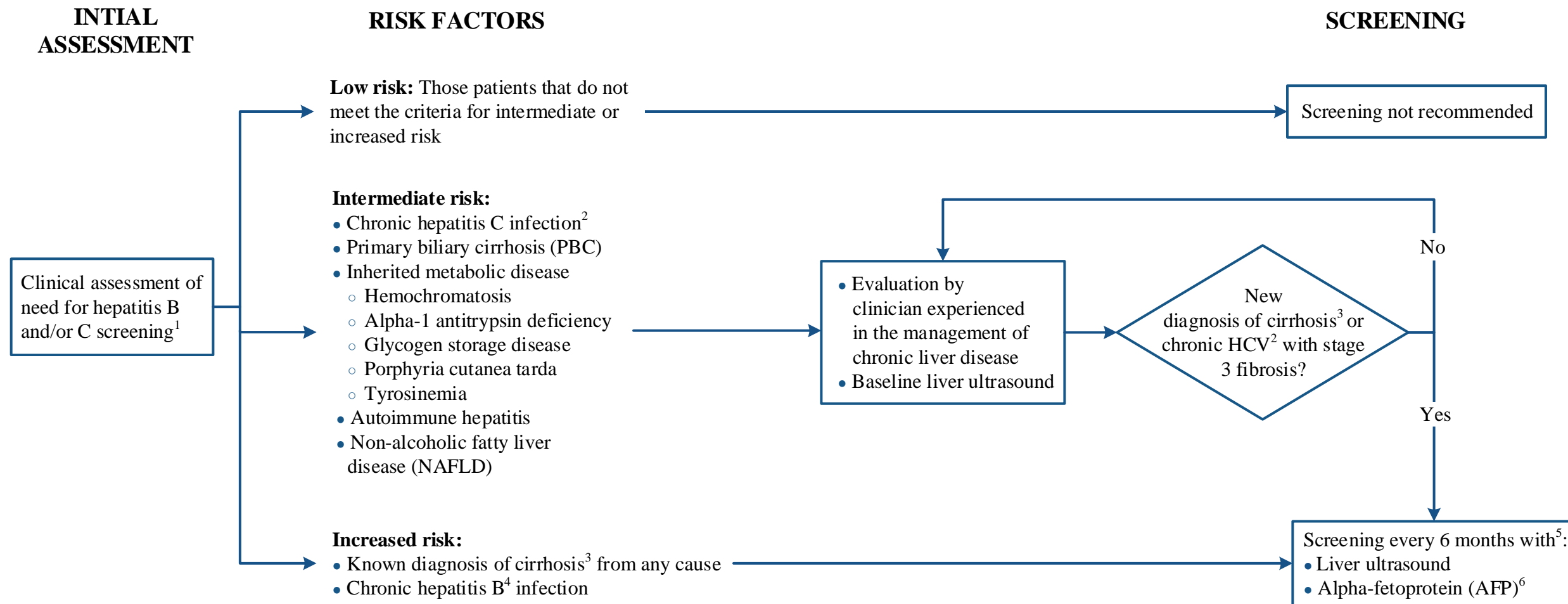


This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson's specific patient population; MD Anderson's services and structure; and MD Anderson's clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers.

Note: The screening technique should be performed with a consistent technique and process.



¹See Appendix A and C for hepatitis B and C virus screening. Refer to CDC risk assessment tool: <https://www.cdc.gov/hepatitis/riskassessment/>

²See Appendix A and B for hepatitis C virus (HCV)

³Diagnosis of cirrhosis based on imaging and pathology

⁴See Appendix C and D for hepatitis B virus (HBV)

⁵These patients require management by an experienced clinician

⁶Alpha-fetoprotein as a sole screening marker is inadequate

This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson's specific patient population; MD Anderson's services and structure; and MD Anderson's clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers.

APPENDIX A: Persons for Whom HCV Screening is Recommended

- Persons born during 1945-1965
- Persons who have injected illicit drugs in the recent and remote past, including those who injected only once and do not consider themselves to be drug users
- Persons with conditions associated with a high prevalence of HCV infection including:
 - Persons with HIV infection
 - Persons with hemophilia who received clotting factor concentrates prior to 1987
 - Persons who have ever been on hemodialysis
 - Persons with unexplained abnormal aminotransferase levels
- Prior recipients of transfusions or organ transplants prior to July 1992 including:
 - Persons who were notified that they had received blood from a donor who later tested positive for HCV infection
 - Persons who received a transfusion of blood or blood products
 - Persons who received an organ transplant
- Children born to HCV-infected mothers
- Health care, emergency medical and public safety workers after a needle stick injury or mucosal exposure to HCV-positive blood
- Current sexual partners of HCV-infected persons¹

APPENDIX B: Test Used to Screen and Diagnose HCV

Test used to screen for HCV:

- Antibody to HCV (anti-HCV)

Diagnostic work up and therapy should be undertaken by providers experienced in management of viral hepatitis in close collaboration with primary teams.

Test used to diagnose HCV:

- HCV RNA level

¹Although the prevalence of infection is low, a negative test in the partner provides reassurance, making testing of sexual partners of benefit in clinical practice.

This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson's specific patient population; MD Anderson's services and structure; and MD Anderson's clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers.

APPENDIX C: Persons for Whom HBV Screening is Recommended

Individuals born in areas of high¹ and intermediate² prevalence rates for HBV including immigrants and adopted children^{3,4}

- Asia: All countries
- Africa: All countries
- South Pacific Islands: All countries
- Middle East (except Cyprus and Israel)
- European Mediterranean: Malta and Spain
- The Arctic (indigenous populations of Alaska, Canada, and Greenland)
- South America: Ecuador, Guyana, Suriname, Venezuela and Amazon regions of Bolivia, Brazil, Colombia and Peru
- Eastern Europe: All countries except Hungary
- Caribbean: Antigua and Barbuda, Dominica, Granada, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, and Turks and Caicos
- Central America: Guatemala and Honduras

Other groups recommended for screening

- U.S. born persons not vaccinated as infants whose parents were born in regions with high HBV endemicity (greater than or equal to 8%)
- Household and sexual contacts of HBsAg-positive persons⁴
- Persons who have ever injected drugs⁴
- Persons with multiple sexual partners or history of sexually transmitted disease⁴
- Men who have sex with men⁴
- Inmates of correctional facilities⁴
- Individuals with chronically elevated ALT or AST⁴
- Individuals infected with HCV or HIV⁴
- Patients undergoing renal dialysis⁴
- All pregnant women
- Persons needing immunosuppressive therapy

¹ HBsAg prevalence 8%

² HBsAg prevalence 2%-7%

³ If HBsAg-positive persons are found in the first generation, subsequent generations should be tested

⁴ Those who are seronegative should receive hepatitis B vaccine

APPENDIX D: Tests to Screen and Confirm HBV Diagnosis

Tests used to screen for HBV:

- Hepatitis B surface antigen – HBsAg
- Antibody to hepatitis B surface antigen – anti-HBs (HBsAb)
- Antibody to hepatitis B core antigen – anti-HBc (HBcAb)

Diagnostic work up and therapy should be undertaken by providers experienced in management of viral hepatitis in close collaboration with primary teams.

Test used to confirm HBV diagnosis:

- HBV DNA level

This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson's specific patient population; MD Anderson's services and structure; and MD Anderson's clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers.

SUGGESTED READINGS

- American Association for the Study of Liver Diseases, & Infectious Diseases Society of America. (2014). Recommendations for testing, managing, and treating hepatitis C. <http://hcvguidelines.org/>. Accessed July 7, 2015
- Bruix, J., & Sherman, M. (2011). Management of hepatocellular carcinoma: an update. *Hepatology*, 53(3), 1020-1022.
- Centers for Disease Control and Prevention. (1998). Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. *Morbidity and Mortality Weekly Report: Recommendations and Reports*, 47(RR-19), 1-39.
- European Association For The Study Of The Liver. (2012). EASL-EORTC clinical practice guidelines: management of hepatocellular carcinoma. *Journal of hepatology*, 56(4), 908-943.
- Lok, A. S., & McMahon, B. J. (2009). Chronic hepatitis B: update 2009. *Hepatology*, 50(3), 661-662.
- Lok, A. S., Seeff, L. B., Morgan, T. R., Di Bisceglie, A. M., Sterling, R. K., Curto, T. M., ... & Dienstag, J. L. (2009). Incidence of hepatocellular carcinoma and associated risk factors in hepatitis C-related advanced liver disease. *Gastroenterology*, 136(1), 138-148.
- Pugh, R., Murray-Lyon, I. M., Dawson, J. L., Pietroni, M. C., & Williams, R. (1973). Transection of the oesophagus for bleeding oesophageal varices. *British Journal of Surgery*, 60(8), 646-649.
- Smith, B. D., Morgan, R. L., Beckett, G. A., Falck-Ytter, Y., Holtzman, D., Teo, C. G., ... & Alter, M. (2012). Recommendations for the identification of chronic hepatitis C virus infection among persons born during 1945–1965. *Morbidity and Mortality Weekly Report: Recommendations and Reports*, 61(RR-4), 1-36.

This practice algorithm has been specifically developed for MD Anderson using a multidisciplinary approach and taking into consideration circumstances particular to MD Anderson, including the following: MD Anderson's specific patient population; MD Anderson's services and structure; and MD Anderson's clinical information. Moreover, this algorithm is not intended to replace the independent medical or professional judgment of physicians or other health care providers.

DEVELOPMENT CREDITS

This screening algorithm is based on majority expert opinion of the Liver Screening work group at the University of Texas MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following:

Thomas Aloia, MD
Tharakeswara Bathala, MD
Deepak Bedi, MD
Therese Bevers, MD[†]
Boris Blechacz, MD, PhD
Powel Brown, MD, PhD
Elise Cook, MD
Robin Coyne, APRN, FNP-BC
Joyce Dains, DrPH, APRN, FNP-BC
Marta Davila, MD[†]
Suzanne Day, APRN, FNP-BC
Wendy Garcia, BS[♦]
Manal Hassan, MD, MPH, PhD[†]
Ernest Hawk, MD, MPH

Jessica Hwang, MD, MPH[†]
Tiffany Jackson, APRN, FNP-BC
Ahmed Kaseb, MD[†]
Harmeet Kaur, MD[†]
Marita Lazzaro, APRN, ANP-BC[†]
Evelyne Loyer, MD, BS[†]
Ethan Miller, MD
Ana Nelson, APRN, FNP-BC
Lonzetta Newman, MD
Tilu Ninan, APRN, ANP-BC
Amy Pai, PharmD[♦]
Harrys Torres, MD
Eduardo Vilar-Sanchez, MD, PhD
Jean-Nicholas Vauthey, MD

[†] Core Development Team

[♦] Clinical Effectiveness Development Team