Public Health England

Protecting and improving the nation's health

Guidelines on managing rabies post-exposure

April 2019

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Document information

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Document history

Date	Reason for change	Issue number
January 2015	PHE version. This updates 'HPA guidelines on managing rabies post-exposure prophylaxis (January 2013)'. Changes to the guidance include a new category of 'partially immune' for those individuals who are not fully immune but have received vaccine in the past, advice on what to do if it is more than 10 years since the last rabies vaccine, and information on dealing with animals imported into the country under the EU PETS passport scheme. The guidance is also reformatted to PHE specifications	1.0
June 2015	Rewording of section 'B9 Imported pets (dogs, cats or ferrets)', paragraph 'Background' to clarify that pets from EU or listed countries do not need a blood test, and the waiting period is only 21 days post vaccination.	1.1
April 2016	Updated information about the new Rabies and Immunoglobulin Service and updated risk assessment to include HRIG for primate category III bites to the head and neck	1.2
June 2017	Updated contact information. Additional information provided on what to do if a fully immunised patient has received HRIG as part of the management. Revised information on the use of the revised rabies risk assement form.	2.0
June 2018	Updated guidance in view of the changes to rabies post-exposure treatment as agreed by JCVI February 2018. Specifically changes in definitions of exposures and animal and country risk, reduction in the number of vaccine doses for immunocompetent individuals to 4, change to the recommendations on the use of HRIG, and guidance on the management of immunosuppressed individuals.	3.0

April 2019	Updated guidance clarifying risk assessment of possible bat exposures,exposures to confirmed rabid animals, implications on pet travel when UK leaves EU, and updated vaccines and immunoglobulin compatible with UK schedule	4.0

Document review plan

Responsibility for review (disease group lead)	Kevin Brown
Next review date	2022
Next issue date	-
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Contents

A. Introduction

Rabies is an acute viral encephalomyelitis caused by several members of the Rhabdoviridae family. It transmits through infected saliva via bites or scratches from rabid animals (in particular dogs). It is almost invariably fatal once symptoms develop.

Rabies still poses a significant public health problem in many countries in Asia and Africa where 95% of human deaths occur. Post-exposure treatment (PET) using rabies vaccine with or without rabies immunoglobulin (HRIG) is highly effective in preventing disease if given correctly and promptly after exposure.

The UK has been free of rabies in terrestrial animals since 1922. However, European Bat Lyssavirus 1 (EBLV1) was found for the first time in two serotine bats (Eptesicus serotinus) in southern England in 2018, and European Bat Lyssavirus 2 (EBLV2), a rabies-like virus, has been found in Daubenton's bats (Myotis daubentonii) across the UK.

Further information, guidance and the risk assessment form are available on the rabies pages of the PHE website https://www.gov.uk/government/collections/rabies-risk-assessment-post-exposure-treatment-management

Purpose and scope

This guidance provides a practical guide to undertaking risk assessment of potential rabies exposures and the correct use of PET. It is aimed at duty doctors at Colindale, health protection teams and other health professionals who may be involved in the assessment and management of potential rabies exposures. It also describes the logistics of issuing vaccines and immunoglobulins as appropriate, and the clinical governance aspects of the Rabies and Immunoglobulin Service (RIgS), Colindale. A separate document deals with the risk assessment of other pathogens associated with animal bites which should be used in conjunction with this document if necessary.

Requests for pre-exposure vaccine or advice on possible human rabies are outside the scope of this document and should be managed as follows:

- a possible case of clinical rabies - all calls should be referred to one of the RIgS consultants, PHE Colindale (0208 327 6204), or out of hours to

Colindale Duty Doctor (0208 200 4400); additional information can be found on the PHE website

- vaccines prior to travel - refer caller to NaTHNaC (website: https://travelhealthpro.org.uk/ or for complex queries, advice line 0845 602 6712)
- vaccines for those with occupational risk (see Green Book) are the responsibility of the employer, and will no longer be provided through PHE. Vaccine will only be provided from PHE for those who regularly handle bats on a voluntary basis (ie not part of employment) – requests should be made using the pre-exposure risk assessment form available on the website https://www.gov.uk/government/publications/rabies-pre-exposure-request-form and returned by secure e-mail to lg.clerks@nhs.net

Individual risk assessment of potential rabies prone exposures should be undertaken promptly, so that post-exposure treatment (PET) can be initiated if required**.** Although treatment should be started promptly, initiating rabies PET is not a medical emergency, and can often wait until the next day (see section D6). In complex cases treatment can be initiated and further advice sought from consultants within RIgS the next working day.

All risk assessments should be completed using the rabies post-exposure risk assessment form (https://www.gov.uk/government/publications/rabies-post-exposure-risk-assessment-form-and-calendar) and either directly uploaded into HPZone, or emailed to RIgS by secure email. The form can be encrypted using the button on the form, and the password sent in a separate email.

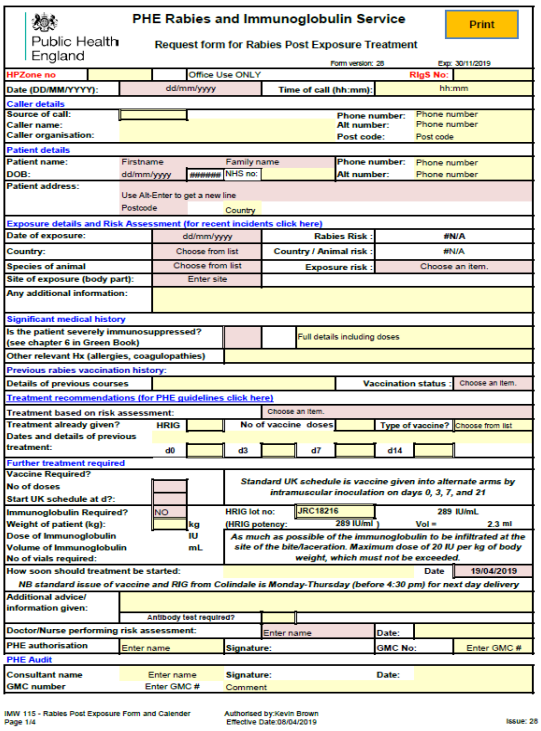
Devolved administrations

Requests for post-exposure treatment from Scotland, Northern Ireland and Wales should be directed to the appropriate services as given in the Green Book https://www.gov.uk/government/publications/rabies-the-green-book-chapter-27). PHE/Department of Health does not supply rabies vaccines for Scotland or Northern Ireland (or Channel Islands).

B. Post-exposure risk assessment: does the person need PET?

The rabies risk assessment comprises five main parts:

- collection of basic information about the exposed person
- details of the exposure incident, and an assessment of the composite rabies risk: Green, Amber or Red
- any significant past medical history that might affect treatment including immunosuppression, previous rabies immunisation or treatment
- PHE treatment recommendation based on rabies risk and medical history
- treatment already given for this exposure, and further treatment required



PHE Rabies and Immunoglobulin Service

Public Health England

Request form for Rabies Post Exposure Treatment

Print

Form version: 28 Exp: 30/11/2019

HPZone no | Office Use ONLY | RIgS No:

Date (DD/MM/YYYY): dd/mm/yyyy | Time of call (hh:mm): hh:mm

Caller details

Source of call: | Phone number: Phone number

Caller name: | Alt number: Phone number

Caller organisation: | Post code: Post code

Patient details

Patient name: Firstname Family name | Phone number: Phone number

DOB: dd/mm/yyyy ###### NHS no: | Alt number: Phone number

Patient address: Use Alt-Enter to get a new line

Postcode Country

Exposure details and Risk Assessment (for recent incidents click here)

Date of exposure: dd/mm/yyyy | Rabies Risk : #N/A

Country: Choose from list | Country / Animal risk : #N/A

Species of animal: Choose from list | Exposure risk : Choose an item.

Site of exposure (body part): Enter site

Any additional information:

Significant medical history

Is the patient severely immunosuppressed? (see chapter 6 in Green Book) | Full details including doses

Other relevant Hx (allergies, coagulopathies)

Previous rabies vaccination history:

Details of previous courses | Vaccination status : Choose an item.

Treatment recommendations (for PHE guidelines click here)

Treatment based on risk assessment: Choose an item.

Treatment already given? HRIG | No of vaccine doses | Type of vaccine? Choose from list

Dates and details of previous treatment: d0 d3 d7 d14

Further treatment required

Vaccine Required?

No of doses

Start UK schedule at d?:

Standard UK schedule is vaccine given into alternate arms by intramuscular inoculation on days 0, 3, 7, and 21

Immunoglobulin Required? NO | HRIG lot no: JRC18216 | 289 IU/mL

Weight of patient (kg): kg | (HRIG potency: 289 IU/ml) Vol = 2.3 ml

Dose of Immunoglobulin IU

Volume of Immunoglobulin mL

No of vials required:

As much as possible of the immunoglobulin to be infiltrated at the site of the bite/laceration. Maximum dose of 20 IU per kg of body weight, which must not be exceeded.

How soon should treatment be started: | Date 19/04/2019

NB standard issue of vaccine and RIG from Colindale is Monday-Thursday (before 4:30 pm) for next day delivery

Additional advice/ information given:

Antibody test required?

Doctor/Nurse performing risk assessment: Enter name | Date:

PHE authorisation Enter name | Signature: | GMC No: Enter GMC #

PHE Audit

Consultant name Enter name | Signature: | Date:

GMC number Enter GMC # | Comment

IMW 115 - Rabies Post Exposure Form and Calender Page 1/4 | Authorised by:Kevin Brown Effective Date:08/04/2019 | Issue: 28

For these steps the following information is required to complete the risk assessment:

- patient name, date of birth, age, address, and NHS number if possible
- date of exposure
- country of exposure
- species and current health status of animal involved
- category of exposure
- site of exposure
- whether the patient is immunosuppressed or has any allergies
- any previous rabies vaccinations or immunoglobulin treatment

This should be recorded in the rabies post-exposure form shown here, (https://www.gov.uk/government/publications/rabies-post-exposure-risk-assessment-form-and-calendar) which can be found in the PHE duty doctor pack and on the GOV.UK website. Boxes in pink are mandatory boxes and need to be completed for all risk assessments. All enquiries should be recorded with the patient details, even if vaccine and/or immunoglobulin are not issued.

B1. Patient details

Complete the patient details as indicated. The PET form also acts as the written order if vaccine or immunoglobulin is issued. It is a legal requirement for these cases to record the date of birth (4 digits for the year), age if under 18 years old (the form should calculate this for you), and the patient's address.

B1

Patient details					
Patient name:	Firstname	Family name		**Phone number:**	Phone number
DOB:	dd/mm/yyyy	######	NHS no:	**Alt number:**	Phone number
Patient address:	Use Alt-Enter to get a new line				
	Postcode		Country		

B2

Exposure details and Risk Assessment (for recent incidents click here)			
Date of exposure:	dd/mm/yyyy	**Rabies Risk :**	**#N/A**
Country:	Choose from list	**Country / Animal risk :**	#N/A
Species of animal	Choose from list	**Exposure risk :**	Choose an item.
Site of exposure (body part):	Enter site		
Any additional information:			

B3

B4

B5

B7

B6

B2. Date of exposure

Risk assessment should be undertaken as soon as reasonable following exposure, so that PET, if required, can be started promptly. The incubation period for rabies is typically 1–3 months, but may vary from <1 week to >2 years. Due to the potentially long incubation period for rabies there is no time limit for giving PET and all potential exposures should be risk assessed. This will include knowing what the animal/country risk was at the time of the exposure.

If the exposure is more than one year ago, HRIG is not generally indicated and specialist advice should be sought from the RIgS team.

B3. Which country?

The risk of rabies in each country takes into account the presence or absence of endemic rabies in domesticated cats and dogs (companion animals) and the presence or absence of rabies in wild-life.

All countries should be considered as risk countries for bat exposures, including the UK which is considered low risk for bat-bites.

The combined risk of rabies according to geographical location (country, island and territory) and animal exposure is updated regularly. This information is incorporated into the Rabies PET form and the most recent version of the combined country/animal risks can be found on the PHE website at: https://www.gov.uk/government/publications/rabies-risks-by-country.

B4. Species of animal: was it a bat, primate, rodent or other terrestrial mammal?

> **99% of human rabies cases occur following a deep bite from a rabid dog. However an exposure to infected cats, wild carnivorous species like foxes, raccoons, skunks, jackals and wolves, and insectivorous and vampire bats can also lead to human rabies infection.**

All mammals: All warm blooded mammals and bats, including those that are apparently healthy, may pose a risk. Even vaccinated animals need to be reviewed as transmission of rabies may still be possible. Carnivores generally pose a greater risk for transmitting the virus to humans than herbivores, such as cattle, horses, deer, etc.

Domestic dogs and cats: The natural history of rabies in domestic dogs and cats is that an animal shedding rabies virus through its saliva will be in the terminal phase of illness, and is unlikely to be behaving normally.

If the animal is observed, remains well and behaves normally 15 days after the date of an exposure it will not have had rabies infection at the time of exposure.

The decision whether to start post-exposure treatment during the 15 day period should be based on a full individual risk assessment of the circumstances of the incident. This includes health and immunisation status of the animal, the nature of the incident (provoked or non-provoked) and how well the animal can be observed, and whether the exposed person is immunocompetent. Generally not starting treatment is only appropriate if it is a family pet, a provoked exposure, and the owners will promptly report any change in animal behaviour, and the individual is not immunosuppressed. If in doubt, start treatment.

Rodents and monkeys: Rabies-infected rodents and primates have been sporadically described in countries where rabies is endemic. Although the

risk of transmission of rabies from a rodent (ie rat or mouse) or primate bite is extremely low, all rodent and primate bites should be assessed.

Bats: All bats, including those in the UK, may carry rabies-related viruses and so careful assessment of potential exposure is required. Bats may carry rabies and related lyssaviruses without signs of disease. Therefore exposure to bats or their secretions may constitute an exposure to virus even in countries which are declared rabies free in terrestrial mammals.

In the UK, bats are the only reservoir of rabies-related lyssaviruses (EBLV1 and EBLV2), but they are a protected species and cannot be destroyed to determine rabies status if caught.

B5. Country/animal risk?

A combination of the species of mammal and the rabies status of the country is used to determine if the combined country/animal risk is is consided to be ”No risk”, “Low risk” or “High risk”.

All countries apart from the UK and Ireland are considered High risk for a bat exposure: the UK and Ireland are considered Low risk for bat exposures.

All countries where rabies is present in terrestrial animals (either endemic rabies or rabies in wildlife) are considered to be Low risk for rodent and monkey exposures.

In some countries there is an additional risk for some wildlife species, ie foxes, skunks and raccoons in USA, foxes in certain countries in Eastern Europe. In these circumstances the country/animal risk would change from Low risk to High risk.

The post-exposure treatment form will automatically determine the country/animal risk based on the information that is entered for the country where the exposure took place and the animal species involved. The information is also available on the website: https://www.gov.uk/government/publications/rabies-risks-by-country and in Annex 2.

Non-indigenous animals or bats in zoos or wildlife centres will need a separate risk assessment, including whether the animal/bat was bred in captivity, contact with other animals etc. Further advice can be obtained from the RIgS team.

B6. Category of exposure?

The assessment of exposure needs to take into account the risk of direct physical contact with saliva, neural tissue and other body fluids. The assessment will be different for terrestrial mammals and bats.

Category	Terrestrial mammals	Bats
1	**No physical contact with saliva** For example: • touching, stroking or feeding animals	**No physical contact** (i.e. no direct contact with the bat's saliva) For example: • touching a bat where the person was protected by a barrier capable of preventing saliva contact, such as a boot, shoe, or appropriate protective clothing • a bat in the same room as a person (including a sleeping person in the UK/Ireland)*
2	**Minimal contact with saliva and/or unable to infiltrate wound with HRIG if needed** For example: • bruising or abrasions • licks to broken skin (ie over insect bites or scratches) • minor scratches (ie not down to the muscle) • minor bites (ie to covered areas where saliva does not contaminate the wound directly)	**Uncertain physical contact** (i.e. where there has been no observed direct physical contact (with saliva) but this could have occurred) For example: • handling a bat without appropriate protective clothing(ie gloves) • a bat becoming tangled in hair • potentially unrecognised contact with bat (i.e. any bat found in the room of a sleeping person outside the UK/Ireland; or any bat found in the room of an intoxicated person or young child in any country)**

3	**Direct contact with saliva** For example: • severe/deep lacerations (ie down to the muscle) • major bites (ie direct saliva contact with muscle through the wound) • contact of mucous membranes with saliva (e.g. licks)	**Direct physical contact with bat's saliva** For example: • all bites or scratches • contamination of mucous membrane with saliva or urine

*Most bats found in houses and attics in the UK/Ireland are pipistrelles, which are not known to be infected with rabies-related viruses. Healthy bats avoid contact with humans therefore bats behaving normally (i.e flying into a room but not grounded or acting aggressively) do not constitute a risk.

**For countries outside the UK/Ireland, any bat found in the room of a sleeping or intoxicated person should be considered a category II exposure. In the USA 50% of human rabies with bat variant virus have resulted from unrecognised bat bites.

In the UK most bat bites are felt, not seen, and rarely cause an obvious break in the skin, but should still be considered a direct physical exposure (category 3). PHE recommends that all bat bites, even if said to be from a pipistrelle, should be treated.

B7. Site of bite /Additional useful information

The site of the bite should be given if known. If the bite is to the head or neck and treatment with HRIG is required, PET must be started as soon as possible within 12 hours of reporting.

If the animal was a terrestrial mammal (wild or domestic), these details are useful:

- if the animal has died, does laboratory examination of the animal's brain confirm rabies
- is rabies known or suspected to be present in the species in the locality?
- is there an owner known and contactable?
- was the animal behaving normally at the time of the incident?
- had it been immunised against rabies?
- if the animal was a dog or a cat did it become ill while under observation?
- is the animal non-indigenous or imported? If imported it is important to determine the risk of rabies in both the country of potential exposure and the country of origin of the animal

B8. Imported pets (dogs, cats or ferrets) in UK

Background

In 2012 the UK harmonised with the EU pet travel scheme (having launched its own pet travel scheme in 2000). This regime allows people who are travelling with a pet dog or cat (or ferret) to enter the UK without quarantine so long as they fulfil the conditions of the scheme depending on the country they are travelling into the UK from. This requires the pet to have: a microchip and rabies vaccination; if travelling to or from an unlisted country, a blood test 30 days following the date of vaccination; and to complete a waiting period prior to travel (21 days from the date of vaccination if travelling to/from an EU or 'listed' country, or a three month wait from date of blood sampling if travelling from an 'unlisted' country). All pets must travel with either a pet passport or an official third country veterinary certificate issued by an authorised vet.

When the UK leaves the EU (either with or without a deal), it will be categorised as a 'third country' in the EU Pet Travel Scheme.The requirements for pet travel will then change depending on whether the UK as a 'third country' is designated an unlisted county, Part 1 listed, or Part 2 listed. Further information on the status of the UK and implications for pet travel can be found at: https://www.gov.uk/pet-travel-information-for-pet-owners.

B9. Suspicion that a pet dog, cat or ferret has been illegally imported

The policy underpinning the pet travel scheme is managed by Defra and operationalised by the Animal and Plant Health Agency (APHA). The regime is enforced by local authorities. These organisations work closely together to monitor the effectiveness of the scheme.

All suspected illegally imported animals should be reported to, and investigated by, a Trading Standards officer. Vets who are suspicious about the compliance or legality of an imported animal should report this to the local Trading Standards office, or in London boroughs to Animal Health, City of London (through the Heathrow Animal Reception centre: 0208 745 7894). Details of local Trading Standards offices can be found at: https://www.gov.uk/find-local-trading-standards-office

Suspicion that a pet may have been illegally imported is not the same as suspicion of rabies. Where it is suspected that a pet is not compliant with the

pet travel rules the local Trading Standards office should be contacted and they may decide to quarantine the animal.

Suspicion of rabies in an animal

Rabies is a notifiable disease in animals. If suspected, there is a legal requirement to notify the duty vet in the local APHA office (Defra Rural Services Helpline on 03000 200 301). A Notifiable Disease Investigation (NDI) is then started and an NDI report is sent (as is any follow-up report) to the RIgS team at Colindale, to alert them to the possibility of an animal with suspected rabies. A Defra approved veterinary officer (VO) visits the premises to assess the animal, and may rule out suspicion of rabies at this visit.

If rabies cannot be ruled out during the official veterinary inquiry then the VO will ask for the animal to be euthanised and tested to confirm or rule out a diagnosis of rabies. The animal carcase is sent to the Rabies Reference Laboratory at APHA Weybridge for these diagnostic tests. Initial results are usually available within a few hours of the carcase arriving at the laboratory.

No public health action should be initiated prior to this decision to euthanise and test.

Public health response

The responsibility for advice on the requirement for post-exposure treatment lies only with the RIgS consultant (or Colindale duty consultant if out of hours) in collaboration with the local health protection team, and not Trading Standards or a vet. Where possible, decisions should only be made during working hours.

Exposure to a non-compliant pet animal

All animals suspected to be illegally imported should be reported to, and investigated by, the local Trading Standards office. Post-exposure treatment should not be started solely on the basis that an animal is illegally imported. If the animal is also behaving abnormally it should be assessed as soon as possible by a vet, and post-exposure treatment should not be initiated until further assessment has taken place (see below).

Exposure to a pet in the UK displaying signs of rabies

The RIgS consultant in collaboration with Emerging Infections and Zoonoses Department and the appropriate local health protection team will coordinate/oversee risk assessment of all persons (owner and household, vet etc) who have been exposed to the animal. **(It is possible however that the vet, VO or Trading Standards officer may already have advised individuals in contact with the animal to seek medical advice or vaccination from their general practitioner).**

If the risk assessment considers that the exposure does **not** require immediate treatment (ie exposures other than head and neck), then decisions about post-exposure treatment can await the initial results of rabies testing in the suspect animal.

In the event of a head and neck exposure then rabies post-exposure treatment may need to be started before results are available.

If rabies is confirmed in the animal by APHA an incident management team is usually convened to coordinate public health actions.

B10. Animals in quarantine

All staff working with animals in Defra-authorised quarantine premises should have received pre-exposure vaccination. As the animals are under observation, generally there is no need to treat exposures in quarantine unless rabies is confirmed.

B11. Exotic pets, and non-indigenous animal in zoos/wildlife centres (in UK)

Exotic pets are not illegal in the UK, although a licence is required to keep some types of animal. A full risk assessment should be done, with specific emphasis on ascertaining how long the animal has been in this country, its source (captive bred, wild-caught etc), whether the animal has been vaccinated against rabies and the circumstance of the exposure. Importation of animals that are not domestic animals or pets should comply with the Balai Directive: https://www.gov.uk/government/collections/guidance-on-importing-and-exporting-live-animals-or-animal-products#balai-directive.

B12. Composite rabies risk

Using the combined country/animal risk and the category risk, a composite rabies risk is given a Red, Amber or Green rating. This rating is then used with the past medical history to determine what treatment, if any, is required. All exposures with a Green composite risk rating do not need treatment for this exposure, unless there are extenuating circumstances in the additional information field (**B7**).

Composite rabies risk table

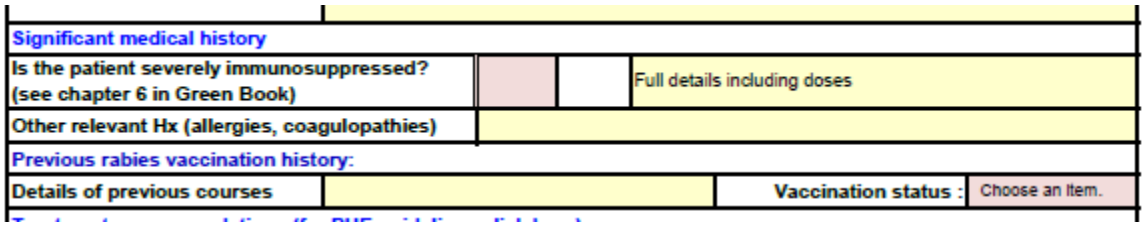
Country/Animal risk	Category 1 exposure	Category 2 exposure	Category 3 exposure
No risk	Green	Green	Green
Low risk	Green	Amber	Amber
High risk	Green	Amber	Red
Confirmed rabid animal*	Green/Amber*	Red	Red

*Advice should be sought from the RIgS team in the assessment of these contacts

C. Significant past medical history

Information is required in three main areas

- is the patient severely immunosuppressed
- does the patient have a relevant past medical history requiring caution when given vaccines or immunoglobulin
- has the patient received any previous (that is before the current incident) rabies vaccines and/or immunoglobulin



C1. Immunosuppression

Severe immunosuppression is described in chapter 6 of the Green Book as the conditions where the individual should not receive live vaccines: https://www.gov.uk/government/publications/contraindications-and-special-considerations-the-green-book-chapter-6. (see also Annex 1)

Anyone who falls into any of the groups listed should be considered to be immunosuppressed and will require treatment with five doses of vaccine and HRIG for any Red or Amber exposures, and follow up blood tests at the time of the 4th dose of vaccine.

Full details, including doses of medication should be provided on the form so that the degree of immunosuppression can be assessed.

C2. Other relevant history

This should include any history of allergy or bleeding disorders. There are no contra-indications for rabies vaccination and/or HRIG if the risk assessment indicates it is needed. However if there is a history of allergy to any of the excipients, the vaccine/HRIG should be given under close medical supervision with the ability to appropriately manage anaphylactic reactions.

Intramuscular injection is the preferred route of vaccine administration. However for individuals with a bleeding discorder vaccinations should be given by subcutaneous injection to reduce the risk of bleeding.

C3. Previous rabies pre-exposure prophylaxis or post-exposure treatment

For those without severe immunosuppression (see section C1) the immune status will be based on history of previous vaccination either as part of rabies post-exposure treatment or pre-exposure prophylaxis given before the current exposure. Ignore any treatment given following the current incident being assessed, as this will only affect what further treatment needs to be given (see section D2). Full information of previous vaccinations should be given on the form.

Immunosuppressed: see section C1

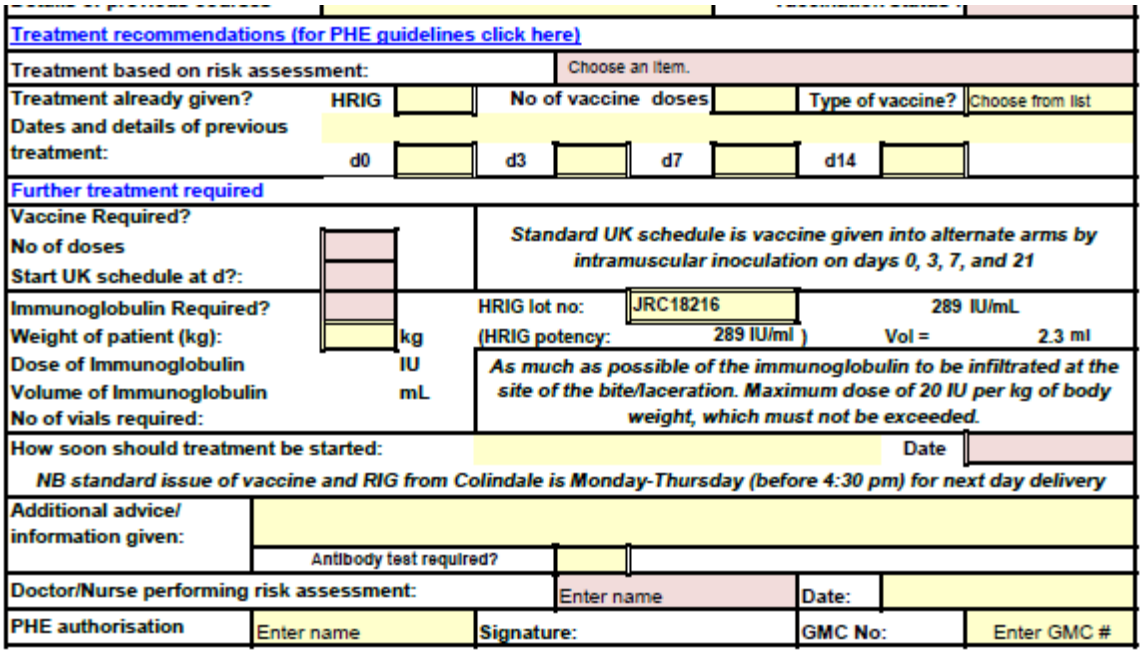
Fully immunised: At least three documented doses of rabies vaccine (on at least two separate days, either as a complete primary pre-exposure course or as part of a four or five dose post-exposure treatment course) or documented rabies antibody (VNA) titres of at least 0.5 IU/ml.

If within the last three months the patient has completed a rabies post-exposure treatment course (either four doses of vaccine, or two doses if previously fully immunised), no further treatment is required for a more recent exposure.

Partially immunised:. Person who has had an incomplete / inadequate primary vaccination course (i.e. less than three doses of intramuscular pre-exposure prophylaxis, or anything less than three doses of intradermal vaccine over two separate days), or VNA never greater than 0.5IU/ml.

Non immunised: Person who has never received pre- or post-exposure immunisation with rabies vaccine.

D. Treatment recommendations



D1. Treatment based on risk assessment

A formal risk assessment based on the composite rabies risk and the vaccine status should be performed; Recommended treatment will generally fall into five categories (see algorithms on following pages):

- no risk and therefore no treatment required
- vaccine only
- vaccine and HRIG
- vaccine, HRIG and blood test with the 4th dose of vaccine – see section C1
- observation of animal (domestic cats and dogs only – see section B4)

Post-exposure treatment based on composite rabies risk and vaccine status

	Post-exposure treatment		
Composite rabies risk	**Non-immunised/ partially immunised**	**Fully immunised**	**Immunosuppressed**
Green	None	None	None
Amber	Four doses of vaccine d0, d3, d7, d21	Two doses of vaccine d0, d3-7	HRIG and five doses of vaccine d0, d3, d7, d14 and d30
Red	HRIG* and four doses of vaccine d0, d3, d7, and d21	Two doses of vaccine d0, d3-7	HRIG and five doses of vaccine d0, d3, d7, d14 and d30

*HRIG is not required more than 7 days after the first dose of vaccine, or more than 1 day after the second dose. HRIG is not required for partially immunised patients (unless immunosuppressed).

D2 What treatment has already been given?

If treatment has already been started find out details of what has been given, route of administration and timing. Consider whether:

- treatment is appropriate to exposure
- which vaccine (type and name of vaccine if known) - is this compatible with vaccines given in the UK (see section G)?
- what vaccine schedule and route has been used - is this compatible with the UK schedule?
- has human rabies immunoglobulin (HRIG) been given - if not is this indicated and is there still time to give this?
- finally - how soon does the patient need to receive their next treatment?

If no treatment has been started, post-exposure treatment should ideally be started within 24 hours of contact with PHE. However for high risk exposures, such as severe and multiple bites to the head and neck or from a confirmed rabid animal, treatment must be started as soon as possible within 12 hours of reporting.

Global vaccines – compatibility with UK vaccines

Most vaccines used globally are now derived from primate or avian diploid cell culture and are compatible with the UK vaccines (see Table 1: Section G). However, a wide variety of different schedules are used, including multiple doses on the same day, and intramuscular and intradermal administration. Information including dates and route of administration should be collected when possible, and further advice sought from the RIgS team as appropriate.

D3. Is vaccine required?

The UK schedule for immunocompetent individuals is 4 vaccines given by the intramuscular (IM) rounte at the following intervals 0, 3, 7, 21 days.

Day 0 is the day of 1st vaccine NOT necessarily the day of exposure.

Movianto and vaccine issuing centres, including Colindale, usually only hold one of the following vaccines (depending on availability), either human diploid cell (HDCV), chick embryo (PCECV), or Vero (PVRV)-derived vaccine, and this will be the only possible vaccine that can be issued. If an individual insists on a particular type of vaccine not held within the PHE supply, this will have to be sourced and paid for privately by that individual.

If a dose is missed, or timing has been compromised, the next vaccine should be considered as the missed dose, and subsequent intervals readjusted.

If a person is travelling and has difficulty in achieving the specified interval for PET, it is most important to deliver the first 3 vaccines with plus/minus one day.

The 4th and final dose of rabies vaccine PET must not be given before day 21.

If the 4th dose of vaccine has been given before day 21 a fifth dose of vaccine should be administered. This should be 2 weeks after the 4th dose. Enter the date of the 4th vaccine in the d14 box, and change the recommended treatment to 5 doses of vaccine.

In a patient who is partially immunised, a full course of 4 doses of rabies vaccine should be given, but there is no need to issue HRIG.

In a patient who is fully immune at the time of exposure the UK schedule is 2 vaccines at day 0 and day 3-7.

If an immunocompetent patient who is fully immune is inadvertently given HRIG they will need a complete 4 dose course of vaccines.

Patients started on alternative regimens

Most of the vaccines available globally are compatible with the UK schedule. If the type of vaccine administered elsewhere is compatible with the UK schedule, then convert timing of doses to closest UK vaccine dose. If the vaccine is not compatible, please contact RIgS for further advice.

If two doses of vaccine have been given on the same day, consider this to be a single dose of vaccine.

If a dose is missed, or timing has been compromised, the next vaccine should be considered as the missed dose, and subsequent intervals readjusted.

In the UK we no longer give a 28-30 or 90-day dose in immunocompetent individuals. If four doses of vaccine have been given according to the UK schedule then there is no need to give a dose at day 28-30 or day 90.

D4. Is rabies immunoglobulin (HRIG) required?

The mainstay of rabies post-exposure treatment (PET) is rabies vaccine. Human rabies immunoglobulin (HRIG) may provide short term immunity in the first seven days post initiation of treatment.

The total antibody level induced by active immunisation (vaccine) is many orders of magnitude greater than can be provided by passive immunisation (HRIG). For this reason HRIG is not given more than seven days after the first dose of rabies vaccine or to an individual who is already partially or previously immunised. HRIG is not indicated if the person has already received two doses of rabies vaccine, (ie d0 and d3 doses) or if the exposure was more than 12 months previously.

HRIG is manufactured from non-UK human blood products. The final formulation is a liquid and the potency of the material is assessed in international units (IU/ml). The maximum dose is 20IU/kg, adults and children (all ages), and should not be exceeded as it may inhibit the immune response to rabies vaccine.

The packaging of the HRIG will have the minimum quantity of immunoglobulin in the vial. This should not be used for calculating the dose required. Instead the potency recorded on the vial itself must be used.

The preparations of HRIG available for dispensing do vary in potency and volume. It is therefore CRITICAL to know the following:

- the potency of the current batch in use; information about potency of batches in current use is encoded into the rabies PET form, is available on the PHE website, is also available from RIgS team (0208 327 6204), and is on the individual vial.

- weight of the patient

- volume that is contained in the vials (vials contain 1- 4mls, depending on batch and manufacturer)

If the weight (in kg – there is a calculator on the 'Weight converter' page to convert stones and lbs to kg if needed) and the lot number of the HRIG to be issued are entered into the form, the dose, volume and number of vials to be issued will be calculated, and be automatically given on the patients letters.

Alternatively the correct volume for each patient should be calculated as indicated below:

Worked example 1
Child wt 19kg, potency of BPL product is 180IU/ml, vials contain 2.5ml
Required units total = 19 x 20 IU = 380IU
Need to administer 380/180 = 2.1ml
Need to supply 1 vial, there will be some wastage, which should be discarded.

Worked example 2
Adult wt 70 kg potency of Berirab P product is 150 IU/ml, vials contain 2ml
Required units total = 70 x 20 IU= 1400IU
Need to administer 1400/150 = 9.3ml
Need to supply 5 vials, there will be some wastage, which should be discarded

Equine immunoglobulin (eRIG) or rabies monoclonal antibody (mAb) products may be used as part of rabies post-exposure treatment in other

countries where access to HRIG is limited. If eRIG or mAb have been administered overseas, HRIG is not required.

D5. Administering vaccine and immunoglobulin

Vaccine is given in the deltoid muscle by intramuscular injection. Each sequential dose should be given in alternate deltoids. Suggest starting in nondominant arm. The schedule is indicated in the letter and calendar that should accompany a copy of the risk assessment form.

Immunoglobulin (HRIG) acts to neutralise the virus at the site of the wound and to be effective HRIG must be infiltrated around the site of the wound. If it is not possible to infiltrate the whole volume at the site then any excess can be given by intramuscular injection in the anterolateral thigh. Only in the case of mucous membrane contamination should the whole volume of HRIG be given intramuscularly.

If more than 5ml (2ml in children under 20kg) of HRIG needs to be administered intramuscularly it should be given in divided doses, at different sites.

Vaccine and HRIG should NEVER be given at the same anatomical site.

Adverse reactions to rabies vaccine and immunoglobulin are briefly discussed in the Green Book (https://www.gov.uk/government/publications/rabies-the-green-book-chapter-27

D6. How soon should treatment be started?

Although treatment should be started promptly, initiating rabies PET is not a medical emergency. In most cases rabies vaccine/HRIG can be sent out for administration the next day. However For high risk exposures, such as severe and multiple bites to the head and neck or from a confirmed rabid animal, treatment must be started as soon as possible within 12 hours of reporting.

Rabies vaccine is available through some travel clinics, and they can often provide post-exposure vaccine treatment, although they may charge the patient an administration fee. If vaccine is given for post-exposure treatment, the patient should not be charged for the vaccine itself and the RIgS team can be contacted the next working day, to replace the travel clinic’s vaccine.

Similarly for vaccine provided for post-exposure treatment through emergency departments or walk-in clinics.

Vaccines (but not HRIG) can sometimes be obtained from pharmacies on prescription. The patient will be charged, and PHE cannot reimburse.

The date of the next vaccine should be completed in the risk assessment form so that the correct schedule can be completed in the accompanying letter and calendar.

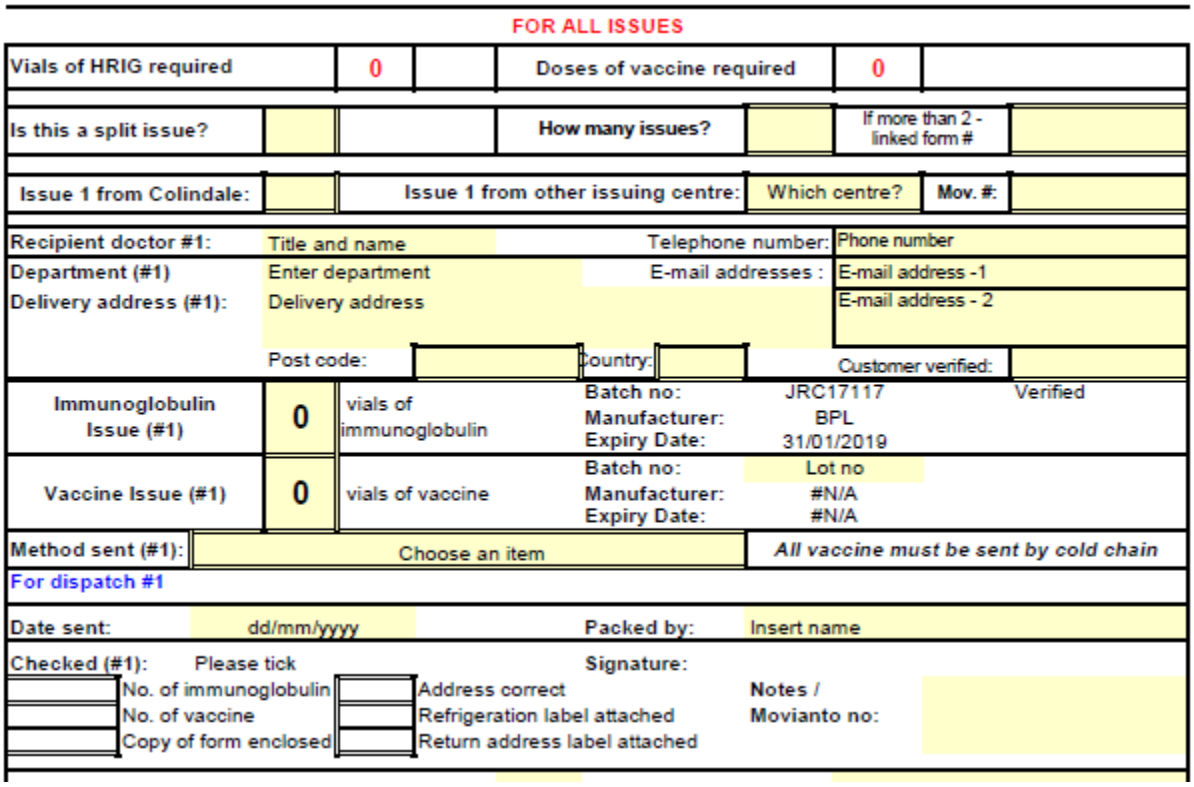
D7. Is rabies antibody testing required?

In England routine measurement of rabies antibody titres post-exposure is not offered for immunocompetent individuals for reasons of expense and practicality. Rabies antibody testing is required for individuals who are immunosuppressed (see C1) and the blood sample should be taken at the same time as the 4th dose of vaccine. Depending on the results of testing, further antibody tests may be required. Antibody testing may also be requested in some patients who have started or completed their post-exposure treatment with a vaccine not compatible with the UK schedule, or by the intradermal (ID) rather than the intramuscular (IM) route. Further advice can be sought from the RIgS team.

If antibody testing is recommended by RIgS, a collection pack and prepaid envelope will be sent to the GP surgery for blood collection. The sample (10ml clotted blood or serum sample) should be collected into the tubes provided, the request form completed, and sample and form sent to APHA for testing. The results will be returned to RIgS, who will advise if further treatment or testing is needed.

If there is no clinical indication for testing, the cost will need to be borne by the patient or requesting health facility. If an individual is insistent on this in the absence of clinical indications the cost is approximately £80 and APHA (Rabies Help Line, Monday to Friday 9am to 5pm 01932 357345, or main number 01932 341111) should be contacted directly to arrange this. Samples should be sent directly to APHA and testing will be charged to the sender.

E. Logistics



FOR ALL ISSUES

Vials of HRIG required	0		Doses of vaccine required	0	
Is this a split issue?			How many issues?		If more than 2 - linked form #	
Issue 1 from Colindale:		Issue 1 from other issuing centre:		Which centre?	Mov. #:	
Recipient doctor #1:	Title and name		Telephone number:	Phone number	
Department (#1)	Enter department		E-mail addresses :	E-mail address -1	
Delivery address (#1):	Delivery address			E-mail address - 2	
	Post code:		Country:	Customer verified:	
Immunoglobulin Issue (#1)	0	vials of immunoglobulin	Batch no: JRC17117 Manufacturer: BPL Expiry Date: 31/01/2019	Verified	
Vaccine Issue (#1)	0	vials of vaccine	Batch no: Lot no Manufacturer: #N/A Expiry Date: #N/A		
Method sent (#1):	Choose an item		*All vaccine must be sent by cold chain*		
For dispatch #1					
Date sent:	dd/mm/yyyy		Packed by:	Insert name	
Checked (#1):	Please tick		Signature:		
	No. of immunoglobulin		Address correct	Notes /	
	No. of vaccine		Refrigeration label attached	Movianto no:	
	Copy of form enclosed		Return address label attached		

E1. Issuing rabies vaccine/HRIG throughColindale

RIgS is a combined service with responsibility to support the post-exposure treatment of serious infections, through the production of guidance and by undertaking risk assessments, providing clinical advice and issuing of immunoglobulins and antitoxins. These rare products are procured by PHE from a range of producers, using the programme budget delegated by the Department of Health and Social Care for the national immunisation programmes. Stock is held at Movianto, but also at Colindale and a number of stock holders distributed throughout the country. RIgS is a busy service; in the financial year 2018 there were almost 3000 calls related to rabies post-exposure treatment (vaccine and/or human rabies immunoglobulin).

Routine service

RIgS operates between 9am-5pm Monday to Friday. All requests for stock and advice about issuing should be directed to this service:
(Tel: 020 8327 6204).

Requests for immunoglobulin/vaccine received before 1pm Monday-Friday will be ordered through Movianto for delivery to a named responsible clinician to arrive the next working day before midday. Requests received after 1pm can generally not be ordered/requested until the next working day.

There are no facilities at Colindale for the administration of vaccine and/or immunoglobulin. The responsibility for arranging administration of vaccine and/or immunoglobulin lies with the requesting clinician.

Urgent service

PHE can issue vaccine and immunoglobulin from Colindale between 2 and 3pm at weekends and bank holidays for the requestor to arrange collection (generally using a courier). Therefore, for the majority of patients, it is preferable to try and source vaccine locally and/or to make arrangements for collection and administration of the immunoglobulin product on the next day.

Requests to issue immunoglobulin at other times will only be considered where there is an immediate threat to life – for rabies vaccine/immunoglobulin this would be for a Red composite rabies risk in previously untreated rabies exposures to the head and neck.

Alternatively vaccine/HRIG may be able to be collected from the nearest stock-holder – RIgS can provide the contact details.

PHE cannot issue vaccines or HRIG for patients outside of England.

E2. Issuing rabies vaccine/HRIG from stockholders

Vaccines and HRIG are also held in various centres throughout England. It may be more convenient to issue vaccine and HRIG from an alternative supply centre, once the decision has been made that vaccine/immunoglobulin are appropriate. However vaccine supply centres elsewhere may be used for collection only of vaccines and RIG; they do not provide postal delivery. If a split issue is required, the second part of the issue can be sent out through Movianto.

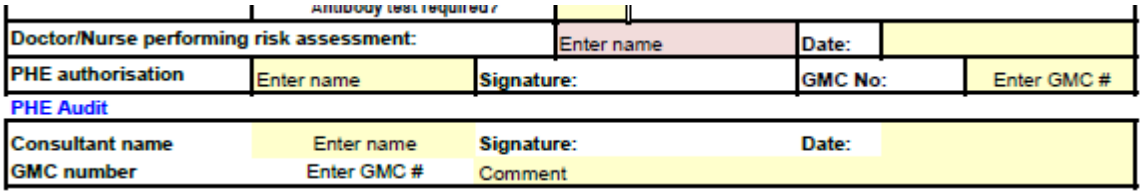
Current issuing centres in England are :

- Birmingham
- Cambridge
- Leeds
- Liverpool
- Manchester

- Newcastle
- Norwich

For PHE staff a complete listing of issuing centres with contact details is available in the PHE Intranet Duty Doctor Pack and in HPZone:
Rabies vaccine and Ig issuing centres

F. Governance issues



Antibody test required?				
Doctor/Nurse performing risk assessment:		Enter name	**Date:**	
PHE authorisation	Enter name	**Signature:**	**GMC No:**	Enter GMC #
PHE Audit				
Consultant name	Enter name	**Signature:**	**Date:**	
GMC number	Enter GMC #	Comment		

Colindale issues

All calls must be logged in HPZone and the form uploaded by the end of each working day at the latest.

If calls are taken out of hours, the call should still be recorded in HPZone, the form uploaded and the RIgS clerks informed as soon as possible the next working day.

All forms with collections from Colindale need to be signed by a medical doctor (prescribing clinician) and GMC number recorded before issue.

All calls relating to the provision of rabies clinical advice are subject to audit and must be documented (in HPZone or equivalent) whether vaccine is issued or not. The forms will be regularly reviewed and audited by a PHE consutlant This should not delay the issue of vaccine as it may take place 24-48 hours later.

All those participating in the Colindale duty doctor service should have completed relevant training on risk assessments for rabies post-exposure treatment, for example, viewing the rabies webinar. Participation in Colindale clinical audit and duty doctor training on a regular basis is required.

Initial training for registrars/trainees and new consultants can be arranged through the RIgS team and is an essential requirement for participation in the Colindale duty rota.

G. Rabies vaccines compatible with UK schedule

Table 1 provides a generic classification of types of vaccine available globally and their compatibility with UK vaccines. Most vaccines available in Europe, N America, Australia, and New Zealand are either HDCV, PCECV or vaccines grown on mammalian cells (PVRV). Further information can be found in the WHO Expert Consultation on Rabies, third report (2018): https://www.who.int/rabies/resources/who_trs_1012/en/:

Rabies vaccine/Ig	Comment	Manufacturer and likely distribution	Compatible with UK
Human diploid cell vaccine (HDCV)	Immunogenicity efficacy data do exist for this.	**Imovax**, Pasteur Mérieux Group, Sanofi Pasteur MSD Ltd UK **Chengdu Kanghua, Rabivax**	✓
Purified chick embryo cell vaccine (PCECV)	Immunogenicity efficacy data do exist for this.	(UK licence) **Rabavert, Rabipur, Vaxirab-N** Chiron vaccines	✓
Purified vero cell vaccine (PVRV)	Vaccine is made on mammalian cells (VERO cells) as an alternative cell substrate to fibroblast cells. This is a licensed vaccine produced in many parts of the world (although unlicensed in the UK), for which formal efficacy data do not exist, but the potency and immunogenicity is evaluated similarly to HDCV and PCECV vaccines. These are generally reliable vaccines.	Variety of manufacturers make this. Possible trade names include **Verorab. Abhayrab, Indirab** (India) **SII Rabivax** (India) **SPEEDA** (CELBIO)	✓
Purified duck embryo vaccine (PDEV)	The vaccine uses duck embryo cells as substrate. These are inactivated by ß-propiolactone and purified by ultracentrifugation. PDEV contains thiomersal.	**Lyssavac, Vaxirab**	✓
Primary Syrian hamster kidney cell (PHKCV)	Uses the Beijing strain of the rabies virus and is inactivated with formalin and adsorbed to	Local producers in China	✓

	aluminium hydroxide. The vaccine contains thiomersal.		
Baby hamster kidney cells (BHKV)	The vaccine uses baby hamster kidney cells as substrate and is produced in Russia	**Kokav** (Russia)	✓
Suckling mouse brain vaccine (SMBV)	Vaccines of this sort are generally reliable but may have marginally reduced efficiency with increased risk of side effects.	Used in some countries in S America, including Bolivia	X
Nervous tissue vaccine (sheep, goat)	Nerve tissue vaccines induce more severe adverse reactions and are less immunogenic than cell culture and embryonated egg vaccines; therefore their production and use is not recommended by WHO.	Used in Asia, Ethiopia and Argentina but being phased out	X
Horse Serum (equine RIG or eRIG)	Trade name is not always clear. May be given as treatment alone or with vaccine. Most often found in certain S American and Middle East countries, and India. If this is the only treatment given, need to start PET (Omit HRIG).	EquiRab, CARIG, Rabix IG, Abhay-RIG, Pars, Plasmarab, PremiRab, VINRIG, VINRAB, TRCS eRIG	X*
HRIG		**Berirab-P** **Bayrab** **HyperRab S/D** **Imogan HRIG** **Kendrab,** **KamRAB,** **KedRABImogram** **Rabies HT,** **Rabigam,** **Rabishield** **Rabglob**	✓

*Although not recommended in the UK, patients who have received horse serum do not need HRIG

H. Source documents and useful references

Immunisation against infectious disease - "The Green Book"
https://www.gov.uk/government/publications/rabies-the-green-book-chapter-27

WHO Expert Consultation on Rabies, April 2018
http://www.who.int/rabies/resources/who_trs_1012/en/

Rabies vaccines: WHO Position Paper :Weekly Epidemiological Record (WER) April 2018. Vol 93 pp 201-220.
http://www.who.int/rabies/resources/who_wer9316/en/

British National Formulary
http://www.bnf.org

Terrestrial animal health code
http://web.oie.int/eng/normes/mcode/en_chapitre_1.8.10.htm

PETS animal passport scheme
http://www.defra.gov.uk/wildlife-pets/pets/travel/pets/

Further documents relating to rabies, rabies pre-exposure prophylaxis and rabies post-exposure prophylaxis are also available on the rabies page of the duty doctor pack on the Intranet, and on the PHE website:
https://www.gov.uk/government/collections/rabies-risk-assessment-post-exposure-treatment-management

Annex 1 Immunosuppression definitions

Individuals who lose or may not maintain adequate antibody levels from previous vaccination or rabies treatment prior to immunosuppression

- Patients on or after completion of immunosuppressive chemotherapy for acute lymphoblastic leukaemia (ALL)
- Patients with lymphoproliferative disorders (including haematological malignancies such as indolent lymphoma, leukaemia and plasma cell lymphoma).
- Patients who have received a solid organ transplant
- Patients who have received a haematopoietic stem cell transplant (HSCT)
- Patients receiving or within six months of completing biological therapies (alone or in combination with steroids). These include:
    - monoclonal antibodies e.g. alemtuzumab, ofatumumab and rituximab
    - cytokine inhibitors e.g. etanercept
- Patients with a diagnosis of acquired immunodeficiency syndrome (AIDS)
- Patients with severe primary immunodeficiency

Individuals who may be able to maintain adequate antibody from previous vaccination or rabies treatment:

- Patients receiving or within six months of completing immunosuppressive chemotherapy or radiotherapy for malignant disease, (other than those with ALL, a lymphoproliferative disorder or who have had HSCT)
- Patients receiving systemic high-dose steroids, or who have received high dose steroids in the past three months. This would include:
    - Children who receive prednisolone, orally or rectally, at a daily dose (or its equivalent) of 2mg/kg/day for at least one week, or 1mg/kg/day for one month.
    - Adults who receive short term high-dose corticosteroids (>40mg prednisolone per day or equivalent for more than 1 week)
    - Adults who receive long term lower dose corticosteroids (>20mg prednisolone per day or equivalent for more than 14 days)
- Patients receiving high doses of non-biological oral immune modulating or other types of immunosuppressive drugs (alone or in combination with steroids) or who have received such therapy in the past three months. This excludes people on replacement corticosteroids for adrenal insufficiency, but would include:
    - Adults who receive methotrexate >25mg per week
    - Adults who receive azathioprine >3.0mg/kg/day or
    - Adults who receive 6-mercaptopurine >1.5mg/kg/day

    - Adults on cyclosporin, cyclophosphamide, leflunomide AND
    - Children (<16years) who receive any dose of the above drugs
- Patients with human immunodeficiency virus (HIV) infection:
    - >5 years of age and with a CD4 count <200 cells/µl (but without a diagnosis of AIDS)
    - aged 5 years or less, with a CD4 count <500 cells/µl

Annex 2 Country/animal risk

This list is accurate as of 18 April 2019 and may not represent the most up to date list of country/animal risks if printed. The most up to date list is available on the PHE website (https://www.gov.uk/government/publications/rabies-risks-by-country)

The country/animal risks presented here represent risks assessed by PHE for use in rabies post-exposure risk assessments and incorporate the presence or absence of rabies in domestic and wild animals, surveillance systems in place and consideration of UK traveller behaviours.

Bats

Bats may carry rabies-like viruses in countries which are declared rabies-free in terrestrial animals. Therefore exposure to bats or their secretions should be considered as a potential rabies risk wherever in the world this has occurred.

All countries worldwide are considered high risk for bat exposures, apart from the UK and Ireland which are low risk for bats.

Primates and rodents

The risk of rabies transmission to humans from primates or rodents is considerably lower than the risks associated with exposures from other animals, particularly carnivores.

All countries where rabies is present in terrestrial animals (ie low or high risk ratings) are considered to be low risk for any exposures from primates and rodents.
For all other terrestrial animals use the table overleaf:

Afghanistan	High risk
Albania	High risk
Algeria	High risk
American Samoa	No risk
Andaman and Nicobar Islands	High risk
Andorra	No risk
Angola	High risk
Anguilla	No risk
Antarctica	No risk
Antigua and Barbuda	No risk
Argentina	High risk
Armenia	High risk
Aruba	No risk
Ascension Island	No risk
Australia	No risk
Austria	No risk
Azerbaijan	High risk
Azores	No risk
Bahamas	No risk
Bahrain	Low risk
Balearic islands	No risk
Bali	High risk
Bangladesh	High risk
Barbados	No risk
Belarus	High risk
Belgium	No risk
Belize	High risk
Benin	High risk
Bermuda	No risk
Bhutan	High risk
Bolivia	High risk
Borneo	High risk
Bosnia and Herzegovina	High risk
Botswana	High risk
Brazil	High risk
British Virgin Islands	No risk
Brunei Darussalam	Low risk
Bulgaria	Low risk, but foxes are high risk
Burkina Faso	High risk
Burma	High risk
Burundi	High risk
Cabrera	No risk
Cambodia	High risk
Cameroon	High risk
Canada	Low risk, but foxes, skunks and racoons are high risk
Canary Islands	No risk
Cape Verde	No risk
Cayman Islands	No risk
Central African Republic	High risk
Chad	High risk
Channel Islands	No risk
Chile	Low risk
China	High risk
Christmas Island	No risk
Cocos (Keeling) Islands	No risk
Colombia	High risk
Comoros	High risk
Congo (Republic)	High risk
Congo (Democratic Republic of)	High risk
Cook Islands	No risk
Corsica	No risk
Costa Rica	High risk
Côte d'Ivoire	High risk
Croatia	Low risk, but foxes are high risk
Cuba	High risk
Cyprus	No risk
Czech Republic	No risk
Czech Republic, within 50km border Poland/Slovakia*	Low risk, but foxes are high risk
Democratic Republic of the Congo	High risk
Denmark	No risk
Djibouti	High risk

Dominica	No risk
Dominican Republic	High risk
East Timor	Low risk
Easter Island	No risk
Ecuador	High risk
Egypt	High risk
El Salvador	High risk
Equatorial Guinea	High risk
Eritrea	High risk
Estonia	Low risk, but foxes are high risk
Ethiopia	High risk
Faeroe Islands	No risk
Falkland Islands	No risk
Fiji	No risk
Finland	No risk
Formentera	No risk
France	No risk
French Guiana	High risk
French Polynesia	No risk
Gabon	High risk
Galapagos Islands	No risk
Gambia, The	High risk
Georgia	High risk
Germany	No risk
Ghana	High risk
Gibraltar	No risk
Greece	No risk
Greenland	High risk
Grenada	Low risk
Guadeloupe	No risk
Guam	No risk
Guatemala	High risk
Guinea	High risk
Guinea-Bissau	High risk
Guyana	High risk
Haiti	High risk
Hawaii	No risk
Honduras	High risk
Hong Kong	Low risk
Hungary*	Low risk, but foxes are high risk
Ibiza	No risk
Iceland	No risk
India	High risk
Indonesia	High risk
Iran	High risk
Iraq	High risk
Ireland	No risk
Isle of Man	No risk
Israel	High risk
Italy	No risk
Jamaica	No risk
Jan Mayen & Svalbard (Norway)	High risk
Japan	No risk
Jordan	High risk
Kazakhstan	High risk
Kenya	High risk
Kiribati	No risk
Korea, North	High risk
Korea, South	High risk
Kosovo	High risk
Kuwait	Low risk
Kyrgyzstan	High risk
Laos	High risk
La Reunion	No risk
Latvia	Low risk, but foxes are high risk
Lebanon	High risk
Lesotho	High risk
Liberia	High risk
Libya	High risk
Liechtenstein	No risk
Lithuania	High risk
Luxembourg	No risk
Macau SAR	High risk
Macedonia	High risk
Madagascar	High risk
Madeira Islands	No risk

Majorca	No risk
Malawi	High risk
Malaysia	High risk
Maldives	No risk
Mali	High risk
Malta	No risk
Margarita Island	High risk
Marshall Islands	No risk
Martinique	No risk
Mauritania	High risk
Mauritius	No risk
Mayotte	No risk
Menorca	No risk
Mexico	High risk
Micronesia	No risk
Moldova	High risk
Monaco	No risk
Mongolia	High risk
Montenegro	High risk
Montserrat	No risk
Morocco	High risk
Mozambique	High risk
Myanmar (Burma)	High risk
Namibia	High risk
Nauru	No risk
Nepal	High risk
Netherlands	No risk
Netherlands Antilles	No risk
New Caledonia	No risk
New Zealand	No risk
Nicaragua	High risk
Niger	High risk
Nigeria	High risk
Niue	No risk
Norfolk Island	No risk
Northern Mariana Islands	No risk
Norway (mainland only)	No risk
Oman	High risk
Pakistan	High risk
Palau	No risk
Palestine	High risk

Panama	High risk
Papua New Guinea	No risk
Paraguay	High risk
Peru	High risk
Philippines	High risk
Pitcairn Islands	No risk
Poland	High risk
Portugal	No risk
Puerto Rico	High risk
Qatar	Low risk
Republic of Korea (S. Korea)	High risk
Reunion	No risk
Romania	High risk
Russian Federation	High risk
Rwanda	High risk
Saint Helena	No risk
Saint Kitts and Nevis	No risk
Saint Lucia	No risk
Saint Martin/Sint Maarten	No risk
Saint Pierre and Miquelon	No risk
Saint Vincent and the Grenadines	No risk
Samoa	No risk
San Marino	No risk
Sao Tome & Principe	Low risk
Saudi Arabia	High risk
Senegal	High risk
Serbia	High risk
Seychelles	No risk
Sierra Leone	High risk
Singapore	No risk
Slovakia	Low risk, but foxes are high risk
Slovenia	Low risk, but foxes are high risk
Solomon Islands	No risk
Somalia	High risk
South Africa	High risk

South Georgia and the South Sandwich Islands	No risk
Spain - mainland, Balearic and Canary Islands	No risk
Spain - north African territories of Ceuta and Melila	High risk
Sri Lanka	High risk
Sudan (North and South)	High risk
Suriname	High risk
Svalbard	High risk
Swaziland	High risk
Sweden	No risk
Switzerland	No risk
Syria	High risk
Tahiti	No risk
Taiwan	Low risk
Tajikistan	High risk
Tanzania	High risk
Thailand	High risk
Tibet	High risk
Timor-Leste	Low risk
Togo	High risk
Tokelau	No risk
Tonga	No risk
Trinidad and Tobago	Low risk
Tunisia	High risk
Turkey	High risk
Turkmenistan	High risk
Turks and Caicos Islands	No risk
Tuvalu	No risk
Uganda	High risk
Ukraine	High risk
United Arab Emirates	Low risk
United Kingdom	No risk
United Kingdom - imported animal	Contact RIgS
United States of America	Low risk, but foxes, skunks and racoons are high risk
Uruguay	High risk
Uzbekistan	High risk
Vanuatu	No risk
Venezuela	High risk
Vietnam	High risk
Virgin Islands	No risk
Wake Island and the US Pacific Islands	No risk
Wallis and Futuna Islands	No risk
Western Sahara	High risk
Yemen	High risk
Zambia	High risk
Zanzibar	High risk
Zimbabwe	High risk

This list is accurate as of 18 April 2019 and may not represent the most up to date list of country/animal risks if printed. The most up to date list is available on the PHE website: (https://www.gov.uk/government/publications/rabies-risks-by-country)

Annex 3 Summary of risk assessment and treatment

1. Determine the combined country / animal risk
   https://www.gov.uk/government/publications/rabies-risks-by-country

2. Determine the category of exposure

Category	Terrestrial mammals	Bats
1	**No physical contact with saliva**	**No physical contact** (i.e. no direct contact with the bat's saliva)
2	**Minimal contact with saliva and/or unable to infiltrate wound with HRIG if needed**	**Uncertain physical contact** (i.e. where there has been no observed direct physical contact (with saliva) but this could have occurred)
3	**Direct contact with saliva**	**Direct physical contact with bat's saliva**

3. Determine the composite rabies risk

Country/Animal risk	Category 1 exposure	Category 2 exposure	Category 3 exposure
No risk	Green	Green	Green
Low risk	Green	Amber	Amber
High risk	Green	Amber	Red
Confirmed rabies	Green/Amber	Red	Red

4. Determine the post-exposure treatment required

	Post-exposure treatment		
Composite rabies risk	**Non immunised/ partially immunised**	**Fully immunised**	**Immunosuppressed**
Green	None	None	None
Amber	Four doses of vaccine d0, d3, d7, d21	Two doses of vaccine d0, d3-7	HRIG and five doses of vaccine d0, d3, d7, d14 and d30
Red	HRIG* and four doses of vaccine d0, d3, d7, and d21	Two doses of vaccine d0, d3-7	HRIG and five doses of vaccine d0, d3, d7, d14 and d30

*HRIG not required if more than 7 days after first dose of vaccine, or more than 1 day after the second dose or for partially immunised patients (unless immunosuppressed)