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Office of  
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Security

MSDS

**MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES****SECTION I - INFECTIOUS AGENT****NAME:** *Hepatitis C virus***SYNONYM OR CROSS REFERENCE:** Parenterally transmitted non-A, non-B hepatitis, Non-B transfusion-associated hepatitis, Post-transfusion non-A, non-B hepatitis (PT-NANB), HCV**CHARACTERISTICS:** Single stranded, small, positive sense RNA, enveloped, 50 nm diameter, *Flaviviridae***SECTION II - HEALTH HAZARD****PATHOGENICITY:** Onset is insidious, with anorexia, vague abdominal discomfort, nausea and vomiting, progressing to jaundice (less frequently than hepatitis B); severity ranges from unapparent cases in approximately 90% of infections to rare fulminating, fatal cases; chronic liver disease with fluctuating or persistently elevated liver enzymes is common, occurring after 50%-80% of HCV infections in adults; of those with chronic liver disease, 30%-60% may develop chronic active hepatitis and 5%-20% may develop cirrhosis; chronic infection is often not symptomatic; there appears to be an association between HCV infection and hepatocellular carcinoma, of these chronically infected persons, approximately 50% will develop cirrhosis or cancer of the liver**EPIDEMIOLOGY:** HCV has been found in every part of the world where it has been sought; the virus is parenterally transmitted; in the United States, HCV accounts for about 20% of acute viral hepatitis cases, of which less than 5% are associated with blood transfusion; prevalence of anti-HCV is highest in injecting drug users and hemophilia patients (70%-90%), moderate in hemodialysis patients (10%-20%), low in heterosexuals with multiple sex partners, homosexual men, health care workers and family contacts of HCV-infected persons (1%-5%), and lowest in volunteer blood donors (0.3%-0.5%); major cause of parenterally transmitted non A, non B hepatitis**HOST RANGE:** Humans; has been experimentally transmitted to chimpanzees**INFECTIOUS DOSE:** Not known**MODE OF TRANSMISSION:** Percutaneous exposure to contaminated blood ( $10^2$  -  $10^3$  infectious particles / mL of blood) and plasma derivatives; contaminated needles and syringes are important vehicles of spread, especially among injecting drug users; risk of HCV transmission by household contact and sexual activity has not been well defined, but efficiency of transmission via these routes appears to be low; vertical transmission appears to be uncommon, however risk of transmission may increase when the mother is co-infected with HIV; in over 40% of cases, the risk factor(s) for HCV transmission cannot be identified**INCUBATION PERIOD:** Ranges from 2 weeks to 6 months; most commonly 7

- 10 weeks; chronic infection may persist for up to 20 years before onset of cirrhosis or heptoma

**COMMUNICABILITY:** From one or more weeks before onset of first symptoms; may persist in most persons indefinitely

### SECTION III - DISSEMINATION

**RESERVOIR:** Humans. Other reservoirs are unknown in the current literature

**ZOONOSIS:** Not known

**VECTORS:** Not known

### SECTION IV - VIABILITY

**DRUG SUSCEPTIBILITY:** No specific antivirals

**SUSCEPTIBILITY TO DISINFECTANTS:** The data available in the current literature on the susceptibility of HCV to disinfectants are limited. Therefore, because HCV is an enveloped virus, general disinfection measures against hepatitis B virus are applicable to HCV (1% sodium hypochlorite, 70% ethanol, 2% glutaraldehyde, formaldehyde).

**PHYSICAL INACTIVATION:** The data available in the current literature on the susceptibility of HCV to physical inactivation are limited. Again, because HCV is an enveloped virus, general inactivation measures against hepatitis B virus are applicable to HCV (stable at 37°C for 60 min but not at temperatures above 60°C; stable at pH 2.4 for up to 6 hours). May not be inactivated by UV.

**SURVIVAL OUTSIDE HOST:** Not known. Suspected to be similar to hepatitis B virus (survives in dried blood for long periods-weeks)

### SECTION V - MEDICAL

**SURVEILLANCE:** Testing of blood samples for elevated liver enzyme levels, anti-HCV or direct viral RNA detection by PCR amplification

**FIRST AID/TREATMENT:** Interferon alpha has been shown to have an overall beneficial effect in about 25% of chronic hepatitis cases; a combined treatment of ribavirin-interferon alpha has been reported to be equally effective or better than alpha interferon alone for treatment of chronic hepatitis

**IMMUNIZATION:** Applicability of immunization not known; repeated infections with HCV have been demonstrated in an experimental chimpanzee model

**PROPHYLAXIS:** None available

### SECTION VI - LABORATORY HAZARDS

**LABORATORY-ACQUIRED INFECTIONS:** Medical personnel have slightly higher antibody prevalence to HCV than the general population; therefore health care workers handling blood are at higher risk to HCV infection, however, not to the same degree as HBV infection

**SOURCES/SPECIMENS:** Blood and blood products. Transmission through sexual and casual contact is not well documented

**PRIMARY HAZARDS:** Parenteral inoculation of blood and plasma products. However, over half of HCV infections in the United States are due to factors other than percutaneous exposure to HCV. These other factors are yet unknown

**SPECIAL HAZARDS:** Needle stick with infected blood

## SECTION VII - RECOMMENDED PRECAUTIONS

**CONTAINMENT REQUIREMENTS:** Containment level 2 practices for activities utilizing infectious body fluids and tissues; Containment level 3 and personnel precautions for activities with high potential for droplet or aerosol production and high production quantities or concentrations; Animal Pathogen containment level 2 for work with non-human primates

**PROTECTIVE CLOTHING:** Laboratory coat; gloves when skin contact is unavoidable and when working with animals; wrap-around gown and gloves for work in biosafety cabinet

**OTHER PRECAUTIONS:** General needle safety precautions important - do not bend, break or recap needles; dispose directly into puncture-proof container; universal precautions for blood

## SECTION VIII - HANDLING INFORMATION

**SPILLS:** Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel and apply 1% sodium hypochlorite (effective for HBV), starting at perimeter and working towards the centre; allow sufficient contact time (30 min-effective for HBV) before clean-up

**DISPOSAL:** Decontaminate before disposal; steam sterilization, chemical disinfection, incineration

**STORAGE:** In sealed containers that are properly labelled

## SECTION IX - MISCELLANEOUS INFORMATION

**Date prepared:** June, 2001

**Prepared by:** Office of Laboratory Security, PHAC

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