HEPATITIS

Viral hepatitis is an infection of the liver. Scientists have identified six hepatitis viruses, but three-known as A, B & C cause about 90% of acute hepatitis cases in Canada. They are similar in many ways but differ in some epidemiological, immunological, clinical and pathological characteristics. Their prevention and control vary greatly, hence each will be presented separately.

Typical symptoms of acute hepatitis include
- Fever
- Appetite loss
- Nausea
- Abdominal pain
- Jaundice

HEPATITIS A (HAV)

Cause/Epidemiology:

Hepatitis A disease is caused by the Hepatitis A virus (HAV). It is classified as a hepatovirus, a member of the Picornaviridae family. HAV multiplies in the liver cells and is shed in stool.

The occurrence is worldwide, with sporadic and epidemic cycles. Where environmental sanitation is poor, infection is common and occurs at an early age (e.g., in developing countries). Adults therefore, are usually immune and epidemics are uncommon.

In industrialized countries, disease transmission is primarily seen in day care centres, in household and sexual contacts of acute cases, in injecting and non-injecting drug users, and travelers to countries where the disease is common. Hepatitis A is most common among school age children and young adults. In recent years, community wide outbreaks have accounted for most disease transmission, although common source outbreaks due to food contaminated by infected food handlers and contaminated water continue to occur.

In Manitoba, Hepatitis A is endemic, with the possibility of prolonged outbreaks occurring in northern reserve communities.

Clinical Presentation:

Onset is usually abrupt with fever, malaise, anorexia, nausea and abdominal discomfort, followed within a few days by jaundice. The infection varies from a mild illness lasting one to two weeks, to a severely disabling disease lasting several months (rare).

In general severity increases with age, but complete recovery without complications or recurrences is the rule. There is no chronic infection.

Many infections are asymptomatic. Many are without jaundice especially in children and recognizable only by liver function tests. Since most children have unrecognizable infections, they play an important role in HAV transmission and serve as a source of infection to others.

Incubation Period:

The incubation period ranges from 15-50 days, usually 28-30 days. The maximum infectivity occurs during the latter half of incubation and continues for a few days after onset of jaundice (two weeks before, to one week after the onset of symptoms).

Transmission:

HAV is found in the stool of persons with Hepatitis A. It is spread person-to-person resulting from fecal contamination and oral ingestion (i.e., fecal-oral route).

Common source outbreaks have been related to contaminated water, food contaminated by infected food handler, raw or undercooked produce harvested from contaminated water.

A diagnosis of acute Hepatitis A is confirmed by finding IgM antibodies against HAV (HAV IgM) in serum of acutely or recently ill persons. HAV IgM may remain detectable for four to six months after onset. Antibodies to HAV persist for a lifetime.

Hepatitis A vaccines are available and have shown 85 -90 % efficacy in preventing clinical illness. Hepatitis A vaccination is recommended for

- Pre-exposure prophylaxis for individuals at increased risk of infection
- Post- exposure prophylaxis
- Management of Hepatitis A outbreaks as decided by Public Health Officials. This may include passive immunization with immune globulin (IG).

Infection Prevention and Control Practice

Follow Routine Practices for any resident over 6 years of age with Hepatitis A, unless he/she is incontinent and feces cannot be contained, or who contaminates the environment. Refer to Routine Practices section 4 and/or the Routine Practices policy #90.00.060 for specific information.

Implement Contact Precautions for a resident who has incontinence and feces that cannot be contained, or for adults who contaminate their environment. Refer to Contact Precautions in the Additional Precautions section 5 for specific information.

Occupational Health:

Definition of an Occupational Exposure

A susceptible healthcare worker who has had direct or indirect oral contact with infectious feces during period of communicability (two weeks before and up to one week after onset of symptoms).

Exposure may also occur with ingestion of contaminated food or water.

A healthcare worker exposed to Hepatitis A

- Determine healthcare workers' immune status
- Consider immune if evidence of Hepatitis A immunization, or documentation of Hepatitis A immune titre
- Exposed, susceptible healthcare workers shall contact Occupational health for clinical management
- No modifications to work practices or work restrictions

A healthcare worker symptomatic or infected with Hepatitis A

- Physician confirmed diagnosis
- Inform Infection Prevention and Control immediately if suspected or confirmed case of Hepatitis A
- Healthcare workers shall be referred to Occupational Health/designate for clinical management
- Healthcare workers shall be excluded from work until 7 days after the onset of jaundice or other clinical symptoms

HEPATITIS B (HBV)

Cause/Epidemiology

Hepatitis B disease is caused by the Hepatitis B virus (HBV). It is a double-stranded DNA virus composed of a core antigen (HBcAg), surrounded by an outer coat containing the surface antigen (HbsAg). HBeAg (e antigen) is an antigen within the core and is another marker for the degree if infectivity.

Hepatitis B (HBV) is the most prevalent hepatitis strain in the world. In areas of Africa and Asia there is widespread infection in infancy and childhood. In North America, infection is most common in young adults. In industrialized countries, exposure to HBV is common in certain high-risk groups.

- Persons with multiple sex partners or diagnosis of a sexually transmitted disease
- Homosexual men
- Injection drug users
- Hemodialysis patients
- Sex contacts of infected persons
- Infants born to infected persons
- Household contacts of chronically infected persons
- Healthcare and public safety workers

Percutaneous and mucosal exposure to blood or serous fluids is associated with occupationally acquired HBV infections: surgeons, dentists, oral surgeons, pathologists, operating room, dialysis and emergency staff, and clinical laboratory workers who handle blood are at highest risk.

Pre-transfusion screening of blood donors and processing of pooled blood clotting factors have virtually eliminated the risk of Hepatitis B infection. In developing countries this risk still exists.

Contaminated and inadequately sterilized syringes and needles have resulted in outbreaks among patients in clinics and physicians' offices. Occasionally, outbreaks have been traced to tattoo parlors and acupuncturists. Rarely has transmission to patients from HBsAg positive healthcare workers been documented.

Clinical Presentation

Approximately, 30% of persons have no signs or symptoms of disease. Clinically recognizable symptoms are less common in children than adults.

In persons with clinical illness the onset is usually gradual with anorexia, vague abdominal discomfort, nausea and vomiting and sometimes arthralgias and rash and progressing to jaundice. Fever may be absent or mild. The range of severity is from

inapparent cases detected only by liver function tests to fulminating fatal cases of acute hepatic necrosis.

Many people infected with HBV recover completely and develop lifelong immunity to the virus. The risk of developing chronic infection following acute HBV infection varies inversely with age

- 90% of infants infected at birth
- 25-50% of children infected at age 1-5
- 6% of persons infected after age 5 years

Death from chronic liver disease from cirrhosis or hepatacellular carcinoma occurs in 15-25% of chronically infected persons.

Incubation Period

The incubation period ranges from 45-180 days, usually 60-90 days. The presence of one or more of HBsAg, HBeAg and Hepatitis B DNA indicates the person is potentially infectious. Communicability is highest in the acute stage of illness.

HBsAg can be detected in serum from several weeks before onset of symptoms, to weeks or months after onset in acute cases: it persists in chronic cases. When HBsAg declines and is followed by anti-HBs, infectivity is resolved.

The presence of e antigen indicates higher infectivity while the presence of e antibody indicates reduced infectivity.

To diagnose chronic or acute cases of Hepatitis B, the serological tests commonly used are

- Hepatitis B surface antigen (HBsAg)
- Antibody to HBcAg (anti-HBc)
- Antibody to HBsAg (anti-HBs)

Transmission

HBsAg or HBV DNA has been found in virtually all body secretions and excretions, however: only blood (and serum derived fluids), saliva, semen, and vaginal fluids have been shown to be infectious. Blood and serum are the most infectious, while saliva is the least infectious.

Susceptibility to infection is universal. Transmission occurs by percutaneous (IV, IM, SC or intradermal) and mucosal exposure to infective body fluids.

Percutaneous exposure that could result in HBV transmission include:

- Transfusion of blood or blood product
- Human bites

- Sharing needles during injection drug use
- Hemodialysis
- Acupuncture
- Tattooing and body piercing
- Needlesticks or other injuries from sharp instruments sustained in healthcare settings

Sexual and perinatal HBV transmission usually results from mucous membrane exposure to infectious blood and body fluids. HBV is stable on environmental surfaces for seven days, hence indirect inoculation of HBV can also occur via inanimate objects.

Shared razors and toothbrushes have been implicated as occasional vehicles of HBV transmission causing percutaneous and mucosal inoculation. Fecal-oral or vectorborne transmission has not been demonstrated. In about 35% of cases, no transmission source can be identified.

Important measures to prevent HBV transmission include
- Universal Hepatitis B immunization programs and ongoing immunizing of high risk groups
- Investigation and follow up of contacts of acute and chronic cases
- Investigation and follow up of persons with significant exposures to blood or body fluids
- Prenatal screening
- Screening of blood donors
- Management of contacts per Public Health protocol may include HBIG administration and Hepatitis B vaccination

Education of acute and chronic cases includes
- Not sharing toothbrushes, razors or IV drug needles, or donating blood or organs.
- Minimize sexual transmission through adoptions of safe sex practices
- Proper clean up of blood spills

Infection Prevention and Control Practices

Follow Routine Practices for a resident with Hepatitis B.

Refer to the Routine Practices section 4 and/or the Routine Practices policy #90.00.060 for specific information.

Occupational Health

Definition of Occupational Exposure

A susceptible healthcare worker who has had a percutaneous injury from equipment contaminated with infectious blood or body fluids, or mucous membranes, or non-intact skin contact with infectious blood or body fluids.

Infectious blood or body fluids on intact skin is **not** a significant exposure.

A healthcare worker exposed to Hepatitis B

- Refer to and follow WRHA Blood & Body Fluids-Post Exposure Management Policy #20.10.100 and the Protocol for Exposure To Blood and Body Fluids in Personal Care Homes algorithm
- Determine healthcare workers immune status
- Consider immune if documented evidence of Hepatitis B immune titre, or Hepatitis B surface antigen (HBsAg) positive from Hepatitis B infection.
- Exposed healthcare workers shall immediately contact Occupation Health/designate for clinical management and/or follow up.

May include administration of HBIG within 48 hours and up to 7 days post exposure

- If occupational health/designate is not available refer to site specific process (i.e.; go to emergency department or urgent care)
- No modifications to work practices or work restrictions

A healthcare worker symptomatic or infected with Hepatitis B

- Physician confirmed diagnosis
- Healthcare workers shall be referred to Occupational Health/designate for clinical management
- Work modifications or restrictions may be required for healthcare workers who perform exposure-prone procedures or who have extensive dermatitis.

HEPATITIS C (HCV)

Cause/Epidemiology

A small flavivirus-like single stranded RNA virus causes hepatitis C infection. Occurrence is worldwide. HCV rates are directly related to the number of persons who routinely share injection equipment and to the prevalence of poor parenteral practices in healthcare settings. It is estimated that 2-3% of the world population is chronically infected with HCV and like HBV, is one of the most common global causes of chronic hepatitis, cirrhosis, and liver cancer.

Before donor screening, HCV was the most common cause of post transfusion hepatitis, accounting for about 90% of cases in North America. HCV is highest in injection drug users, persons with hemophilia (50-90%) and in hemodialysis patients (10-20%). In Manitoba, the primary risk factor for new HCV infection is injection drug use.

Clinical Presentation

Onset is usually insidious, with anorexia, vague abdominal discomfort, nausea and vomiting. Progression to jaundice is less frequent than with Hepatitis B. Although initial infection may be asymptomatic (more than 90% of cases) or mild, a high percentage (55-85%) develops a chronic infection.

Of chronically infected persons, about half will eventually develop cirrhosis or cancer of the liver. Another long-term effect of Hepatitis C infection is chronic and intermittent fatigue, which may be profound and debilitating. It is a leading indication for liver transplantation.

Early detection of HCV infection is important so treatment may be initiated if indicated. Treatment with antiviral drugs, primarily interferon and ribavarin is effective in eradicating infection in approximately 30-40% of Hepatitis C cases. Treatment is most effective when given early in the course of the disease.

Incubation Period

The incubation period ranges from 2 weeks to 6 months, usually 6-9 weeks. Communicability is from one or more weeks before onset of the first symptoms and may persist in most persons indefinitely. Peaks in virus concentration appear to correlate with peaks in ALT activity.

Diagnosis depends on detecting antibody to the Hepatitis C virus (Anti HCV). Various tests are available for the diagnosis and monitoring of HCV infection. It may take 12-14 weeks or longer after infection for the antibodies to be detected.

Transmission

HCV is spread primarily through direct blood-to-blood contact with an infected person. Transmission, through sharing of contaminated needles and syringes by injection drug users, is now the most common method of spread (high risk).

The current risk for HCV from blood transfusion is very low, estimated to be between 1/10,000 and 1/100,000. People who received blood transfusions before the screening of blood and blood products in July 1990 are considered to be at risk.

The risk of HCV being transmitted sexually, from mother to child perinatally or through household contact is low (approximately 5%). The risk of transmission of HCV by accidental needlestick exposure is estimated to range from 4-10%. There is no vaccine to prevent Hepatitis C.

Prevention strategies center on risk and harm reduction and may include

- Participation in addiction and needle exchange programs.
- Avoiding procedures such as tattooing and body piercing, or assure it is performed with sterile equipment
- Avoiding sharing personal care items such as razors, toothbrushes
- Following safe sex practices

Infection Prevention and Control Practices

Follow Routine Practices for a resident with Hepatitis C.

Refer to Routine Practices section 4 and/or the Routine Practices policy # 90.00.060 for specific information.

Occupational Health

Definition of occupational exposure

> A susceptible healthcare worker who has had a percutaneous injury from equipment contaminated with blood or body fluids, or mucous membranes, or non-intact skin contact with infectious blood or body fluids.

A healthcare worker exposed to Hepatitis C

- Refer to and follow WRHA Blood and Body Fluids-Post Exposure Management Policy #20-10-100 and the Protocol for Exposure To Blood and Body Fluids in Personal Care Homes algorithm
- Consider all healthcare workers susceptible to Hepatitis C even with lab documentation of previous infection.
- Exposed healthcare workers shall immediately contact Occupational Health/designate for clinical management and/or follow up.
- If Occupational Health/designate is not available, refer to site-specific process.

- No modification to work practices or work restrictions

A healthcare worker symptomatic or infected with Hepatitis C

- Physician confirmed diagnosis
- Healthcare workers shall be referred to Occupational Health/designate for clinical management
- Work modifications or restrictions may be required for healthcare workers who perform exposure-prone procedures or who have extensive dermatitis