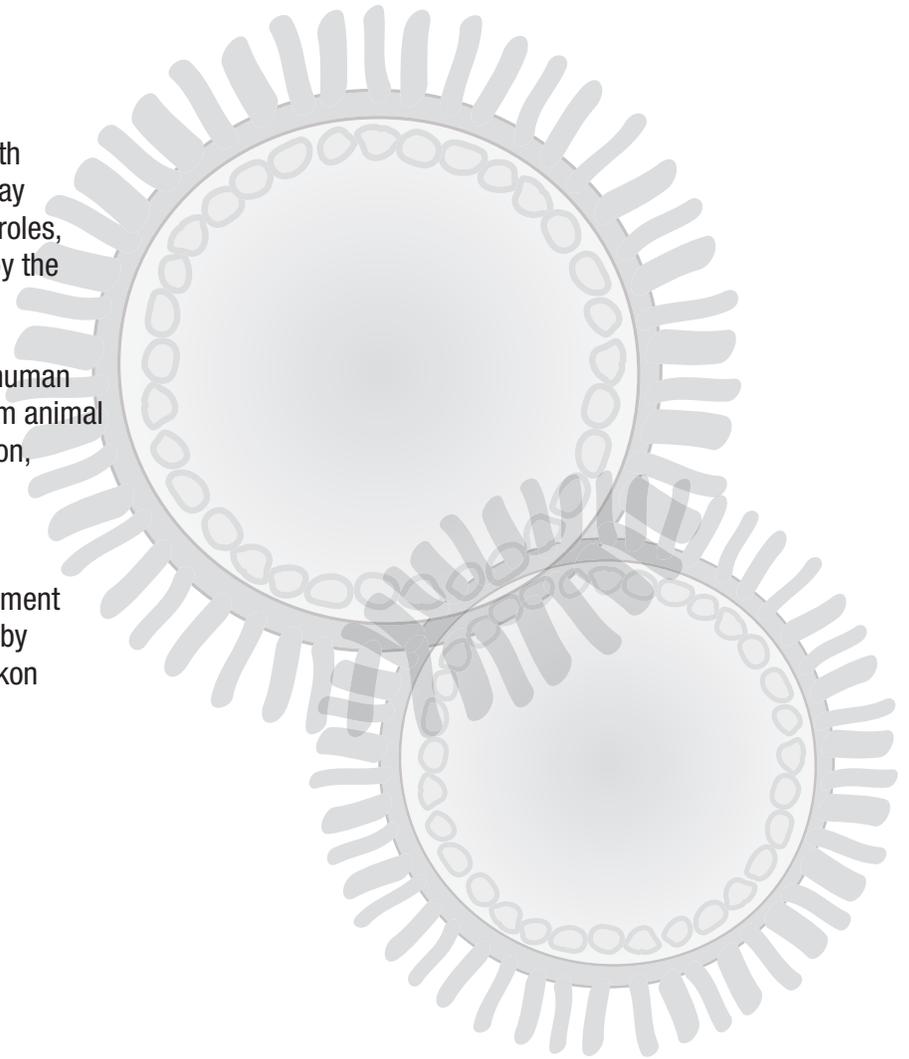


# Yukon Rabies Risk Management GUIDELINES

These guidelines will assist Primary Health Care Workers to manage patients who may be at risk of rabies. They summarize the roles, responsibilities and processes followed by the Yukon Rabies Risk Management team.

The goal is to prevent the acquisition of human rabies by assessing the risk of rabies from animal exposure and to make informed prevention, treatment and communication decisions.

These guidelines are subject to ongoing review by the Yukon Rabies Risk Management Team. Updated versions will be provided by administrative circulars posted on the Yukon Health and Social Services website.



## CURRENT VERSION

Section	Updated
Health Care Providers.....	October 2011
YCDC/Chief Medical Officer of Health ....	October 2011
Environmental Health Services .....	October 2011
Animal Health .....	October 2011
General Information.....	October 2011



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## ACRONYMS

**BCCDC:** British Columbia Centre for Disease Control

**BC PHSA:** British Columbia Provincial Health Services Authority

**CATMAT:** Committee to Advise on Tropical Medicine and Travel

**CFIA:** Canadian Food Inspection Agency

**CMOH:** Chief Medical Officer of Health

**CVO:** Chief Veterinary Officer

**EHS:** Environmental Health Services

**EHO:** Environmental Health Officer

**ID:** Infectious Disease

**IM:** Intramuscular

**NACI:** National Advisory Committee on Immunizations

**PHSA:** Public Health and Safety Act

**Rablg:** Rabies Immune Globulin

**RPEP:** Rabies post-exposure prophylaxis is accomplished through the administration of rabies immune globulin (Rablg) and rabies vaccine. Rablg provides rapid, short-term protection. Rabies vaccines contain inactivated virus and induce an active immune response beginning seven to 10 days post-immunization.

**WGH:** Whitehorse General Hospital

**WGH ER:** Whitehorse General Hospital Emergency Room

**WHO:** World Health Organization

**YCDC:** Yukon Communicable Disease Control

## CONTACT INFORMATION

OFFICE	NAME/POSITION	OFFICE/CELL PHONE	FAX
<b>Environmental Health Services</b>			
#2 Hospital Rd Whitehorse Yukon Y1A 3H8		Office: (867) 667-8391 <a href="mailto:environmental.health@gov.yk.ca">environmental.health@gov.yk.ca</a>	(867) 667-8322
<b>Yukon Communicable Disease Control</b>			
#4 Hospital Road Whitehorse Yukon Y1A 3H8		Office: (867) 667-8323	(867) 667-8349
<b>Chief Medical Officer of Health</b>			
#4 Hospital Road Whitehorse Yukon Y1A 3H8	Dr. Brendan Hanley	Office: (867) 456-6136 Cell: (867) 332-1160	(867) 667-8349
<b>Chief Veterinary Officer</b>			
#14C Burns Road Whitehorse Yukon Y1A 2C6	Dr. Mary VanderKop	Office: (867) 456-5582 Cell: (867) 335-7339 <a href="mailto:mary.vanderkop@gov.yk.ca">mary.vanderkop@gov.yk.ca</a>	(867) 456-6124
<b>Fish and Wildlife Branch</b>			
Environment Laboratory Coordinator	Meghan Larivee	Office: (867) 667-5285	(867) 393-6263
<b>Canadian Food Inspection Agency (CFIA)</b>			
District Veterinarian	Dr. Corrina Harvey	(250) 719-6855	(250) 719-6849
<b>Testing Laboratories</b>			
Whitehorse General Hospital Laboratory		(867) 393-8739	(867) 393-8772
BC Centre for Disease Control Laboratory - Vancouver		(604) 707-2400	(604) 707-2401
National Microbiology Lab Zoonotics and Special Pathogens - Winnipeg		(204) 789-7037	(204) 789-2140
CFIA – Lethbridge Laboratory		(403) 382-5559	(403) 381-1202

## PRIMARY HEALTH CARE PROVIDER GUIDELINES

**These guidelines apply to any patient seeking medical attention for a bite from an animal or with exposure of a wound to saliva of an animal, even though there is typically a low risk of rabies exposure in Yukon.**

### **What you will do:**

Complete Rabies Risk Investigation Form A and fax to Environmental Health Services (fax: (867) 667-8322) as soon as possible if the following criteria are fulfilled:

- the animal was a bat or a wild animal of significant size (bigger than a rabbit)

### **OR**

- the animal was any domestic species, most commonly a dog, cat or ferret

### **AND**

- ANY of the following have occurred:
  - the animal encounter appears to have been unprovoked
  - the animal's behaviour appears to have been unusual
  - the animal has bitten or injured someone else recently (or in last 72 hours)
  - the animal is unvaccinated for rabies
  - the animal is a stray, unavailable, or without an available owner
  - the animal has any history of possible contact with wildlife
  - the animal has had contact with another animal suspected to have rabies
  - the incident occurred outside Yukon

*NOTE: Contact with animals the size of a rabbit or smaller (other than bats), such as rodents, has a negligible risk of rabies and does not typically require further investigation.*

- Provide primary wound management in all cases (see page 7).
- Advise the client about what they can expect (see page 8).

### **What you can expect:**

- An Environmental Health Officer (EHO) will coordinate the rabies risk evaluation with the Chief Medical Officer of Health (CMOH) and Chief Veterinary Officer (CVO).
- If the CMOH determines that rabies post-exposure prophylaxis (RPEP) is required, you will be notified within 48 hours.
- You, the client or the animal owner may be contacted to obtain further information on the incident to determine whether animal control measures or community warnings are required.
- If the rabies risk evaluation indicates no need for RPEP, you will be notified that the investigation is finalized (typically within four working days).
- Data collected from the Rabies Risk Investigation Form will be compiled annually to provide baseline information on animal bites and contact in Yukon and this report will be made available to all participants.

## Who you can contact if you have questions:

- Public Health Questions  
Environmental Health Services: Main Office (867) 667-8391
- Animal Health Questions  
Chief Veterinary Officer (CVO): (867) 456-5582
- Patient Treatment Questions  
Yukon Communicable Disease Control: YCDC Main Office (867) 667-8323

## Rabies Specimen Containers (for animal sampling)

- Rabies specimen containers are kept in supply (one or two) at Community Nursing Stations as well as at Environment Yukon offices throughout Yukon.
- These specimen containers (a labeled box containing a green can and sample packaging) are used for safe shipment of rabies suspect samples and will be used ONLY under the direction of the Chief Veterinary Officer (CVO) or a designated representative.
- In most instances of animal sampling, the attending veterinarian will provide a specimen container. Those stored in the Community Health Centre are for atypical or unusual situations only.
- All requests for these containers will be made to the Community Health Centre during regular office hours. If the container cannot be picked up during regular office hours, the nurse will advise where the container will be left for pick up. Nurses will not be expected to respond to requests for after hours service related to these containers.
- Community nurses and staff will NOT be involved in animal handling, control or sampling.
- For clarification or further information contact the CVO, Dr. Mary VanderKop at ([mary.vanderkop@gov.yk.ca](mailto:mary.vanderkop@gov.yk.ca)).

## Primary Wound Management: The first and immediate action

Wash with a mild soap and flush the wound with copious amounts of water under moderate pressure. Expert opinion suggests washing should be done for at least 15 minutes (NACI 2011, as cited in BCCDC 2011). Some authorities recommend disinfecting the wound with an iodine-containing or other topical virucidal disinfectant to further decrease the viral load, although there is no evidence to support this (NACI 2011, as cited in BCCDC 2011).

Sutures, if required, should be placed after local infiltration of Rablg. They should be loose and not interfere with free bleeding and drainage (Heymann 2008, as cited in BCCDC 2011).

As appropriate, follow-up wound care should be undertaken by or in consultation with a physician. Although the risk of rabies may be small, there is a risk of other infections at the wound site. Tetanus-diphtheria vaccination should be updated as required and administration of antibiotics should depend on the clinical picture.

## Key Points for Post-Exposure Prophylaxis

- The Chief Medical Officer of Health will make the decision about when post-exposure prophylaxis is required and will communicate this to the primary care providers and YCDC as quickly as possible.
- If indicated, post-exposure prophylaxis should be started as soon as possible after exposure.
- RPEP should be offered to exposed individuals regardless of the elapsed interval since exposure. The longest incubation periods for rabies have been reported to be several years (Smith 1991, Johnson 2008, as cited in BCCDC 2011).

- The World Health Organization recommends there be no more than a 48-hour delay to the initiation of RPEP once a risk assessment has determined that RPEP should be given
- Once the rabies virus enters the nerve axons, it is very difficult to stop its progression through the use of rabies immune globulin.

## What to tell the client

For any significant encounter that triggers the Rabies Risk Investigation Form, the client should be advised that they may be contacted by EHS to obtain further information about the incident. This will help determine the level of risk of rabies and whether any action is needed to prevent further risk in the community. Most instances in Yukon are dog bites that are single occurrences with minimal risk of rabies, but it is important to gather complete information to make the best decisions. Refer to the **EHS Tab** for details on information gathering and public health risks.

The client should be told that if further treatment (RPEP) is required they will be notified as soon as possible and they should provide a phone number at which they can be contacted over the next two days. Refer to the **YCDC** and **CMOH Tabs** for details on RPEP decision process and examples of the RPEP forms.

The owner of the suspect animal will be contacted to obtain information on whether the animal is vaccinated for rabies and whether it is showing any abnormal behaviour. The owner will receive recommendations to monitor the health of the animal for 10 days and to prevent any further risk of contact. If the owner of the animal wishes to have it euthanized, they will receive advice on what, if any, further testing is required. Refer to the **Animal Health Tab** for details of animal management options.

## What Will Happen to the Animal

### Domestic Animals

If the suspect animal has been vaccinated for rabies and the vaccination status can be confirmed by the investigating EHO and CVO as adequate to provide protection, there is usually no further action taken.

If the suspect animal does not have a valid vaccination status, the owner is given the option of confining the animal for observation for 10 days if they do not choose to euthanize the animal based on its behaviour. If the animal remains healthy, rabies vaccination is recommended and there is no further action. If the confined animal develops any signs of disease, this must be reported to EHS and the CVO for further investigation because euthanasia and testing for rabies may be required.

In circumstances where the animal's behaviour is strongly suggestive of rabies, an official quarantine may be ordered. The owner always has the option to euthanize the animal and further advice can be obtained from the CVO on possible rabies testing. Refer to the **Animal Health Tab** for details.

### Wild Animals

If the suspect animal is a wild or free-roaming (stray) animal, it often cannot be confined or held for observation. The course of action and recommendations will be decided on a case-by-case basis by EHS and the CVO, drawing information and support from conservation officers and other local officials. Refer to the **Animal Health Tab** for details.



# RABIES RISK INVESTIGATION FORM A – PAGE 1

To be completed by the Health Care Provider

		<b>RABIES RISK INVESTIGATION FORM 'A'</b>	
Date Reported: _____ YYYY-MM-DD		Person Reporting: _____ Please Print Name	
Location: (Medical Clinic/ER/Health Centre) _____		Phone: _____	
		E-mail: _____	
<b>CLIENT INFORMATION – EXPOSED PERSON</b>			
Name: _____ Last _____ First _____		DOB: _____ YYYY-MM-DD	
		Gender: _____ YHCIP#: _____	
Address: _____		City or Community _____	
		Province/Territory: _____	
		Postal Code: _____	
Phone #: Home _____		Work: _____	
		Cell: _____	
		Present Weight (kg): _____	
<b>***** Thorough Completion of These Questions will Expedite Human Treatment and Animal Management *****</b>			
1) Where did the exposure occur? <input type="checkbox"/> Yukon _____ Location/Address _____ City or Community _____			
<input type="checkbox"/> Outside Yukon _____ Location/Address _____ City or Community _____			
Date of exposure: _____ YYYY-MM-DD Time: _____			
2) Type of exposure: <input type="checkbox"/> Bite <input type="checkbox"/> Saliva – contact with non-intact skin or mucous membrane		Physical location of exposure on client <input type="checkbox"/> Head/Neck <input type="checkbox"/> Finger/Hand <input type="checkbox"/> Mucosa <input type="checkbox"/> Torso <input type="checkbox"/> Extremities Describe exact location: _____ Describe severity of wound(s) if present: _____	
3) Client vaccinated against rabies? <input type="checkbox"/> No <input type="checkbox"/> Yes, date: _____ YYYY-MM-DD    Vaccine type: _____    Proof of vaccination? <input type="checkbox"/> No <input type="checkbox"/> Yes			
<b>ANIMAL INFORMATION / IDENTIFICATION</b>			
4) Type of animal involved: Domestic <input type="checkbox"/> Dog <input type="checkbox"/> Cat <input type="checkbox"/> Ferret <input type="checkbox"/> Livestock <input type="checkbox"/> Other _____ <input type="checkbox"/> Household pet - indoor <input type="checkbox"/> Household pet - outdoor <input type="checkbox"/> Stray Wild <input type="checkbox"/> Bat <input type="checkbox"/> Fox, Arctic <input type="checkbox"/> Fox, Red <input type="checkbox"/> Other _____ Description of animal (e.g., species, colour, size): _____			
5) If a domestic animal, is the identity of the owner known? <input type="checkbox"/> No <input type="checkbox"/> Yes _____ Name _____ Address _____ Phone _____			
6) If a domestic animal, is it vaccinated against rabies? <input type="checkbox"/> No <input type="checkbox"/> Yes, date: _____ YYYY-MM-DD    Proof of vaccination? <input type="checkbox"/> No <input type="checkbox"/> Yes			
7) Is the animal showing clinical signs consistent with rabies? (see reverse) <input type="checkbox"/> No <input type="checkbox"/> Yes, consistent with # _____			
8) Was the exposure: <input type="checkbox"/> Unprovoked    or <input type="checkbox"/> Provoked (see reverse for examples), consistent with # _____ Description of exposure: _____ _____			
9) Where is the animal located now? <input type="checkbox"/> alive <input type="checkbox"/> dead <input type="checkbox"/> unknown Description of location: _____			
<b>Fax this form to Environmental Health Services at (867) 667-8322                  Advise the client that they may be contacted by Environmental Health Services &amp; the Chief Medical Officer of Health</b>			
Information is collected under the authority of the Health Act and the Public Health & Safety Act for purposes of providing health services and public health services. Queries should be directed to the Manager of Yukon Communicable Disease Control, at (867) 667-8323 or toll free, at 1-800-661-0507.			
June 22, 2011			



# YUKON COMMUNICABLE DISEASE CONTROL (YCDC) AND CHIEF MEDICAL OFFICER OF HEALTH (CMOH) GUIDELINE

## Roles and Responsibilities

### Chief Medical Officer of Health (CMOH)

- Responsible for the final decision regarding the usage of rabies post-exposure prophylaxis (RPEP) and authorizing release of RPEP.
- Responsible for the final decision regarding animal euthanasia and authorizing this to occur.
- Responsible for notifying YCDC when RPEP is advised and the provision of supporting documentation (Forms A and B).
- The authority (or delegation of authority) to enforce observation and quarantine periods of animals.

### Yukon Communicable Disease Control (YCDC)

- Facilitate the release and administration of RPEP throughout Yukon.
- Responsible for investigating and following up on possible rabies exposure that occurs outside Yukon, especially when exposure was in a country where rabies is endemic (suggest enzootic).
- Responsible for records management in all instances where RPEP is initiated

## Decision to Implement Rabies Post-exposure Prophylaxis (RPEP)

- The Chief Medical Officer of Health makes a final decision regarding the use of RPEP and this decision is based on a risk evaluation.
- It is critical that the primary health care provider complete the client exposure information on Form A because this is essential for assessing the need for RPEP.
- Environmental Health Services gathers the information related to the animal contact in a timely manner and shares this with the Chief Veterinary Officer (CVO) and the CMOH. This information helps the CMOH to determine the risk of rabies and the need for RPEP.

## When is RPEP recommended

- Typically, RPEP is indicated if at least one of the following criteria is met:
- The suspect animal exhibited clinical signs suggestive of rabies, especially if the animal has not been vaccinated against rabies.
- The bite wounds are severe and the attack was not provoked.
- Especially if the bite wounds involve the head or neck.
- A suspect animal may be held for observation or tested to allow RPEP to be discontinued if the animal is negative for rabies.
- If an animal bit because it was in the early stages of clinical rabies, its clinical status will typically deteriorate rapidly over two to three days, progressing to paralysis and death.
- The attack was by a wild animal, resulting in severe wounds, and was not provoked.
- The attack occurred outside Yukon in a rabies endemic area and animal testing was not done or results of animal tests cannot be confirmed.

The RPEP decision is based on information gathered from the Rabies Investigation Forms A (completed by the primary health care provider) and B (completed by Environmental Health Services).

## Rabies Risk Investigation Form A Rationale for RPEP Decision

### Question 1: Where did the exposure occur?

YCDC and the CMOH are responsible for following up on possible rabies exposure that occurs outside Yukon and if the exposure was in a country where rabies is endemic, it may require RPEP administration.

**Outside of Yukon:** (adapted from BCCDC, 2011)

#### Wild animals

Rabies is enzootic to varying degrees in wild animals in Canada east of the Rockies and in other countries. Consider skunk, raccoon, coyote, bobcat, fox and other wild animals to be rabid unless tested and shown to be negative (except in rabies-free countries).<sup>1</sup>

#### Domestic animals (pets and livestock)

In some countries, domestic animals are enzootic for rabies or are regularly infected with rabies. Dog bites provide the greatest risk of rabies transmission in most developing countries. Consider RPEP on an individual basis, taking into account the behaviour of the animal and the geographic location. The risk is higher in Asia and Africa.<sup>2</sup>

#### Rodents and lagomorphs

Rabies is extremely rare in small rodents and lagomorphs (rabbits and hares). No action is normally needed with exposure to these species, unless unusual behaviour of the animal warrants it. Exceptions include woodchucks found to be rabid in parts of the US in association with raccoon rabies expansion and the occasional report of an infected rodent in other parts of the world (Moro 1991, Childs 1997, Kamoltham 2002, Wang 2009, as cited in BCCDC, 2011). However, no rodent-human transmission of rabies has been reported (NACI 2011 as cited in BCCDC, 2011).

Rabies post-exposure prophylaxis should be offered to individuals who have had non-intact skin or mucous membrane exposure to an animal outside the Yukon area where rabies is known to occur in that species or cannot be excluded (e.g., a returning traveller exposed in a rabies enzootic area).

If the animal involved in the exposure is a potential rabies reservoir in a rabies-enzootic region, RPEP should be started as soon as possible after the exposure. Initiation of RPEP should not await the results of laboratory examination or an observation period of the implicated animal. As a rule, the 10-day observation period for dogs, cats and ferrets should not be relied on for exposure in rabies-enzootic areas because transmission of virus may occur earlier than 10 days before the onset of symptoms in the animal (Dutta 1994; Kasempimolporn 2000, as cited in BCCDC, 2011).

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<sup>1</sup> For animal rabies activity in Canada, see the CFIA website at: <http://www.inspection.gc.ca/english/anima/disemala/rabrag/statse.shtml>

<sup>2</sup> In 2000-10, the total human rabies deaths due to domestic animal exposure outside of Asia and Africa was 19. For Asia and Africa, for the years 2000-02 and 2003-09 the total was 2177. (WHO 2010, as cited in BCCDC, 2011) For information on the risk of rabies in other countries, consult the WHO publication "International Travel and Health" available at: <http://www.who.int/ith/en/>. To help assess the risk in specific countries, refer to the WHO map at [http://gamapserver.who.int/mapLibrary/Files/Maps/Global\\_Rabies\\_ITHRiskMap.png](http://gamapserver.who.int/mapLibrary/Files/Maps/Global_Rabies_ITHRiskMap.png)

## **Question 2: Type of exposure?** (Adapted from BCCDC, 2011)

In a potentially infected animal, the following body substances/tissues may be infectious:

- Saliva and salivary glands
- Neural fluid and tissue

As such, the highest risk exposure is from the bite of an infected animal that breaks the skin. Scratches from an infected animal can theoretically introduce rabies virus if, for example, the animal had licked its nails prior to the scratch. In practice, very few cases of human rabies have been reported secondary to this route of transmission (Afshar 1979 as cited in BCCDC, 2011).

The virus can rarely be found in urine, muscle and lungs. Contact with such materials has not been documented to lead to transmission of rabies. Fresh bat feces (guano) may also contain the virus. There is theoretical risk of airborne transmission of rabies virus from bat feces (Brown 1971, Heymann 2008, as cited in BCCDC, 2011). RPEP should only be considered for an aerosol exposure where the number of bats in an enclosed area is very high, the exposure is prolonged and the appropriate personal protective equipment was not used. Blood is considered non-infectious, as infected animals are not viremic.

Exposure to the face and hands increases the risk of rabies because these body parts are highly innervated, providing greater and faster opportunity for virus to enter the nervous system. Although the distance of the exposed body part to the brain affects the incubation period, it does not affect the time available to provide RPEP (i.e., once the virus enters the peripheral nervous system, RPEP is no longer of use).

## **Question 3: Is the client vaccinated against rabies?**

While the vaccination status of the person does not influence the need for RPEP, the protocol for RPEP does differ for those individuals who have previously been vaccinated for rabies, so it is critical to assess this information.

## **RPEP Started in Other Countries** (Adapted from BCCDC, 2011)

When travellers are exposed to an animal in a rabies-zoonotic country, they may be started on RPEP in that country. For various reasons, the RPEP received may not be adequate.<sup>3</sup>

In determining the value of biologicals administered overseas, factors to consider include:

- Does the client have the details of RPEP documented by the provider (label for the biologicals and the schedule of injections)?
- Was the RPEP administered at a well known urban hospital, university or a clinic affiliated with a hospital?
- Is the physician or clinic listed with the International Society of Travel Medicine?

If the validity of the RPEP series given or begun in another country is in question (e.g., non-WHO approved vaccine or counterfeit vaccine), draw serum for rabies antibody titres and start a new series of RPEP (WHO 2008 and CATMAT 2002 as cited in BCCDC, 2011). Provide Rablg if the person had not received WHO-approved vaccine and no Rablg or Rablg of questionable validity was provided (CATMAT 2002 as cited in BCCDC, 2011).

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<sup>3</sup> RPEP provided in some countries may be inadequate for various reasons such as compromised cold chain, counterfeit vaccine or lack of Rablg. There are reports of counterfeit vaccines being used in the developing world; however, there are no specific details as to the countries where this occurs or how widespread the practice is (Wandeler A; Meslin FX; Rupprecht CE; personal communication, 2008). As of 2008, there was no WHO-approved Rablg available in China, apart from Hong Kong (Davis 2008).

Submit the specimen to the Whitehorse General Hospital Lab, which will forward to BCCDC, which again forwards it to the National Microbiology Laboratory. Allow for at least a one- to two-week turnaround. If the titre returns an Ab level of  $\geq 0.5$  IU/mL, and the client has had a complete series of vaccinations, the new series of vaccinations can be discontinued. If the titre is  $< 0.5$  IU/mL, the series of vaccinations started in Canada should be completed.

If a WHO-approved vaccine was administered using a WHO-approved schedule<sup>4</sup> under appropriate conditions but no Rablg was administered, there is no need to repeat vaccination, provide Rablg or test antibody titres. This is based on the logic that such a vaccine course will induce an antibody response and Rablg will not be effective given more than seven days after the first dose of vaccine.

If a WHO-approved vaccine series was started overseas, the series can be completed with another WHO-approved vaccine licensed in Canada (WHO 2010, as cited in BCCDC, 2011). If the vaccine series was started using the ID route, it can be completed using the IM route.<sup>5</sup> The opposite is not recommended. If a different, but WHO-approved, dosing schedule was used overseas, attempt to continue with this schedule. If the schedule used is not WHO-approved, consider re-initiation of the series.<sup>6</sup>

Travellers who have been treated should try to obtain detailed, written information on the type of Rablg and vaccine they received, and the vaccination schedule. It would also be advisable to obtain a label of the biologicals they received. This will help determine the validity of the vaccine used. Reference should also be made to the list of WHO approved vaccines in the current edition of the Canadian Immunization Guide.

#### **Question 4: What type of animal is involved?**

##### **Domestic Animals**

Most exposures to domestic animals from Yukon do not warrant RPEP. If the animal can be confined, a 10-day observation period is advised. If the animal displays neurological signs suggestive of rabies or if it dies within 10 days, the brain should be immediately tested (refer to Animal Health Tab for details) and RPEP should begin immediately. RPEP can be discontinued if the rabies test is negative.

The euthanasia of pets specifically for rabies testing is discouraged in favour of a 10-day confinement and observation period, but an owner may choose to euthanize any animal that has bitten or attacked a person. A decision on whether euthanized animals should be tested for rabies will be made in conjunction with the CVO and CFIA District Veterinarian. Refer to **Animal Health Tab** for details.

A pet kept exclusively indoors (day and night) has virtually no risk of acquiring rabies, unless a bat or other potentially rabid animal entered the house and had physical contact with the pet.

If a domestic animal is known to have had physical contact with an animal later confirmed to be rabid and a person has an exposure to the domestic animal to which rabies virus could have been transmitted, initiation of RPEP may be indicated. A minimum of four days must elapse from when the rabid animal contacted the domestic animal to

<sup>4</sup> WHO-recommended IM dosing schedules include a five-dose schedule on days 0, 3, 7, 14 and 28, a four-dose schedule with two doses on day 0 followed by one dose each on days 7 and 21 and a four-dose schedule on days 0, 3, 7 and 14 (WHO 2010, as cited in BCCDC, 2011). ID schedules can be found at <http://www.who.int/rabies/human/postexp/en/>

<sup>5</sup> No study has been done on immunogenicity following a change of the route of vaccine administration. The recommendation provided here is based on expert opinion and on current practice which have led to no failures.

<sup>6</sup> There is no evidence for or against this. This recommendation is based on expert opinion.

when the domestic animal contacted the human to allow for incubation and transmission of rabies virus. Domestic animals can shed rabies virus up to 10 days before symptoms appear and minimum incubation period is 14 days.

### **Wild or Exotic Animals**

The incubation period and period of rabies virus shedding in animals other than dogs, cats or ferrets are not established. Other species must be euthanized and appropriate specimens submitted for testing to definitively rule out rabies. This includes dog-wolf and cat-bobcat hybrids, and other wild or exotic animals. If these animals are not available for testing, consider proceeding with RPEP.

In all geographic jurisdictions, squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice and other rodents, rabbits and hares are only rarely infected with rabies. This is not because they are not susceptible to infection but because they rarely survive an encounter with another rabid animal long enough to develop infection. They are not known to have caused human rabies in North America. RPEP should only be considered if the animal's behaviour was highly unusual.

### **Bats** (Adapted from BCCDC, 2011)

These recommendations apply to all bat exposures that occur in Yukon or globally.

For bat exposures, intervene (testing and/or RPEP) when both of the following conditions apply:

- There has been direct contact with a bat

#### **AND**

- A bite, scratch or saliva exposure into a wound or mucous membrane cannot be ruled out (NACI 2009 as cited in BCCDC, 2011).

Evidence for direct bat contact may include observation of physical contact or verbal history of physical contact. Consult the NACI statement on bat behaviour and exposure. (NACI 2009, as cited in BCCDC, 2011)

In children and other people whose histories are less reliable (cannot accurately report bites or scratches), any direct contact with a bat may require RPEP. While clothing may act as a barrier to direct contact, it can also mask exposure. NACI recommends that children who have contact with a bat through clothing may require RPEP because their histories are less reliable. (NACI 2009 as cited in BCCDC, 2011)

RPEP is not indicated if there is no history of direct contact; for example, if a bat was found in the house, or if someone woke up with a bat in the bedroom, without any evidence it touched someone.<sup>7</sup> When a bat is found in the room with a child or an adult who is unable to give a reliable history, assessment of direct contact can be difficult.

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<sup>7</sup> The risk of rabies in the absence of recognized physical contact with bats is exceedingly small. A Québec survey found that ~0.1 per cent of the population may be exposed annually to a bat in the bedroom while they are sleeping (De Serres 2009). However, only a minority (<5 per cent) of these individuals eligible for RPEP sought advice and received RPEP.

There have been 56 bat-variant rabies cases in Canada and the US in 1950-2007 (3.9/1 billion person-years) with only six of those in Canada. (De Serres 2008) Thirty-one (55 per cent) had direct contact with a bat, six (11 per cent) found bats in their home and 19 (34 per cent) reported no bat exposure at all. Among those with a bat found in their home, two reported bats in their bedroom while sleeping and the other four reported bats in the home either while sleeping or close to the time they may have been exposed. Of the 11 cases with a history of a bat in the bedroom, nine reported being bitten or awoken by the bat landing on them and two reported no direct contact.

The number needed to vaccinate to prevent a single case of rabies from bat-in-bedroom exposures is 2.7 million at a cost of \$2.1 billion (De Serres 2009 as cited in BCCDC, 2011).

Factors indicating that direct contact may have occurred include the individual waking up crying or upset while the bat was in the room or observation of the bat in close proximity to the individual (e.g., in or on the bed).

Evidence for bat contact may include observation of contact, verbal history of contact, or physical evidence of a bite or scratch. When there has been no direct contact, bats should not be captured or tested. An attempt to capture a bat may increase the risk of direct contact. Since no RPEP is recommended if there is no contact, there is no point in testing such bats.

In instances where a domestic animal has had a bat in its mouth, and immediately licks broken skin or bites someone, the risk of rabies virus transmission is minimal. It is conceivable that rabies virus could be present, but there are no known incidents of transmission by this route (Fehlner-Gardiner C, personal communication as cited in BCCDC, 2011). As a rule, transmission of rabies is by infected animals and not by healthy animals that may have (in less time than the incubation period of rabies) come into contact with a rabid animal.

There is low risk of airborne transmission of rabies virus. RPEP should only be considered for an aerosol exposure where the number of bats in an enclosed area is very high, the exposure is prolonged and the appropriate personal protective equipment was not used.

#### **Question 6: Vaccination status of a domestic animal?**

Rabies vaccination is available through veterinarians for dogs, cats, ferrets and livestock. Commercial vaccines confer good protection against rabies infection although the time of protective antibody varies depending on the species and the vaccine. When there is proof of vaccination that provides valid protection to the time of the exposure incident, RPEP is not required.

#### **Question 7: Is the animal showing clinical signs consistent with rabies?**

An animal showing one or more of the clinical signs listed is suggestive of rabies. While it is possible for other diseases or conditions to produce similar signs, it is essential that any suspect animal that is showing these signs either be confined for 10 days for observation or euthanized for rabies testing to support a decision for RPEP. **A suspect animal that is showing any clinical signs suggestive of rabies will result in an investigation by the CFIA and an official quarantine is likely to be ordered if the animal is not euthanized in order to ensure protection of human health during observation.** If the animal has rabies, its condition will deteriorate rapidly and it is likely to die within several days. Quarantine would be under veterinary supervision and euthanasia is often required for humane reasons. Refer to **Animal Health Tab** for further details.

#### **Question 8: Was the exposure provoked?**

An unprovoked attack or exposure may indicate abnormal behaviour suggestive of rabies. Often the person may not be aware of what will provoke an animal, so may interpret an attack as unprovoked when there was something that initiated it. An unprovoked attack may support administering RPEP when combined with other information.

## **Rabies Risk Investigation Form B Rationale for RPEP Decision**

### **Page 1**

#### **Question 2: If a domestic animal was involved, can recent contact with wildlife be ruled out?**

Domestic animals that have had recent contact with wildlife, especially if it has been aggressive contact or a fight, may suggest a higher risk of rabies. If the owner doesn't know about wildlife contact or cannot confirm that a domestic animal has not been in contact with wildlife, it is assumed to be a possible risk.

#### **Question 4: Has the animal involved bitten more than one person in the past 72 hours?**

If the animal has shown sustained aggressive behaviour and has bitten more than a single individual in a short time period, it is more likely that it might be in the clinical stages of rabies when the incident occurred.

### **Page 2**

#### **Question 5: If a sample of the animal was collected and sent for rabies testing, what was the result?**

If RPEP has not been initiated pending the results of testing the brain of a suspect animal for rabies, then a positive animal test is full justification for RPEP.

If RPEP was initiated and the brain of the suspect animal was sent for testing and the test is negative, the decision to discontinue the RPEP will need to consider that tissues from an animal can test negative if the animal was in the early stages of rabies when it was killed. For this reason, it is considered preferable to hold a suspect animal for 10 days for observation rather than to kill it immediately for testing, to ensure that if rabies is present, the disease can progress to the point where the virus can be detected. This is more of a concern in countries where rabies is endemic, and typically if the rabies tests on a suspect animal are negative, RPEP would be discontinued.

### **RPEP Administration Information**

When the CMOH makes the decision to implement RPEP the health care provider will be advised within 48 hours.

YCDC will provide copies of all RPEP instructions and dosage protocol information to the primary health care provider who will be administering the RPEP series. The instruction sheets for protocol and dosage follow.

YCDC or CMOH will fax the "Record of Rabies Vaccine and Rabies Immune Globulin Administration" to the person who will be administering the RPEP. This document is intended to serve as a tool for health care providers in reminding and scheduling subsequent vaccinations for the client.

YCDC will create a patient record file in each instance when RPEP is authorized. As per all immunizing agents in the Yukon, documentation of RPEP (Rablg and Vaccine) will be entered into iPHIS.

## **Release of Biologicals for Rabies Post-Exposure Prophylaxis (RPEP)**

**The Medical Officer of Health must authorize all releases of RPEP**

### **How to Access RPEP**

#### **Monday-Friday (0800-1600 hrs)**

The CMOH or assigned designate will call the WGH pharmacy to request the release of the products (request Rabies vaccine and Rablg) at (867) 393-8737.

**After hours**, the CMOH or assigned designate will phone WGH Admitting and Discharge and request that the pharmacist on call be paged. Phone: (867) 393-8700.

### **Administration Arrangements – Location of Exposed Person**

#### **Whitehorse:**

In Whitehorse, the administration of the initial dose of vaccine along with Rablg should occur in the WGH ER or as arranged by YCDC.

**WGH ER phone: (867) 393-8926**

Subsequent doses of vaccine will be arranged through YCDC. Potential sites include: YCDC, Whitehorse Health Centre or WGH ER.

#### **Communities:**

Old Crow Health Centre has a stock of RPEP (Vaccine and Rablg).

All other communities: Arrangements will be made in collaboration with the nurse to have RPEP sent as soon as possible to the community from WGH hospital, where the administration of RPEP will be done by the Primary Health Care Nurse or Community Health Nurse at the Community Health Centre. Arrangements for administration could also include having the client come into Whitehorse.



## Rabies PEP Instruction Sheet - Dosage



### Rabies Post - Exposure Prophylaxis

#### Rabies Immune Globulin (Rablg) Dosage by Bodyweight

**Rablg:** 1 vial = 2 ml = 300 IU

**Dose (ml):** 20(IU per kg) x wt (kg)/150(IU per ml)

Infiltrate as much Rablg as possible deep into and around the wound(s) in order to neutralize the virus. Inject the remaining amount intramuscularly (IM) in the ventrogluteal area (in those > 7 months of age) or in the anterolateral thigh. When more than one wound site exists, each site should be locally infiltrated with a portion of the Rablg using a separate syringe and needle for each infiltration. If there are extensive wounds, where the calculated dose of Rablg (by weight) is **not** adequate in volume to infiltrate all wounds, dilute the Rablg 2-3 fold in normal saline to create an adequate volume to infiltrate all wounds. When there is no wound site, the Rablg should be given IM in the ventrogluteal site (in those > 7 months of age) or in the anterolateral thigh.

Rablg should not be given in the deltoid. Both deltoid muscles should be reserved for the administration of rabies vaccine.

***Do not exceed the recommended dose***

#### POST-EXPOSURE RABIES VACCINE :

##### Not previously immunized:

- 1 ml IM days 0,3,7,14 (Rablg on day 0) for immunocompetent

- 1 ml IM days 0,3,7,14,28 (Rablg on day 0) for immunocompromised

##### Previously immunized:

- Refer to page 12 in persons previously immunized against rabies

Weight (pounds)	Weight (Kg)	Dose (I.U)	# of vials	Dose (ml)
10	4.5	91	1	0.6
12	5.4	109	1	0.7
15	6.8	136	1	0.9
20	9.1	181	1	1.2
22	10.0	200	1	1.3
25	11.3	227	1	1.5
30	13.6	272	1	1.8
35	15.9	318	2	2.1
40	18.1	363	2	2.4
45	20.4	408	2	2.7
50	22.7	454	2	3
55	24.9	499	2	3.3
60	27.2	544	2	3.6
65	29.5	590	2	3.9
70	31.8	635	3	4.2
75	34.0	680	3	4.5
80	36.3	726	3	4.8
85	38.6	771	3	5.1
90	40.8	816	3	5.4
95	43.1	862	3	5.7
100	45.4	907	3	6
105	47.6	953	4	6.4
110	49.9	998	4	6.7
115	52.2	1043	4	7
120	54.4	1089	4	7.3
125	56.7	1134	4	7.6
130	59.0	1179	4	7.9
135	61.2	1225	5	8.2
140	63.5	1270	5	8.5
145	65.8	1315	5	8.8
150	68.0	1361	5	9.1
155	70.3	1406	5	9.4
160	72.6	1452	5	9.7
165	74.8	1497	5	10
170	77.1	1542	6	10.3
175	79.4	1588	6	10.6
180	81.6	1633	6	10.9
185	83.9	1678	6	11.2
190	86.2	1724	6	11.5
195	88.5	1769	6	11.8
200	90.7	1814	6	12.1
205	93.0	1860	7	12.4
210	95.3	1905	7	12.7
215	97.5	1950	7	13
220	99.8	1996	7	13.3
225	102.1	2041	7	13.6
230	104.3	2087	7	13.9
235	106.6	2132	8	14.2
240	108.9	2177	8	14.5
245	111.1	2223	8	14.8
250	113.4	2268	8	15.1

# Record of Rabies Vaccine and Rabies Immune Globulin Administration



## Record of Rabies Vaccine and Rabies Immune Globulin Administration

### CLIENT INFORMATION

Name: \_\_\_\_\_ DOB: \_\_\_\_\_ Gender: ( ) YHCIP# \_\_\_\_\_  
LAST FIRST  
 Address: \_\_\_\_\_ City or Community: \_\_\_\_\_ Province: \_\_\_\_\_ Postal Code: \_\_\_\_\_  
 Phone Numbers: Home: \_\_\_\_\_ Work: \_\_\_\_\_ Cell: \_\_\_\_\_ Message: \_\_\_\_\_

### RABIES VACCINE

<b>Dose 1:</b> (day 0)	Due: _____ Given: _____	Lot #: _____ Site: _____	#1 _____ (Provider)
<b>Dose 2:</b> (day 3)	Due: _____ Given: _____	Lot #: _____ Site: _____	#2 _____ (Provider)
<b>Dose 3:</b> (day 7)	Due: _____ Given: _____	Lot #: _____ Site: _____	#3 _____ (Provider)
<b>Dose 4:</b> (day 14)	Due: _____ Given: _____	Lot #: _____ Site: _____	#4 _____ (Provider)
<b>Dose 5:</b> (day 28) <small>(dose 5 needed only if immunocompromised)</small>	Due: _____ Given: _____	Lot #: _____ Site: _____	#5 _____ (Provider)

### RABIES IMMUNE GLOBULIN

Date administered: \_\_\_\_\_  
 Lot #(s): \_\_\_\_\_  
 Provider: \_\_\_\_\_

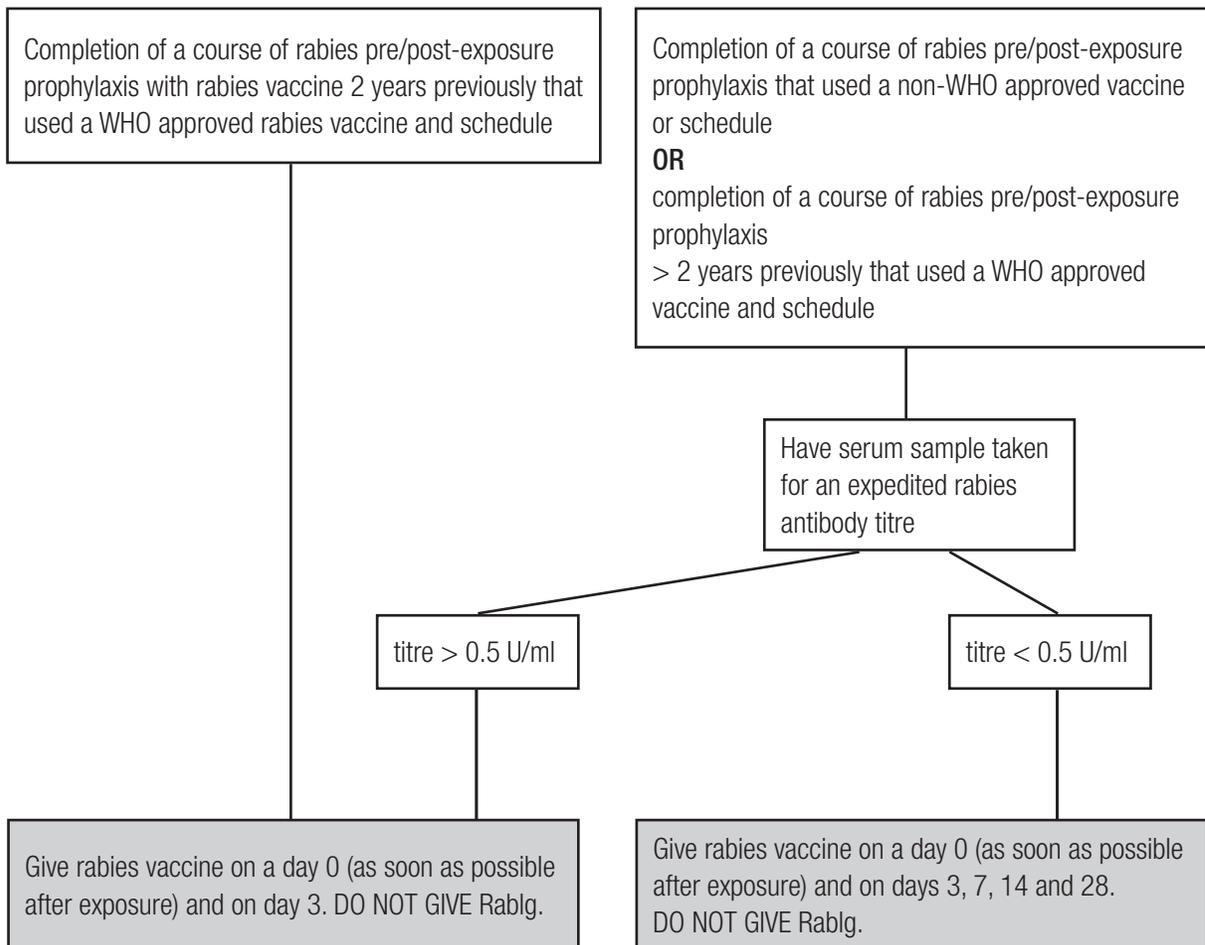
## Exposures in persons previously immunized against rabies *(Adapted from BCCDC, 2011)*

Have serum sample taken and administer first doses of rabies vaccine while awaiting lab results. Submit the specimen to WGH laboratory and indicate that an expedited result is requested.

The WGH lab will forward the specimen to BC's PHSA Laboratory, which then forwards samples to the National Microbiology Laboratory in Winnipeg where rabies antibody titre tests are run twice a week. The test takes two days. The timing of the notification of testing results will depend on when the specimen arrives at Winnipeg Laboratory.

It is very likely that the rabies antibody titre result will not be available by day 7. Administer the third dose of rabies vaccine on day 7.

The PHSA Laboratory will attempt to obtain an expedited result in one week. If the rabies antibody titre result is not available by day 14, administer the fourth dose of rabies vaccine on day 14.



## Pre-Exposure Rabies Immunization *(Adapted from BCCDC, 2011)*

Pre-exposure rabies immunization is elective and should be offered to persons at potentially increased risk of contact with rabid animals. Refer to the Community Nursing Immunization Manual for details regarding vaccine administration.

Table 1 presents the personal risk categories for which pre-exposure rabies immunization is recommended.

**Table 1: Pre-exposure Rabies Immunization**

Personal Risk Category	Nature of Risk	Typical Populations	Pre-exposure Immunization
Very low risk (Yukon population at large)	Rare exposure to virus. Potential for mucous membrane, bite or non-bite exposure.	Yukon population at large and most travellers to epizootic areas not in any of the higher risk groups below.	No immunization necessary.
Low risk	Exposure to virus nearly always episodic with source recognized. Potential for mucous membrane, bite, or non-bite exposure.	Veterinarians and staff, animal control and wildlife workers in areas of low rabies enzooticity veterinary and animal health technology students. Children and travellers visiting foreign epizootic areas for one month or more. Travellers to foreign epizootic areas, trekking/hiking for any length of time, and going to be far away from a major medical centre.	Initial series. Booster only following a subsequent exposure, or as determined by post-exposure serology.
Moderate Risk	Virus present episodically, with source recognized, but exposure may be unrecognized. Potential for mucous membrane, bite, non-bite or aerosol exposure.	Rabies diagnostic lab workers and spelunkers. Veterinarians and staff, animal control and wildlife workers in rabies epizootic areas. Hunters and trappers in high-risk areas such as the far north.	Initial series. Serologic testing every 2 years. Booster immunization when antibody level is < 0.5 IU/ml.
High Risk	Frequent exposure. Virus present continuously, often in high concentrations. Potential for mucous membrane, bite, non-bite or aerosol exposure. Specific exposures may go unrecognized.	Rabies research lab workers; rabies biologicals production workers.	Initial series. Serologic testing every six months. Booster immunization when antibody level is < 0.5 IU/ml



# ENVIRONMENTAL HEALTH SERVICES GUIDELINES

## What will Environmental Health Services do?

1. Upon receipt of Form A, an Environmental Health Officer will carry out the following procedure:
  - Review the responses to the questions on Form A. Gather any missing information required to complete the form. Possible sources include:
    - health care provider who submitted Form A;
    - exposed person (patient);
    - owner of the domestic animal involved;
    - bylaw services or municipal/First Nation government;
    - wildlife officer; and
    - R.C.M.P.

***Note:** Inform the owner or other person who has taken responsibility of the animal that it is to be contained, confined and under observation until further direction is received from the CVO.*

2. Gather information to complete the follow-up section of Form B. Possible sources include:
  - owner of the domestic animal involved;
  - bylaw services or municipal/First Nation government;
  - wildlife officer; and
  - R.C.M.P.
3. Decide if a public communications strategy should be recommended (question 5 on Form B).
  - If yes, go to Step 10.
4. Decide if the situation is **urgent** based on the following criterion:
  - If you decided to recommend a public communications strategy in question 5 on Form B, the situation is considered to be **urgent**.
5. Scan Form A (pages 1 and 2) and Form B (page 1) and:
  - send (e-mail) it to yourself;
  - prepare an e-mail (i.e., forward the e-mail) with one of the following subject lines:
    - Rabies Risk Investigation; or
    - Rabies Risk Investigation – URGENT.
  - add any relevant/important information to the e-mail which does not appear on the forms; and e-mail it to the:
    - Chief Medical Officer of Health;
    - Chief Veterinary Officer; and
    - person reporting (top of Form A).
6. In addition to e-mailing Forms A and B to the Chief Medical Officer of Health and Chief Veterinary Officer, contact them by phone if the situation is **urgent**.

7. The Chief Medical Officer of Health will report back his or her decision on RPEP; if there is any delay, contact them directly for this information. Review the decision, and:
  - If rabies post-exposure prophylaxis is to be administered or offered, consult with the Chief Medical Officer of Health.
  - In consultation with the Chief Medical Officer of Health, discuss and decide if a public communications strategy should be recommended.
    - If yes, go to Step 10.
  
8. The Chief Veterinary Officer will report back his or her decision on an animal management strategy. If there is any delay, contact them directly for this information. Review the decision, and:
  - If an animal management strategy was put into place, consult with the Chief Veterinary Officer.
  - In consultation with the Chief Veterinary Officer, discuss and decide if a public communications strategy should be recommended.
    - If yes, go to Step 10.
  
9. Based on the results of an animal management strategy and/or the results of a rabies test, decide if a public communications strategy should be recommended.
  - If yes, go to Step 10.
  
10. If it has been decided that a public communications strategy should be recommended, the following people must be informed:
  - Manager, Environmental Health Services;
  - Manager, Yukon Communicable Disease Control;
  - Chief Medical Officer of Health;
  - Chief Veterinary Officer;
  - Director, Community Health Programs;
  - Director, Communications and Social Marketing, Health and Social Services; and
  - Director, Community Nursing.

In cooperation with these people, decide if a public communications strategy will be conducted. If so, participate in the development of the message that will be released to the public to communicate the risk and advise as to what actions they need to take. This could include:

- description of the animal;
- significant dates/times;
- details of the incident;
- what to look out for (e.g., animal(s) displaying clinical signs consistent with rabies);
- what to do if they may have been exposed;
- what to do if they see a suspicious animal or find a dead animal; and
- who to contact (e.g., wildlife officer, R.C.M.P., bylaw officer, health care provider).

11. Document all information gathered, contacts, and actions taken on the appropriate form and attach supplementary notes as required. Also attach any e-mails, letters, media releases and other relevant documents. Place documents in the Rabies Risk Investigation file located in the Environmental Health Services administration office.



# RABIES RISK INVESTIGATION FORM B – PAGE 2

This section is to be completed after Form A and B have been sent to the Medical Officer of Health and the Chief Veterinary Officer.

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**Rabies Post Exposure Prophylaxis**

1) Was rabies post-exposure prophylaxis recommended (determined by the Medical Officer of Health)?  Yes  No

2) If yes, is a public communications strategy required?  Yes  No

Comments / Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  additional notes and/or documents attached

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**Animal Management**

1) Was an animal management strategy implemented (determined by the Chief Veterinary Officer)?  Yes  No

10 day observation period  6 month quarantine period  
 3 month quarantine period  euthanize the animal

Dates of observation or quarantine period: From: \_\_\_\_\_ YYYY-MM-DD To: \_\_\_\_\_ YYYY-MM-DD

2) If yes, is a public communications strategy required?  Yes  No

Comments / Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  additional notes and/or documents attached

3) If an animal management strategy was implemented, what was the result? (check one)

the animal is alive and did not develop clinical signs consistent with rabies.  
 the animal develop clinical signs consistent with rabies. Date: \_\_\_\_\_ YYYY-MM-DD  
 the animal died. Date: \_\_\_\_\_ YYYY-MM-DD

4) Based on this result, is a public communications strategy required?  Yes  No

Comments / Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  additional notes and/or documents attached

5) If a sample from the animal was collected and sent for rabies testing, what was the result?

the animal tested **positive** for rabies. Date: \_\_\_\_\_ YYYY-MM-DD  
 the animal tested **negative** for rabies.

Date sample was sent for testing: \_\_\_\_\_ YYYY-MM-DD

6) Based on this result, is a public communications strategy required?  Yes  No

Comments / Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  additional notes and/or documents attached

June 22, 2011 Rabies Risk Investigation Form B

## **EHS Timelines for Follow Up**

Due to the potential risk that rabies poses to human health, a review of the Rabies Investigation Form A will be completed immediately upon receipt. If the situation is classified as urgent the follow up will be completed immediately, otherwise an EHO will initiate follow up within 18 hours of receipt of Form A and will complete actions required for Form A & B within 24 hours. If the review and information gathering process cannot be completed within 24 hours, the Chief Medical Officer of Health, the Chief Veterinary Officer, and the person reporting shall be informed and provided with whatever information is available at that time. Additional information shall be forwarded as it's gathered. All required follow up will be completed within four days and the reporting person (health care provider) will be notified when the investigation is complete.

## **EHS Roles and Responsibilities**

Environmental Health Services collects and shares information relevant to public health risks from rabies in Yukon. They ensure appropriate communication strategies to protect public health and coordinate with the CMOH, CVO and other partners to manage the risk to public health from rabies.

EHS specific roles include:

- Information gathering on the animal involved or implicated to support RPEP decisions and animal management decisions.
- Evaluation of information to determine the need for a public advisory concerning the risk posed by a rabid animal.
- Sharing information and collaborating with other units within Health and Social Services, other departments within the Government of Yukon, and with other agencies (e.g., R.C.M.P., Bylaw Services) in a timely manner.
- Distribution of information on rabies.

## **Information Gathering and Rationale for Decision Making**

Environmental Health Services (EHS) typically becomes involved in a rabies investigation upon receipt of a Rabies Risk Investigation Form A, which is to be submitted directly to EHS by the person who completed it.

For EHS, information regarding the animal involved is most important as it is essential for determining whether there is a risk to public health.

Before a risk assessment can be properly conducted, Form A needs to be completed and information gathered for the Rabies Risk Investigation Form B.

The following pages provide a detailed rationale for Forms A and B to assist EHOs with gathering the necessary information.

## **Rabies Risk Investigation Form A Rationale for Public Health Implications**

*Note: Only the questions specific to public health responsibility are included in this section. Refer to the YCDC and CMOH Tab for questions related to RPEP decision making.*

### **Question 1: Where did the exposure occur?**

EHS is responsible for mitigating risks to public health within Yukon only, so it is important to consider the location of exposure. It is the responsibility of YCDC and the CMOH to follow up on potential rabies exposures that occur outside of Yukon.

### **Question 4: Type of animal involved?**

Certain species of animals are more likely to carry the rabies virus. In Yukon, these include: domestic animals, such as dogs, cats, ferrets and livestock; and wild animals, such as bats, arctic fox, red fox and any wild carnivore.

If the animal involved is wild, the risk of rabies is considered to be higher. Additionally, exposure incidents involving stray (i.e., feral) domestic animals are also considered higher risk for rabies.

For domestic animals that are indoor pets only, the risk of rabies is lower because there would be few opportunities for the animals to interact with other animals, either domestic or wild. It should be noted that animals such as rodents, small caged pets, rabbits, squirrels, moles, muskrats, shrews and voles are not considered likely to carry rabies and, therefore, contact with these types of animals is not considered a risk.

### **Question 5: If a domestic animal, is the identity of the owner known?**

Identifying the owner of a domestic animal is important for gathering information (for subsequent questions) and, if necessary, implementing and maintaining an animal management strategy.

While unfortunate, failure to identify the owner of a domestic animal is interpreted to mean that the risk of rabies is unknown. In these cases, mitigating of a risk to public health is based on the premise that it's best to err on the side of caution.

### **Question 6: If a domestic animal, is it vaccinated against rabies?**

The vaccination status of a domestic animal is important because it identifies the level of risk the animal poses for the transmission of rabies. Animals that have been vaccinated against rabies within the last year, or vaccinated with a three-year vaccine, are considered low risk for the transmission of rabies.

Animals that have not been vaccinated, or have an out-of-date vaccination, are considered higher risk for the transmission of rabies. The animal should be isolated and observed for 10 days or until further direction from the Chief Veterinarian Officer.

**Question 7: Is the animal showing clinical signs consistent with rabies?**

Clinical signs consistent with rabies include:

- inability to swallow, slack jaw, drooling, foamy saliva;
- staggering, walking without purpose, partial paralysis, weakness;
- atypical vocalizations; change in voice tone; excessive vocalizations;
- change in mental state either agitated/aggressive or depression;
- rapid progression of clinical illness, especially weakness to paralysis;
- unprovoked, sustained aggression that is “mindless” and intense;
- confusion; wandering aimlessly; excessive boldness; and
- behaviour not typical of the species (e.g., nocturnal animals out in daytime).

If an animal is or did display any of the above clinical signs, it is considered to be high risk for rabies.

**Question 8: Was the exposure unprovoked or provoked?**

A provoked exposure/attack is one where the person did something to “provoke” the animal, even if the action was unintentional, and the attack would be the animal’s normal response to such an action. For example:

- attempting to corner or trap an animal;
- entering an area that the animal considers its territory;
- Rapid movement (running, biking) near an animal that incites a chase response
- Approaching an animal’s litter;
- coming too close to an injured animal;
- coming between two fighting animals;
- picking up or petting an unfamiliar animal;
- interfering with an animal’s food;
- interfering/wrestling with an animal’s owner; or
- teasing an animal.

Unprovoked contact is when nothing is done by the person to instigate the action from the animal. Unprovoked contact is of greatest concern and is considered high risk for rabies.

**Question 9: Where is the animal now?**

The availability of the animal involved is important so that it can either be confined and observed for the development of rabies, euthanized, and/or tested for rabies. Without the animal, the presence of rabies is unknown and mitigating a risk to public health is based on the premise that it is best to err on the side of caution.

Rabies Risk Investigation Form B Rationale for Public Health Implications

## **Follow-up questions are completed on Form B to assist in risk determination.**

### **Question 2: If a domestic animal was involved, can recent contact with wildlife be ruled out?**

Domestic animals that have had recent contact with wildlife, especially if it has been aggressive contact or a fight, may suggest a high risk for rabies. An owner may not always know if the animal has had contact with wildlife, so if it cannot be confirmed that the domestic animal has NOT had contact, it is assumed to be a possible risk.

### **Question 3: If a domestic animal was involved:**

Does the owner want to euthanize the animal?

Will the animal be euthanized as a risk to public safety?

Sometimes, the owner decides to euthanize their domestic animal following an incident. Other times, the R.C.M.P. or Bylaw Services decide to euthanize the domestic animal as it poses a risk to public safety. If either of these is the case, there will be no ongoing risk to public health.

Exposures which occurred prior to this will still need to be assessed and mitigated if necessary.

### **Question 4: Has the animal involved bitten more than one person in the last 72 hours?**

If the animal involved has bitten more than one person in the last 72 hours, it is considered a high risk for rabies as this type of behaviour is unusual.

### **Question 5: Based on the information gathered on Forms A and B, is a public communications strategy required?**

At different stages of the process, a decision will need to be made about whether or not to recommend that the public be informed of a past or ongoing risk of rabies. To assist in the decision-making process, Table 2 outlines which combination of responses indicates that a public communications strategy is recommended.

**Table 2: Forms A + B responses indicating that a public communication strategy should be recommended**

Combination 1:					
Form A	Question 1: the exposure occurred within Yukon	➔	Yes to all	➔	Public Communications Strategy Recommended
	Question 4: a domestic or wild species of animal was involved	➔			
	Question 7: the animal is (was) showing clinical signs consistent with rabies	➔			
Combination 2:					
Form A	Question 1: the exposure occurred within Yukon	➔	Yes to all	➔	Public Communications Strategy Recommended
	Question 4: a wild species of animal was involved	➔			
	Question 8: the exposure was unprovoked	➔			
Form B	Question 4: the animal has bitten more than one person in the last 72 hours	➔			
Combination 3:					
Form A	Question 1: the exposure occurred within Yukon	➔	Yes to all	➔	Public Communications Strategy Recommended
	Question 4: a domestic species of animal was involved; the domestic animal is (was) stray (feral)	➔			
	Question 5: the owner of the domestic animal is not known	➔			
	Question 8: the exposure was unprovoked	➔			
Form B	Question 4: the animal has bitten more than one person in the last 72 hours	➔			
Combination 4:					
Form A	Question 1: the exposure occurred within Yukon	➔	Yes to all	➔	Public Communications Strategy Recommended
	Question 4: a domestic species of animal was involved; the domestic animal is an outdoor household pet	➔			
	Question 5: the owner of the domestic animal is known	➔			
	Question 6: the animal's vaccination status is not up-to-date	➔			
	Question 8: the exposure was unprovoked	➔			
Form B	Question 2: recent contact with wildlife cannot be ruled out	➔			
	Question 4: the animal has bitten more than one person in the last 72 hours	➔			
Responses to question 9 on Form A, and follow-up question 3 on Form B do not affect a decision to recommend a public communication strategy, instead they would affect the message in the following way:					
FORM A: Question 9	The location of the animal is known (either alive or dead)	➔	The public only needs to be advised of past exposures		
	The location of the animal is unknown	➔	The public need to be advised of past and future exposures		
FORM B: Question 3	The animal will be euthanized	➔	The public only needs to be advised of past exposures		
	The animal will not be euthanized	➔	The public need to be advised of past and future exposures		

## Rabies Post-Exposure Prophylaxis

### Question 1: Was rabies post-exposure prophylaxis recommended?

The decision to administer rabies post-exposure prophylaxis (RPEP) is made by the CMOH. If the risk to the exposed person (patient) is high enough that RPEP is either administered or offered, the public may need to be informed of a past or ongoing risk to public health due to the presence of a rabid animal. This is necessary in order to assess and/or treat unreported exposures, and to prevent further exposures to both humans and other animals.

### Question 2: If yes, is a public communications strategy required?

The decision to recommend RPEP may incorporate some or all of the information used to determine whether or not to carry out a public communications strategy. However, other information will also be used, such as the vaccination status of the exposed person. Therefore, it's important to know why rabies post-exposure prophylaxis was or was not administered or offered.

To determine whether or not to recommend a public communications strategy based the decision for rabies post-exposure prophylaxis, consult with the CMOH and follow their direction.

## Animal Management

### Question 1: Was an animal management strategy implemented?

Animal management strategies are determined by the Chief Veterinary Officer (CVO) in consultation with the CFIA. Depending on the specific animal management strategy, the public may need to be informed of a possible risk to public health due to the presence of a rabid animal. This is necessary in order to assess and/or treat unreported exposures to both humans and other animals. Refer to **Animal Health Tab** for details.

### Question 2: If yes, is a public communications strategy required?

Decisions on appropriate animal management strategies may incorporate some or all of the information used to determine whether or not to carry out a public communications strategy. However, information may be interpreted or weighted differently, and tolerances may be lower when considering the risk an animal poses to human health (e.g., if available, a wild or feral domestic animal that bites someone will always be euthanized, but not necessarily because rabies is suspected). Therefore, it's important to know why a particular animal management strategy was put in place.

To determine whether or not to recommend a public communications strategy based the decision for an animal management strategy, consult with the CVO and follow their direction.

### Question 3: If an animal management strategy was implemented, what were the results?

The result of an animal management strategy is important to know because one possible outcome is that the animal could develop clinical signs consistent with rabies. The animal may also die for other reasons, or may remain healthy. Depending on the results, the public may need to be informed of a possible risk to public health due to the presence of a rabid animal. This is necessary in order to assess and/or treat non-reported exposures to both humans and other animals.

**Question 4: Based on this result, is a public communications strategy required?**

To assist in the decision-making process, possible responses to this question, combined with those for question 6, which would lead to a decision to recommend the public be informed are provided in Table 3.

**Question 5: If a sample from the animal was collected and sent for rabies testing, what were the results?**

Test results are also important because one possible outcome is that the animal tests positive for rabies. If this is the case, the public may need to be informed of a possible risk to public health due to the presence of a rabid animal. This is necessary in order to assess and/or treat non-reported exposures to both humans and other animals.

**Question 6: Based on this result, is a public communications strategy required?**

To assist in the decision making process, Table 3 combines possible responses to this question with those for question 4, which would lead to a decision to recommend the public be informed.

**Table 3: Form B Animal management section responses indicating that a public communication strategy should be recommended**

<b>Combination 1:</b>				
Question 1: 10 day observation period	➔	Yes to all	➔	Public Communications Strategy Recommended
Question 3: the animal developed clinical signs consistent with rabies; and/or the animal died	➔			
<b>Combination 2:</b>				
Question 1: 3-month quarantine; or 6-month quarantine	➔	Yes to all	➔	Public Communications Strategy Recommended
Question 3: the animal developed clinical signs consistent with rabies; and/or the animal died	➔			
<b>Combination 3:</b>				
Question 1: euthanize the animal	➔	Yes to all	➔	Public Communications Strategy Recommended
Question 5: the animal tested positive for rabies	➔			
<b>Combination 4:</b>				
Question 5: the animal tested positive for rabies	➔	Yes	➔	Public Communications Strategy Recommended



# ANIMAL HEALTH UNIT GUIDELINES

## What will the Animal Health Unit (and CVO) do?

- Environmental Health Services will forward the completed Rabies Risk Investigation Forms A and B (by fax or scanned to email) to the CVO ([mary.vanderkop@gov.yk.ca](mailto:mary.vanderkop@gov.yk.ca)) when they are completed.
- The CVO will assess the information provided and provide an opinion on rabies risk to the CMOH and EHS as soon as possible (at the latest within 24 hours) and the CMOH will decide on administration of RPEP.

## If RPEP is initiated

- When RPEP is initiated, this indicates the animal involved in the encounter must be managed if possible, to control the risk of rabies.
- The CVO will contact the CFIA district veterinarian who has legislated authority over rabies, to report a rabies suspect animal and provide all supporting documentation.
- The CVO will support the CFIA to implement an official quarantine if the animal can be identified and confined.

While the CVO will defer to the CFIA district veterinarian in matters related to animal management of a rabies suspect animal, the remote location of Yukon communities requires a locally coordinated response in a timely manner. The following will be under the direction of the CFIA.

- The CVO will provide direction to local animal control officers or veterinarians for animal or sample handling when the animal can be identified and confined for quarantine or euthanasia for testing.
- When the animal involved is a wildlife species, the CVO will provide direction to conservation officers to facilitate capture or killing the animal for testing, recognizing that identifying a wild suspect animal may not be possible.
- When there is no local animal control officer, the CVO or program veterinarian will provide direct support to the community, by traveling to the location and working with RCMP and local officials to confine and quarantine or kill the animal for testing.
- When there is no local veterinarian, the CVO or program veterinarian will provide direct support to the community and be responsible to sample the animal for rabies testing.
- The CVO will liaise with the CFIA district veterinarian and rabies laboratory to coordinate rabies sample submission.

## If RPEP is not initiated

If the CMOH determines that RPEP is not required, the risk of rabies in the animal involved is minimal. The CVO will support EHS in those instances when an observation period of the animal is required (domestic animals that do not have current vaccination status).

## If rabies is confirmed from an animal submission

- The CVO will support the CFIA in establishing and monitoring quarantines for in-contact animals
- The CVO will support EHS in community communication plans

## Roles and Responsibilities

### Canadian Food Inspection Agency (CFIA)

In Canada, rabies is a reportable disease under the federal *Health of Animals Act* and Regulations and the CFIA has national authority to diagnose and manage the disease. The authority for rabies management in domestic animals rests with the CFIA district veterinarian.

CFIA District Veterinarian  
Canadian Food Inspection Agency  
Unit 2, 12008 - 8<sup>th</sup> Street, Dawson Creek, B.C. V1G 4Y5  
Telephone: (250) 719-6855 Facsimile: (250) 719-6849

### Chief Veterinary Officer (CVO) and Animal Health Unit

The CVO is responsible for the management and coordination of rabies control strategies for animals in Yukon in consultation with the CFIA. Although the management of rabies in animals is a federal responsibility, in Yukon the CVO serves as a liaison with the CFIA District Veterinarian. The CVO will also support the CMOH in emergencies, when the Yukon *Public Health and Safety Act* can be used to implement and enforce an animal management strategy in order to protect public health.

The CVO helps assess the risk of rabies in any animal that might be considered suspect because it has bitten or scratched a person. The CVO works closely with Environmental Health Services to evaluate information that they have gathered about the incident and coordinate a rabies control strategies for animals. This is in consultation with the CFIA District Veterinarian when rabies is considered a high possibility.

#### The CVO will:

- Be a resource for the CMOH and health care providers, providing information on rabies clinical appearance, diagnosis and reporting requirements in animals.
- Provide support and information to Environmental Health Officers on rabies surveillance, diagnosis and control as well as advice and support for suspect animal control in coordination with conservation officers, animal control officers and local enforcement officials.
- Liaise with Canadian Food Inspection Agency (CFIA) to facilitate information distribution, ensure timely reporting of suspect cases and develop rabies surveillance programs.

As rabies is a federally reportable disease, the CVO will report suspect and confirmed cases to the district office of the CFIA and coordinate submission of required animal samples for testing.

### Animal Handling Guidelines for Possible Rabies Suspect Animals

Domestic or wild animals that are designated as rabies suspect should be either confined for 10 days for observation to rule out rabies or euthanized so that the head can be collected for rabies testing. Because the legislative authority for handling rabies, as a reportable disease, rests with the CFIA, the following guidelines apply in Yukon unless superseded by the CFIA.

**If the animal is domestic and can be handled by the owner or caregiver:**

- Confine it to a secure enclosure of appropriate size until a decision about euthanasia or confinement for observation is made
- The enclosure should prevent any contact with a person or other animal that could create exposure through a bite, scratch or spread of saliva
- Muzzle the animal before confining it if it is a high-risk suspect

Yukon Environmental Health Officers recommend, and have the authority under the *PHSA* to enforce, a 10-day observation period for any animal that has bitten a person and does not have current rabies vaccination.

- No contact with any animals or people other than the primary caregiver during the 10 days.
- Animal must be confined to the owner's home or a kennel except when exercised.
- The animal will be on a leash under the control of an adult when exercised and should wear a muzzle designed to prevent biting.
- Owner must report any biting, nervous system signs, illness or death of the animal during the observation period to the Environmental Health Officer and the CVO.
- Owner cannot destroy, sell or give away the animal during the observation period without notifying the EHO or CVO.
- If the animal remains healthy at the end of 10 days, the restrictions are lifted.

The CFIA may issue an official quarantine order for a rabies suspect animal.

- An animal showing clinical signs suggestive of rabies if it is not immediately euthanized.
- Quarantine supervised by a veterinarian due to the need to treat or euthanize if the clinical signs progress.
- CFIA establishes the quarantine requirements and confirms that they can be met.
- The owner is responsible for all costs incurred to maintain the quarantine.
- CFIA may quarantine animals that have been exposed to known or suspect rabies cases. These determinations are made on an individual basis dependent on the vaccination status of the animal.

**Euthanasia Guidelines for Rabies Suspect Animals****Rabies suspect animal that can be confined and handled**

When a rabies suspect is an animal with an identified owner who has chosen euthanasia, if possible confine the animal so that handlers are not exposed to bites, scratches or saliva and take the animal to a veterinary practitioner for euthanasia.

- Muzzle the animal to prevent bites.
- Only essential personnel have contact with the animal.
- Veterinarian will sedate the animal and perform euthanasia by injection.
- Veterinarian will exercise appropriate personal protection during handling.
- Veterinarian is responsible for confirming the death of the animal and collecting the sample in the required manner for submission to CFIA for testing.
- Veterinarian will contact the CFIA and the CVO to report a suspect rabies case and confirm the process for submission of the samples.

### **Wild trapped animal**

Euthanasia by injection may be possible if a suspect wild animal has been trapped or confined with the assistance of a conservation officer who can provide sedation from a pole dart or a dart gun. The assistance of conservation officers can be sought from the nearest Environment Yukon office, but this is a function that is ancillary to their primary role, so they may not be available.

### **Rabies suspect animal that is not confined**

- When a rabies suspect animal cannot be confined (it is either a wild animal or a stray/feral/un-owned animal)
- Keep people and other domestic animals away from the animal until it can be killed.
- Only key people required to identify, monitor and kill the animal should be present.
- Confine all domestic animals away from the suspect animal.
- Animals that were in contact with the suspect animal should be identified (by photographing individuals if there is no permanent animal identifier—tattoo, microchip, tag) for monitoring if the suspect animal is confirmed positive.

### **Killing by gunshot when the suspect animal is not confined or cannot be approached**

- Euthanasia by gunshot requires that the shot destroys the brain; however, the requirement to preserve the brain for rabies testing requires that the animal be killed expediently, while still providing the most humane death possible.
- Kill a rabies suspect with an appropriate sized firearm, placing the shot in the chest, directed behind and slightly above the elbow, with the intention of striking the heart and lungs. This will kill the animal as humanely as possible under the circumstances.
- The shot should be fired by an individual experienced with the firearm.
- Observe the animal from a distance to be confident that it is dead before approaching it.

### **Carcass Handling Guidelines for Rabies Suspect Animals**

One individual, preferably someone who has been vaccinated against rabies, should be responsible for handling the carcass of a rabies suspect animal. A second individual can provide support and prevent observers from approaching. While the tissues of an infected animal are potentially infectious, the virus is quite fragile in the environment and once the head has been removed for testing, the remainder of the carcass can be disposed of in compliance with local regulations.

It is more efficient to remove the head where the animal is killed rather than transporting the carcass. If the entire carcass must be moved, anyone handling it should wear personal protection as indicated below and the carcass should be placed in a heavy-duty plastic bag, double knotted and then placed in a second bag, again double knotted. The bagged carcass should be placed in a smooth walled container (plastic garbage bucket or tub) for transport to prevent puncture of the bags and leakage of body fluids during transport.

The person responsible for removing the head should wear personal protection as follows: Two pairs of close-fitting surgical gloves, a mask (preferably an appropriately fitted mask) and eye protection. A full-face shield is preferable to an eye shield and a cut-resistant glove may be desirable. Coveralls and washable rubber boots are desirable. A disposable plastic tarp or opened heavy-duty plastic bag that the carcass can be rolled onto before making any cuts provides a clean surface that can contain the carcass when collection is complete to minimize contamination of the site.

The entire head is removed by cutting the soft tissue and muscles behind the angle of the jaw on both sides and completing the disarticulation between the skull and the spinal column with a sharp knife. Don't use a bone saw to cut through the spinal column because a saw can create an aerosol of virus-laden particles and leave sharp bony edges that may puncture a bag and result in injury to someone handling the sample. Do not remove the skin or the ears from the head. The head is prepared for submission according to the CFIA guidelines. The remainder of the carcass is rolled into the plastic sheet, then double-bagged in heavy-duty bags for disposal. All instruments and equipment used are washed in hot soapy water and disinfected (diluted household bleach is adequate).

## **CFIA role in Rabies Sampling and Management**

Contact the CFIA District Office when there is a minimum of Category II or higher exposure to a rabies suspect animal. The World Health Organization defines categories of exposure as:

- Category I: No Exposure – touching, feeding, licks on intact skin
- Category II: Minor Exposure – nibbling of uncovered skin, minor scratches or abrasions without bleeding
- Category III: Severe Exposure – transdermal bites (two or more) or transdermal scratches, licks on broken skin, mucous membrane contamination with saliva

The CFIA District Veterinarian Contact information is:

CFIA District Veterinarian  
Canadian Food Inspection Agency  
Unit 2, 12008 - 8<sup>th</sup> Street, Dawson Creek, British Columbia V1G 4Y5  
Telephone: 250-719-6855 Facsimile: 250-719-6849

The CFIA does not order the euthanasia of any animal suspected of having rabies although the CMOH may order the euthanasia of an animal to protect public health. The CFIA has a Disease Control Directive in place to guide decisions in the management of domestic animals exposed (actual or suspected) to rabies. They will provide testing of wildlife when there has been a human or domestic animal exposure that meets at least Category II exposure.

The CFIA is responsible for quarantining domestic animals suspected of being exposed to a confirmed or suspected rabid domestic or wild animal. There are multiple variables (including the type of exposure, vaccination status, time lapse from exposure, symptomatic vs. asymptomatic) that affect the decision on the type and length of quarantine.

The Yukon CMOH, EHO or CVO may impose a 10-day observation period for domestic animals to monitor their behaviour as a means to be confident rabies is not present. This is not to be confused with an official CFIA quarantine for rabies.

In any situation in which rabies is confirmed in a wild or domestic animal, the CFIA district veterinarian will decide upon and enact an official quarantine for animals that may have been in contact with the positive animal. This will be done in communication with the Yukon CVO and EHO who will coordinate the public communication strategy.

## **Rabies Testing Guidelines for Rabies Suspect Animals**

### **Emergency rabies testing**

Rabies specimens can be tested on weekends or statutory holidays under specific conditions. The CFIA applies the Ontario MOH definition of serious human exposure as an incident where a bite from a suspect animal occurred to the neck or face, or to an immunocompromised person as the basis for weekend or holiday submissions. The CFIA District Office must be contacted to coordinate this testing and must be contacted when there has been a human and/or domestic animal exposure to rabies.

CFIA District Veterinarian  
Canadian Food Inspection Agency Unit 2,  
12008 - 8<sup>th</sup> Street, Dawson Creek, British Columbia V1G 4Y5  
Telephone: (250) 719-6855 Facsimile: (250) 719-6849

### **Communications with CFIA about rabies suspects**

- Always call the laboratory prior to submitting a rabies suspect sample.
- Lethbridge Laboratory (Western) (403) 382-5559 (Monday to Friday).
- Always fax a copy of the sample submission form (CVO has copies of the official sample submission form) to the CFIA Dawson Creek District Office, Attn: CFIA District Veterinarian, FAX: (250) 719-6849.
- Always include the CFIA rabies submission form with the sample.
- Always include the CFIA laboratory phone number on the outside of the sample packaging.
- Always include contact information of the submitter on the sample submission form.
- Always include a complete history of the situation describing all human or domestic animal exposure on the sample submission form.

### **Rabies specimen containers (for animal sampling)**

- Rabies specimen containers are kept in supply (one or two) at community health centres as well as at Environment Yukon offices throughout Yukon.
- These specimen containers (a labeled box containing a green can and sample packaging) are used for safe shipment of rabies suspect samples and will be used **ONLY** under the direction of the chief veterinary officer (CVO) or a designated representative.
- In most instances of animal sampling, the attending veterinarian will provide a specimen container. Those stored in the community health centres are for atypical or unusual situations only.
- All requests for these containers will be made to the community health centre during regular office hours. If the container cannot be picked up during regular office hours, the nurse will advise where the container will be left for pick up. Nurses will not be expected to respond to requests for after-hours service related to these containers.
- Community nurses and staff will **NOT** be involved in animal handling, control or sampling.
- Additional or replacement containers are available by contacting the CVO.

## Sample Handling Guidelines from Rabies Suspect Animals

The rabies-suspect animal should be euthanized using a humane method that provides minimal damage to the brain. The CFIA requires that all CFIA staff involved in sampling for rabies be vaccinated and recommends that all non-CFIA persons involved in the handling of rabies suspects and samples should be vaccinated.

The training information from CFIA on the collection, packaging and shipping of samples by non-CFIA staff for rabies laboratory testing is currently being updated and will be provided as soon as available.

### Packaging a rabies specimen for shipment to the laboratory

The following items are supplied:

- labeled green can (or with labels supplied);
- two plastic sample bags;
- cardboard box;
- ice packs;
- labels for box; and
- rabies submission form—ensure all required information is recorded on this form.

### Specimen packaging

- Place the rabies specimen in the first bag and close tightly with two knots if possible.
- Wrap this bag in absorbent material such as newspaper.
- Place the bag and absorbent material in the second bag.
- Attach an identifying label to the outer bag and record this number on the rabies submission form.
- Place additional absorbent material (newspaper) in the bottom of the green can. Place the bagged sample on that with ice packs around it if there is room.
- Place the lid and collar on the green can and tighten the collar bolt. Label the green can.
- Place the green can and the completed rabies submission form in the box and seal the box with tape. Label the box.

## Sample Shipping Guidelines from Rabies Suspect Animals

### Labeling and shipping documentation

If **rabies IS NOT suspected**, the specimen can be shipped unregulated and can be shipped by bus.

### Unregulated Shipment Labeling

On labels (on both box and can), include:

- Shipper's name, address and phone #;
- Consignees name, address and phone # (see below); and
- **Exempt animal submission.**  
Mark the box 'R-Unit'.

If **rabies IS suspected**, the specimen must be shipped as Dangerous Goods UN3373 and cannot be shipped by bus.

#### **Dangerous goods shipment labeling**

- On labels (on both box and can), include:
- Shipper's name, address and phone #;
- Consignees name, address and phone # (see below);
- **UN3373 diamond shaped label;** and
- **Biological substance, category B label.**

Mark the box 'R-Unit'. Mark the box 'OverPack' if shipped by air.

#### **Documentation**

Only a shipper's waybill is needed, describe goods on waybill as:  
Biological substance, category B, UN3373, P1650

#### **Ship to:**

CFIA – Lethbridge Laboratory, R-UNIT  
Township Road 9-1  
Lethbridge, AB T1J 3Z4  
Phone 403-382-5559 Fax 403-381-1202  
Email: kushj@inspection.gc.ca

The method of shipping from Whitehorse to Lethbridge is decided by the CVO at the time the sample is ready for shipment. Rabies samples cannot be sent directly by air to Lethbridge. Air Canada does not ship cargo and Air North has no relationship with an airline to transfer to Lethbridge.

Purolator is the carrier of choice for unregulated shipments. Shipments must be picked up before noon and can be expected to arrive within two working days. Cost is between \$300 and \$400 per shipment.

Dangerous goods shipments or those that would be delayed due to a weekend if sent by courier should be shipped by Air North to the CFIA in Calgary or Edmonton. Arrangements **MUST** be made with the CFIA rabies laboratory prior to shipping to ensure staff in Calgary or Edmonton are available to take responsibility for the shipment.

## Common Rabies Sample Submission Concerns

- Complete all sections of the rabies submission form, especially with respect to human exposure. Distinct protocols are applied depending on the level of human exposure and submitter's comments are very useful in helping the laboratory assess human exposure.
- Securely close the lid on the can. Improperly closed or insecure lids affect the integrity of the sample and can expose staff who receive the samples to potential infection.
- Do not skin the head or remove the ears or the snout from the suspect animal. Take care in removing the skull from the neck to avoid sharp bone protrusions. Intact heads without bone fragments are easier and safer for laboratory staff to handle.
- Don't include euthanasia materials (syringes, needles, darts, chemicals) with the sample. These materials should be handled according to departmental protocols for disposal of contaminated biological materials or for cleaning and disinfection (for reusable darts).
- Ensure the animal is dead before packaging. Chilling is not sufficient to kill bats and they must be euthanized before shipment. Suffocation or exposure to ice packs in the can is inhumane and may not result in death, creating a risk for laboratory staff if the animal is alive when the container is opened.
- Do not use ether for euthanasia. It is no longer acceptable due to its explosive nature and the hazard to staff who may encounter vapors.
- Insure adequate absorptive material is included in the packaging, especially when a sample is shipped frozen because it may thaw partially during transit.



# BACKGROUND, LEGISLATION, DEFINITIONS, REFERENCES

## RABIES GENERAL INFORMATION

### Clinical Presentation in Humans and Epidemiology

**Clinical description:** The first signs of illness are non-specific and include fever, anxiety and malaise. Often there is tingling and severe pruritus at the site of the animal bite. After two to 10 days, frank neurological signs appear, ranging from hyperactivity to paralysis. The disease is divided into encephalitic (“furious rabies”) and paralytic (“dumb rabies”) forms:

- In the encephalitic form, signs of irritation of the central nervous system predominate, including agitation, confusion, hydrophobia, aerophobia, hyperventilation, hypersalivation, priapism and convulsions. After a few days to a week, the person may experience a stage of excitement that lasts only a few days before he or she lapses into coma and death.
- The paralytic form of rabies differs in that the person does not experience a stage of excitement, but retreats steadily and quietly downhill, with some paralysis, to coma and death.

Once the virus enters the nervous system, treatment rarely affects the rapid progression to death. In 2004, a teenager who had not received RPEP developed rabies disease but survived following aggressive treatment (Willoughby 2005). This is the only known instance of survival following disease.

### Incubation period

After inoculation, the virus may persist and replicate at the inoculation site for hours to weeks before progressing to nerve endings at the site of the bite. As the virus does not travel through the bloodstream or lymph system, it does not readily induce an immune response prior to entering the nerves. Once the virus enters the nerves, it is virtually impossible to treat it. The virus slowly travels up the nerves to reach the CNS where it replicates and then disseminates through nerves to many body sites including the cornea, hair follicles and salivary glands where there is further replication.

The incubation period is usually three to eight weeks, rarely as short as a few days or as long as several years. The length of the incubation period depends on the severity of the wound, site of the wound in relation to the richness of the nerve supply and its distance from the brain, and the amount and strain of virus introduced (Heymann 2008 as cited in BCCDC, 2011).

### Infectious agent

The rabies virus is a rhabdovirus belonging to the genus **Lyssavirus**.

### Mode of transmission

Infection occurs by percutaneous introduction of the virus-laden saliva or cerebrospinal fluid of a rabid animal through a bite or scratch, or into a fresh break in the skin, or by contact with intact mucous membranes. Transmission has been reported through the transplantation of organs taken from persons who died of undiagnosed rabies. Also, wild animals may bite and infect domestic animals, which in turn may infect humans.

Airborne transmission has been reported in two instances in a laboratory setting, where there was significant aerosolization and possible lack of personal protection. Also, there have been two reports of rabies acquired in a bat-infested cave attributed to aerosol transmission, but there is no proof in either case that a bite or wound contamination did not occur (Irons 1957, Humphrey 1960 as cited in BCCDC, 2011). No well-documented natural transmission of rabies by aerosols has occurred (Gibbons 2001 as cited in BCCDC, 2011).

### **Susceptible animals**

Rabies virus can cause acute encephalitis in all warm-blooded hosts, including pets, livestock, wildlife and humans, and the outcome is almost always fatal. Although all species of mammals are susceptible to rabies virus infection, only a few species are important as reservoirs for the disease, with bats and foxes being the most probable reservoirs in northern climates (Alaska Rabies Prevention and Control Manual Oct. 2009). Skunks and raccoons are important vectors where they occur but they do not range through Yukon currently.

### **Background of rabies in Canada and Alaska**

The following information is selective and based only on human contact and does not rule out rabies in a given animal species, since all mammals are potentially susceptible to rabies. The information may be used to assess the risks and benefits of treatment, particularly when the animal is not available for testing or observation.

#### **Canada**

Rabies is a fatal disease of mammals most often transmitted through the bite of a rabid animal. Monoclonal antibodies have revealed that there are distinct variants or strains of rabies virus. Some rabies variants occur within terrestrial wildlife reservoirs in geographically discrete regions. Virus transmission is primarily between members of the same species but there are exceptions. Outbreaks of arctic fox rabies have involved arctic foxes (**Alopex lagopus**), red foxes (**Vulpes vulpes**) and striped skunks (**Mephitis mephitis**) as active vectors (MacInnes, 1999). Other rabies variants are found in many bat species without geographic boundaries. Several bat variants occur in a single bat species, and the geographical distribution of variants is overlapping. Spillover to terrestrial animals is observed frequently (WHO 2005, as cited in Canadian Rabies Management Plan, 2009).

Although rabies virus can infect many animal species, each strain is perpetuated within populations of a certain species that acts as a viral reservoir (Nadin-Davis et. al., 2006, as cited in Canadian Rabies Management Plan, 2009). In Canada, rabies persists throughout most arctic regions with the arctic fox serving as the main host for this rabies virus variant. The arctic variant of the rabies virus has been present in the red fox populations in Ontario. Bat rabies is found throughout Canada. In Canada, the big brown bat is the most commonly diagnosed species; other bats species include the little brown bat, the silver-haired bat, the hoary bat and the red bat (Nadin-Davis et. al., 2001, as cited in Canadian Rabies Management Plan, 2009).

#### **Yukon**

At the time of writing this guideline, there have been no reports of human rabies in Yukon. From 1955 to 2004 there have been 88 animal specimens submitted for laboratory testing. In the 1970s, there were four dog, one cat and one fox head submissions which tested positive for rabies. There have been 11 animal submissions from the Yukon between 1999 and 2010, including a bat, bear, cat, lynx, wolf and fox as well as four dogs and one unspecified species that all tested negative.

There have been no other rabies-positive animal results since 1975. Of note, Yukon does not currently have a systematic rabies surveillance strategy in place for particular animal populations. The animals that were submitted over the past decades and which continue to be submitted are for a variety of reasons, i.e., involved in an exposure with a human or were displaying unusual behaviour. Rabies surveillance in wild species is being initiated and a substantial number of wolverine, fox and coyote brains were submitted in 2011 for testing to improve overall understanding of rabies risk in Yukon. Results are pending.

### **Northwest Territories (NWT)**

The arctic fox is the primary, permanent reservoir in the NWT. The red fox was thought to be another major reservoir, but dogs—namely sled dogs—have a higher incidence of positive rabies infection in the NWT. Rabies has also been documented in other wildlife like wolf, caribou and polar bear. In most areas, rabies in humans is directly related to the number of rabid dogs, the NWT's secondary reservoir. Although there has never been a case of human rabies in the NWT, northern residents living in remote communities and leading traditional lifestyles that embrace hunting and trapping face a relatively high risk of rabies exposure. The vast NWT wilderness is home to a large wildlife population (Walker & Elkin, 2005).

### **British Columbia (BCCDC, 2011)**

In BC, bats are the only known reservoir. Over the past 10 years, approximately four to eight per cent of the BC bats submitted for testing each year have been infected (Kush J, CFIA, personal communication, 2010 as cited in BCCDC, 2011). Bats submitted for testing have a higher likelihood of being infected.

**Human epidemiology:** In Canada, there have been 23 human cases reported since 1924 and only one of these occurred in BC. Of the 11 cases that occurred since 1950, six were due to a bat strain of rabies. Among them, a 25-year-old male Alberta resident was infected by a bat while in Alberta and died in BC in 1983, and a 60-year-old male BC resident was infected by bat variant rabies virus in BC, and died in 2003 (NACI 2006, DeSerres 2008 as cited in BCCDC, 2011).

### **Rabies post-exposure prophylaxis (RPEP)**

If the risk assessment suggests RPEP is warranted, consider providing immediate RPEP. Expert opinion recommends that if RPEP is indicated, it should not be delayed beyond 48 hours after the exposure while waiting for the results of testing (NACI 2011, as cited in BCCDC, 2011). However, the decision to wait for test results, regardless of the time it takes, should be based on the level of risk.

RPEP is now a series of one dose of rabies immune globulin (Rablg) and four doses of vaccine for immunocompetent individuals (NACI 2011, as cited in BCCDC, 2011).<sup>8</sup> Rablg (20 IU/kg body weight) is given on day 0 at the same time as the first dose of vaccine (1.0 mL IM), or within seven days of the first vaccination.

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<sup>8</sup> NACI recommends an RPEP dosage of one dose of rabies immune globulin and four doses of rabies vaccine, administered on days 0, 3, 7 and 14. This approach is based on evidence that the most critical element of prophylaxis is the rapid administration of Rablg and the first dose of vaccine. In most cases, rabies antibody levels reach  $\geq 0.5$  IU/mL before the 5<sup>th</sup> vaccination. There is no correlation between the number of doses received and the long-term presence and level of antibodies. Further, when the prophylaxis of exposed individuals has been interrupted after the fourth dose of vaccine, there have been no RPEP failures. Finally, many countries use the WHO-approved Zagreb regimen of Rablg plus a series of two-one-one vaccine doses. (Rupprecht 2009, NACI 2011 as cited in BCCDC, 2011).

Rabies vaccine is given on days 0, 3, 7 and 14. RPEP (Rablg and vaccine) must always be administered by the intramuscular route (IM). Rablg should be infiltrated at the wound site (WHO 1992, as cited in BCCDC, 2011). If necessary, it can be diluted with normal saline to ensure there is sufficient volume to infiltrate all wounds. See the Community Nursing Immunization Manual for details on dosage and administration. Immunocompromised individuals should receive Rablg (20 IU/kg body weight) on day 0 or within seven days of the first vaccination and five doses of vaccine (1.0 mL IM) given on days 0, 3, 7, 14 and 28.

RPEP should be offered to exposed individuals regardless of the elapsed interval since exposure. The longest incubation periods for rabies have been reported to be several years (Smith 1991, Johnson 2008, as cited in BCCDC, 2011).

## Definitions

**Confirmed case of human rabies: Clinical illness with laboratory confirmation of infection by at least one of the following:**

- detection by direct fluorescent antibody of viral antigen in an appropriate clinical specimen (preferably the brain or the nerves surrounding hair follicles in the nape of the neck);
- isolation (in cell culture) of rabies virus from saliva, cerebrospinal fluid, or central nervous system tissue;
- identification of a rabies-neutralizing antibody titre greater than or equal to 5 IU/ml (complete neutralization) in the serum or cerebrospinal fluid of an unvaccinated person;
- detection of Negri bodies in brain tissue; or
- detection of rabies virus by RT-PCR from tissues.

**Direct physical contact:** Any contact with a rabid or potentially rabid animal whereby rabies virus could be introduced through contact with eyes or mucous membranes, or through a break in the skin by means of a bite or scratch. This currently includes touching bare skin, which could have breaks that are not visible to the eye.

**Enzootic:** Consistently present in an animal population (equivalent to endemic in human population).

**Epizootic:** Greater than expected occurrence in an animal population (equivalent to epidemic in human population).

**Intervention:** Testing an animal for rabies and/or providing RPEP as indicated.

**NACI:** National Advisory Committee on Immunizations. NACI makes recommendations for the use of vaccines currently or newly approved for use in humans in Canada, including the identification of groups at risk for vaccine-preventable disease for whom vaccine programs should be targeted.

See: <http://www.phac-aspc.gc.ca/naci-ccni/index-eng.php>.

**Provoked vs. unprovoked attacks:** A provoked attack is one in which the human did something to “provoke” the animal (even if the action was unintentional) and the attack would be the animal’s normal response to such a human action. Examples include:

- Attempting to corner or trap an animal;
- Entering an area that the animal considers its territory;
- Rapid movement (running, biking) near an animal that incites a chase response;
- Approaching an animal’s litter;
- Coming too close to an injured animal;
- Coming between two fighting animals;
- Picking up or petting an unfamiliar animal;
- Interfering with an animal’s food;
- Interfering/wrestling with an animal’s owner; or
- Teasing an animal.

**An unprovoked attack** is one in which the person did not surprise, antagonize or threaten the animal or enter its territory.

### **Rabies Vaccines – WHO-approved**

WHO approves of the use of cell-culture and embryonated egg based vaccines. These include vaccines produced on human diploid cells (HDCV), fetal rhesus diploid cells, Vero (African green monkey kidney) cells (PVRV), primary Syrian hamster kidney cells, primary chick embryo cells (PCECV) and embryonated duck eggs (PDEV).

The following rabies vaccines meet WHO’s safety, potency and efficacy requirements (WHO 2002):

- Imovax<sup>®</sup> Rabies\*; Rabivac (HDCV)
- RabAvert<sup>®\*</sup>; Rabipur<sup>™</sup> (PCECV)
- Verorab<sup>™</sup>; Imovax Rabies vero; TRC Verorab<sup>™</sup> (PVRV)
- Lyssavac N<sup>™</sup> (PDEV)

\* Licensed in Canada

Nerve tissue vaccines are less immunogenic and more reactogenic and are not WHO-approved (CATMAT 2002, WHO 2010, as cited in BCCDC, 2011). Individuals who have received it should be considered unvaccinated. (BCCDC, 2011)

**Unusual behaviour:** This will vary according to species and other variables. Generally, rabies will manifest as either furious rabies (unprovoked attack, lack of fear) or dumb rabies (increasing paralysis and salivating).

### **Animal signs/behaviours can include:**

- Inability to swallow, drooling, slack jaw, foamy saliva;
- Staggering, walking without purpose, partial paralysis, weakness;
- Atypical vocalizations, change in tone of voice, excessive vocalization;
- Trembling, muscle tremors, lack of muscle control, paresis, paralysis;
- Change in mental state—different from what is typical for that animal—either depressed or agitated/aggressive;
- Confused, erratic, restless, hyperactive, intense but unfocused, aimless;
- Atypical of the species or individual (nocturnal species out in daylight, formerly friendly animal acting aggressively); and
- Agitated, frantic, directly aggressive, showing unrelenting aggression.

## Legislative Authorities for Rabies Risk Management

### Human health and public health

In Yukon, the *Public Health and Safety Act* provides legal authority to act when public health is at risk due to the presence of a potentially rabid animal within a community.

#### ***Public Health and Safety Act—Communicable Disease Regulations***

Authority to place animals into observation and quarantine periods:

- Section 12(e): "... a Medical Health Officer may... detain or order to be detained for such period as he deems fit any dog, cat or other animal which, in his opinion, is capable of transmitting a communicable disease to any person or any other animal."

Authority to investigate and take actions:

- Section 11(1): "Every Medical Health Officer who is notified of the discovery of a case of communicable disease or has reason to believe or suspect that there is such an occurrence, shall investigate or cause an investigation to be made and, if satisfied that action is necessary, shall insure that the specific control measures for such disease are taken."

Authority to delegate duties:

- Section 18(1): "Where in his discretion it is necessary to do so, a Medical Health Officer may, in carrying out these regulations, delegate any of his duties for a specific purpose during such period he may consider necessary, to any qualified medical practitioner and such person shall be deemed to be a Medical Health Officer during such period and for such purpose."

#### ***Public Health and Safety Act—Public Health Regulations***

Responsibility of individuals not to create or maintain risks to public health:

- Section 5: "... no person shall accumulate, or permit to accumulate upon his premises or upon his land, anything that may endanger health, ..."
- Section 6(1): "... No person shall create, establish or maintain a condition injurious to health ... on any (a) premises or part thereof ..."

Authority to control risks to public health, gather information, and conduct enforcement:

- Section 34: "Where not otherwise provided herein, a Medical Health Officer or a Health Officer may, by order, direct that any matter or thing relating to the enforcement of these regulations be done by any person within such specified period of time as the Medical Health Officer may deem reasonable."

### Animal Health

Under the federal *Health of Animals Act*, rabies is a reportable disease in animals and the Canadian Food Inspection Agency (CFIA) is authorized to respond when there is human or animal exposure and to provide testing to confirm the presence of rabies. The authority for rabies management in domestic animals rests with the CFIA district veterinarian.

### ***Federal Health of Animals Act Canada***

Section 22 of the Act gives the Minister the authority to determine that a place is “infected” and to take actions to contain, control and prevent the spread of a disease or toxic substance. For these purposes it is necessary to deliver a notice to the owner or occupant of the place. Any time rabies is known or suspected of being on a premise, CFIA veterinary inspectors declare the place to be infected and restrict the movement of animals from the premises until a veterinary inspector is satisfied that the disease is not present on the premises.

Under Section 64 (f) of the Act, the minister may make regulations “for controlling or eradicating, or preventing the spread of, vectors, diseases and toxic substances and for quarantining, segregating, treating or disposing of, or for dealing generally with, animals or things that (i) are, or are suspected of being, affected or contaminated by a disease or toxic substance, (ii) have been in contact with or in close proximity to animals or things that were, or are suspected of having been, affected or contaminated by a disease or toxic substance at the time of contact or close proximity, or (iii) are, or are suspected of being, vectors, the causative agents of disease or toxic substances.” Although this section has been implemented in controlling rabies in all domesticated animals, it has not been used to control or eradicate rabies in wildlife.

### **Federal Reportable Disease Regulations**

Rabies is prescribed as a “reportable” disease under the Reportable Disease Regulations. A veterinary inspector under the Health of Animals Act must be notified by veterinarians who suspect that an animal is affected with rabies and by other persons of the presence or any fact indicating the presence of rabies. (Section 5)

### **Federal Health of Animals Regulations**

Part IX of the Regulations is entitled the “Eradication of Diseases.” The diseases specifically mentioned are those diseases for which the minister has developed policy for the purpose of eradicating them, e.g., tuberculosis and brucellosis. Section 80 of the Regulations allows the minister to designate the movement of animals or things when a control area has been declared under subsection 27(1) of the Act. Section 90 of the Regulations deals with the eradication of diseases specified by the minister. It states “The minister may order the owner or the person having the possession, care or control in an eradication area of any poultry, ruminant or equine or porcine animal to segregate the animal and to have the animal inspected in such manner and for such communicable disease as the minister may specify.” The regulation is specific to domesticated animals only.

The Yukon Animal Health Unit and chief veterinary officer provide liaison with the CFIA district veterinarian to facilitate the diagnosis of rabies in animals and coordinate the management of animals at risk as well as submission of samples for testing.

The Yukon Public Health and Safety Act provides authority to investigate cases of communicable disease. This allows for questions to be asked and information gathered from people involved, including owners of animals. It can also support the quarantine of animals suspected of being infected by rabies.



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For up-to-date details on animal rabies activity in Canada, see the Canadian Food Inspection Agency (CFIA) web site at: <http://www.inspection.gc.ca/english/anima/disemala/rabrag/statse.shtml>

For information on other countries, consult the WHO publication “International Travel and Health” available at: <http://www.who.int/ith/en/>.

For information specific to bats and rabies, refer to National Advisory Committee on Immunization (NACI) Recommendations Regarding the Management of Bat Exposures to Prevent Human Rabies Volume 35 • ACS-7 November 2009 <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09vol35/acs-dcc-7/index-eng.php>.