

Hepatitis A, B, and C

INTRODUCTION

In April 2000, The American Medical Association endorsed a new hepatitis panel for diagnosis of the most common types of hepatitis in the United States. The panel includes four markers that are useful in the initial diagnosis of hepatitis A, B, and C. This panel is intended to be used in place of the Hepatitis Comprehensive Panel, which includes markers that are not required for the initial diagnosis of hepatitis. The following is a list of the common hepatitis tests that CompuNet offers and their use in diagnosing and monitoring patients with hepatitis:

Individual Markers	Test	Order Code	Purpose
	Hepatitis A Total Antibody (HATot)	508	Determine immune status for hepatitis A . Useful to determine past exposure or response to hepatitis A vaccine.
	Hepatitis A IgM (HAIGM)	512	Present in current or recent hepatitis A infections.
	Hepatitis B Surface Antigen (HBsAg)	498	First detectable marker in hepatitis B infections. If present for more than 6 months, indicates chronic carrier for hepatitis B .
	Hepatitis B Surface Antibody (HBsAb)	499	Used to determine immune status for hepatitis B . At least 10 mIU/mL of antibody is recommended by the CDC to ensure adequate immunity.
	Hepatitis B Core Total Antibody (HBcTot)	501	First detectable antibody to hepatitis B . Long-lasting antibody, usually for life.
	Hepatitis B Core IgM (HBcIGM)	4848	Indicates current or recent hepatitis B infection. Present for 3-6 months after infection
	Hepatitis B e Antigen (HBeAg)	555	Present during the most infective stage of hepatitis B infection. Only performed when HBsAg is present.
	Hepatitis B e Antibody (HBeAb)	556	Present once HBeAg has been cleared. Usually indicates progression toward resolution of disease.
	Hepatitis C Antibody (HCAb)	8472	Present after an exposure to hepatitis C. Level of antibody fluctuates.
AMA Hepatitis Panel (Hepatitis Acute Panel)	10306	Used for initial diagnosis of suspected hepatitis A,B or C. Includes HAIGM, HBsAg, HBcIGM, HCAb	

Panels and Supplemental Tests	Test	Order Code	Purpose
	AMA Hepatitis Panel (Hepatitis Acute Panel)	10306	Used for initial diagnosis of suspected hepatitis A, B, or C. Contains: HAIgM, HBsAg, HbcIgM, and HCAb.
	Hepatitis Comprehensive Panel	70639	NOT RECOMMENDED! Contains markers that are not required for the initial diagnosis of hepatitis. Includes: HATot, HAIgM, HBsAg, HbsAb, HbcTot, HBcIgM, HBeAg, HBeAb, HcAb. In the future, a Physician Authorization Form will be required before ordering this panel.
	Hepatitis B Monitoring Panel	7104	Useful in monitoring progress of patients previously diagnosed with hepatitis B. Contains: HBsAg, HbsAb, HBcTot, and HBeAb.
	Hepatitis C RIBA	8739	Confirmation test for hepatitis C antibody.
	Hepatitis C PCR - Qualitative	34024	Useful in confirming presence of hepatitis C virus. Will identify resolved vs. chronic infections Repeat testing may be required if a negative result is reported and the clinical signs indicate HCV infection. Used to assess response to therapy (clearance of virus).
	Hepatitis C PCR - Quantitative	35645	Used to determine initial viral load, and assess early response to therapy.
Hepatitis Delta Panel	7151	Used for diagnosis of hepatitis D. Hepatitis D requires infection with hepatitis B. Panel includes: HBsAg, HDAG, HDAb.	

Questions concerning hepatitis testing may be addressed to Ike Northern, Microbiology Manager, (937) 297-8334, or Ted Schutzbank, Ph.D., Technical Director at (937)-290-7326.

CompuNet Clinical Laboratories Guide to Application of Hepatitis Testing

Each test may be ordered on an individual basis
Explanation of abbreviations

Anti-HAV = Hepatitis A antibody

HBsAg = Hepatitis B surface antigen

Anti-HBs = Antibody to HBsAg

HBeAg = Hepatitis B e antigen

Anti-HBe = Antibody to HBeAg

Anti-HBc = Hepatitis B core antibody

Anti-HCV = Hepatitis C antibody

ALT = Alanine aminotransferase

PCR = Polymerase chain reaction

Diagnostic Tests: Potential Clinical Significance Standard Panel for Acute Hepatitis Screening and Diagnosis (AMA Approved)

Pattern	Anti-HAV Total*	Anti-HBs	HBsAg	Anti-HBc Total*	Anti-HCV	Potential Clinical Significance
1	+	-	-	-	-	Acute hepatitis A, previous infection with hepatitis A with immunity, or immunization to HAV
2	-	+	-	+	-	Previous infection with hepatitis B with immunity (not for determining immune status in immunized individuals)
3	-	-	+	+/-	-	Probable hepatitis B carrier or possible acute hepatitis B [†]
4	-	-	+	+	-	Acute hepatitis B
5	-	-	-	+	-	Recent acute hepatitis B
6	-	-	-	-	-	HCV infection possible, retest at 2-month intervals
7	-	+	-	+	+	Coinfection of acute or recent HBV and HCV
8	-	-	+	+	+	Coinfection of chronic HBV and HCV ²

*Some authorities recommend IgM antibodies as true acute markers³

[†]Status may be monitored via HBsAg or molecular diagnostic test (HBV DNA by PCR qualitative; or HBV DNA, quantitative, by hybrid capture methodology). May also retest for anti-HBc (potential chronic carrier)

Hepatitis B Monitoring Tests

Pattern	ABsAg	Anti-Hbc	ABeAg	Anti-HBe	Anti-HBs	Potential Clinical Significance
1	+	+	+	-	-	Acute hepatitis B (if seroconversion to anti-HBe does not occur, probable progression to chronic carrier state) or chronic hepatitis B (high infectivity) ^{**}
2	+	+	-	+	-	Acute hepatitis B (probable recovery) or chronic hepatitis B with seroconversion (low infectivity)
3	-	+	-	+	+	Recovery from hepatitis B and immunity

*HBV DNA quantitation by hybrid capture may help in monitoring therapy and disease progression.

^{**}Patients with fulminant hepatitis B and chronic HBsAg carriers who exhibit sudden deterioration may be tested for hepatitis D (delta) virus antibody.

Hepatitis B Immunity Tests

Pattern	Anti-HBs	Anti-HBc	Potential Clinical Significance
1	+	+	Previous hepatitis B with recovery
2	+	-	Previous hepatitis B with recover or hepatitis B vaccine recipient
3	-	+	Previous exposure to hepatitis B with acute or chronic infection, or recovered from previous infection occurring in the distant past
4	-	-	No previous exposure or immunity to hepatitis B

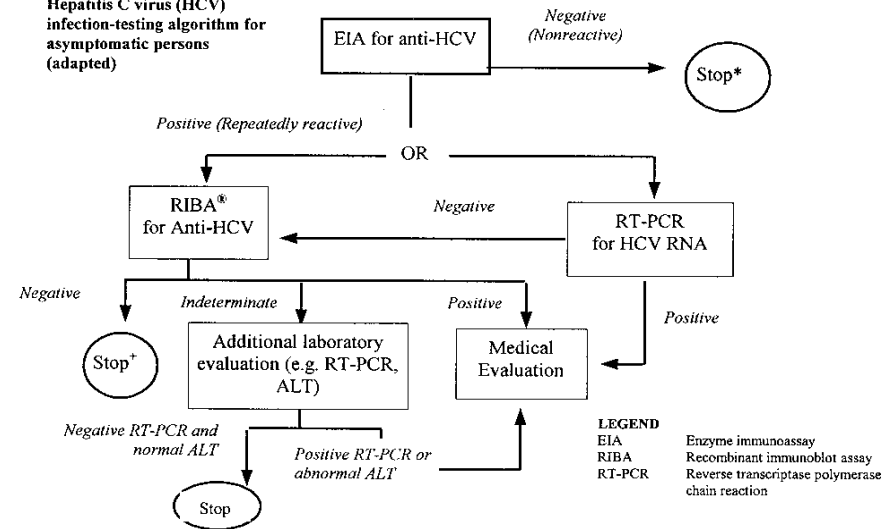
Hepatitis C Tests

Pattern	ALT	Anti-HBc	Anti-HCV*	HCV RNA by PCR (Qual.) [†]	Potential Clinical Significance
1	-	-	-	-	No previous exposure to hepatitis C or possibly acute hepatitis C (early stage; seroconversion window). Possibly loss of antibody in persistently infected individual. Retest for anti-HCV at intervals. (May test for HCV RNA if antibody test is negative but clinical signs/symptoms suggest hepatitis C. If negative for HCV RNA, possibly toxic or other infectious hepatitis.)
2	+/-	-	+	+	Chronic hepatitis C. [‡] ALT levels variable.
3	-	+	+	+	Acute or recent hepatitis B infection with acute or chronic hepatitis C infection. Normal ALT suggests carrier or convalescent state.
4	+	+	+	+	Acute or recent hepatitis B infection with acute or chronic hepatitis C infection. Elevated ALT suggests active disease.

*Enzyme immunoassay; may retest positive area with HCV recombinant immunoblot assay for greater specificity

[†]Quantitative assay may be used for disease monitoring.

Hepatitis C virus (HCV) infection-testing algorithm for asymptomatic persons (adapted)



*Some authorities recommend retesting in 2 or more months if ALT is persistently elevated.

[†]EIA/RIBA- is still excluded from blood donation.

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Molecular Diagnostic Tests for Confirmation of Infection and Disease Monitoring

HBV DNA by PCR, qualitative
HBV DNA, quantitation (hybrid capture)
HCV RNA by RT-PCR, qualitative
HCV RNA by PCR, quantitative
HCV RNA by branched DNA (viral load), for research use only

References:

American Medical Association: *Physicians' Current Procedural Terminology CPT '99*. Chicago: American Medical Association, 1998.
Sato S, Fujiyama S, Tanaka M et al. Coinfection of hepatitis C virus in patients with chronic hepatitis B infection. *J Hepatol* 1994; 21:159-166.
Hsu HH, Feinstone SM, Hoofnagle GH: Acute Viral Hepatitis. In: Mandell GL et al (eds). *Principles and Practice of Infectious Diseases*, 4th ed. New York: Churchill Livingstone, 1995, pp. 1136-1153.
Centers for Disease Control and Prevention: Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic diseases. *MMWR* 47(RR-19):1-39, 1998.

HIV Testing – Which Test to Use?

INTRODUCTION

Since the discovery of HIV in the late 70's, many tests have been developed for the diagnosis and monitoring of patients with AIDS. At times there is confusion about which test is appropriate to order.

The following is a list of HIV tests that are offered by CompuNet and when the test may be useful:

Test	Order Code	Purpose
HIV 1 Antibody	6449	Screening test. Present 3-8 weeks after infection. If positive, always confirmed by western blot.
HIV 2 Antibody	34186	Screening test for patients exhibiting AIDS symptoms but negative for HIV1 antibodies. Most patients with HIV2 have either lived in or recently visited western Africa.
STAT HIV 1 Antibody	73652	Used for screening source patients when an exposure has occurred. Includes a STAT charge. Intended to assist physicians in determining the necessity of HIV prophylaxis for the person that had an exposure. Not performed for routine screening of patients.
p24 Antigen	8377	Detected during acute phase of primary HIV infection and during late symptomatic stages.
PCR - Proviral DNA	8401	Used to confirm the diagnosis of HIV in newborns born of infected mothers and when western blot results are inconclusive. Highly sensitive PCR assay for the detection of viral nucleic acid in peripheral blood mononuclear cells.
Quantitative RNA, Standard Baseline	73458	Determines the amount of virus in the plasma (viral load). Used for patients that have not been treated with anti-retroviral drugs or who are failing therapy. Assay range: 400 to 600,000 copies of virus per mL of plasma.
Quantitative RNA, Ultrasensitive	91498	Used for regular monitoring of anti-retroviral therapy. Assay range: 50 to 75,000 copies of virus per mL of plasma.

For questions concerning this testing, you may contact Ike Northern, Microbiology Manager at (937) 297-8334 or Ted Schutzbank Ph.D., Technical Director at (937)-290-7326.