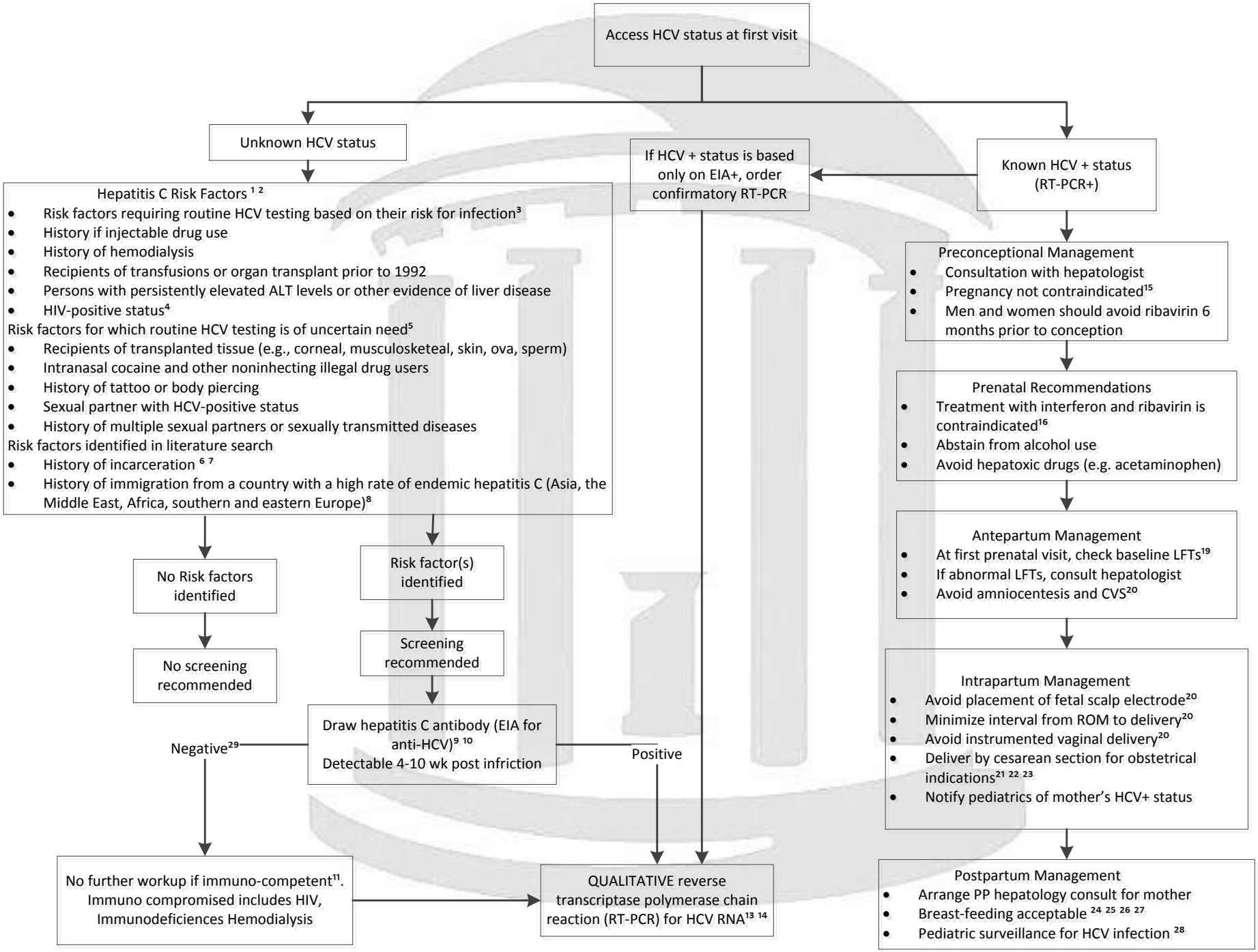
Hepatitis C and Pregnancy



Hepatitis C References

1. Giles M, Hellard M, Sasadeusz J. Hepatitis C and pregnancy: An update. Aust N Z J Obstet Gynaecol. 2003;43:290-3. *Obstetricians should be aware of the risk factors for hepatitis C infection. Universal antenatal screening of pregnant women for hepatitis C virus (HCV) is not currently recommended*

2. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-19):[24]. *Health-care professionals caring for pregnant women should determine the need for testing based on risk factors for hepatitis C infection. Routine hepatitis C virus (HCV) testing is not recommended unless they have risk factors for infection.*

3. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-19):[21]. *The determination of which persons at risk to recommend for routine testing is based on various considerations, including a known epidemiologic relationship between at risk factor and acquiring HCV infection, prevalence of risk behavior or characteristic in the population, prevalence of infection among those with a risk behavior or characteristic, and the need for persons with a recognized exposure to be evaluated for irifection.*

4. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-19):[12]. *All HIV-infected persons should be screened for HCV. Patients with chronic hepatitis C and concurrent HIV infection may have an accelerated course of HCV disease.*

5. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-19):[25]. *For persons at potential (or unknown) risk for HCV infection, the need for, or effectiveness of, routine testing has not been determined.*

6. Giles M, Hellard M, Sasadeusz J. Hepatitis C and pregnancy: An update. Aust N Z J Obstet Gynaecol. 2003;43:290-3. *A period of incarceration* is *also an important risk factor for hepatitis C infection with 67% of women in Victorian prisons being hepatitis C antibody positive.*

7. Reindollar RW. Hepatitis C and the correctional population. Am J Med. 1999;27:1OOS-103S. *Epidemiologic data estimate that 30% to 40% of the 1.8 million inmates in the United States are infected with the hepatitis C virus (HCV).*

8.Giles M, Hellard M, Sasadeusz J. Hepatitis C and pregnancy: An update. Aust N Z J Obstet Gynaecol. 2003;43:290-3. *A history of migration from a country with a high rate of endemic hepatitis C* is *another risk factor for HCV infection. Regions of high prevalence include, but are not limited to Asia, the Middle East, Africa and southern and Eastern Europe.*

9. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis *C* virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-19):[27]. *Anti-HCV is recommended for routine testing and should include the use of EIA to test for anti-HCV. This test detects anti-HCV in 2:: 97% of infocted patients. The EIA should be confirmed with a more specific assay such as RIBA or RT-PCR.*

10. National Institutes of Health Consensus Development Panel. Management of hepatitis C. NIH Consensus Statement 2002 (Jun 10-12);16:1-28. *The EIA is suitable for screening at-risk populations and patients with clinical liver disease. A high sensitivity and specificity of the version 3 (third-generation) EIAs (sensitivity of greater than 99"/o, specificity of 99%) is seen in immunocompetent patients.*

II. National Institutes of Health Consensus Development Panel. Management of Hepatitis C. NIH Consensus Statement 2002 (Jun 10-12);16:1-28. *A negative EIA test is sufficient to exclude a diagnosis of chronic HCV infection in immune- competent patients. Rarely, patients on hemodialysis and patients with immune deficiencies may have false-negative EIAs. Conversely, false-positive EIAs may occur in patients with*

autoimmune disorders. In these patients, an assay for HCV RNA is necessary for diagnosis of chronic infection.

12. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-19):[27]. *Supplemental anti- HCV testing confirms the presence of anti-HCV and can be performed on the same serum sample collected for the EIA. Confirmation or exclusion of HCV infection in a person with indeterminate anti-HCV supplemental test results should be made on the basis of further laboratory testing, which might include repeating the anti-HCV in two or more months or testing for HCV RNA and ALT level.*

13. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWRMorb Mortal Wkly Rep 1998;47(no.RR-19):[27]. *Detection ofHCV RNA by RT-PCR in a person with an anti-HCV-positive result indicates current injection. However, absence of HCV RNA in a person with an anti-HCV-positive result based on EIA testing alone cannot differentiate between resolved infection and a false-positive anti-HCV test result. In addition, because some persons with HCV infection might experience intermittent viremia, the meaning of a single negative HCV RNA result is difficult to interpret, particularly in the absence of additional clinical information. IfHCV RNA is used to confirm anti-HCV results,a separate serum sample will need to be collected and handled in a manner suitable for RT-PCR. Ifthe HCV RNA result is negative, supplemental anti-HCV testing should be performed.*

14. National Institutes of Health Consensus Development Panel. Management of hepatitis C. NIH Consensus Statement 2002 (Jun I0-12);16:1-28. *Acute or chronic HCV infection in a patient with a positive EIA test should be confirmed by a qualitative HCV RNA assay with a lower limit of detection of 50 IU/mL or less (approximately 100 viral geneslmL). The specificity of these assays for detecting HCV RNA exceeds 98 percent. A single positive qualitative assay for HCV RNA confirms active HCV replication, but a single negative assay does not exclude viremia and may reflect only a transient decline in viral level below the level of detection of the assay. A follow-up qualitative HCV RNA should be performed to confirm the absence of active HCV replication.*

15. Landon MB. Creasy RK, Resnik R, eds. Diseases of the Liver, Biliary System, and Pancreas. *Maternal-fttal medicine: principles and practice.* 5th edn. Philadelphia: WB Saunders, 2003:1135-1136. *There is no contraindication to pregnancy in HCV-if!focted women. Clearly, the risk of perinatal infection must be reviewed and the extent of maternal disease considered before making recommendations.*

16. Su GL H e p a t i t i s C in pregnancy. Curr Gastroenterol Rep. 2005;7:45-9. *Avoidance of ribavirin is recommended in men and women for at least 6 months before conception and throughout pregnancy.*

17. Yeung LT, King SM, Roberts, EA. Mother-to-infant transmission of hepatitis C virus. Hepatology 2001;34:223. *Coirifection with HIV has been associated with increased rates of vertical transmission of hepatitis C. A systematic review that included eight relevant studies estimated that the risk was increased more than fourfold (approximately 19 versus 4 percent).*

18. Su GL. Hepatitis C in pregnancy. Curr Gastroentero1 Rep. 2005;7:45-9. *Standard therapy for chronic hepatitis C includes a combination of PEGylated interferon and ribavirin. Treatment during pregnancy is contraindicated due to potential effects on the fetus. Interferon is a category C drug, which suggests that risk cannot be ruled out due to lack of well-controlled human studies. Ribavirin is category X, which is contraindicated based on evidence of fetal abnormalities in many different animals.*

19. Paternoster DM, Santarossa C, Grella P, Palu G, Baldo V, Boccagni P, et al. Viral load in HCV RNA-positive pregnant women. Am J Gastroenterol. 2001;96:2571-4. *Transaminases tended toward a reduction from the baseline during the second and third trimesters, and then an increase in both AST and ALT was recorded 6 months after delivery. Monitoring transaminases in HCV+ mothers during pregnancy is unnecessary: testing liver enzymes at the beginning is sufficient.*

20. Pembrey L, Newell ML, Tovo PA, the EPHN Collaborators. The management of HCV infected pregnant women and their children: European pediatric HCV network. J Hepatol. 2005;43:515-525. *Although the evidence is inconclusive, it would be prudent to avoid amniocentesis, instrumented vaginal delivery and prolonged rupture of membranes wherever possible for HCV infected women, in particular in those with high viral load. However, these procedures*

should be used where indicated to avoid maternal or infant morbidity. (Based on Level C evidence: consensus/expert opinion).

21. Pembrey L, Newell ML, Tovo PA, the EPHN Collaborators. The management of HCV infected pregnant women and their children: European pediatric HCV network. J Hepatol. 2005;43:515-525. *Elective caesarean section should not be offired to HCV infected women to prevent transmission. (Based on Level B evidence: other evidence including clinical cohort studies, case-control studies, and well-designed epidemiological studies).*

22. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-19):[9]. *Data regarding the relationship between delivery mode and HCV transmission are limited and presently indicate no difference* in *irifection rates between infants delivered vaginally compared with cesarean-delivered infants.*

23. American College of Obstetricians and Gynecologists. Viral hepatitis in pregnancy: ACOG educational bulletin, no. 248. *Currently no method has been found to prevent prenatal transmission of HCV.*

24. National Institutes of Health Consensus Development Panel. Management of hepatitis C. NIH Consensus Statement 2002 (Jun 10-12);16:1-28. *Breast-feeding does not appear to transmit HCV.*

25. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-l9):[9]. *The transmission of HCV infection through breast milk has not been documented. In the studies that have evaluated breastfeeding in infants born to HCV-infected women, average rate of infection was 4%* in *both breastfed and bottle-fed infants.*

26. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep l998;47(no.RR-19):[29]. *Limited data regarding breastfeeding indicate that it does not transmit HCV, although HCV- positive mothers should consider abstaining from breastfeeding iftheir nipples are cracked or bleeding.*

27. American Academy of Pediatrics. Policy Statement: Breastfeeding and the Use of Human Milk. Pediatrics 2005;115:496-506. *Breastfeeding is not contraindicated for infants born to mothers who are infected with hepatitis C* virus.

28. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR Morb Mortal Wkly Rep 1998;47(no.RR-19):[23]. *Because of their recognized exposure, children born to HCV-positive women should be tested for HCV infection. IG and antiviral agents are not recommended for post exposure prophylaxis of infants born to HCV-positive women. Testing of infants for anti- HCV (EIA) should be performed no sooner than age 12 months, when passivelytransferred maternal anti-HCV declines below detectable levels. Ifearlier diagnosis of HCV infection* is *desired, RT-PCRfor HCV RNA may be performed at or cifter age 1-2 months. Children, who test positive for either anti-HCV or HCV RNA, should be referred to a specialist for medical management.*

29. Centers for Disease Control and Prevention. Testing for HCV infection: an update of guidance for clinicians and laboratorians. MMWR Morb Mortal Wkly Rep 2013 May 10;62(18):362-5. *In the United States, an estimated 4.1 million persons have been infected with hepatitis C virus (HCV), of whom an estimated 3.2 (95% confidence interval [CI]=2.7-3.9) million are living with the infection. New infections continue to be reported particularly among persons who inject drugs and persons exposed to HCV-contaminated blood in health-care settings with inadequate infection control.*

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Notification to Users

These algorithms are designed to assist the primary care provider in the clinical management of a variety of problems that occur during pregnancy. They should not be interpreted as a standard of care, but instead represent guidelines for management. Variation in practices should take into account such factors as characteristics of the individual patient, health resources, and regional experience with diagnostic and therapeutic modalities.