Australian bat lyssavirus (ABLV) guidelines for veterinarians
Purpose

These guidelines are for veterinarians to help manage the situation when a member of the public presents a dog or cat with actual or suspected contact with a bat. It provides information that relates to:

- Australian bat lyssavirus (ABLV) disease and epidemiology
- practical information for handling bats and submitting for laboratory testing
- treatment/management options if the bat is not available or tests positive for ABLV
- the use of inactivated rabies vaccine to protect the pet, including the associated permit, Chief Veterinary Officer (CVO) authorisation and evaluation of the response to vaccination.
Contents

Purpose ................................................................................................................................................. i

Contents ................................................................................................................................................ i

Background information on ABLV ........................................................................................................ 1

ABLV in Australia................................................................................................................................... 1

National Policy ....................................................................................................................................... 1

Categories of risk .................................................................................................................................... 1

Legal considerations ............................................................................................................................... 2

Prevalence of ABLV ............................................................................................................................... 2

Clinical Signs in bats .............................................................................................................................. 2

Infection in humans and animals ........................................................................................................... 3

Actions following an animal bat exposure ............................................................................................ 3

1. Notify Biosecurity NSW .................................................................................................................. 3

2. Obtain the history .............................................................................................................................. 3

3. Reporting potential human exposure to NSW Public Health .......................................................... 4

4. Personal Protective Equipment (PPE) ............................................................................................. 4

5. Disinfection ....................................................................................................................................... 4

6. Handling a live bat .............................................................................................................................. 4

7. Emergency treatment if bitten or scratched by a bat ....................................................................... 5

8. Handling a dead bat ........................................................................................................................... 5

9. Euthanasia of a bat ............................................................................................................................ 5

10. Storage or disposal of a bat carcass ............................................................................................... 5

11. Testing the bat .................................................................................................................................. 5

   a. Laboratory testing .......................................................................................................................... 5

   b. Submission of the bat for testing .................................................................................................... 6

   c. Packaging Diagnostic Specimens ................................................................................................ 7

   d. IATA packing instruction 650 (Biological Substance Category B) ................................................ 7

Actions if the bat tests negative for ABLV ............................................................................................ 8

Actions if the bat tests positive for ABLV or is not available ............................................................... 8

   a. Euthanasia ...................................................................................................................................... 8

   b. Monitor the animal for up to 2 years ............................................................................................. 8

   c. Vaccination .................................................................................................................................... 8

Vaccination of the animal with rabies vaccine ..................................................................................... 8

   1. General information ...................................................................................................................... 8

   2. Rabies vaccine .............................................................................................................................. 9
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Permit PER14236</td>
<td>9</td>
</tr>
<tr>
<td>4. Application by veterinarian to obtain and use rabies vaccine</td>
<td>9</td>
</tr>
<tr>
<td>5. Safety when administering the vaccine</td>
<td>10</td>
</tr>
<tr>
<td>6. Vaccination protocol – Post-exposure Prophylaxis (PEP)</td>
<td>10</td>
</tr>
<tr>
<td>7. Collecting serum to measure response to vaccination</td>
<td>10</td>
</tr>
<tr>
<td>8. How to interpret serum results</td>
<td>11</td>
</tr>
<tr>
<td>Animals showing clinical signs consistent with ABLV</td>
<td>11</td>
</tr>
<tr>
<td>Responsibility for costs</td>
<td>11</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>12</td>
</tr>
<tr>
<td>Appendix 1 NSW Health contact numbers</td>
<td>14</td>
</tr>
<tr>
<td>Appendix 2 Application to Chief Veterinary Officer</td>
<td>16</td>
</tr>
<tr>
<td>Appendix 3 Category B logo for packaging</td>
<td>17</td>
</tr>
</tbody>
</table>
Background information on ABLV

ABLV in Australia
The virus was first identified in 1996 in bats and is found in both flying foxes/fruit bats (megabats) and insect-eating microbats. All Australian bat species are considered potentially infectious.

Human health is an overriding factor in managing all incidents involving potential ABLV infection of pet animals and their owners.

Since November 1996, three people have died as a result of ABLV infection. All three cases had a history of scratches or bites from bats and the affected people were not previously vaccinated against rabies. In two of these cases the bats involved showed clinical signs consistent with ABLV infection.

The incubation period, can be from days to years and death occurs after a short illness of progressive severe nervous signs.

In 2013, 2 horses were infected with ABLV from bats and were euthanased. Overseas, closely related lyssaviruses cause illness in a wide range of domestic and wild animals. It is possible ABLV infection in other animals may be reported in Australia in the future.

Virus survival outside the host is short term and it is inactivated by many disinfectants and soap. Rabies vaccination is thought to provide cross protection against an ABLV challenge.

Australian bat lyssavirus (ABLV) is one of seven types of lyssavirus which are found around the world. Six of these exist in bats but only ABLV is known to occur in Australia. The best known lyssavirus is classical rabies.

Australia has a current international health status through the World Organisation for Animal Health (OIE) of ‘rabies-free’. The presence of ABLV and the use of rabies vaccines does not affect Australia’s rabies-free status.

National Policy
National policy and approach to ABLV is presented in the AUSVETPLAN disease strategy for ABLV. AUSVETPLAN contains comprehensive information for the management of animals that have potentially been infected with ABLV.

It is presumed that, if an animal of a non-bat species develops clinical disease due to ABLV infection, that animal has the potential to transmit ABLV to humans and other animals.

Categories of risk
Bats can be categorised based on their potential to transmit ABLV to humans and other animals (i.e. potential for an infected bat to have infectious contact with a human or other animal). These categories are listed from highest to lowest urgency for action:

**Category 3** (high human health risk). Bat that is known or reasonably suspected to have had potentially infectious contact with a human (e.g. has bitten or scratched a person). Within Category 3, bats with clinical signs suggestive of ABLV are of highest risk.

**Category 2** (high animal health risk, medium human health risk). Bat that poses a potential risk of infection to humans. Disease investigation and exclusion testing is recommended due to either:

- history or clinical signs suggestive of ABLV without a history of a potentially infectious contact with a human (Category 2a)
- history of known or suspected contact with another animal (other animal potentially exposed to ABLV via bat) (Category 2b).
Category 1 (low risk). Bat that is neither Category 2 nor Category 3 — that is, bat that has no history of known or suspected contact with another animal or person and for which the index of suspicion for ABLV infection is low (e.g. no clinical signs consistent with ABLV).

Legal considerations
ABLV infection is an emergency animal disease (EAD) and is notifiable under both the Stock Diseases Act 1923 and the Animal Diseases and Animal Pests (Emergency Outbreaks) Act 1991. This means that veterinarians and all other people consulted about the disease must report suspected or confirmed incidents of ABLV infection to a Stock Inspector (NSW Department of Primary Industries (DPI) or Local Land Services (LLS)).

The current APVMA (Australian Pesticides and Veterinary Medicines Authority) permit, PER 14236 outlines the permitted use of rabies vaccine in Australia.

Prevalence of ABLV
The natural reservoir of ABLV in Australia is bats. Wherever, bats are located, then there is the risk of ABLV infection. Within NSW, positive cases of ABLV in bats have come from a wide area of the state. The most recent positive cases in 2014 have been from Sydney and the lower Hunter region.

Research indicates that ABLV is a rare disease, estimated to be present in less than 1% of all wild bats. However the prevalence in sick or injured bats is much higher, particularly in bats showing central nervous system signs. In Queensland up to 30% of unwell bats showing nervous signs were found to be ABLV infected. Infection was still present in around 2% of sick bats where nervous signs were not present confirming that behaviour or appearance of bats is indicative but not definitive of ABLV infection status.

Clinical Signs in bats
Bats showing clinical disease caused by ABLV can present with a range of non-specific clinical signs that may include one or more of the following:

- Overt aggression,
- Paresis and paralysis
- Seizures, tremors and weakness
- Respiratory difficulties, change of voice
- On ground or low in a tree with inability to take off or to fly in a normal manner
- Bats in unusual locations during the daytime. i.e not in normal roosts

The behaviour or appearance of a bat is not a reliable guide to whether it is infected and all bats should be treated as potentially infectious.

Differential diagnosis of central nervous signs (CNS) in bats
- Head trauma and
- *angiostrongylus* spp infection
- ABLV infection.

If the course of the illness is longer than 7 days and not progressive, angiostrongyliasis may be more likely.

All three conditions have a poor prognosis and because of the risks involved, caring for bats with central nervous system signs should be discouraged. The bats should be euthanased.
Infection in humans and animals

ABLV is a zoonotic disease and has caused the death of three people in Australia.

People are at risk of contracting ABLV if they handle bats without due precautions. Rabies virus and other lyssaviruses are usually transmitted to humans via bites or scratches. This provides direct access of the virus in saliva to exposed tissue and nerve endings. Exposure to virus in bat saliva via mucous membranes (eyes, nose, mouth) and open wounds (bites, sores) can also occur.

ABLV has also infected horses in Australia. There have been no reported cases in other animals in Australia yet, but the potential is there. Any bat-animal (including pets) interaction is potentially serious. These animals are interacting with the sub-population of bats where there is the greatest likelihood of finding ABLV.

It is unknown if a Lyssavirus positive animal (besides bats) can transfer infection to humans or other animals.

There is no effective treatment for ABLV once clinical signs are seen. Prevention by pre-exposure vaccination or post exposure prophylaxis is the best method. Both these approaches involve the use of rabies vaccine.

Reports are regularly received by Biosecurity NSW of domestic pets, particularly dogs or cats, coming into close physical contact with bats (through chasing and catching bats and/or ingestion of bats). This close contact forms a theoretical risk of transmission of ABLV to dogs and cats and, theoretically, to their owners. Currently this chain of transmission is rated as remote, but possible.

Actions following an animal bat exposure

1. Notify Biosecurity NSW

There is a legal requirement to notify staff at your Local Lands Services (LLS) or Biosecurity NSW of all suspected ABLV incidents (discussed under legal considerations)

Please contact:

- A veterinary or biosecurity officer/Stock Inspector with your LLS (see http://www.lls.nsw.gov.au/ for contact numbers) or
- Ph number 63913412 (business hours)
- 1800 675 888 (any time).

Biosecurity NSW takes a precautionary approach to potential exposures to ABLV while scientific knowledge continues to be accumulated. This precautionary approach assumes that possible exposures between animals and bats may transmit ABLV to the in-contact animals.

Further it is assumed that an animal infected with ABLV may progress to develop rabies-like clinical disease and may then pose a risk of transmitting ABLV to humans and other animals.

2. Obtain the history

It is important to include details such as:

- When the animal came in contact with the bat.
- The clinical condition of the bat. If the bat appeared ill at the time of the incident it is more likely to be infected with ABLV.
- Is the bat is dead or still alive? If still alive it becomes a priority to provide advice on safe handling and personal protection.
• If the client has been scratched or bitten by a bat, NSW Public Health must be informed immediately.

3. Reporting potential human exposure to NSW Public Health

When a human/bat interaction has occurred, the person should be advised to immediately ring their local Public Health Unit (see Appendix 1).

These bats are described as C3 (Risk Category 3).

Advice should be given to isolate the bat or avoid further contact. Wash the affected area with soap and water (further details under Emergency measure if bitten or scratched by a bat).

If the bat is available it should be safely kept for testing. NSW DPI is responsible for testing C3 bats.

4. Personal Protective Equipment (PPE)

PPE should be worn to minimise the risk of exposure to ABLV. It should be selected based upon the assessed level of risk and the task. PPE may include:

• Puncture resistance gloves (eg Nitrile gloves (double) or thicker gloves eg Kevlar or suede/leather welding type gloves)
• Long sleeved clothing and long pants
• Puncture resistant gauntlets to protect the forearms
• Safety eyewear or a face shield
• Towel to hold the bat

Hand washing should be done after contact with bats and removing PPE. All cuts should be covered with a water-resistant dressing.

5. Disinfection

The virus is short lived outside the host being rapidly inactivated by heat, direct sunlight and lipid solvents including soap. It lasts up to 24 hours in saliva but less when unprotected and exposed to the elements.

6. Handling a live bat

Live bats should only be handled by people who have received rabies vaccination.

Members of the public are strongly advised not to attempt to handle an injured, unwell or aggressive bat. They should contact WIRES 1300 094 737 who can then transport these bats to a private veterinarian who normally deals with wildlife.

AUSVETPLAN states that ‘Animals potentially infected with Australian bat lyssavirus should be approached with extreme caution. ….Only experienced bat handlers who have been vaccinated for rabies should attempt to capture and care for sick or injured bats’.

The following precautions should be taken when handling bats:

• Only vaccinated people with titres >0.5IU/ml should handle bats
• Take all reasonable steps to avoid being bitten or scratched
• Prevent mucous membrane exposure (eyes/mouth) by using PPE
• Wear appropriate PPE
• Where possible have a vaccinated, experienced bat handler hold the bat when conducting a clinical examination or euthanasia.
7. Emergency treatment if bitten or scratched by a bat
If bitten or scratched, proper cleansing of the wound is the single most effective measure for reducing transmission:

- Do not scrub the wound.
- The wound should be immediately washed with soap and water for at least 5 minutes.
- An antiseptic with anti-viral action, such as povidine-iodine, iodine tincture, aqueous iodine solution or alcohol (ethanol) should be applied after washing.
- If saliva enters the eyes, nose or mouth, the area should be flushed thoroughly with water.
- Contact your Doctor or NSW Public Health immediately (see Appendix 1 for contact details).

8. Handling a dead bat
If the bat is dead, it should be collected and placed inside a secure and waterproof container. Exposure of skin or mucous membranes to the secretions or excretions of the bat must be avoided. Handling the carcass remotely (e.g. using a garden fork, spade or other implement), inverting a thick plastic bag over the carcass, and using rubber gloves are recommended methods of preventing direct exposure.

9. Euthanasia of a bat
Bats can be euthanased using pentobarbitone solution injected intra-peritoneally. Ideally this should be done after the bat has been anaesthetised. The bat can also be placed in a bag and gassed with anaesthetic to reduce the risk of being scratched during euthanasia.

10. Storage or disposal of a bat carcass
Bat carcasses should be submitted to the laboratory as soon as possible to minimise post-mortem decomposition.
All bat carcasses should be refrigerated only (not frozen) until submission.
If a client elects not to submit a dead bat for testing, the carcass must be disposed of by:

- either in routine clinic biological waste,
- deep burial where dogs cannot dig them up,
- or check with your local council as to which local council service may be used

11. Testing the bat
The advantage of testing the bat for ABLV is that a negative result will exclude the risk of ABLV transmission to other animals or humans.
Testing is best done on the brain tissue, so it is important to retrieve the head. However other nervous tissue may be useful. Therefore whatever is left of the bat should be submitted.

a. Laboratory testing
When to submit a bat to the state laboratory:

- In cases of known or probable exposure of an animal to a bat (C2 bat)
- where a bat shows clinical signs suggestive of ABLV
- Where there has been known, possible or probable human exposure to ABLV from the bat (C3 bat). NSW Public Health must be notified too (contact details in Appendix 1).
How to interpret the tests:

- Two separate real time PCR assays are run that detect the two known genotypes of lyssavirus found in bats in Australia (these are the insectivorous and flying fox strains of ABLV). The real time PCR assays are not only highly sensitive and specific, they are more tolerant of poor sample quality.
- Testing at Australian Animal Health Laboratory (AAHL) is also done as it offers the IFAT test and the results from AAHL are used as a verification.
- It is believed that in theory if there was another strain of lyssavirus present in Australian bats then the IFAT may detect it more readily if it was genetically very different to the current strains.
- If a positive is detected on PCR at Elizabeth Macarthur Agricultural Institute (EMAI), it is recommended that treatment of the pet commence immediately while verification from AAHL is pending.
- Results may be available within 24 hrs and even in 4-5 hours in high risk cases.

b. Submission of the bat for testing

DPI will pay for the cost of the courier and the lab testing for bat submissions.

Send all bat submissions to:

State Veterinary Diagnostic Laboratory (SVDL)
at the Elizabeth Macarthur Agricultural Institute (EMAI),
Woodbridge Road, Menangle NSW 2568

For further information on submissions during business hours

EMAI SVDL Customer Service Unit  02 4640 6325
Email: emai.svdl@dpi.nsw.gov.au

- To notify EMAI of incoming samples
- For general enquiries about testing, sample submission, or couriers
- To speak to a Veterinary Pathologist

After hours - call the Emergency Animal Disease Hotline on 1800 675 888.

- For arrangement of couriers out of normal working hours

Submission information

- Samples can only be submitted by a Veterinarian.
- All sample submissions must have a completed Sample Submission Form. It can be downloaded from http://www.dpi.nsw.gov.au/agriculture/vetmanual/submission/specimen-submission-form
- Information required includes:
  1. the location the bat was found, or where the bite/scratch occurred
  2. clinical information (eg human exposure vs animal exposure), neurological state of bat etc, if it was dead or alive upon arrival at the vet clinic, and the method of euthanasia.
  3. Reliable contact details for the submitter
  4. Ideally the name of the human exposed.
The laboratory has accounts with three nominated couriers in NSW (TNT, Toll Priority and Metrostate). Submitters sending samples through TNT and Toll Priority need to advise the courier of the account number. No account number is required for samples being sent to EMAI with Metrostate:

- TNT Account number 21857635
- Toll Priority Account number 20013X
- Metrostate No account number required.

On weekdays send it overnight for delivery by midday the next day.

Samples will be received at SVDL between 7.30 am and 4.30 pm on weekdays, and 9-12 on Saturday mornings.

NB these account numbers are only used when submitting specimens/samples for notifiable diseases

c. Packaging Diagnostic Specimens

Packaging and transport of dead bats needs to meet relevant transport and packaging guidelines (IATA packing instruction).

- Ensure safety of all personnel involved
- Triple bag bat in sealed watertight plastic bag. Ensure sufficient absorbent material to absorb all the fluid in the first bag.
- Indelibly label the secondary container with the owner’s name.
- Put Specimen Submission Form(s) into a separate plastic bag.
- Put specimens, Specimen Submission Form(s), cooler bricks and tight packing into an esky. Crumpled newspaper will suffice for tight packing.
- Put a note on top of samples inside the esky Caution ABLV exclusion (don't write this on the outside)
- If the esky is foam, seal it into a cardboard box.
- Complete the Consignment Note and stick it onto the outer package
- Make sure the packaging complies with the IATA packing instructions

d. IATA packing instruction 650 (Biological Substance Category B)

- This instruction covers the labelling and packaging of diagnostic specimens as defined by the International Air Transport Association (IATA).
- Virtually all submissions sent by veterinarians to laboratories satisfy this definition of Biological Substance Category B and must be packed accordingly.
- See Guidelines for packaging diagnostic specimens for practical advice on packaging to comply with IATA packing instruction 650.
- A number of companies sell suitable packaging. The most common outer container is the foam esky enclosed within a rigid cardboard box.
- A Diamond label stating UN3373 inside the diamond and the wording Biological Substance Category B under the diamond must be attached to the outer box or esky (See Appendix 3).
- The total volume allowance for IATA Packing Instruction 650 is to be recorded on the freight docket and is:
Unrestricted (for material not known to contain Infectious Substances), or Max 500 ml (for material with low probability of containing Infectious Substances).

- The Consignment Note must include the following details:
  - Biological Substance Category B
  - Net quantity (weight) and
  - UN number (3373)

**Actions if the bat tests negative for ABLV**

When the bat tests negative for ABLV, there is no risk to the in-contact animal and the no further action is required.

Situations have occurred where the animal may have been bitten by more than one bat. Therefore the risk of exposure may not be resolved by testing only one bat. In this situation the veterinarian may decide to proceed with vaccination of the pet.

**Actions if the bat tests positive for ABLV or is not available**

If the bat is available and tests positive or is not available for testing, there is a real risk of the pet owners or other in-contact humans contracting ABLV infection from the pet. To date, transmission from an affected pet to a human has never been reported. Public health guidance is that the risk of transmission of ABLV from a dog or a cat to a person is very low but the risk exists. If such transmission was to occur, the potential outcomes are obviously extremely serious as reported cases of ABLV infection in humans have been fatal.

Advice to the owner should include the following options:

- **a. Euthanasia**
  
  To avoid any further risk of humans contracting ABLV infection from the pet, the owner has the option of authorising euthanasia of the pet (especially in those cases where it can be established that physical contact between the animal and the bat definitely occurred.)

- **b. Monitor the animal for up to 2 years**
  
  The pet owner can keep the animal at home but should be advised to observe their pet closely for one to two years for any changes in behaviour or signs of ill-health (due to the possible long incubation period). Any changes should be immediately reported to Biosecurity NSW. The owner needs to also understand that taking no action does nothing to lower the potential risk of ABLV infection. If clinical signs suggesting ABLV disease are reported, it is likely to be recommended that the animal be euthanased and samples taken for examination.

- **c. Vaccination**
  
  Vaccinate the affected pet with inactivated rabies vaccine as soon as possible after the contact with the bat to reduce the risks of clinical ABLV infection. This mirrors the current public health recommendation for post-exposure treatment of people against ABLV infection. The rabies vaccine is used on the basis of the limited available animal data and clinical experience supporting its use.

  For the costs associated with vaccination, please see section – Responsibility for costs.

**Vaccination of the animal with rabies vaccine**

1. **General information**
When the bat tests positive or is not available for testing, the owner should be offered the option of vaccinating the animal/s with rabies vaccine. This is conditional on the understanding that Biosecurity NSW will determine further action required should the animal/s develop clinical signs of ABLV infection at any time.

If the owner is considering the vaccination program, it should be commenced as soon as possible after the bat/animal interaction. The earlier the vaccine is given to the dog or cat after potential exposure to ABLV (via the bat), the less likely they will develop the disease before the PEP protocol can take effect. This will also lower the risk to any dog, cat or humans associated with the animal.

The incubation period for ABLV is approximately 28 – 60 days but can be shorter or much longer.

If the private veterinarian suspects ABLV infection of the animal/s at any time, Biosecurity NSW should be urgently contacted for advice on the appropriate course of action.

The owner is responsible for:

- Observing the dog or cat closely for any changes in behaviour for 60 days following vaccination and return the animal to the veterinarian for examination should there be any concerns.
- Presenting their animal to their private veterinarian at the required times to meet all the requirements of the vaccination and sampling program.
- Complying with the requirement to microchip the animal/s.
- Payment for all costs associated with PEP (including vaccinations, microchips, consultations and lab charges).

2. Rabies vaccine

Vaccination with an inactivated rabies vaccine is used to protect both people and animals against ABLV. Information to date supports that cross protection occurs against ABLV from the rabies vaccine (From the AUSVETPLAN Australian Bat Lyssavirus Disease Strategy Section 1.5). Both people and animals exposed or potentially exposed to ABLV should undergo post exposure prophylaxis (PEP) which involves the use of rabies vaccine. NSW Public Health is responsible for PEP in people; Biosecurity NSW in conjunction with private veterinarians is responsible for PEP in animals.

3. Permit PER14236

Veterinarians need to be aware that Nobivac Rabies Inactivated Rabies Vaccine is an unregistered veterinary chemical product. Its use in ABLV incidents is covered by an Emergency Use Permit, PER14236, issued by the Australian Pesticides and Veterinary Medicines Authority (APVMA) and held by the Australian Chief Veterinary Officer, Commonwealth Department of Agriculture, Fisheries and Forestry.

PER14236 also covers emergency use of this inactivated rabies vaccine to vaccinate ‘animals held in Australia in the event of a rabies outbreak’. A condition of the permit is that ‘Persons who wish to prepare for use and/or use the products for the purposes specified in this permit must read, or have read to them, the permit particularly the information included in DETAILS OF PERMIT and CONDITIONS OF PERMIT’.

A copy of PER14236 can be obtained from the APVMA web-site:


4. Application by veterinarian to obtain and use rabies vaccine
Nobivac Rabies Inactivated Rabies Vaccine supplied by Intervet (Australia) Pty Ltd is the only approved vaccine. To use this vaccine for animals potentially exposed to ABLV, a veterinarian will need to apply to the Chief Veterinary Officer using the form “Application for authorisation to use rabies vaccine” (see Appendix 2). Any animals being vaccinated must be microchipped prior to applying. Once the approval is received the veterinarian can order the vaccine from their preferred wholesaler who will arrange direct delivery of the vaccine to the practice. The vaccine needs to be ordered before 1pm Monday - Wednesday in case there are transport delays. It is advisable to order sufficient vaccine to complete the full course (see protocol for details).

It is best to consider two days for delivery when making the appointment for the client to attend the practice for vaccination. This takes into account application for the vaccine, and delivery.

5. Safety when administering the vaccine
The veterinarian and assistants are advised to wear suitable long-sleeved protective clothing when administering the vaccine. Use suitable restraint measures to avoid being bitten or scratched by the pet animal. Caution should also be taken to avoid contamination of unhealed cuts or abraded skin.

6. Vaccination protocol – Post-exposure Prophylaxis (PEP)
All costs associated with post exposure rabies vaccination of domestic animals are the responsibility of the owner. This includes vaccinations, microchips, consultations and laboratory charges.

The primary objective of the Post-Exposure Prophylaxis (PEP) vaccination schedule is to reduce the risk of exposure to ABLV.

Vaccination should commence as soon as possible after suspected exposure. Blood sampling is also recommended to check that immunity reaches an adequate level. Two doses of vaccine are required for post exposure prophylaxis (PEP) to ensure a rapid and effective immune response.

Table 1 Post-Exposure prophylaxis (PEP) program

<table>
<thead>
<tr>
<th>Visit</th>
<th>Day</th>
<th>Action</th>
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<tbody>
<tr>
<td>First PEP visit</td>
<td>Day 0</td>
<td>• <strong>Vaccination</strong> with 1 ml dose of Nobivac Rabies Inactivated Rabies Vaccine (Intramuscular or subcutaneous injection)</td>
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<tr>
<td></td>
<td></td>
<td>• <strong>Microchip</strong> animal if not already microchipped</td>
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<td></td>
<td></td>
<td>• A microchip number is needed to be to apply for the rabies vaccine</td>
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<tr>
<td></td>
<td></td>
<td>• Take <strong>first blood sample</strong>, collect serum, label and freeze</td>
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<tr>
<td>Second PEP visit</td>
<td>Day 5-7</td>
<td>• <strong>Repeat vaccination</strong> with 1 ml dose of Nobivac Rabies Inactivated Rabies Vaccine (intramuscular or subcutaneous injection)</td>
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<td>• Advise owner to monitor animal closely for 60 days</td>
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<tr>
<td>Third PEP visit</td>
<td>Day 28-35</td>
<td>• Take <strong>second blood sample</strong>, collect serum, label and freeze</td>
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<td>• <strong>Send paired sera to SVDL at EMAI</strong></td>
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<td>• Specimen advice sheet should be marked “Post–bat exposure vaccination. Paired samples for serology”</td>
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By 21 days post vaccination, exposed animals should be protected but observation should be continued until 60 days post vaccination before allowing unrestricted contact with the animal.

7. Collecting serum to measure response to vaccination
The primary purpose of the serum sampling is to monitor the response to vaccination. This is optional but does give more information about the pet’s protection. It is important to get both the day 0 and 28 samples to show the level of response to the vaccine. An appropriate rise in titre
between day 0 and day 28 will provide a basis for declaring the animal ‘safe’ to stay at home and no longer a risk to others.

- Serum should be removed after clotting and labelled with identification details, date of collection and the day relative to vaccination eg day 0 (day of first vaccination). Freeze samples after collection.
- The specimen advice should indicate “Post-bat exposure vaccination-paired samples for serology”.
- The serum samples are to be submitted to the State Veterinary Diagnostic Laboratory, EMAI, Woodbridge Rd, Menangle NSW 2568 for antibody testing.
- **Contact details for SVDL:** Phone: 02 4640 6327 or 1800 675623 during office hours. Email: emai.svdl@dpi.nsw.gov.au
- Samples will be received at SVDL between 7.30 am and 4.30 pm on weekdays, and 9-12 on Saturday mornings.

### 8. How to interpret serum results

- The titre on day 0 gives no indication whether the dog or cat will develop clinical ABLV disease.
- The vaccination schedule still must be followed and an elevated titre at day 28 relative to day 0 is what is important.
- Because a positive titre on day 0 has no value in predicting the likelihood of disease, the serum samples must be forwarded to SVDL and analysed as paired sera.
- Once a period of 60 days has elapsed post vaccination, it is expected that vaccine induced protection will prevent disease occurring from that exposure.
- In animals, an anti-rabies titre of >2IU/ml is regarded as being adequate for cross protection against ABLV challenge. This level has not been validated by animal challenge studies.

### Animals showing clinical signs consistent with ABLV

Biosecurity NSW will coordinate the investigation of animals showing clinical signs consistent with ABLV infection.

Animals exhibiting classical rabies-like signs, particularly if the animal is aggressive or unmanageable, will usually be euthanased. A post mortem will be done to find the cause of the signs. Biosecurity NSW will cover the costs for the investigation.

Manageable animals may be kept in a secure quarantine facility to allow safe monitoring of clinical signs and any testing required.

### Responsibility for costs

The owner will be responsible for costs associated with:

- Collecting the bat
- All veterinary consultations
- the rabies vaccine
• microchipping of the animal
• vet and lab charges for collection of serum to measure response to vaccination
• euthanasia of the animal if the owner elects that course of action

Biosecurity NSW will cover the following costs:
• initial testing of the bat/s for ABLV
• courier charges to submit the bat to SVDL
• testing of in-contact animals showing signs of ABLV

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAHL</td>
<td>Australian Animal Health Laboratory</td>
</tr>
<tr>
<td>ABLV</td>
<td>Australian bat lyssavirus</td>
</tr>
<tr>
<td>APVMA</td>
<td>Australian Pesticides and Veterinary Medicines Authority</td>
</tr>
<tr>
<td>Bats</td>
<td>Fruit eating bats (flying foxes) and insect eating bats (microbats)</td>
</tr>
<tr>
<td>CNS</td>
<td>Central Nervous System</td>
</tr>
<tr>
<td>CVO</td>
<td>Chief Veterinary Officer of NSW</td>
</tr>
<tr>
<td>DPI</td>
<td>NSW Department of Primary Industries</td>
</tr>
<tr>
<td>EMAI</td>
<td>Elizabeth Macarthur Agricultural Institute</td>
</tr>
<tr>
<td>Exposure</td>
<td>Exposure occurs when an animal or human is bitten or scratched by a bat or has mucous membrane or broken skin, contact with saliva or neural tissue from a bat</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Traffic Association standards for packaging biological samples for air transport</td>
</tr>
<tr>
<td>Incubation period</td>
<td>The time period between virus entry and the onset of clinical signs</td>
</tr>
<tr>
<td>Inspector</td>
<td>An inspector appointed under section 68 of the ADAP (EO) Act or section 6 of the Stock Diseases Act 1923 or a police officer.</td>
</tr>
<tr>
<td>PEP</td>
<td>Post exposure prophylaxis</td>
</tr>
<tr>
<td>Positive animals</td>
<td>an animal that tests positive for ABLV using the Fluorescent Antibody Test (fat) on fresh brain smears</td>
</tr>
<tr>
<td>Precautionary Principle</td>
<td>The establishment of an obligation, if the level of harm may be high, for action to prevent or minimise such harm even when the absence of scientific certainty makes it difficult to predict the likelihood of harm occurring, or the level of harm should it occur</td>
</tr>
<tr>
<td>Susceptible animals</td>
<td>Species susceptible to ABLV infection. Bat human and horse cases reported to date but closely related lyssaviruses overseas cause illness in many warm-blooded animals both domestic and wild.</td>
</tr>
<tr>
<td>Suspect animal</td>
<td>Any animal (including bats) showing clinical signs that are consistent with infection by ABL, as well as any bat that has bitten/scratched a person or animal.</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>SVDL</td>
<td>State Veterinary Diagnostic Laboratory</td>
</tr>
<tr>
<td>WIRES</td>
<td>Wildlife Information, Rescue and Education Service</td>
</tr>
</tbody>
</table>
# Appendix 1 NSW Health contact numbers

Ring 1300 066 055 and it will direct you to your local Public Health Unit

<table>
<thead>
<tr>
<th>Public Health Unit</th>
<th>Contact Details</th>
<th>After Hours Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goulburn Office</td>
<td>Locked Bag 11, Goulburn, 2580</td>
<td>Ph: 02 6080 8900 (diverts to Albury Base Hospital)</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 4824 1837 / 4822 5038 (*s)</td>
<td>- ask for Public Health Officer on call,</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 4824 1831 / 4822 5038 (*s)</td>
<td></td>
</tr>
<tr>
<td>Albury Office</td>
<td>PO Box 3095, Albury, 2640</td>
<td>Ph: 02 6080 8900 (diverts to Albury Base Hospital)</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 6080 8999</td>
<td>- ask for Public Health Officer on call,</td>
</tr>
<tr>
<td>Broken Hill Office</td>
<td>PO Box 457, Broken Hill, 2880</td>
<td>Ph: 08 8080 1333 (Broken Hill Base Hospital)</td>
</tr>
<tr>
<td></td>
<td>Ph: 08 8080 1499</td>
<td>- ask for Public Health Officer on call, if no answer:</td>
</tr>
<tr>
<td></td>
<td>Fax: 08 8080 1683 / 8080 1196 (*s)</td>
<td>Mob: 0417 685 259</td>
</tr>
<tr>
<td>Dubbo Office</td>
<td>PO Box 739, Dubbo, 2830</td>
<td>Ph: 02 6885 8666 (Dubbo Base Hospital)</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 6841 5569</td>
<td>- ask for Public Health Officer on call, if no answer:</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 6841 5571 (*s)</td>
<td>Mob: 0418 866 397</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 6885 8666 (Dubbo Base Hospital)</td>
<td>- ask for Public Health Officer on call, if no answer:</td>
</tr>
<tr>
<td></td>
<td>(diverts to Albury Base Hospital)</td>
<td>Mob: 0418 866 397</td>
</tr>
<tr>
<td></td>
<td>- ask for Public Health Officer on call</td>
<td></td>
</tr>
<tr>
<td>Bathurst Office</td>
<td>PO Box 143, Bathurst, 2795</td>
<td>Mob: 0428 400 526</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 6339 5601</td>
<td>- ask for Public Health Officer on call,</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 6339 5173 (*s)</td>
<td></td>
</tr>
<tr>
<td>Newcastle Office</td>
<td>Locked Bag 10, Wallsend, 2287</td>
<td>Ph: 02 4924 6477</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 4924 6477</td>
<td>(diverts to John Hunter Hospital)</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 4924 6048 (*s)</td>
<td>- ask for Public Health Officer on call,</td>
</tr>
<tr>
<td>Tamworth Office</td>
<td>Locked Mail Bag 9783, NEMSC 2348</td>
<td>Ph: 02 6764 8000 (diverts to Public Health Officer on call)</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 6764 8000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax: 02 6766 3890 (*s)</td>
<td></td>
</tr>
<tr>
<td>Matraville Office (Justice Health)</td>
<td>PO Box 150, Matraville, 2036</td>
<td>Mob: 0408 273 465</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 9311 2707</td>
<td>- ask for Public Health Officer on call,</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 9700 3747 (*s)</td>
<td></td>
</tr>
<tr>
<td>Port Macquarie Office</td>
<td>PO Box 126, Port Macquarie, 2444</td>
<td>Ph: 0439 882 572 Infectious Disease</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 6588 2750</td>
<td>or</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 6588 2837 (*s)</td>
<td>Ph: 0428 882 805 Environmental Health</td>
</tr>
<tr>
<td>Lismore Office</td>
<td>PO Box 498, Lismore, 2480</td>
<td>Ph: 0439 882 752 Infectious Disease</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 6620 7585</td>
<td>or</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 6622 2151 / 6620 2552 (*s)</td>
<td>Ph: 0428 882 805 Environmental Health</td>
</tr>
<tr>
<td>Hornsby Office</td>
<td>Hornsby Hospital, Palmerston Rd, Hornsby, 2077</td>
<td>Ph: 02 9477 9123 (Hornsby Hospital)</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 9477 9400</td>
<td>- ask for Public Health Officer on call,</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 9482 1650 / 94821358 (*s)</td>
<td></td>
</tr>
<tr>
<td>Gosford Office</td>
<td>PO Box 361, Gosford, 2250</td>
<td>Ph: 02 4320 2111 (Gosford Hospital)</td>
</tr>
<tr>
<td></td>
<td>Ph: 02 4320 9730</td>
<td>- ask for Public Health Nurse on call,</td>
</tr>
<tr>
<td></td>
<td>Fax: 02 4320 9746 (*s)</td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>Address</td>
<td>Phone</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Randwick Office</td>
<td>Locked Bag 88, Randwick, 2031</td>
<td>02 9382 2222</td>
</tr>
<tr>
<td>Wollongong Office</td>
<td>Locked Bag 9, Wollongong 2500</td>
<td>02 4222 5000</td>
</tr>
<tr>
<td>Eastern Zone (Camperdown Office)</td>
<td>PO Box 374, Camperdown 2050</td>
<td>02 9515 6111</td>
</tr>
<tr>
<td>Penrith Office</td>
<td>PO Box 63, Penrith 2751</td>
<td>02 4734 2000</td>
</tr>
<tr>
<td>Parramatta Office</td>
<td>Locked Bag 7118, Parramatta BC 2150</td>
<td>02 9845 5555</td>
</tr>
</tbody>
</table>

(*s) = secure line
Appendix 2 Application to Chief Veterinary Officer

For authorisation to use Nobivac rabies inactivated rabies vaccine

This form can be downloaded from the DPI website: http://www.dpi.nsw.gov.au/biosecurity/animal/humans/bat-health-risks
Appendix 3 Category B logo for packaging