Association for the Study of Obesity (EASO). EASL-EASD-EASO Clinical Practice Guidelines on the management of metabolic dysfunction-associated steatotic liver disease (MASLD). *J Hepatol*. 2024;81(3):492-542.
- Targher G, Byrne CD, Tilg H. MASLD: a systemic metabolic disorder with cardiovascular and malignant complications. *Gut*. 2024;73(4):691-702.
- Le MH, Le DM, Baez TC, et al. Global incidence of non-alcoholic fatty liver disease: A systematic review and meta-analysis of 63 studies and 1,201,807 persons. *J Hepatol*. 2023;79(2):287-295.
- Schöler D, Schnabl B. The role of the microbiome in liver disease. *Curr Opin Gastroenterol*. 2024;40(3):134-142.
- Abdelmalek MF, Harrison SA, Sanyal AJ. The role of glucagon-like peptide-1 receptor agonists in metabolic dysfunction-associated steatohepatitis. *Diabetes Obes Metab*. 2024;26(6):2001-2016.
- Abushamat LA, Shah PA, Eckel RH, et al. The Emerging Role of Glucagon-Like Peptide-1 Receptor Agonists for the Treatment of Metabolic Dysfunction-Associated Steatohepatitis. *Clin Gastroenterol Hepatol*. 2024;22(8):1565-1574.
- Dutta D, Kamrul-Hasan ABM, Mondal E, et al. Role of Resmetirom, a Liver-Directed, Thyroid Hormone Receptor Beta-Selective Agonist, in Managing Nonalcoholic Steatohepatitis: A Systematic Review and Meta-Analysis. *Endocr Pract*. 2024;30(7):631-638.
- Au K, Zheng MH, Lee WJ, et al. Resmetirom and Metabolic Dysfunction-Associated Steatohepatitis: Perspectives on Multidisciplinary Management from Global Healthcare Professionals. *Curr Obes Rep*. 2024;13(4):818-830.
- Ratziu V, Scanlan TS, Bruinstroop E. Thyroid hormone receptor-β analogues for the treatment of metabolic dysfunction-associated steatohepatitis (MASH). *J Hepatol*. 2025;82(2):375-387.

- Harrison SA, Rolph T, Knott M, et al. FGF21 agonists: An emerging therapeutic for metabolic dysfunction-associated steatohepatitis and beyond. *J Hepatol*. 2024;81(3):562-576.
- Wang X, Zhang L, Dong B. Molecular mechanisms in MASLD/MASH-related HCC. *Hepatology*. 2024:10.1097/HEP.0000000000000786.
- Kalligeros M, Henry L, Younossi ZM. Metabolic dysfunction-associated steatotic liver disease and its link to cancer. *Metabolism*. 2024;160:156004.

Section 2: Viral Hepatitis

Example Case

JP is a 50-year-old with fatigue, mild right upper quadrant discomfort, and intermittent nausea. He has no history of alcohol use disorder but has a remote history of intravenous drug use. Physical exam reveals no jaundice, hepatomegaly, or ascites. His aspartate aminotransferase level is 120 U/L (normal 10-40 U/L), and his alanine aminotransferase is 150 U/L (normal 7-56 U/L). His hepatitis C virus antibody test is positive, and hepatitis C virus RNA is detected, confirming active infection. Abdominal ultrasound shows no evidence of cirrhosis.

Key Questions to Consider

Overview of Viral Hepatitis

- How common are various types of viral hepatitis in the United States and worldwide? Is the prevalence in the United States increasing or decreasing? What factors are contributing to this?
- What are the modes of transmission and risk factors for infection? Use tables when appropriate.
- What are the current recommendations regarding immunization and screening for viral hepatitis?
- What are typical clinical presentations?

Diagnostic Evaluation of Hepatitis A, B, and C

- What is the recommended diagnostic evaluation for hepatitis A, B, and C? Use tables and figures to show how to interpret diagnostic tests for acute and chronic viral hepatitis.
- What is the rationale for and status of point-of-care testing for viral hepatitis?
- What are the roles of clinical prediction tools such as the aspartate aminotransferase to platelet ratio index (APRI), fibrosis-4 index, and noninvasive imaging techniques such as vibration-controlled transient elastography for identifying and staging hepatic fibrosis? *Avoid overlap with Section 1.*
- What are the indications for liver biopsy?
- What are the risks of developing fibrosis, cirrhosis, and hepatocellular carcinoma with chronic hepatitis? What are the recommendations regarding monitoring for hepatocellular carcinoma?

Management of Hepatitis A

- What is the recommended management of hepatitis A infection? What does supportive care include?
- What is the prognosis for patients infected with hepatitis A? How long does recovery typically take?

Management of Hepatitis B

- What are the indications for antiviral therapy for hepatitis B? Which antiviral regimens are recommended for initial therapy in patients with hepatitis B?
- Can/should family physicians prescribe antiviral therapy for patients with hepatitis B? What are the recommendations for those who wish to do so?

Management of Hepatitis C

- How can family physicians incorporate hepatitis C treatment into their practices? What are potential barriers and resources and recommendations for overcoming them?

- How effective and well tolerated is direct-acting antiviral therapy for hepatitis C? Is treatment cost effective? What role if any do genotypes play in hepatitis C treatment?
- Which patients are candidates for treatment? How is this different for treatment-naive and treatment-experienced patients? What are potential contraindications to treatment?
- What direct-acting antiviral regimens are currently preferred? Use tables to highlight doses, duration of therapy, adverse effects, cost, and other important considerations.
- What resources, such as the American Association for the Study of Liver Diseases/Infectious Diseases Society of America website, are available to guide treatment?
- What laboratory and imaging tests are recommended at baseline and during follow-up? What long term follow-up is needed for patients with a remote history of hepatitis C infection that cleared with treatment?
- When should referral to a specialist be considered?

Initial References to Consider

- Usuda D, Kaneoka Y, Ono R, et al. Current perspectives of viral hepatitis. *World J Gastroenterol*. 2024;30(18):2402-2417.
- Odenwald MA, Paul S. Viral hepatitis: Past, present, and future. *World J Gastroenterol*. 2022;28(14):1405-1429.
- Nagra N, Kozarek RA, Burman BE. Therapeutic Advances in Viral Hepatitis A-E. *Adv Ther*. 2022;39(4):1524-1552.
- Pauly MD, Ganova-Raeva L. Point-of-Care Testing for Hepatitis Viruses: A Growing Need. *Life (Basel)*. 2023;13(12):2271.
- Kapadia SN, Jordan AE, Eckhardt BJ, Perlman DC. The Urgent Need to Implement Point-of-Care RNA Testing for Hepatitis C Virus to Support Elimination. *Clin Infect Dis*. 2024;78(5):1235-1239.
- Van Damme P, Pintó RM, Feng Z, et al. Hepatitis A virus infection. *Nat Rev Dis Primers*. 2023;9(1):51.
- Nemes K, Persson S, Simonsson M. Hepatitis A Virus and Hepatitis E Virus as Food- and Waterborne Pathogens-Transmission Routes and Methods for Detection in Food. *Viruses*. 2023;15(8):1725.
- Wilkins T, Sams R, Carpenter M. Hepatitis B: Screening, Prevention, Diagnosis, and Treatment. *Am Fam Physician*. 2019;99(5):314-323.
- Andrews R. Family doctors can easily treat hepatitis B in house. The AFP Community Blog. https://afpjournal.blogspot.com/2019/03/guest-post-family-doctors-can-easily.html
- Jeng WJ, Papatheodoridis GV, Lok ASF. Hepatitis B. *Lancet*. 2023;401(10381):1039-1052.
- Dusheiko G, Agarwal K, Maini MK. New Approaches to Chronic Hepatitis B. *N Engl J Med*. 2023;388(1):55-69.
- Yardeni D, Chang KM, Ghany MG. Current Best Practice in Hepatitis B Management and Understanding Long-term Prospects for Cure. *Gastroenterology*. 2023;164(1):42-60.e6.
- Higgins DM, O'Leary ST. Prevention of Perinatal Hepatitis B Transmission. *Obstet Gynecol Clin North Am*. 2023;50(2):349-361.

- Maness DL, Riley E, Studebaker G. Hepatitis C: Diagnosis and Management. *Am Fam Physician*. 2021;104(6):626-635.
- Bhattacharya D, Aronsohn A, Price J, et al. Hepatitis C Guidance 2023 Update: AASLD-IDSA Recommendations for Testing, Managing, and Treating Hepatitis C Virus Infection. *Clin Infect Dis*. 2023:ciad319.
- Martinello M, Solomon SS, Terrault NA, Dore GJ. Hepatitis C. *Lancet*. 2023;402(10407):1085-1096.
- Alqahtani SA, Sulkowski MS. Chronic Hepatitis C: Advances in Therapy and the Remaining Challenges. *Med Clin North Am*. 2023;107(3):423-433.
- Martinello M, Naggie S, Rockstroh JK, et al. Direct-Acting Antiviral Therapy for Treatment of Acute and Recent Hepatitis C Virus Infection: A Narrative Review. *Clin Infect Dis*. 2023;77(Suppl 3):S238-S244.
- Devan P, Tiong KLA, Neo JE, et al. Treatment Outcomes of Sofosbuvir/Velpatasvir/Voxilaprevir in Direct-Acting Antiviral-Experienced Hepatitis C Virus Patients: A Systematic Review and Meta-Analysis. *Viruses*. 2023;15(7):1489.
- Shetty A, Lee M, Valenzuela J, et al. Cost effectiveness of hepatitis C direct acting agents. *Expert Rev Pharmacoecon Outcomes Res*. 2024;24(5):589-597.

Section 3: Substance-Induced Hepatitis

Example Case

PS is a 43-year-old with jaundice, nausea, and anorexia for 3 weeks. She has used alcohol daily for 15 years. Physical exam is notable for tender hepatomegaly and proximal muscle wasting. Her aspartate aminotransferase level is 276 U/L (normal 10-40 U/L), alanine aminotransferase is 123 U/L (normal 7-56 U/L), and total serum bilirubin is 7.2 mg/dL (normal 0.2-1.2 mg/dL). Ultrasound shows hepatomegaly with diffuse fatty infiltration and no biliary obstruction or ascites.

Key Questions to Consider

Overview

- What is substance-induced hepatitis, and how does it differ from other forms of hepatitis?
- What are the primary substances known to cause hepatitis, including alcohol, prescription drugs, over the counter drugs, illicit drugs, supplements/complementary and alternative medicine therapies, and occupational and environmental toxins (eg, organic solvents, aflatoxins, vinyl chloride, and polyfluoroalkyl substances (PFAS))?
- Which are the most common causes? What doses of common drugs (eg, acetaminophen) are toxic? Consider using a table to summarize this information.

Alcohol-Induced Hepatitis

- How does chronic alcohol use contribute to liver inflammation and hepatocellular damage?
- What are the clinical features and diagnostic criteria for alcohol-induced hepatitis? What clinical models (eg, Maddrey Discriminant Function and the Model for End-Stage Liver Disease (MELD) score) are validated for assessing disease severity? What are their limitations?
- What treatment strategies, including lifestyle modifications, pharmacologic interventions, and supplements/complementary and alternative medicine therapies, are recommended for alcohol-induced hepatitis? When are glucocorticoids indicated in the management of alcohol-induced hepatitis, and how efficacious are they? What are the indications for liver transplantation?
- What nutritional support should be offered to patients with alcohol-induced hepatitis?

Drug- and Medication-Induced Hepatitis

- How does the pathophysiology of substance-induced hepatitis differ from that of other types of hepatitis?
- How can physicians differentiate between idiosyncratic and dose-dependent drug-induced liver injury? What are the roles of liver function tests, diagnostic imaging, and liver biopsy for identifying medication-related liver injury? What levels of aminotransferase elevation should raise concern? What is the typical timeline for drug-induced liver injury?
- What are the recommendations for managing suspected drug-induced hepatitis, including discontinuation and alternative medication options?

Illicit Drugs and Toxins

- How do illicit substances such as anabolic steroids, cocaine, and methamphetamine contribute to hepatitis?
- In what industries are occupational and environmental hepatotoxins used?

- What are the typical presentations of these types of hepatitis?

Prevention and Prognosis

- How can family physicians educate themselves and their patients about specific exposure risks in their communities?
- How should physicians counsel patients on avoiding hepatotoxic substances? What is the data on early intervention? What is the most effective method of counseling?
- What are the long-term outcomes and prognosis for patients with substance-induced hepatitis? When should patients be referred to a hepatologist?

Initial References to Consider

- Keating M, Lardo O, Hansell M. Alcoholic Hepatitis: Diagnosis and Management. *Am Fam Physician*. 2022;105(4):412-420.
- De La Torre SA Jr, Morcos M, Saab S, et al. Alcohol-Associated Hepatitis: Short- and Long-Term Management. *Dig Dis Sci*. 2025;70(1):74-84.
- Chaudhry H, Sohal A, Iqbal H, et al. Alcohol-related hepatitis: A review article. *World J Gastroenterol*. 2023 May 7;29(17):2551-2570.
- Penninti P, Adekunle AD, Singal AK. Alcoholic Hepatitis: The Rising Epidemic. *Med Clin North Am*. 2023;107(3):533-554.
- Osna NA, Rasineni K, Ganesan M, et al. Pathogenesis of Alcohol-Associated Liver Disease. *J Clin Exp Hepatol*. 2022;12(6):1492-1513.
- Yoon EL, Kim W. Current and future treatment for alcoholic-related liver diseases. *J Gastroenterol Hepatol*. 2023;38(8):1218-1226.
- Kasper P, Lang S, Steffen HM, et al. Management of alcoholic hepatitis: A clinical perspective. *Liver Int*. 2023;43(10):2078-2095.
- Fontana RJ, Liou I, Reuben A, et al. AASLD practice guidance on drug, herbal, and dietary supplement-induced liver injury. *Hepatology*. 2023;77(3):1036-1065.
- Björnsson HK, Björnsson ES. Drug-induced liver injury: Pathogenesis, epidemiology, clinical features, and practical management. *Eur J Intern Med*. 2022;97:26-31.
- Fontana RJ, Bjornsson ES, Reddy R, et al. The Evolving Profile of Idiosyncratic Drug-Induced Liver Injury. *Clin Gastroenterol Hepatol*. 2023;21(8):2088-2099.
- Kwo PY, Cohen SM, Lim JK. ACG Clinical Guideline: Evaluation of Abnormal Liver Chemistries. *Am J Gastroenterol*. 2017;112(1):18-35.
- Chidiac AS, Buckley NA, Noghrehchi F, et al. Paracetamol (acetaminophen) overdose and hepatotoxicity: mechanism, treatment, prevention measures, and estimates of burden of disease. *Expert Opin Drug Metab Toxicol*. 2023;19(5):297-317.
- Moss MJ, Hinchman B, Lambson JE, et al. Assessment of high-dose acetylcysteine in acute high-risk paracetamol (acetaminophen) ingestion. *Clin Toxicol (Phila)*. 2024;62(8):519-525.
- National Center for Environmental Health. National Report on Human Exposure to Environmental Chemicals. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Updated March 2024. https://stacks.cdc.gov/view/cdc/133100
- Brauner C, Joveleviths D, Álvares-da-Silva MR, et al. Exposure to organic solvents and hepatotoxicity. *J Environ Sci Health A Tox Hazard Subst Environ Eng*. 2020;55(10):1173-1178.

- Costello E, Rock S, Stratakis N, et al. Exposure to per- and Polyfluoroalkyl Substances and Markers of Liver Injury: A Systematic Review and Meta-Analysis. *Environ Health Perspect*. 2022;130(4):46001.

Section 4: Less Common Causes of Hepatitis

Example Case

EH is a 52-year-old with fatigue, arthralgias, and mildly elevated liver enzymes noted on routine labs. He has type 2 diabetes that is controlled with metformin. He reports a family history of liver disease but denies alcohol or drug use. Physical examination reveals mild hepatomegaly and bronze hyperpigmentation of the skin. Laboratory tests reveal significantly elevated serum ferritin and transferrin saturation. His viral hepatitis panel and liver ultrasound are unremarkable.

Key Questions to Consider

Note: Answer the following questions in separate subsections for hemochromatosis, autoimmune hepatitis, and Wilson disease.

Overview

- What are hemochromatosis, autoimmune hepatitis, and Wilson disease?
- How common are these conditions?
- What are the mechanisms by which these conditions cause liver disease?

Presentation

- What are the typical ages of onset and clinical presentations of these conditions? Use a table as needed.
- What extra-hepatic manifestations may patients have?
- What features may help distinguish these conditions from other kinds of hepatitis?

Diagnostic Evaluation

- What diagnostic laboratory, genetic, and imaging tests are recommended? What are newer biomarkers for the early detection of these diseases?
- What are the indications for liver biopsy and specialist referral?

Management

- What are the recommended pharmacologic and nonpharmacologic treatments?
- What is the role of liver transplantation?
- What immunizations (eg, hepatitis A and B) should patients receive?
- What are the recommendations for patients regarding alcohol consumption and the use of medications with potential hepatotoxicity?

Prognosis

- What complications are associated with these conditions? What are the risks of cirrhosis and hepatocellular carcinoma?
- What is the long-term prognosis with and without treatment?
- What counseling and genetic testing should be offered to patients' family members?

Initial References to Consider

- Palmer WC, Stancampiano FF. Hemochromatosis. *Ann Intern Med*. 2025;178(2):ITC17-ITC32.
- Turshudzhyan A, Wu DC, Wu GY. Primary Non-HFE Hemochromatosis: A Review. *J Clin Transl Hepatol*. 2023;11(4):925-931.
- Akbarialiabad H, Jamshidi P, Callen JP, Murrell DF. Dermatologic manifestations of hereditary hemochromatosis: A systematic review. *J Eur Acad Dermatol Venereol*. 2025;39(5):976-986.

- Ahmed G, Rathi S, Sidhu HK, et al. Paroxysmal atrial fibrillation and hemochromatosis: a narrative review. *Ann Med Surg (Lond)*. 2023;86(2):909-919.
- Harrison AV, Lorenzo FR, McClain DA. Iron and the Pathophysiology of Diabetes. *Annu Rev Physiol*. 2023;85:339-362.
- Muratori L, Lohse AW, Lenzi M. Diagnosis and management of autoimmune hepatitis. *BMJ*. 2023;380:e070201.
- Shiffman ML. Autoimmune Hepatitis: Epidemiology, Subtypes, and Presentation. *Clin Liver Dis*. 2024;28(1):1-14.
- Meng Z, Yang Y. Advances in the Treatment of Autoimmune Hepatitis. *J Clin Transl Hepatol*. 2024;12(10):878-885.
- Weinberg EM. Current and Emerging Treatments for Autoimmune Hepatitis. *Gastroenterol Hepatol (N Y)*. 2024;20(3):176-178.
- Rashad E, Moazam MM, Chaudhry R, et al. Efficacy of Combination Therapies for Autoimmune Hepatitis: A Systematic Review and Meta-Analysis. *Cureus*. 2024;16(5):e60049.
- Snijders RJALM, Stoelinga AEC, Gevers TJG, et al. An open-label randomised-controlled trial of azathioprine vs. mycophenolate mofetil for the induction of remission in treatment-naive autoimmune hepatitis. *J Hepatol*. 2024;80(4):576-585.
- Roberts EA, Schilsky ML. Current and Emerging Issues in Wilson's Disease. *N Engl J Med*. 2023;389(10):922-938.
- Mazhar A, Piper MS. Updates on Wilson disease. *Clin Liver Dis (Hoboken)*. 2023;22(4):117-121.
- Schilsky ML, Roberts EA, Bronstein JM, et al. A multidisciplinary approach to the diagnosis and management of Wilson disease: 2022 Practice Guidance on Wilson disease from the American Association for the Study of Liver Diseases. *Hepatology*. 2022; doi:10.1002/hep.32801
- Kerkar N, Rana A. Wilson Disease in Children. *Clin Liver Dis*. 2022;26(3):473-488.
- Schilsky ML, Czlonkowska A, Zuin M, et al. Trientine tetrahydrochloride versus penicillamine for maintenance therapy in Wilson disease (CHELATE): a randomised, open-label, non-inferiority, phase 3 trial. *Lancet Gastroenterol Hepatol*. 2022;7(12):1092-1102.