



Ontario Rabies Vector Species Course

for wildlife custodians

Home Study Materials
2007

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INTRODUCTION

You have received this document because you are an authorized wildlife custodian or a foster care giver who would like to work with raccoons, skunks, foxes or bats under your wildlife custodian authorization or foster care agreement. Before you can provide care or rehabilitation to these Rabies Vector Species (RVS) you must successfully pass the Ontario Rabies Vector Species Exam (the RVS Exam). You may also be someone who works with wildlife in a different capacity (e.g., a wildlife rehabilitation volunteer) who wants to learn more about rabies.

This home study guide provides information about rabies that will be useful to wildlife rehabilitators and their foster care givers and volunteers to help protect both human and wildlife health. This document is not a comprehensive manual on rabies diagnosis, treatment and prevention. It builds on internationally recognized wildlife rehabilitation practices such as those promoted by the International Wildlife Rehabilitation Council (IWRC) and the National Wildlife Rehabilitators Association (NWRA) through their *Minimum Standards for Wildlife Rehabilitation, 2000*.

Before taking the RVS exam please review this document carefully, paying special attention to the highlighted portions. All of the questions on the RVS Exam are taken from the material in this document. Note that some of the material is quite detailed and may appear intimidating to some readers. Please do not feel discouraged; we have included a wide range of material to ensure people at all levels of learning will find the materials interesting and helpful. Don't forget, when studying for the RVS exam focus on the highlighted portions of this document.

Please contact your local MNR district office to arrange for a date and time to take the exam. Note that it may take several weeks before the office is able to accommodate you, so book your exam appointment accordingly. The RVS exam is 'closed book'; you will not be able to bring this document or any other study materials with you into the exam room. A score of 75% or more correct answers is a passing grade.

GLOBAL SIGNIFICANCE OF RABIES

The following information is taken from these World Health Organization websites: <http://www.who.int/topics/rabies/en/>, <http://www.who.int/rabies/epidemiology/en/> and <http://www.who.int/rabies/animal/en/>

Rabies is a zoonotic viral disease which infects domestic and wild animals. It is transmitted to other animals and humans through close contact with saliva from infected animals (i.e. bites, scratches, licks on broken skin and mucous membranes). Once symptoms of the disease develop, rabies is fatal to both animals and humans.

Geographical Distribution and Incidence

Rabies is widely distributed throughout the world and is present in all continents. The number and size of rabies-free countries, territories, or areas are small compared to those of rabies-affected areas. According to the World Survey of Rabies for 1999, 45 out of 145 countries and territories reported no rabies for that year and had no rabies in 1998. Many rabies-free countries and territories are islands of the developed world (e.g., Japan, New Zealand) and the developing world (e.g., Barbados, Fiji, Maldives, and Seychelles). In addition, parts of northern and southern continental Europe (e.g., Greece, Portugal, Scandinavian countries) and Latin America (e.g., Uruguay and Chile) are also free of rabies.

Reliable data on rabies is scarce in many areas of the globe, making it difficult to assess its full impact on human and animal health. The World Health Organization (WHO) commissioned a re-assessment of the burden of rabies in 2004. According to this study **the annual number of deaths worldwide caused by rabies is estimated to be 55 000**, mostly in rural areas of Africa and Asia. An estimated 10 million people receive post-exposure treatments each year after being exposed to rabies-suspect animals.

The assessment shows that Asia carries a larger part of the public health burden of rabies (with an estimated 31 000 deaths), although the estimate for Africa (24 000 deaths) is much greater than initially believed. Asia also carries 96.5% of the economic burden of rabies in the developing world with US\$ 560 million spent each year mostly on post-exposure prophylaxis.

Transmission

In developed countries, rabies is present mainly in wild animal hosts, from which the disease spills over to domestic animals and humans. Recently, bat rabies has emerged as an important epidemiologic reservoir in some parts of the world (i.e. the Americas and Australia). In North America, most documented human rabies deaths occurred as a result of infection from the silver haired bat rabies virus variant and in Australia at least two human deaths have occurred from exposure to a previously unrecognized rabies virus. In South America, wildlife rabies, especially bat rabies is increasing. For the first time in 2003, more people died from rabies following bites from wildlife than from dogs in South America.

However, dogs continue to be the main hosts in Africa and Asia and are responsible for most of the human rabies deaths that occur worldwide.

The most frequent way that humans become infected with rabies is through the bite of infected dogs and cats, wild carnivorous species like foxes, raccoons, skunks, jackals and wolves, and insectivorous and vampire bats. Cattle, horses, deer and other herbivores can become infected with rabies and although they could potentially transmit the virus to other animals and to people, this rarely occurs.

Oral immunization of wild carnivores

A trend toward a decline in the number of cases in animals has been reported in many European countries. Some of these countries are now free of rabies such as Belgium, France, Luxembourg and Switzerland. This improvement followed the massive use of the oral immunization technique for foxes and the dispersal over wide areas of more than 90 million vaccine baits since 1989. Remarkable decreases have also been noted in Canada and Texas (USA), where oral vaccination projects targeting foxes and coyotes, respectively, have been conducted. Requirements and criteria for field trials on oral vaccination were established by a WHO consultation in 1989.

*The following information is taken from the CDC webpage
<http://www.cdc.gov/ncidod/dvrd/rabies/Introduction/intro.htm>*

Rabies in the United States

Over the last 100 years, rabies in the United States has changed dramatically. More than 90% of all animal cases reported annually to the U.S. Centres for Disease Control and Prevention (CDC) now occur in wildlife; before 1960 the majority were in domestic animals. The principal rabies hosts today are wild carnivores and bats. The number of rabies-related human deaths in the United States has declined from more than 100 annually at the turn of the century to one or two per year in the 1990's. Modern day prophylaxis has proven nearly 100% successful. In the United States, human fatalities associated with rabies occur in people who fail to seek medical assistance, usually because they were unaware of their exposure.

Although human rabies deaths are rare, the estimated public health costs associated with disease detection, prevention, and control have risen, exceeding \$300 million annually. These costs include the vaccination of companion animals, animal control programs, maintenance of rabies laboratories, and medical costs, such as those incurred for rabies post exposure prophylaxis (PEP).

Accurate estimates of these expenditures are not available. Although the number of PEPs given in the United States each year is unknown, it is estimated to be about 40,000. When rabies becomes epizootic or enzootic in a region, the number of PEPs in that area increases. Although the cost varies, a course of rabies immune globulin and five doses of vaccine given

over a 4-week period typically exceeds US\$1,000. The cost per human life saved from rabies ranges from approximately \$10,000 to \$100 million, depending on the nature of the exposure and the probability of rabies in a region.

THE RABIES VIRUS

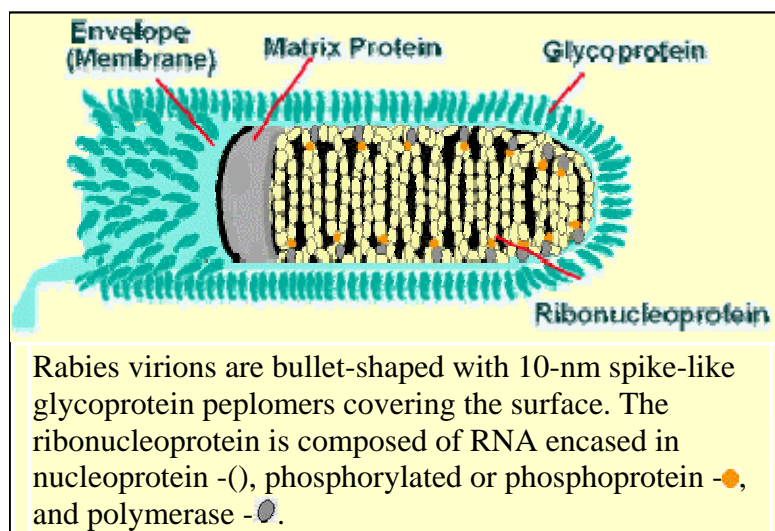
The following information is taken from the CDC website
http://www.cdc.gov/ncidod/dvrd/rabies/the_virus/virus.htm

Classification

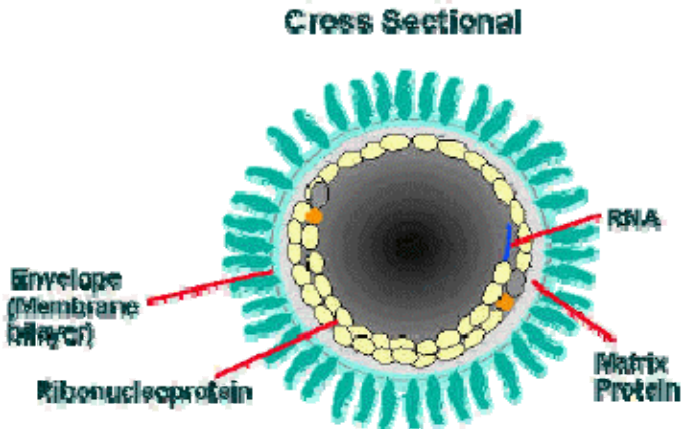
Rabies virus belongs to the order *Mononegavirales*, viruses with a nonsegmented, negative-stranded RNA genomes. Within this group, viruses with a distinct "bullet" shape are classified in the *Rhabdoviridae* family, which includes at least three genera of animal viruses, *Lyssavirus*, *Ephemerovirus*, and *Vesiculovirus*. The genus *Lyssavirus* includes rabies virus, Lagos bat, Mokola virus, Duvenhage virus, European bat virus 1 & 2 and Australian bat virus.

Structure

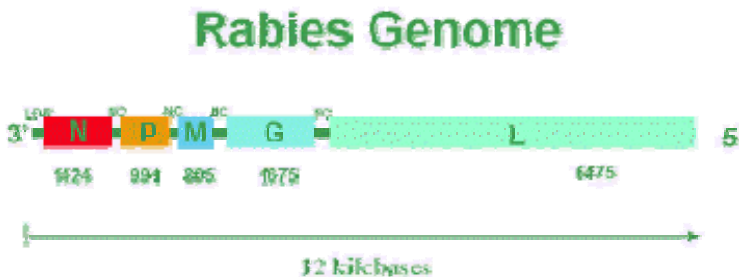
Rhabdoviruses are approximately 180 nm long and 75 nm wide. The rabies genome encodes five proteins: nucleoprotein (N), phosphoprotein (P), matrix protein (M), glycoprotein (G) and polymerase (L). All rhabdoviruses have two major structural components: a helical ribonucleoprotein core (RNP) and a surrounding envelope. In the RNP, genomic RNA is tightly encased by the nucleoprotein. Two other viral proteins, the phosphoprotein and the large protein (L-protein or polymerase) are associated with the RNP. The glycoprotein forms approximately 400 trimeric spikes which are tightly arranged on the surface of the virus. The M protein is associated both with the envelope and the RNP and may be the central protein of rhabdovirus assembly. The basic structure and composition of rabies virus is depicted in the longitudinal diagram below.



The cross-sectional diagram below demonstrates the concentric layers: envelope membrane bilayer, M protein, and tightly coiled encased genomic RNA.



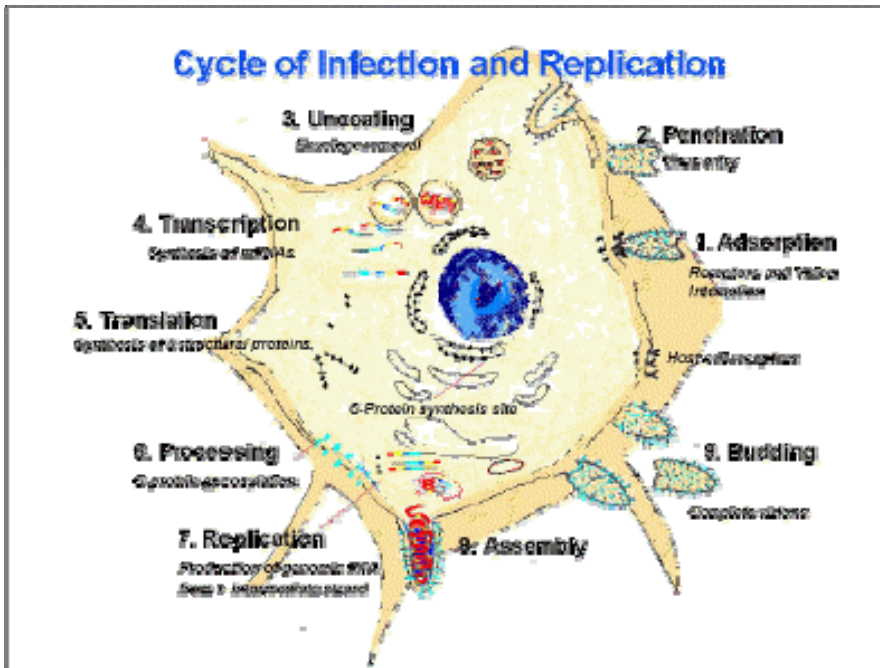
Rabies is an RNA virus. The genome encodes 5 proteins designated as N, P, M, G, and L. The order and relative size of the genes in the genome are shown in the figure below. The arrangement of these proteins and the RNA genome determine the structure of the rabies virus.



The rabies virus genome is single-stranded, antisense, nonsegmented, RNA of approximately 12 kb. There is a leader-sequence (LDR) of approximately 50 nucleotides, followed by N, P, M, G, and L genes.

Replication

The fusion of the rabies virus envelope to the host cell membrane (adsorption) initiates the infection process. The interaction of the G protein and specific cell surface receptors may be involved. After adsorption, the virus penetrates the host cell and enters the cytoplasm by pinocytosis (via clathrin-coated pits). The virions aggregate in the large endosomes (cytoplasmic vesicles). The viral membranes fuse to the endosomal membranes, causing the release of viral RNP into the cytoplasm (uncoating). Because lyssaviruses have a linear single-negative-stranded ribonucleic acid (RNA) genome, messenger RNAs (mRNAs) must be transcribed to permit virus replication.



A viral-encoded polymerase (L gene) transcribes the genomic strand of rabies RNA into leader RNA and five capped and polyadenylated mRNAs, which are translated into proteins. Translation, which involves the synthesis of the N, P, M, G and L proteins, occurs on free ribosomes in the cytoplasm. Although G protein synthesis is initiated on free ribosomes, completion of synthesis and glycosylation (processing of the glycoprotein), occurs in the endoplasmic reticulum (ER) and Golgi apparatus. The intracellular ratio of leader RNA to N protein regulates the switch from transcription to replication. When this switch is activated, replication of the viral genome begins. The first step in viral replication is synthesis of full-length copies (positive strands) of the viral genome. When the switch to replication occurs, RNA transcription becomes "non-stop" and stop codons are ignored. The viral polymerase enters a single site on the 3' end of the genome, and proceeds to synthesize full-length copies of the genome. These positive strands of rabies RNA serve as templates for synthesis of full-length negative strands of the viral genome.

During the assembly process, the N-P-L complex encapsulates negative-stranded genomic RNA to form the RNP core, and the M protein forms a capsule, or matrix, around the RNP. The RNP-M complex migrates to an area of the plasma membrane containing glycoprotein inserts, and the M-protein initiates coiling. The M-RNP complex binds with the glycoprotein, and the completed virus buds from the plasma membrane. Within the central nervous system (CNS), there is preferential viral budding from plasma membranes. Conversely, virus in the salivary glands buds primarily from the cell membrane into the acinar lumen. Viral budding into the salivary gland and virus-induced aggressive biting-behavior in the host animal maximize chances of viral infection of a new host.

 The following information is taken from the CDC website
http://www.cdc.gov/ncidod/dvrd/rabies/natural_history/nathist.htm

Natural History

Rabies virus causes an acute encephalitis in all mammals, including 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. In the United States, several distinct rabies virus variants have been identified in terrestrial mammals, including raccoons, skunks, foxes, and coyotes. In addition to these terrestrial reservoirs, several species of insectivorous bats are also reservoirs for rabies.

The primary Rabies Vector Species (RVS) in Ontario are raccoon, fox, skunk and bat.

Transmission

Transmission of rabies virus usually begins when infected saliva of a host is passed to an uninfected animal. Various routes of transmission have been documented and include contamination of mucous membranes (i.e., eyes, nose, mouth), aerosol transmission, and organ transplants. The most common mode of rabies virus transmission is through the bite and virus-containing saliva of an infected host.

Following primary infection the virus enters an eclipse phase in which it cannot be easily detected within the host. This phase may last for several days or months. Investigations have shown both direct entry of virus into peripheral nerves at the site of infection and indirect entry after viral replication in non-nervous tissue (i.e., muscle cells). During the eclipse phase, the host immune defences may confer cell-mediated immunity against viral infection because rabies virus is a good antigen. The uptake of virus into peripheral nerves is important for progressive infection to occur.

After uptake into peripheral nerves, rabies virus is transported to the central nervous system (CNS) via retrograde axoplasmic flow. Typically this occurs via sensory and motor nerves at the initial site of infection. The incubation period is the time from exposure to onset of clinical signs of disease. The incubation period may vary from a few days to several years, but is typically 1 to 3 months. Dissemination of virus within the CNS is rapid, and includes early involvement of limbic system neurons. Active cerebral infection is followed by passive centrifugal spread of virus to peripheral nerves. The amplification of infection within the

Did you know that...

- Wild animals infected with rabies may shed the rabies virus in their saliva for several days before that animal exhibits signs of the disease.
- Rabies has been confirmed in wild animals less than three weeks old.
- The incubation period between exposure to rabies virus and the onset of the disease may range from ten days to several years.

From New York DEC brochure "Rabies Information for Wildlife Rehabilitators"

CNS occurs through cycles of viral replication and cell-to-cell transfer of progeny virus. Centrifugal spread of virus may lead to the invasion of highly innervated sites of various tissues, including the salivary glands. During this period of cerebral infection, the classic behavioural changes associated with rabies develop.

Pathology

Pathology of rabies infection is typically defined by encephalitis and myelitis. Perivascular infiltration with lymphocytes, polymorphonuclear leukocytes, and plasma cells can occur throughout the entire CNS. Rabies infection frequently causes cytoplasmic eosinophilic inclusion bodies (Negri bodies) in neuronal cells, especially pyramidal cells of the hippocampus and Purkinje cells of the cerebellum. These inclusions have been identified as areas of active viral replication by the identification of rabies viral antigen.

Several factors may affect the outcome of rabies exposure. These include the virus variant, the dose of virus inoculum, the route and location of exposure, as well as individual host factors, such as age and host immune defences.

Signs and symptoms

The first symptoms of rabies may be non-specific flu-like signs — malaise, fever, or headache, which may last for days. There may be discomfort or paresthesia at the site of exposure (bite), progressing within days to symptoms of cerebral dysfunction, anxiety, confusion, agitation, progressing to delirium, abnormal behaviour, hallucinations, and insomnia. The acute period of disease typically ends after 2 to 10 days (6). **Once clinical signs of rabies appear, the disease is nearly always fatal**, and treatment is typically supportive. Disease prevention is entirely prophylactic and includes both passive antibody (immune globulin) and vaccine. Non-lethal exceptions are extremely rare. To date only six documented cases of human survival from clinical rabies have been reported and each included a history of either pre- or post exposure prophylaxis.

The following information is from a series of CFIA presentations that were part of the 2005 Ontario Rabies Vector Species training for wildlife custodians. Similar information is available at

<http://www.inspection.gc.ca/english/anima/heasan/disemala/rabrag/rabragfse.shtml>

Animals with rabies may show a variety of different symptoms. Most relate to the effect of the virus on the brain. **It is important to remember that it is not possible to identify if a wild animal has rabies simply by observing them. There is only one definitive test for rabies and it requires the euthanization of the animal, so that the brain tissue can be tested.**

Little is known about the incubation period for rabies in wild animals. Experimental situations have shown incubation periods of up to one year. Therefore **all RVS in a wildlife rehabilitation facility should be considered at risk for developing rabies and treated with the appropriate safety precautions.**

Rabies can appear in two basic forms:

Dumb Rabies

- Animals may appear depressed and try to hide in isolated places.
- Wild animals may lose their fear of humans, and appear unusually friendly.
- Wild animals that usually only come out at night may be out during the day.
- The animal may have paralysis. Areas most commonly affected are the face or neck, causing abnormal facial expressions or drooling, or the body, usually the hind legs.
- Animal rarely bites, not irritable.
- Lethargic behaviour
- Change in tone of voice, becomes hoarse
- May act like there is something stuck in it's throat

Furious rabies

- Animal wanders aimlessly
- Animals may become very excited, restless, irritable or aggressive.
- Periods of excitement usually alternate with periods of depression.
- The animal may attack objects or other animals. They may even bite or chew their own limbs.
- May eat dirt, wood or other objects.
- Change in tone of voice, becomes hoarse
- Lower jaw hangs down, excessive salivation
- The animal may have paralysis. Areas most commonly affected are the face or neck, causing abnormal facial expressions or drooling, or the body, usually the hind legs.

RABIES IN ONTARIO

The following information is taken from the Ontario Ministry of Natural Resources Rabies website at <http://rabies.mnr.gov.on.ca>

Ontario can be thankful for the protection we have from the viral disease called rabies. We now have one of the lowest incidences of this killing disease in North or South America. The Rabies Research and Development Unit (RRDU) of Ontario's Ministry of Natural Resources (MNR) has strategically attacked the rabies virus by developing both vaccines and methods of delivering the vaccine (e.g., bait) to our wildlife. Wildlife, such as fox, eat the bait which then vaccinates the animal, minimizing its chances of catching the rabies virus from other wildlife. Two primary methods are used to vaccinate Ontario's wildlife: distribution of vaccine baits (by airplane, helicopter and by hand), and a trap-vaccinate-release program.

Rabies is often transmitted to humans through our own pets who have come in contact with wild animals carrying the rabies virus. Foxes, raccoons, skunks and bats are the major transmitters of the rabies virus in Canada and the United States.

The RRDU has spent the past 40 years in a campaign to better understand the disease and eliminate rabies carried by raccoons, foxes and skunks from the province. Ontario's incidence of rabies in fox has been reduced from thousands of cases a year to almost none over the past few years.

Raccoon rabies has been a major public health hazard to our American neighbours since the 1940s. In July 1999, Ontario had its first case of raccoon rabies, but the RRDU had been preparing for this invasion for several years. That preparation and the control efforts to date have helped stop the spread of raccoon rabies in Ontario.

The RRDU and MNR provides wildlife rabies immunization control expertise to our neighbours in the US, Quebec, Newfoundland and New Brunswick to help them reduce the spread of the rabies virus from raccoons and foxes.

To showcase our successes and assist our partner nations, the Ministry's office in Peterborough hosted the 2001 International Meeting on Advances in Rabies Research and Control in the Americas.

In jurisdictions such as neighbouring New York State, which did not have proactive, multi-partner programs, the number of raccoon rabies cases had climbed to more than 8000 in the initial six-year period. Ontario's MNR-led program is so effective that, since 1999, only 132 cases of raccoon rabies have been confirmed.

Much of Ontario's success in controlling the spread of raccoon rabies is attributable to the introduction of a high-risk area (HRA) in eastern Ontario. The HRA was established in 2000 and expanded in 2002 to help control the spread of raccoon rabies. Efforts have been so

successful that the boundaries of the HRA were changed July 1, 2005 resulting in a 65% size reduction.

As of January 1, 2006, all rabies vector species (fox, raccoon, and skunks) in a HRA can be released up to 1 km from the point of capture. All non-RVS wildlife brought into care as a juvenile can be released up to 15km from the point of capture. To view an up-to-date High Risk Area map please go to <http://rabies.mnr.gov.on.ca/rabiesmaps.cfm> to see if you are in the Raccoon Rabies High Risk Area, or contact your MNR District Office for further information.

Outside of a rabies HRA all wildlife brought into care as an adult can be released up to 1km from original point of capture. Wildlife brought into care as a juvenile can be release up to 15 km from original point of capture.

Limitation of Vaccination

It is important to remember that, just like human vaccinations for measles or small pox, vaccinating animals against rabies is not 100% effective at preventing rabies infection. Also, if an animal that is already incubating the virus is vaccinated, it will not cure them.

The rabies control program is a joint effort that receives important input from a variety of partners across Ontario. Regional health units, municipalities, wildlife rehabilitators, licensed trappers, wildlife control agents and aboriginal communities are all key to the continued success of Ontario's world-renowned rabies control program.

Mandate of the RRDU

The mandate of the Rabies Research and Development Unit is the research, control and eradication of rabies from terrestrial wildlife in Ontario. This is accomplished through:

- i. development of effective and efficient baits, vaccines and bait delivery systems
- ii. understanding rabies and rabies vectors
- iii. modeling rabies outbreaks
- iv. active involvement in international technology and information exchange on rabies research and control
- v. work with other Ministries to ensure Ontario's publics are aware of rabies and their role in preventing its spread

At one time, Ontario was known as the 'Rabies Capital of North America' due to the high number of rabid animals reported. Since 1992, the number of rabies cases has been reduced by 95%. In Ontario, rabies control programs focus on terrestrial rabies (Arctic fox strain and mid-Atlantic raccoon strain) while education programs focus on the various bat strains of rabies.

Types of Rabies in Ontario

There are several strains of rabies currently in Ontario. It is important to note that, though strains of rabies are named after the species they are usually found in, any mammal can get any strain of rabies.

Arctic Fox Strain

This strain of rabies invaded southern Ontario, between 1954 and 1959, from northern Ontario and Quebec. In northern Ontario, the disease disappeared in 1972 but reappeared in 1989. As a result of aerial baiting with oral vaccination it was eliminated from southeastern Ontario, but still persists in certain areas across southwestern Ontario. It is now seen mostly in skunks.

Raccoon Strain

This strain of rabies was first reported in Florida in 1947, remained in the southeastern coastal parts of the USA until 1977, and then began to rapidly spread northward. It entered Ontario in July 1999. It was first discovered in a juvenile raccoon found dead in a dog kennel, just northwest of Prescott. Since 1999 there have been 132 cases have been reported within this general area of Ontario. Wolfe Island near Kingston was held at six cases during December 1999 and has been rabies free for more than seven years.

The Bat Strains

These strains of rabies were first diagnosed in Ontario in 1961. There are eight species of bats in Ontario, all of which have their own strain of the disease, but the most common are Little Brown bat, Big Brown bat, and Silver-haired bat. Although bats are the most widely distributed mammal, less than 2% of bats submitted for testing have rabies (of all bats acting strangely, dead, or have possibly bitten a human or pet). In the overall population, this percentage would be much lower.

Oral Vaccines

The 'Ontario-slim' bait

The 'Ontario-slim' bait is used in Ontario for both arctic fox rabies and raccoon rabies control. The only difference with respect to the two species is the vaccine in the bait.



The Ontario-slim bait is a 35 mm × 11 mm block and weighs 13.0 grams (includes total weight of bait matrix with vaccine in blister pack). It consists of oleo, wax, icing sugar, vegetable oil, artificial marshmallow flavour,

dark-green food grade fat-soluble dye, and tetracycline (HCl).

Blister-pack (Vaccine Carrier): This is a brown flecked polystyrene blister pack (19 mm × 19 mm × 7.0 mm) with a polyester laminated aluminum foil, heat-sealable lidding (28 mm × 28 mm). The polyester side of the seal, which has a green warning label printed under it, is exposed, while the body of the blister pack is embedded in the bait matrix.

Vaccine in Baits for 'Fox' Strain Rabies: *ERA©-BHK-21 oral rabies vaccine*

Description: a `modified/ live virus liquid vaccine

Volume/bait: 1.8 ±0.1 ml in the blister-pack

Other inclusions: antibiotics and vaccine stabilizers

Colour: golden red opaque

Target species: fox only

Vaccine in Baits for 'Raccoon' Strain Rabies: *RM Raboral® vaccinia-rabies glycoprotein (VRG) oral rabies vaccine*

Description: a 'recombinant' live virus liquid vaccine produced by inserting a copy of rabies glycoprotein protein gene into the genome of the vaccine virus

Volume/bait: 1.8 ±0.1 ml in the blister-pack

Other inclusions: an antibiotic

Colour: light red

Target species: raccoons, foxes

ONRAB vaccine

ONRAB is a 'made-in-Ontario' oral rabies vaccine that shows promising results for all 3 primary rabies vector species (raccoon, skunk, fox). Oral vaccines currently in use do not produce effective seroconversion in skunks (i.e., the vaccination is not effective in protecting the skunk against rabies). The ONRAB vaccine is the result of a dedicated 17-year effort by the Ministry of Natural Resources and its many partners. A field trial of this new vaccine is currently underway.

Trap-Vaccinate-Release (TVR) Program

What is the TVR program?

The TVR program is a preventive measure to protect raccoons and skunks, in certain areas of the province, against the spread of the raccoon strain of rabies.

Why is it necessary?

Ontario had its first case of raccoon rabies north of Brockville in July 1999. The raccoon rabies virus strain had been threatening to cross at the Ontario-New York State border for several years from the United States. The objective of the TVR program is to minimize the spread of the disease in native wildlife populations at high-risk locations, such as border crossings along the St. Lawrence River and in Niagara Falls.

How does the program work?

With the assistance of local trappers hired for their expertise, Ministry of Natural Resources staff set out live-trap cages to catch raccoons without harming them. The raccoons are then vaccinated intra-muscularly against rabies, marked with ear-tags that will identify them as vaccinated, and then released unharmed at the site where they were captured.

Trapping, vaccinating and then releasing animals is an effective, though labour-intensive, way of protecting raccoons against rabies. From 1994 to 2006, the program vaccinated from 52 to 78 per cent of the raccoon population in the buffer zones in the Niagara Region and along the St. Lawrence River. Trapping to control raccoon rabies will continue until rabies is eliminated. Vaccinating a large number of raccoons in these areas against rabies will contain or slow the spread of the disease.

Where are traps placed?

The traps are placed by Ministry of Natural Resources staff in any area that raccoons are known to inhabit, including private land with permission of the landowner. The public can expect to see wildlife technicians setting cages and checking them within 24 hours for raccoons.

What happens if other animals, such as pets, are caught in the traps?

Although other animals may inadvertently be caught, the traps cannot harm them. The cages are checked within 24 hours and any other animals are released. The public should not attempt to release any animals from these cages.

Point Infection Control (PIC)

What happens when a case of raccoon rabies is confirmed in Ontario?

When a case of raccoon rabies is confirmed in Ontario, Ministry of Natural Resources staff implement a point infection control program near the point of discovery, in an effort to contain the disease and prevent it from spreading to the rest of Ontario's raccoons and other mammals. The program will be modified if a case occurs in an area where raccoons have been recently vaccinated against rabies i.e. in the Niagara Region and near the bridge border crossings along the St. Lawrence River.

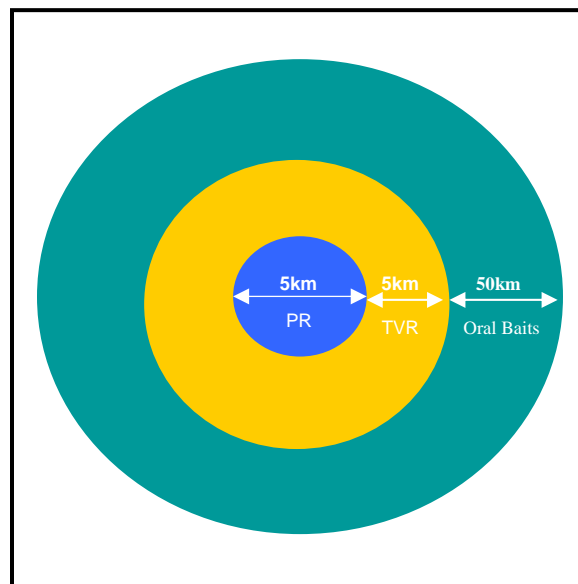
How does the point infection control program work?

In urban areas, the program may involve humanely euthanizing raccoons and skunks within a two-kilometer radius of the confirmed case. Within a further two-kilometer area, raccoons, skunks, foxes, and feral cats will be vaccinated in order to create a buffer zone of inoculated animals.

In rural areas, all raccoons and skunks within a radius of five kilometers may be humanely euthanized, and those within a further five-kilometer radius will be trapped, vaccinated and released (TVR). Outside of the TVR zone, there will be additional distribution of vaccine baits.

The difference in area relates to how far the raccoons are likely to travel within a given period. Urban raccoons inhabit a much smaller territory than raccoons living in less populated areas.

The programs are flexible depending upon the intensity of other rabies control efforts in the immediate area. Each new case is assessed on an individual basis to determine whether a PIC should be modified. If a new case occurs in an area which has recently been treated for raccoon rabies, the PIC will be modified and animals will not be euthanized unless they appear or behave abnormally.



The 3 circular 'zones' in Point Infection Control

Why is it necessary to humanely euthanize some animals?

Rabies incubates for some time. Infected animals may not show symptoms of the disease for weeks. By the time a case of raccoon rabies is confirmed, the disease likely has taken hold in the area and vaccination may no longer be an effective control in the immediate area.

By humanely euthanizing raccoons and skunks in the area where a case is confirmed – as they could be infected – and by vaccinating the surrounding population, the chance of eliminating the disease and preventing it from spreading is increased significantly. Population reduction is a standard procedure for wildlife disease control, for example it is also utilized for control of Chronic Wasting Disease and Avian Influenza.

How does the vaccination program work?

With the assistance of local trappers hired for their expertise, the Ministry of Natural Resources will set out live-trap cages to catch raccoons and skunks without harming them. Cages are checked within 24 hours and trapped raccoons, skunks, foxes, and feral cats are vaccinated. They are also marked with ear tags for identification purposes, and released at the point of capture.

What role will the public play in this process?

The public can initiate preventive measures that are successful against any strain of rabies. You should have your pets vaccinated, warn your children to stay away from wild or stray animals, and report any animal that behaves strangely to your local police department.

If you travel across a region known to have raccoon rabies, remember that raccoons can 'hitch a ride' on trucks and other vehicles. There is a risk that rabies could be spread far into the province this way. Before you begin your trip, or after a roadside stop, make sure that you have not 'picked up' or are carrying raccoons in your vehicle.

Keep in mind that wildlife relocated in protection of property should be released within 1km of the original capture site.

BATS AND RABIES

The following information is taken from the CDC website

http://www.cdc.gov/ncidod/dvrd/rabies/Bats_&_Rabies/bats&.htm

When people think about bats, they often imagine things that are not true. Bats are not blind. They are neither rodents nor birds. They will not suck your blood -- and most do not have rabies. Bats play key roles in ecosystems around the globe, from rain forests to deserts, especially by eating insects, including agricultural pests. The best protection we can offer these unique mammals is to learn more about their habits and recognize the value of living safely with them.

Bats that are active by day, found in unusual places (such as on your lawn), or that are unable to fly have a higher likelihood than others to be rabid (although healthy bats can also be found in these situations). Any person finding such a bat should contact a wildlife custodian to assess the bat's behaviour and determine if admittance to a wildlife rehabilitation centre is required.

People usually know when they have been bitten by a bat. However, because bats have small teeth which may leave marks that are not easily seen, there are situations in which you should seek medical advice even in the absence of an obvious bite wound. For example, if you awaken and find a bat in your room, see a bat in the room of an unattended child, or see a bat near a mentally impaired or intoxicated person, seek medical advice and have the bat tested.

CDC Case study

In February 1995, the aunt of a 4-year-old girl was awakened by the sounds of a bat in the room where the child was sleeping. The child did not wake up until the bat was captured, killed, and discarded. The girl reported no bite, and no evidence of a bite wound was found when she was examined. One month later the child became sick and died of rabies. The dead bat was recovered from the yard and tested--it had rabies.

This case demonstrates several points:

- This child's infection with rabies was most likely the result of a bat bite. Children sleep heavily and may not awaken from the presence of a small bat. A bat bite can be superficial and not easily noticed.
- If the bat had been submitted for rabies testing, a positive test would have led to life-saving anti-rabies treatment.

Remember, in situations in which a bat is physically present and you cannot reasonably rule out having been bitten, safely capture the bat for rabies testing and seek medical attention immediately.

Bat Rabies in Ontario

The following information is taken from the Bat Rabies factsheet available at

<http://rabies.mnr.gov.on.ca/facts.cfm>

There are eight species of bats in Ontario, each of which has its own strain of rabies, but the more common strains are Big Brown bat, Little Brown bat, and Silver-haired bat. The Silver-haired bat tends to be reclusive and therefore rarely come in to contact with humans. Despite large numbers of bats in southern Ontario, rabies is infrequent. From 2001 to 2005 there have been 314 bats confirmed with rabies in Ontario. Fewer than 2% of bats submitted for testing have rabies (2% of all bats acting strangely, dead, or have possibly bitten a human

or pet). In the overall population, this percentage would be much lower. In Ontario, 95% of rabies positive bats are big brown bats.

Rabid bats often lose their ability to fly, or do not fly well. They rarely become aggressive.

Human rabies from bats is a concern, but a relatively rare occurrence. In Canada, since 1925, five of the 26 cases of human rabies have been due to contact with an infected bat. The last fatality in Canada was a 52 year old man from British Columbia in March 2003 after contact with a rabid bat.

Careless handling of bats is the primary source of rabies exposure from bats.

Bats cannot be vaccinated using baits, as has been done for foxes and raccoons, as they are insect-eaters and will not consume vaccine baits. International research is being conducted on vaccination methods for bats

Bats are an important part of our ecosystem and help reduce the insect population. Warn children to stay away from all wild animals, including bats. Submit all dead, sick, or bats exhibiting symptoms of rabies to the Canadian Food Inspection Agency for rabies testing if exposure of people or pets has possibly occurred.

The following information is excerpted from materials prepared by Nightwings Bat Rehabilitation for the 2006 Ontario Rabies Vector Species training for wildlife custodians.

- Although not prevalent (rabies is estimated in less than one half of one percent of bats in the wild), when you are handling bats you should treat each bat as potentially rabid.
- Bites can transmit the virus even if no blood is present at the wound site – wash thoroughly with soap and water, and contact your physician as soon as possible.
- Rabies can incubate for up to one year in bats
- Bats can shed the rabies virus for at least 12 days prior to onset of clinical signs
- Sick bats usually segregate themselves from the group
- Symptoms of rabies in bats are similar to what is seen in other mammals:
 - Lethargy (when combined with other symptoms below)
 - Hypophagia (often linked to inability to swallow)
 - Incessant biting at bedding or anything that touches them (different from defensive or fear biting when being handled)
 - Dirt or other substances in the mouth
 - Constant vocalizations when undisturbed
 - Seizures
 - Legs cramped up against abdomen

Safe Capture

To capture a bat safely wait until the bat lands (do not walk away while the bat is flying, as it may land out of sight in your absence). Wearing light leather gloves, put a yogurt or ice-cream container over the bat; gently slide a piece of cardboard up to cover the opening of the container, and tip the bat gently to the bottom. Keeping the container upright, put a small cloth in with the bat and place the matching lid, with air holes poked through, tightly over the container. Keep the bat in a cool (but not freezing) place until it can be transported.

Note: Cardboard boxes are not recommended as the bat can climb through box edges. Tape applied to prevent this often results in the bat becoming caught in the tape.

OTHER AGENCIES AND PARTNERS IN RABIES PREVENTION AND CONTROL

The Canadian Food Inspection Agency

The following information is from a series of CFIA presentations that were part of the 2006 Ontario Rabies Vector Species training for wildlife custodians.

CFIA is responsible for the following aspects of rabies control:

- Collection of specimens for rabies diagnosis
- Submission of samples to federal laboratories for rabies diagnosis
- Reporting of results on specimens submitted for rabies examination
- Quarantine/control of domestic animals exposed to a suspected or rabies positive animal
- Regulating Veterinary biologics (vaccines)

As a wildlife rehabilitator, you may interact with your CFIA office when:

- You have questions about Rabies
- You think you have been exposed to Rabies
- You would like an animal tested for Rabies
- You would like to report a suspected Rabies incident

The following information is taken from the CFIA website

<http://www.inspection.gc.ca/english/anima/heasan/disemala/rabrag/program-e.shtml>

The extent and limitations of the CFIA's involvement in the rabies control program are mandated and regulated by parts of the Health of Animals Act, Health of Animals Regulations, Reportable Diseases Regulations and Rabies Indemnification Regulations. The main objective of the program is to prevent the transmission of rabies from domestic animals to humans. The CFIA meets this objective by carrying out the activities described in the Disease Control Manual, Section 14, Rabies.

Health of Animals Act

Rabies is a reportable disease under the Health of Animals Act and Regulations. The Health of Animals Act pertains to "diseases and toxic substances that may affect animals or that may be transmitted by animals to persons, and respecting the protection of animals". It gives the Minister of Agriculture and Agri-Food the authority and legal mandate to safeguard the health of Canadian animals and intervene where a disease may be transmitted by animals to persons. As such, any form of rabies including rabies in wildlife, falls within the mandate of CFIA.

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 premises, 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. Neither of these conditions may be satisfied with respect to wildlife who by definition are not owned and cannot be restricted in movement.

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 have been implemented in controlling rabies in all domesticated animals, it has not been used to control or eradicate rabies in wildlife.

In Canada, control of wildlife populations falls under the authority of various federal and provincial bodies. Most provincial governments have legislation with responsibility for managing their wildlife populations. Parks Canada have been empowered to manage the wildlife within the boundaries of federally controlled parkland.

Reportable Disease Regulations

Rabies is prescribed as a "reportable" disease under the Reportable Disease Regulations under the Health of Animals Act.

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)

The Health of Animals Regulations

Part IX of the Regulations is entitled the "Eradication of Diseases". The diseases specifically mentioned are those diseases that 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.

Rabies, which is caused by various strains of the rabies virus, is a serious disease of humans and animals, the disease is considered endemic in the Canadian wildlife population. The government measures allowed by a Ministerial Declaration under Section 27 of the Act are not applicable to control the movement of wild animals.

Rabies Indemnification Regulations

These regulations were created pursuant to an Appropriation Act. Under federal/provincial agreements with Ontario, Quebec and Manitoba the Minister is allowed to provide financial assistance to owners of certain domestic animal species that died as a result of rabies. In these provinces the CFIA pays an indemnity for livestock which have been confirmed either by laboratory evidence or by veterinary diagnosis as having rabies. The Federal share of the indemnity is 40% of the animal's total market value to a maximum of \$400 for cattle, \$200 for horses and \$80 for sheep, swine and goats.

Disease Control Manual of Procedures

The CFIA has established policy in Section 14 of the Disease Control Manual of Procedures that states when and how its inspectors will deal with animals that are affected by or suspected of being affected with rabies. That manual outlines actions to be taken by CFIA inspectors when domesticated animals are exposed to, or suspected of being exposed to, a rabid animal regardless of whether it is a domesticated or wild animal.

The rabies control program is aimed at the reduction or elimination of disease in domestic animals and investigating all human or domestic animal exposures to rabies, suspect or confirmed, domestic or wild animal. The main elements of the CFIA's rabies control include the following.

1. Investigation of all rabies suspect cases in domestic animals. CFIA veterinarians conduct field investigations when domestic animals are reported to have symptoms of rabies. Each positive diagnosis, with known human exposure, is reported to the public health authorities.
2. Quarantine of all domestic animals suspected of being exposed to a confirmed or suspected rabid domestic or wild animal. CFIA veterinarians quarantine any domestic animal that is known or is suspected to have had contact with a rabid animal.
3. Evaluation, isolation and observation for the period of 10 days of all available dogs, cats or ferrets that bite a human. Presently, the CFIA carries out this function solely in the province of Quebec. In all other provinces those responsibilities are being shared between the CFIA and provincial health departments and, the CFIA's involvement is limited to situations in which a biting animal under observation dies, or is reported with signs of abnormal behaviour

4. Collection of samples for rabies diagnosis from rabies suspect animals, domestic or wild. The animal must be made available for testing. CFIA inspectors collect specimens from any diseased animal in contact with humans or domestic animals when the possibility of rabies exists. In remote areas, where the CFIA is not present, special arrangements have been made with the local authorities to collect the sample from the rabies suspect animals which came into contact with humans or domestic animals. The collected samples are sent to the nearest CFIA office capable of submitting the specimens to a federal laboratory for testing. Alternatively in some isolated regions individuals certified for Transportation of Dangerous Goods (TDG) such as RCMP officers, Provincial Wildlife Departments or private veterinarians can submit rabies suspect specimens directly to the appropriate federal laboratories.

CFIA's indirect involvement in the Rabies Control Program

The Animal Import Section of the Health of Animals Regulations, requires proof of rabies vaccination for all dogs, cats and ferrets over 3 months of age entering Canada. CFIA veterinarians can help to determine and provide certification when required to meet the rabies requirements of importing countries.

CFIA laboratories conduct rabies research, including variant typing, however rabies variant typing is not imperative for the current rabies control program.

The CFIA maintains a rabies website which contains quarterly and annual reports on the positive rabies cases listed by species and province. The web site also provides comprehensive information on the disease and CFIA rabies control program.

The CFIA publishes Rabies Pamphlets which are made available to the pet owners or livestock producers through the CFIA District Offices.

Financial contributions have been made to the wild life baiting project and the development of new vaccines.

The CFIA Biologics Section is responsible for licensing rabies vaccines.

Surveillance

Subject to the availability of resources, the disease control program participates in the rabies surveillance program by submitting and laboratory processing specimens from animals not known to have rabies or to have been exposed to rabies.

Ontario's Public Health Units

The following information is from a series of Public Health Unit presentations that were part of the 2006 Ontario Rabies Vector Species training for wildlife rehabilitators, and additional information available at

http://www.health.gov.on.ca/english/public/contact/phu/phu_mn.html

A Public Health Unit is an official health agency established by a group of urban and rural municipalities to provide a more efficient community health program, carried out by full-time, specially qualified staff.

There are 36 public health units in Ontario. Health units administer health promotion and disease prevention programs to inform the public about healthy life-styles, communicable disease control including education in STDs/AIDS, immunization, food premises inspection, healthy growth and development including parenting education, health education for all age groups and selected screening services.

Each health unit is governed by a board of health, which is an autonomous corporation under the Health Protection and Promotion Act, and is administered by the medical officer of health who reports to the local board of health. The board is largely made up of elected representatives from the local municipal councils. The ministry cost-shares the expenses with the municipalities.

Public Health Units are required by law to carry out the following programs:

- Communicable disease control
- Immunization
- Sexual health
- Environmental health (safe food, safe water, etc.)
- Health promotion and information

One goal of public health units is to prevent the occurrence of rabies in humans. This is achieved by increasing the public's awareness of the disease and by providing post-exposure treatment to persons exposed to animals suspected or known to have rabies.

Health Unit Activities:

- Provide rabies information on an ongoing basis
- Promote/Enforce vaccination of dogs and cats
- Investigate potential rabies exposures in humans e.g. animal bites, bat exposures
- Maintain supply of Post Exposure Prophylaxis (PEP)

If you suspect that you, one of your volunteers or foster care givers, or someone that has brought in wildlife may have been exposed to rabies please report it to your local public health unit:

- Type of exposure, what occurred

- Animal involved, description
- Location of animal

Make sure the person gets medical attention. Note that it is the physician that makes the final decision regarding treatment in consultation with victim.

RABIES AND WILDLIFE REHABILITATION

The following information is excerpted from a series of presentations given by Toronto Wildlife Centre that were part of the 2006 Ontario Rabies Vector Species training for wildlife custodians. You can learn more about the TWC at <http://www.torontowildlifecentre.com/> All photos in this section courtesy of TWC.

Toronto Wildlife Centre (TWC) has been open since March of 1993, and is the busiest wildlife centre in Canada. TWC admits almost 5,000 sick, injured or orphaned wild animals to its wildlife rehabilitation program each year, and receives approximately 30,000 calls to its wildlife hotline. The centre has 22 staff members, almost 200 volunteers, and was the first wildlife centre in Canada to have a wildlife hospital with veterinarians on staff.

There are 6 important areas to consider to protect wildlife, your volunteers, and yourself from rabies.

- 1) Continuing Education
- 2) Initial Response
- 3) Field Response
- 4) Admitting
- 5) Medical treatment and rehabilitation
- 6) Release

Continuing Education

You are learning about rabies by reading this home study guide, but it is important to remember that wildlife rehabilitation is an evolving field and continual learning is important. There are numerous organizations and resources included in the appendices that will be useful to you.

Initial Response

Your initial contact with a person who has encountered a wild animal is your opportunity to help wildlife and keep people safe by gathering information on potential rabies exposures. Important questions include:

- What species of animal have you found?
- Under what circumstances was the animal found? How was the animal behaving?
- Has it bitten or scratched anyone? Has anyone handled it with bare hands?
- Do you know how many people have handled the animal?
- If someone has been bitten or scratched, has their family doctor and the health department been notified?
- Have any domestic animals been in contact with it? Are they vaccinated against Rabies?
- If there has been contact with a domestic animal, has the health department been notified?
- What is your name, address and phone number?

- Where was the animal found? (A specific location to allow for release)

The answers you receive to these questions will allow you to determine if rabies exposure has occurred. Any calls or inquiries that suggest a person or domestic animal has been exposed to rabies should be referred to the local public health unit (for human exposure) or the local CFIA office (for domestic animal exposure). Remember, rabies is a “reportable” disease under the Health of Animals Act and you must report any suspected case of rabies exposure. You do not want to be in a position where you potentially endanger a person’s life, or contribute to the spread of rabies infection in the wild animals of Ontario.

Even if your assessment suggests there has not been rabies exposure, it is important to get the person’s contact information. If the animal develops signs of rabies while in your care you can inform the person of their increased potential for exposure.



City of Alexandria, Virginia
Office of the City Manager
Alexandria City Hall
301 King Street, Suite 3500
Alexandria, Virginia 22314-3211
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For Immediate Release
September 14, 2004
PIO 220-04/bg

Health Department Issues Urgent Plea For Anyone Exposed to Rabid Raccoon

The Alexandria Health Department has issued an urgent plea to anyone who may have been exposed to a baby raccoon in the last three to four weeks to report the potential exposure to the Health Department. Rabies is a fatal disease, and finding anyone who may have been exposed to a rabid raccoon is critical, health officials said. On about Aug. 25, someone left a box with a raccoon, a [redacted] on the doorstep of a wildlife rehabilitator who lives in the 400 block of W. Alexandria. The raccoon apparently bit the resident. Later, the raccoon died and tests determined that the raccoon had rabies.

The Health Department only recently learned that the rabid raccoon was left by an unknown person at the residence. For their own health and safety, whoever left the raccoon at the residence in August, and anyone who may have been in contact with a raccoon in Alexandria, should call Bob Custard, Environmental Health Manager, at 571.221.7288, or Kathy DeSnyder, Epidemiologist, 703.838.4400, ext. 264, as soon as possible.

"Rabies in humans is a fatal disease," said Dr. Charles Konigsberg, Jr., Director of Health for the City of Alexandria. "To protect themselves from rabies, citizens should not feed or touch wild animals and should be sure their pets are vaccinated," said Konigsberg.

Rabies have been widespread in the raccoon population in the Northern Virginia area for over 10 years. Thirteen cases of rabid raccoons were reported in Alexandria in 2003 and five have been reported so far this year.

Field Response

Once you have determined that a RVS should be brought to you for rehabilitation, you then must get the animal safely contained and transported to you:

- Members of the public (which includes minimally trained volunteers) should never try and confine RVS unless they can do so safely.
- Ensure that the enclosure being prepared is one from which the animal cannot escape, and that the animal will be safe until it gets to you.
- Bats can be scooped into a container wearing protective gloves (leather), but raccoons, skunks & foxes should only be gently pushed with an object such as a board or broom into a sturdy container – alternatively, a container can be placed over the animal and a board slid underneath (these methods should only be suggested / attempted if the raccoon, skunk or fox is not very mobile).



- Once the animal is contained, take additional precautions to prevent escape e.g. tape the edges of a box.
- If the animal can't be safely confined, the finder should maintain visual contact with the animal until someone able to handle the situation can arrive.

Admitting

- Ask your veterinarian to thoroughly train you in doing a full physical exam, if he/she can't always do it themselves – and pay special attention to any signs that may suggest rabies.
- Symptoms of rabies seen at TWC:
 - Lethargy and quick death
 - Attacking inanimate objects
 - Bats that won't hang
 - Seizure
- Many diseases / conditions may resemble rabies



Medical Treatment and Rehabilitation

Consider each individual of a RVS as having the potential to transmit the virus and handle it with appropriate consideration.



The virus can incubate for long periods of time in wildlife.

Infected animals can shed the virus before they show clinical signs of the disease.

Handling / caring for RVS at TWC

To protect people:

- All RVS who have had ‘contact’ with people, under direction of the health department, are euthanized for the protection of the public.
- All people handling or caring for RVS must be vaccinated against rabies.
- All people vaccinated against rabies must have their titres checked once per year, and must have booster shots as needed.
- All people handling / caring for RVS must initial tasks on each animal’s chart.
- All people handling / caring for RVS must be properly trained to work with those animals and use appropriate care, handling and safety techniques (e.g., wear properly fitted face mask, gloves, long sleeves, safety glasses).
- If vaccinated staff / volunteers are bitten or scratched by a RVS, their family doctor and the health department must still be notified.
- Any suspicious animals are “flagged” and only cared for by senior staff.
- Suspicious animals that die or are euthanized should be submitted for testing to the Canadian Food Inspection Agency or the Canadian Cooperative Wildlife Health Centre.

To protect the animals:

- All new animals must have a thorough exam – consider euthanasia for animals who show suspicious signs

- All animals must be uniquely identifiable (chart and cage, individuals within a group)



These raccoon cages at TWC are “two arm widths” apart so that raccoons in different cages can’t touch each other.

- All new single baby RVS who can be bundled with another should be quarantined for an appropriate amount of time before introduction.
- Animals should not share wash water when cages are being cleaned, gloves should be changed between patients or groups of patients.

- Specific bottles, nipples or syringes should be assigned to each litter, not transferred between litters, and disinfected after use.
- Cages should be thoroughly cleaned and disinfected before a new individual or litter is placed in it.
- Animals should not be able to touch each other between cages.
- Where appropriate, animals should be vaccinated against Rabies.

A special note about ‘taming’ RVS

- It is essential to avoid taming all wildlife in your care, but especially important for RVS.
- If tame upon release, the animal may be mistaken for being rabid since tameness / lack of fear of humans is a symptom of rabies.
- It will greatly reduce an animal’s chances of survival after release if it is tame.
- How to ensure RVS are not tamed:
 - Minimal contact (visual, auditory, olfactory) between animal and caregiver
 - Coordinate cleaning / feeding / meds to limit # of times in contact
 - House with con-specifics where possible
 - Aversive conditioning, make sure they keep their healthy fear of humans
 - Natural surroundings pre-release
- Create a tame animal policy in your facility before the situation arises.

recordonline.com from the TIMES HERALD-RECORD

January 19, 2006

Raccoon that bit woman had rabies

Rock Hill - A Rock Hill woman was vaccinated against rabies today after tests showed that raccoon that bit her had the deadly virus.

Sullivan County Public Health Nurse Carol Ryan confirmed the bite.

Thompson Supervisor Tony Cellini said the woman had raised a litter of raccoons from babies and then released them back into the wild. The raccoons returned to her home for food. As she was feeding them Cellini said, one of them bit her.

The raccoon was captured. It was sent to a Health Department lab in Albany where it was necropsied, and rabies was confirmed. The woman began getting a series of vaccines that will prevent her from developing the disease. She has not shown any symptoms; once symptoms develop, rabies is fatal.

Ryan said that to avoid rabies exposure, people shouldn't feed wild animals. "They can seem cute and sweet, but they can carry deadly diseases," she warned.

People should also vaccinate their pets against rabies. Public Health is planning a rabies-shot clinic for pets for February.

Heather Yakin

Release

Release of wildlife should always be as close as possible to the animal's point of origin. Not only does this ensure the animal its best chance of survival, it helps prevent the spread of rabies in Ontario. Remember that you can't determine if an animal has rabies simply by looking at them, and the virus may exist in the body for up to a year before symptoms develop.

A few additional comments from the TWC

As wildlife rehabilitators, we have an awesome responsibility:

- We hold people's lives in our hands
- What we do affects how the whole field of wildlife rehabilitation is viewed
- We can help – or hurt – the health of wildlife populations
- We can change attitudes through education

Please have a look at the "Wildlife Rehabilitator's Code of Ethics", contained in the NWRA / IWRC Minimum Standards for Wildlife Rehabilitation, which provides further insight on the importance of the work we do!

APPENDIX 1 QUICK LINKS AND RESOURCES

Ontario Rabies Research and Development Unit

The mandate of the Rabies Research and Development Unit is the research, control and eradication of rabies from terrestrial wildlife in Ontario. This is accomplished through:

- i. development of effective and efficient baits, vaccines and bait delivery systems
- ii. understanding rabies and rabies vectors
- iii. modeling rabies outbreaks
- iv. active involvement in international technology and information exchange on rabies research and control
- v. work with other Ministries to ensure Ontario's publics are aware of rabies and their role in preventing its spread

To learn more about the RRDU please go to <http://rabies.mnr.gov.on.ca/rabieshome.cfm>

The Rabies Reporter

The Rabies Reporter, a scientific newsletter about current issues in rabies research and control, is a joint effort of the Rabies Research Unit, Ontario Ministry of Natural Resources; Canadian Food Inspection Agency; the Ontario Ministry of Health; and the Geographic Information Systems Laboratory at Queen's University, Kingston.

The Rabies Reporter is published four times a year. Articles are varied and generally include the following: the status of rabies in Ontario's foxes and skunks for the last quarter of the current calendar year and as of 2000, the status of the mid-Atlantic raccoon strain of the rabies virus in raccoons (see below); plans for bait drops as part of the Wildlife Rabies Control Program in Ontario for the current calendar year; and statistics on all animal rabies reports for Ontario for the last quarter of the current calendar year. In recent years, the Ministry of Natural Resources has also become involved in assisting the eastern states of the U.S. in the control of raccoon rabies and Texas in the control of fox and coyote rabies; articles frequently appear as appropriate regarding these initiatives.

To view the Rabies Reporter please go to <http://www.gis.queensu.ca/rreporter/>

Public Health Units Ontario Ministry of Health and Long-Term Care

A Public Health Unit is an official health agency established by a group of urban and rural municipalities to provide a more efficient community health program, carried out by full-time, specially qualified staff.

One goal of public health units is to prevent the occurrence of rabies in humans. This is achieved by increasing the public's awareness of the disease and by providing post-exposure treatment to persons exposed to animals suspected or known to have rabies.

To learn more about Ontario's public health units please go to http://www.health.gov.on.ca/english/public/contact/phu/phu_mn.html

Ontario Ministry of Agriculture, Food and Rural Affairs

Rabies Factsheet

http://www.omafra.gov.on.ca/english/livestock/general/facts/info_rabies.htm

Canadian Food Inspection Agency

The Canadian Food Inspection Agency has a program to control the spread of rabies in Canada. The program includes:

- investigating all reported suspect cases of rabies;
- diagnosing all suspected cases;
- quarantine of all animals suspected of or at risk of having rabies, to prevent contact with humans or other animals;
- requiring proof of vaccination against rabies for all cats and dogs over 3 months of age entering Canada;
- ongoing research; and
- licensing of rabies vaccines.

To learn more about the CFIA and rabies please go to <http://www.inspection.gc.ca/english/anima/heasan/disemala/rabrag/rabrage.shtml>

Public Health Agency of Canada

Link to Material Safety Data Sheet for the infectious agent *Rabies virus*

<http://www.phac-aspc.gc.ca/msds-ftss/msds124e.html>

Canadian Cooperative Wildlife Health Centre

The Canadian Cooperative Wildlife Health Centre (CCWHC) is an organization encompassing Canada's four veterinary colleges. Its purpose is to apply the veterinary medical sciences to wildlife conservation and management in Canada. The organization is also dedicated to developing and using knowledge of wildlife health and disease to improve human health and the health of domestic animals. The CCWHC coordinates Canada's national wildlife health surveillance program and provides educational programs, information, and consultation to both government and non-government agencies, as well as to the public.

To learn more about the CCWHC, and to obtain information on how to submit specimens for testing please go to http://wildlife1.usask.ca/en/CCWHC_home.php

Compendium of Animal Rabies Prevention and Control, 2005
National Association of State Public Health Veterinarians
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5403a1.htm>

United States Department of Health and Human Services
Centers for Disease Control and Prevention (CDC)

The Centers for Disease Control and Prevention (CDC) is one of the 13 major operating components of the Department of Health and Human Services (HHS), which is the principal agency in the United States government for protecting the health and safety of all Americans and for providing essential human services, especially for those people who are least able to help themselves.

Since it was founded in 1946 to help control malaria, CDC has remained at the forefront of public health efforts to prevent and control infectious and chronic diseases, injuries, workplace hazards, disabilities, and environmental health threats. Today, CDC is globally recognized for conducting research and investigations and for its action oriented approach. CDC applies research and findings to improve people's daily lives and responds to health emergencies—something that distinguishes CDC from its peer agencies.

To learn more about the CDC and rabies please go to
http://www.cdc.gov/ncidod/diseases/submenus/sub_rabies.htm

World Health Organization

The World Health Organization is the United Nations specialized agency for health. It was established on 7 April 1948. WHO's objective, as set out in its Constitution, is the attainment by all peoples of the highest possible level of health. Health is defined in WHO's Constitution as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

View the WHO Rabies Information Page at <http://www.who.int/topics/rabies/en/>

International Wildlife Rehabilitation Council (IWRC)
www.iwrc-online.org

National Wildlife Rehabilitator's Association (NWRA)
www.nwrawildlife.org

Bat Conservation International

BCI's mission is to teach people the value of bats, to protect and conserve critical bat habitats, and to advance scientific knowledge through research.

www.batcon.org

Bat World Sanctuary

www.batworld.org

APPENDIX 2
WILDLIFE REHABILITATION FACTSHEET

Backgrounder/ Document d'information



Ministry of Natural Resources Ministère des Richesses naturelles

January 12, 2006

WILDLIFE REHABILITATION IN ONTARIO

Under the Fish and Wildlife Conservation Act, 1997, wildlife custodians are authorized to provide specialized temporary care to sick, injured and orphaned wildlife so that they can be returned to the wild.

People who do this work are called wildlife custodians. They provide an important service to the people and wildlife of Ontario. The wildlife cared for by a wildlife custodian are not pets, and any interaction between wildlife and humans or their domestic animals is minimized to ensure the animal does not become tame. An important goal of wildlife rehabilitation is to successfully return healthy wildlife back to the wild as quickly as possible.

If you find a bird or animal that you suspect is sick, injured or orphaned, do not move the wildlife until you talk to the Ministry of Natural Resources or to an authorized wildlife custodian for advice, unless it is in immediate danger.

Please read the ministry's fact sheet "What you should do if you find a sick, injured or orphaned wild animal" for more information.

Who can keep or rehabilitate wildlife?

- People who are transporting or keeping wildlife for less than 24 hours for the purposes of delivering the wildlife to a veterinarian or to an authorized wildlife custodian can do so without an authorization.
- An authorized wildlife custodian may keep and provide rehabilitation or care to game wildlife or specially protected wildlife, as specified in the Fish and Wildlife Conservation Act.
- A veterinarian may keep and provide medical care to game or specially protected wildlife without a wildlife custodian authorization. However, they require a wildlife custodian authorization for the purposes of rehabilitating and releasing wildlife.

Responsibilities of a Wildlife Custodian

- Wildlife custodians must follow specific standards of care, housing, record keeping, and requirements on releasing rehabilitated wildlife.
- They can only keep and care for wildlife that they believe have a good chance of being successfully rehabilitated and released into the wild.
- Wildlife custodians must release wildlife as soon as the animal is capable of surviving in the wild.

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Becoming a Wildlife Custodian

- Aspiring wildlife custodians are encouraged to meet and volunteer with authorized wildlife custodians. Wildlife rehabilitation is a time-consuming activity that requires a great deal of specialized knowledge, and you should gain experience in this field before applying for your own authorization.
- In order to become an authorized wildlife custodian, you must apply for an authorization at your local Ministry of Natural Resources district office.
- All new applicants must pass the Ontario Wildlife Rehabilitation Exam. The district office provides home-study materials and arranges an examination date with the applicant.
- The authorization specifies what species you can keep and rehabilitate.
- Applicants who want to rehabilitate rabies vector species (raccoon, skunk, bat, fox) must also take and pass the Ontario Rabies Vector Species course and exam.
- With the exception of a few major centers, wildlife custodians conduct wildlife rehabilitation on their own time and with their own money. Some solicit donations to assist their work.

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Contact your local Ministry of Natural Resources office for more information.

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www.mnr.gov.on.ca