Newfoundland and Labrador Disease Control Manual	
Section 7	**Diseases Transmitted by Direct Contact and through the Provision of Health Care**

7.1 Introduction

This section includes the process required in order to complete investigation, control and reporting measures for diseases transmitted by direct contact and through the provision of health care that are on the Notifiable Diseases List for Newfoundland and Labrador. These include:

- *Clostridium difficile* associated diarrhea
- Creutzfeldt-Jakob Disease, Classic
- Creutzfeldt-Jakob Disease, Variant
- Ebola Virus Disease
- Group B Streptococcal Disease of the Newborn

7.2 *Clostridium difficile* infection

The protocol for the reporting requirements for *Clostridium difficile* infections (CDI) is available at the following website:

http://www.health.gov.nl.ca/health/publichealth/cdc/CDI_surveillance_protocol_final.pdf

The CDI infection prevention and control guidelines for acute care and long term care are available at the following website:

http://www.health.gov.nl.ca/health/publichealth/cdc/infectioncontrol/CDI_acute_care_settings.pdf

http://www.health.gov.nl.ca/health/publichealth/cdc/PHAC_Guidance_CDI_long_term_care_facilities.pdf

7.3 Creutzfeldt - Jakob disease

Case Definition

Case definitions for Creutzfeldt - Jakob disease (CJD) are available at the following website:

http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/35s2/MCJ_vMCJ-eng.php

Creutzfeldt-Jakob Disease (CJD) is one of the forms of human prion diseases. Prion diseases are rare, fatal, degenerative brain disorders that occur worldwide in both humans and animals. They belong to a group of brain diseases called proteinopathies.

The brains of people or animals with prion disease undergo damage, called "spongiform change" or "spongiosis" because when the tissue is examined under a microscope it resembles a sponge, with many tiny holes. In addition, the brain tissue contains abnormal deposits of a specific protein called the prion protein (PrP). These pathological changes can be caused by genetic variations, or apparently arise spontaneously within a single individual. However, they can also be caused by infectious transmission between individuals of the same or different species.

CJD has been defined as either classic CJD or variant CJD (vCJD).

- Classic CJD includes sporadic CJD, genetic CJD and iatrogenic CJD:
  - Sporadic CJD occurs worldwide and is of unknown etiology
  - Genetic (familial or inherited) CJD is linked to mutations of the prion protein gene
  - Iatrogenic CJD is related to transmission from person to person in the course of medical treatment such as being exposed to contaminated neurosurgical equipment
- Variant CJD is a novel form of CJD which has been linked to transmission of bovine spongiform encephalopathy (BSE) from cattle to humans.

The Canadian Creutzfeldt-Jakob Disease Surveillance System (CJDSS) is operated by the Public Health Agency of Canada and conducts prospective national surveillance for all types of human prion disease in Canada. The main purposes of the CJDSS are to better understand the epidemiology of human prion diseases, to improve the options available for their rapid and accurate diagnosis, and ultimately to protect the health of Canadians by reducing risks of prion disease transmission.

Please note that all human prion diseases are provincially reportable and nationally notifiable in Canada.

For more information regarding the Canadian Creutzfeldt-Jakob Disease Surveillance System, please call toll-free: **1-888-489-2999.**

Creutzfeldt - Jakob disease is extremely rare in Newfoundland and Labrador, with one case in a million or one case every two years expected. Due to the complexity of this

condition healthcare professionals are referred to the PHAC's web site for further information. This is available at:
http://www.phac-aspc.gc.ca/hcai-iamss/cjd-mcj/index-eng.php

A fact sheet on CJD is available in Appendix A and more information at:
http://www.phac-aspc.gc.ca/cjd-mcj/vcjd-faq-eng.php

Infection Control Guidelines are available at:
http://www.phac-aspc.gc.ca/hcai-iamss/cjd-mcj/pub-eng.php

An additional source of information is available at:
http://www.health.alberta.ca/documents/Guidelines-Creutzfeldt-Jakob-Disease-2013.pdf

Reporting Requirements and Procedures

Most physicians are aware of CJD, although because the disease is so rare many have never directly observed a case. A prompt referral to a neurologist should follow reporting of any suspicious pattern of symptoms, where a number of investigations must be carried out.

- Since 1998 the PHAC of Canada has had an intensive active surveillance program for CJD. It relies on the direct reporting of all confirmed, probable and possible cases of CJD by all neurologists, neurosurgeons, neuropathologists, geriatricians and infection disease physicians. The surveillance system operates on a reference-services model by offering comprehensive support to referring physicians for laboratory investigations, clinical consultation and education. For more information regarding the Canadian Creutzfeldt - Jakob disease Surveillance System please contact the clinical coordinator 1-888-489-2999.

- The laboratory (hospital or public health laboratories) reports case/s to the attending physician, the Chief Medical Officer of Health and the Medical Officers of Health (MOH)
- MOH office will notify, as required, local physicians, nurse practitioners, environmental health officers, community health nurses, communicable disease control nurses (CDCNs) and Infection control practitioners (ICP), in the particular region as required for follow-up and case investigation
- The Canadian Blood Services screens donors for potential exposure to variant CJD in the donor pre-screening process
- The CDCN in collaboration with the ICP (if necessary) will collect case details
- The CDCN will enter the case details into the electronic reporting system and utilize the Canadian Network for Public Health Intelligence (CNPHI) tool, if indicated, for alerts or outbreak summaries

Provincial Disease Control

- Reports the aggregate case data to Public Health Agency of Canada
- Provides an analysis of the case/s with reports in the Quarterly Communicable Disease Report (CDR), also posted on the Public Health website http://www.health.gov.nl.ca/health/publichealth/cdc/informationandsurveillance.html
- Coordinates the response if an outbreak across RHAs.

Appendix A: Creutzfeldt-Jakob Disease (CJD) Fact Sheet

Frequently asked questions about CJD

Public Health Agency of Canada

1. **Can you catch CJD from someone?**
   CJD and other human prion diseases are not believed to spread by close or casual person-to-person contact or by the airborne/respiratory route. However, transmission can occur during invasive medical interventions. It is sensible for anyone who might be exposed to the blood of another person to wear gloves.

2. **How can we be sure that the diagnosis of CJD is the correct one?**
   It should be emphasized that a definite diagnosis of any form of CJD can only be given by brain tissue examination after death. Each individual case of CJD can be assigned to one of three subtypes: sporadic, genetic or acquired. The considerations for diagnosis vary depending on the subtype. In genetic prion diseases, the diagnosis depends on development of particular neurological symptoms and the identification of a PRNP gene mutation by genetic analysis. Iatrogenic CJD is diagnosed on the basis of a confirmed diagnosis of CJD in someone who had a relevant medical exposure. Variant CJD is diagnosed by distinctive features seen on post-mortem examination of the brain.

3. **Is the blood supply safe from CJD?**
   Since donors cannot, at present, be tested for early biological indicators of CJD, nor can blood donations be tested for the removal of the prion agent after processing, and considering vCJD has been shown to be transmissible through blood transfusion, the Canadian Blood Services has developed policies with regards to CJD and blood donation. Canadian Blood Services deferral policies are available by contacting Canadian Blood Services at 1-888-2donate.

4. **Is there a risk in contracting CJD from organ transplant surgery?**
   The risk of contracting CJD from organ transplants is uncertain, but believed to be small. Unfortunately, a transplant usually has to be done before a full post-mortem examination of the donor can be completed, so this risk cannot be completely eliminated. However, if a potential donor is suspected of having CJD their tissues and organs would not be used for transplantation. Note also that there is a risk of infection in any transplant.

5. **Is the person with CJD in pain?**
   Neurological examination and the EEG of people in the later stages of CJD indicate that they lose awareness of their condition as the disease progresses. In the early stages, however, patients with CJD can develop marked fear, which can be very distressing and is probably associated with visual hallucinations. They may feel discomfort and some of the symptoms of the disease - such as myoclonus, sudden jerking of the limbs - are distressing for caregivers to witness. There are medications which can relieve the symptoms and make the person more comfortable. In vCJD dysesthesia, an unpleasant abnormal sensations to normal stimuli, has been described.

6. **Is a post-mortem examination necessary in CJD?**
   Post-mortem examination is not compulsory when CJD is suspected - the doctor requires the permission of the next of kin. However, because it is the only way, at the moment, to definitively diagnose CJD, this knowledge is often very helpful for families. The autopsy findings and any donated tissues will also be very beneficial to support research into the disease.

7. **Will there be many more cases of variant CJD?**
   As of April 3, 2007, there were 202 cases of vCJD worldwide. If the disease comes from exposure to infected beef products prior to the ban on specified offal in human food in 1989, as is now widely accepted, then there could be more cases if the incubation period is very long. However, without knowing the exact circumstances of infection, or who is most at risk and why, it is currently impossible to predict how many more cases of vCJD there will be.

8. **What is being done to protect us from CJD?**
   At present there is no specific way of protecting people from developing sporadic or familial CJD. Destroying surgical instruments that have been used on certain tissues of people with CJD and not using their organs for transplant guards against iatrogenic CJD. There have also been recent measures taken by the Canadian Blood Services for safeguarding the blood supply from variant CJD.

7.4 Ebola Virus Disease

Etiology

Ebola virus disease (EVD) formerly known as Ebola hemorrhagic fever, is a severe, often fatal illness in humans and nonhuman primates (such as monkeys, gorillas, and chimpanzees). EVD is caused by infection with a virus of the family *Filoviridae,* genus *Ebolavirus*. When infection occurs, symptoms usually begin abruptly. The first *Ebolavirus* species was discovered in 1976 in what is now the Democratic Republic of the Congo near the Ebola River. Since then, outbreaks have appeared sporadically in Africa. There have been no cases reported in North America.

Case definition

Confirmed

A confirmed case can only be done through laboratory testing at the National Microbiology Laboratory.

Probable

A probable case is defined as one with clinical evidence of illness and a history within the three weeks before onset of fever with one of the following:

- Travel in a specific area of a country where an outbreak of EVD has recently occurred
- Contact with a suspect, probable or confirmed case of EVD
- Direct contact with blood or other body fluid secretions or excretions of a person or animal with a confirmed or probable case of EVD
- Work in a laboratory or animal facility that handles haemorrhagic fever viruses

Clinical Presentation

Clinical symptoms of EVD include severe acute viral illness consisting of sudden onset of fever, malaise, myalgia, headache, conjunctival infection, pharyngitis, vomiting, diarrhea that can be bloody, and impaired kidney and/or liver function.

It is often accompanied by a maculopapular or petechial rash that may progress to purpura. Bleeding from the gums, nose, injection sites and gastrointestinal tract occurs in about 50% of patients. Dehydration and significant wasting occur as the disease progresses.

In severe cases, the haemorrhagic diathesis may be accompanied by leucopenia; thrombocytopenia; hepatic, renal and central nervous system involvement; or shock with multi-organ dysfunction.

Some people who get infected with the Ebola virus are able to recover, although, according to the World Health Organization, up to 90% of those infected with EVD will die.

Diagnosis

EVD is diagnosed based on travel history, symptoms and laboratory testing. Other diseases that should be ruled out before a diagnosis of EVD can be made and include: malaria, typhoid fever, shigellosis, cholera, leptospirosis, plague, rickettsiosis, relapsing fever, meningitis, hepatitis and other viral haemorrhagic fevers.[1]

The Public Health Agency of Canada's (PHAC) National Microbiology Laboratory (NML) will provide direction to the Public Health Laboratory on the testing requirements for EVD.

The Public Health Laboratory (PHL) should be notified of any suspected cases of EVD. The following specimens must be collected and sent to the PHL as soon as possible:

- Blood – Ebola PCR – one full tube whole blood EDTA
- Blood – Ebola Serology – one full tube SST
- Travel history and clinical history must be on the requisition

Epidemiology

Occurrence

Typically EVD appears in sporadic outbreaks, but it is likely that sporadic isolated cases occur as well[2]. Since 1976, The World Health Organization (WHO) has reported a total of 2,387 cases including 1,590 associated deaths[3]. Worldwide, cases have been confirmed in the Democratic Republic of the Congo, Gabon, South Sudan, Ivory Coast, Uganda, Republic of the Congo, South Africa, Guinea, and Liberia[4]. A total of 11 EVD outbreaks have occurred since the year 2000[3]. During outbreaks healthcare workers as well as the family and friends of infected individuals were at highest risk. No case of the

[1] World Health Organization. Ebola Virus Disease.

[2] Centers for Disease Prevention and Control (CDC). (2010) Ebola Hemorrhagic Fever Information Packet.

[3] Canadian Public Health Agency of Canada. (2014). Ebola virus disease-Surveillance.
[4] Ibid.

disease in humans has ever been reported in Canada. EVD has been a national notifiable disease in Canada since the year 2000.

Reservoir

In Africa, fruit bats are considered a possible natural host for EVD. Although non-human primates have been a source of infection for humans, they are not thought to be the reservoir but rather an accidental host like human beings. In Africa, infection has been documented through the handling of infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found ill or dead or in the rainforest.

Transmission

EVD is introduced into the human population through close contact with the blood, secretions, organs or other body fluids of infected animals. EVD then spreads in the community through human-to-human transmission, with infection resulting from direct contact (through broken skin or mucous membranes) with the blood, respiratory secretions, and other body fluids of infected people, and indirect contact with environments contaminated with such fluids.

Burial ceremonies in which mourners have direct contact with the body of the deceased person can also play a role in the transmission of EVD. Men who have recovered from the disease can still transmit the virus through their semen for up to 7 weeks after recovery from illness.

Health-care workers have frequently been infected while treating patients with suspected or confirmed EVD. This occurred through close contact with patients when infection control precautions were not strictly practiced.

Incubation Period

Symptoms can begin 2 to 21 days after exposure, although 8 to 10 days is most common.

Communicability

Risk during the incubation period is considered low. Infectivity increases with the stages of illness and remains infectious as long as the blood and secretions contain the virus. Risk is highest during the later stage of the illness when the patient is vomiting, having diarrhea or hemorrhaging and during the preparation of the body for burial.[5]

[5] Heymann, D. (2008). Ebola-Marburg Viral.

Control Measures

Management of Case

Hands must be washed according to the four moments.[6] The four moments are:

- Before initial patient/patient environment contact
- Before aseptic procedure
- After body fluid exposure
- After contact with the patient and the patient's environment

Contact and Droplet Precautions are required for the care of a patient with EVD. Airborne Precautions are required for aerosol-generating medical procedures (AGMPs).[7]

Strategies to reduce aerosol generation should also be implemented when aerosol-generating medical procedures are necessary on patients with EVD and include:

- Aerosol-generating medical procedures should be limited to those that are medically necessary
- Aerosol-generating medical procedures should be anticipated and planned for
- Appropriate patient sedation should be used
- The number of personnel in the room should be limited to those required to perform the aerosol-generating medical procedure
- Aerosol-generating medical procedures should be performed in airborne infection isolation rooms whenever feasible
- Appropriate ventilation (e.g., level of air filtration and direction of air flow) should be maintained
- Single rooms (with the door closed and away from high-risk patients), should be used in settings where airborne infection isolation rooms are unavailable
- Respirators should be worn by all personnel in the room during the procedure

[6] Public Health Agency of Canada. Hand Hygiene Practices in Healthcare Settings.

[7] Public Health Agency of Canada. Routine Practices and Additional Precautions.

- Closed endotracheal suction systems should be used wherever possible

Investigation

- Obtain a travel history
- Rule out other diseases (listed under diagnosis)

Treatment

There is no effective antiviral treatment for EVD infections. Treatment is supportive, and is directed at maintaining renal function and electrolyte balance, and at combatting hemorrhage and shock.

Immunization

There is no vaccine available.

Exclusion

Precautions should remain in place until symptoms resolve.

Management of Contacts

Contact tracing must begin immediately after identification of a confirmed or probable case.

Exclusion

A contact of a probable or confirmed case with symptoms must be followed as a possible case until EVD is ruled out.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

Health professionals in Canada are advised to be vigilant for the recognition, reporting and prompt investigation of patients with symptoms of EVD and other similar diseases that can cause viral haemorrhagic fevers. Other preventative measures include:

- Avoid contact with any medical equipment, such as needles, contaminated with blood or bodily fluids
- Avoid direct contact with blood, saliva, vomit, urine and other bodily fluids of people with EVD or unknown illnesses
- Avoid direct contact with bodies of people who died of EVD or unknown illnesses
- Practice strict infection control measures

  - This includes isolating infected individuals and using personal protective equipment (gowns, masks, goggles and gloves)

- Properly use and disinfect instruments and equipment used to treat or care for patients
- Avoid close contact with wild animals and avoid handling wild meat
  - Avoid potential carriers, both live and dead, since both can spread the virus; potential carriers of the virus include:

▪ Chimpanzees, gorillas, monkeys, forest antelope, pigs porcupines and fruit bats

- Know the symptoms of EVD virus disease and see a health care provider if concerned
  - Seek medical attention immediately if a fever and any other symptoms arise during or after travel to an affected region
  - Inform the health care provider that travel occurred to a region where EVD was present

Reporting Requirements and Procedures

- The laboratory (hospital or public health laboratory) report case/s to the attending physician, the Chief Medical Officer of Health and the Medical Officers of Health (MOH)
- MOH office will notify, as required, local physicians, nurse practitioners, environmental health officers, community health nurses, communicable disease control nurses (CDCNs) and Infection control practitioners (ICP), in the particular region as required for follow-up and case investigation
- The CDCN in collaboration with the ICP (if necessary) will collect case details
- The CDCN will enter the case details into the electronic reporting system and utilize the Canadian Network of Public Health Intelligence (CNPHI) tool for alerts or outbreak summaries

Provincial Disease Control

- Reports all suspect or probable cases of EVD immediately to the Public Health Agency of Canada through its 24-hour emergency line: 1-866-262-8433.

References

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7.5 Group B Streptococcal Disease of the Newborn

Case Definition

Confirmed Case

Clinical illness in an infant less than one month of age with laboratory confirmation of infection:

- Isolation of group B Streptococcus (*Streptococcus agalactiae)* from a normally sterile site (such as blood or cerebrospinal fluid)
  OR
- Demonstration of group B Streptococcus DNA in a normally sterile site

Probable Case

Clinical illness in an infant less than 1 month of age with laboratory confirmation of infection:

- Detection of group B Streptococcus antigen in a normally sterile site

Clinical Presentation

There are two manifestations of this disease: early onset and late onset. Early onset typically begins within the first day of life (range is between 0 and 6 days after birth). Symptoms associated with early onset disease include apnea, meningitis, pneumonia, respiratory distress, sepsis, and shock. Late onset disease typically begins between 3 to 4 weeks of age (range is between 7 to 89 days) commonly manifests as occult bacteremia or meningitis; other focal infection such as osteomyelitis, pneumonia and cellulitis, occur less commonly. This infection is the leading cause of bacterial meningitis among newborns.

Epidemiology

Occurrence

The incidence of group B Streptococcal infection in Canada has decreased dramatically since the introduction of intrapartum prophylaxis. One Canadian population-based study (Himmelberger, 2002) indicates that the overall incidence was 0.64 per 1000 live births, with 57% of the cases being early-onset disease. In NL, there were two cases of group B Streptococcus reported from January 01, 2008 to December 31, 2012.

Reservoir

Group B streptococcus bacteria are common inhabitants of the gastrointestinal and genitourinary tract. About 10-30% of pregnant women harbor group B streptococci in the genital tract, and about 1% of their babies may develop symptomatic infection.

Transmission

Transmission from mother to infants occurs shortly before or during delivery. After delivery person-to-person transmission can occur. Although uncommon, group B Streptococcus can be acquired in the nursery from healthcare workers or visitors. The infection can also be community-acquired.

Incubation Period

Less than one week for early-onset disease; unknown for late-onset disease.

Communicability

If the mother is colonized with group B Streptococcus, it can be passed onto the infant during the intrapartum period; especially high risk with premature birth and/or rupture of membrane greater than 18 hours prior to delivery, or when mother has fever during labor.

Control Measures

Management of Case

Infants with Group B streptococcal infection is a medical emergency requiring immediate medical treatment in an acute care setting. Consultation with a pediatrician or neonatologist is recommended.

Management of Contacts

Investigation of contacts is not required.

Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

Education and Preventive Measures

- Screening pregnant women for group B Streptococcus colonization is one of the strategies recommended for the prevention of early-onset neonatal group B Streptococcal disease. Specific recommendations is provided by experts such as the Society of Obstetricians and Gynecologist of Canada and is available at website: http://sogc.org/wp-content/uploads/2013/01/149E-CPG-September2004.pdf
- Other sources of information include:
  - Management of the infant with neonatal sepsis – Canadian Pediatric Society at http://www.cps.ca/en/documents/position/management-infant-sepsis
  - Prevention of perinatal Group B Strepotococcal Disease disease revised guidelines from CDC, 2010 at http://stacks.cdc.gov/view/cdc/5814

Reporting Requirements and Procedures

- The laboratory (hospital or public health laboratories) reports case/s to the attending physician, the Chief Medical Officer of Health and the Medical Officers of Health (MOH)
- MOH office will notify, as required, local physicians, nurse practitioners, environmental health officers, community health nurses, communicable disease control nurses (CDCNs) and Infection control practitioners (ICP), in the particular region as required for follow-up and case investigation
- The CDCN in collaboration with the ICP (if necessary) will collect case details

- The CDCN will enter the case details into the electronic reporting system and utilize the Canadian Network for Public Health Intelligence (CNPHI) tool, if indicated, for alerts or outbreak summaries

Provincial Disease Control

- Reports the aggregate case data to Public Health Agency of Canada
- Provides an analysis of the case/s with reports in the Quarterly Communicable Disease Report (CDR), also posted on the Public Health website http://www.health.gov.nl.ca/health/publichealth/cdc/informationandsurveillance.html
- Coordinates the response if an outbreak across RHAs.