

HEPATITIS C

1. **Agent:** Hepatitis C virus (HCV).
2. **Identification:**
 - a. **Symptoms:** Cases are typically asymptomatic or have mild diseases. 60-70% of cases have no signs or symptoms, 20-30% have jaundice, and 10-20% have vague symptoms such as anorexia, malaise, or abdominal pain. In terms of late complications, 70% develop chronic liver disease, 15% develop cirrhosis after 20-30 years, and 5% die from liver cancer or cirrhosis. Fulminant hepatic failure following infection is rare.
 - b. **Differential Diagnosis:** Other causes of viral and nonviral hepatitis.
 - c. **Diagnosis:** An acute illness with (1) discrete onset of symptoms **and** (2) jaundice or elevated aminotransferase levels **AND** appropriate lab tests to confirm laboratory criteria for acute hepatitis C diagnosis: Serum alanine aminotransferase levels greater than 7 times the upper limit of normal and IgM anti-HAV negative, and IgM anti-HBc negative (if done) or HBsAg negative, and Antibody to hepatitis C virus (anti-HCV) positive by EIA, verified by an additional more specific assay (e.g., RIBA for anti-HCV or RT-PCR for HCV RNA) or by an average EIA signal to cutoff ratio of ≥ 3.8 .
3. **Incubation:** 2 weeks to 6 months; average 40 days.
4. **Reservoir:** Human.
5. **Source:** Blood or blood products.
6. **Transmission:** By parenteral inoculation or mucous membrane, exposure to human blood or blood products. Injecting drug use accounts for 60% of newly acquired hepatitis C in the United States. Transmission by sexual and perinatal exposure is possible but uncommon.
7. **Communicability:** From one or more weeks prior to onset; may persist indefinitely. Carrier state is common. Viremia appears to be relatively low.
8. **Specific Treatment:** Interferon, alone or in combination with ribavirin may be helpful in some cases of acute and chronic disease.
9. **Immunity:** Unknown.

REPORTING PROCEDURES

1. **Reportable,** (Title 17, Section 2500, *California Code of Regulations*).
2. **Report Form: VIRAL HEPATITIS CASE RECORD (CDC 53.1).** In addition, for cases associated with administration of blood or blood products during the 6-month period prior to onset, use Supplemental Data Sheet, **TRANSFUSION-ASSOCIATED HEPATITIS CASE RECORD (H-2084).**

Chronic carriers of anti-HCV are not investigated; submit CMR only.

3. **Epidemiologic Data:**
 - a. Ensure case has met both the clinical and laboratory criteria for diagnosis of acute hepatitis C (see Diagnosis 2c).
 - b. Record results of laboratory tests: HBsAg, anti-HBs, anti-HBc, anti-HAV (total), anti-HAV IgM, ALT levels, anti-HCV, RIBA, RT-PCR, etc.
 - c. Reason for medical visit leading to diagnoses. This may be helpful in determining if case is acute or chronic hepatitis C.
 - d. Injection drug use.
 - e. Transfusions of blood or blood products: places, dates, lot numbers, manufacturer.
 - f. Medical or dental treatment within past 6 months, including types of injections.
 - g. Surgical procedures including organ or tissue transplant within past 6 months.
 - h. Percutaneous exposure: self-injections (admitted or suspected), tattooing, ear piercing, acupuncture, electrolysis, skin-piercing procedures, etc.
 - i. Intranasal cocaine or other non-injecting illegal drug use.
 - j. Occupational history, especially medical-dental personnel, workers or inmates in institutions and those involved in handling blood or blood products.
 - k. Sexual contact with diagnosed case of viral hepatitis; exposure to multiple sexual partners.

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- l. Contact with or injection of contaminated blood; accidental inoculation by needle (laboratory), accidental splash into the eye.
- m. Patient or employee of a renal dialysis unit.
- n. Diabetic patients with history of finger-pricks.
- o. For infant or child case, status of mother and other sibling(s) should be evaluated. If pertinent, testing of mother's long-term sexual partner may be considered at the discretion of the mother's physician and child's mother.

- 6. Advise patient to abstain from alcohol and not to start any new medications, including over-the-counter and herbal medicines, without first checking with their doctor.
- 7. For cases diagnosed with chronic liver disease, advise vaccination against hepatitis A. For individuals at continued risk for acquiring hepatitis B infection, advise vaccination against hepatitis B.
- 8. HCV-positive mothers may breast feed, but should abstain if nipples become cracked or bleed.

CONTROL OF CASE, CONTACTS & CARRIERS

Investigate within 3 days.

CASE: No restrictions.

CONTACTS:

- 1. For persons exposed to blood or sexual secretions of infected person, use of immune globulin has no protective benefit and is not appropriate.
- 2. No restrictions.

PREVENTION-EDUCATION

- 1. Refer to appropriate personal health care provider for long term follow-up.
- 2. Advise the patient that disease may be transmitted by shared articles that become contaminated with blood (needles, syringes, razors, toothbrushes, etc.) as well as possibly sexually and perinatally transmitted.
- 3. Individuals should be counseled about the risk of sexual transmission of HCV if they have multiple sexual partners, and should be advised to use barrier precautions such as latex condoms. Since long-term sexual partners are at low risk for acquiring HCV infection, use of barrier precautions should be at the discretion of the patient and his/her physician.
- 4. Emphasize sanitary disposal of blood and other body secretions.
- 5. Advise patient that people with a history of viral hepatitis are excluded from blood donor programs.

DIAGNOSTIC PROCEDURES

Clinical and epidemiologic history required to aid laboratory in test selection.

SEROLOGY:

Diagnosis is made by the exclusion of hepatitis A (anti-HAV IgM negative) and hepatitis B (surface antigen [HBsAg] negative), and a positive anti-HCV screening test verified by a supplemental test. These serological tests are performed by the Public Health Laboratory, as well as by many clinical laboratories and require 10 ml of clotted blood or 5 ml of serum.

First-generation enzyme-linked immunosorbent assay (EIA) for HCV antibody worked well for detection of chronically infected persons such as blood donors or past blood recipients; however, those EIA tests were insensitive to diagnosis of acute infection because of the long time to antibody production, up to 15 weeks.

Second and third generation EIA tests are now available that detect antibodies at a much earlier stage of illness; they are 90% sensitive and 99% specific in the detection of HCV infection. Within 2 to 3 weeks of onset of illness, 50% of patients develop antibody detectable by EIA and more than 90% are positive by 4 to 11 weeks. In cases of symptomatic hepatitis, the detection of anti-HCV by EIA (in the absence of serological evidence of hepatitis A and B) is predictive of HCV infection in the patient. However, in the screening situation, such as blood banking, the positive predictive value of a reactive anti-HCV test is only 50% at most.

For confirmation of the EIA test, there is a recombinant immunoblot assay (RIBA), which confirms HCV antibodies, and the polymerase chain reaction (PCR). The PCR detects HCV antigen in serum or blood. The Public Health

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Laboratory performs both EIA and PCR for HCV. The EIA signal-to-cut-off ration (S/CO) > 3.8 is highly predictive of a true positive result and means that a confirmatory test is not required.