



Protocol for the Health Protection Management of Rabies

**Health Protection Scotland
Updated May 2007**

This document is an amended version of the HPA 'Duty Doctor Joint Protocol for Rabies Queries' (updated January 2007), and has been agreed by the Zoonoses Network for Scotland.

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Categories of Rabies Enquiries

There are five categories of rabies query that come to Health Protection Scotland. These are about the need for pre-exposure prophylaxis, post-exposure prophylaxis and advice concerning a suspected case of rabies.

1. Pre-exposure prophylaxis for travellers.

Advice is given on TRAVAX (<http://www.travax.nhs.uk/>) and in the "Green Book". A telephone support line for TRAVAX users is normally available from 2pm - 4pm on weekdays - 0141 300 1130; Scottish NHS users have free access.

2. Pre-exposure prevention in groups in Scotland who are at a higher risk of exposure e.g.. Bat handlers, veterinary surgeons

Advice is given in the 'Green Book'

3. For **post-exposure prophylaxis**, duty doctors should follow this agreed joint protocol on the need for post-exposure prophylaxis assessed according to the information given.

4. Suspect rabies in animals in Scotland

Advice is given in the 'Rabies Memorandum'

5. For a **suspect case** of human rabies,

For further information please see the document: *The Public Health Management of a Suspected Case of Human Rabies - A Standard Operating Procedure for Communication & Action* (on call packs).

Post-Exposure Treatment

As the incubation period for rabies can be prolonged, treatment should still be considered even if the interval from exposure is lengthy.

Summary of key questions:

1. Which country?

Use country-by-country risk assessment at Appendix 1. Note that the origin of the animal is important: Is the animal non-indigenous or recently imported? Was it a terrestrial animal or a bat?

2. What type of exposure?

Use modified DoH chart 'Specific Treatment according to nature of exposure. Important factors are the site and severity of the bite/exposure and whether the bite/scratch was provoked

3. What is the immune status of the individual?

Unimmunised individuals will need 5 doses of vaccine, plus immunoglobulin depending on the risk assessment. A full pre-exposure course is three-dose IM course. If only two doses have been given for pre-exposure, the patient will need to receive a full five-dose IM post-exposure regime, but immunoglobulin is not usually needed.

4. What vaccine and rabies immunoglobulin is indicated?

See section on Vaccines and Human Rabies Immunoglobulin (HRIG) and indications

Assessment of Exposure to Terrestrial Animals e.g. dogs, cats, rodents etc

Nature of exposure	Status of biting animal (irrespective of previous vaccination)		Recommended treatment
	At time of exposure	During 15 days ¹ for dogs and cats only	
I. Contact, including licks to intact skin (but with no lesions); indirect contact; no contact*.	Rabid	-	None
II. Licks of the skin if there are scratches or abrasions; minor bites (covered areas of arms, trunk, and legs).	(a) Suspected as rabid	Healthy	Wash wound. Start vaccine**. Stop treatment if animal remains healthy for 15 days ¹
	(b) Rabid; wild animal or animal unavailable for observation.	Rabid	Wash wound. Start vaccine; administer rabies immunoglobulin if appropriate upon positive diagnosis and complete the course of vaccine. Wash wound. Vaccine + rabies immunoglobulin – according to country-by-country risk and previous immunisation history.
III. Licks of mucosa; major bites (multiple or on face, head, finger or neck).	Suspect ² or rabid domestic or wild animal, or animal unavailable for observation.		Wash wound. Vaccine + rabies immunoglobulin – according to country-by-country risk and immunisation status***. Stop treatment if animal remains healthy for 15 days ¹ .

¹ Observation period in this chart applies only to dogs and cats.

² All unprovoked bites in endemic areas or animals from endemic areas should be considered suspect.

* Exposure to rodents, rabbits and hares seldom, if ever, requires specific anti-rabies treatment. Small rodents (e.g., squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, and mice) and lagomorphs (including rabbits and hares) are almost never found to be infected with rabies in the USA and have not been known to transmit rabies to humans. Post-exposure prophylaxis is not generally indicated for exposure to rodents. The only exception to this in the USA is exposure to woodchucks (also known as groundhogs). These have accounted for 70% of rabies cases among rodents reported to CDC between 1971 and 1988.

** If an apparently healthy dog or cat in or from a low risk area is under observation, the situation may warrant delaying the initiation of treatment

*** Other domestic and wild animals (except threatened or endangered species) suspected as rabid should be killed humanely and their tissues examined using appropriate laboratory techniques.

Assessment of Bat Exposures

In rabies-endemic countries, bat exposures are high risk for classical rabies and should be managed as such.

Several rabies-free countries including UK have rabies-like virus in their bat populations. This includes Australian Bat Lyssavirus in Australia, and European Bat Lyssavirus 1 and 2 in Europe and in the UK. The risk from these viruses is likely to be low because the incidence of acute infection and excretion of virus is rare in bats and because humans are rarely exposed to the most affected bat species (in the UK this is the Daubenton's bat). Nevertheless, because the assessment of exposures is difficult to make and the number of exposures in unvaccinated individuals is relatively limited, previous guidance for unvaccinated individuals has now been simplified to ensure consistency of advice. For all unequivocal exposures to bats such as bites, which are of a nature to be a possible rabies risk, post exposure prophylaxis should be with HRIG and 5 doses of vaccine. If the exposure is uncertain (can't confirm a bite), then vaccination alone may be considered. This replaces the previous guidance and flowchart in the HPA protocol dated December 2004.

Immune Status of the Individual

a) Fully immunised

A full course of pre-exposure vaccination is three-dose IM course, with a single booster at 1 year and every 3-5 years thereafter for those at continuing risk.

b) Delayed boosters and pre-exposure protection

If an individual had a primary course less than 5 years ago and requires ongoing pre-exposure protection then a single booster is adequate to restore their pre-exposure immunity.

If it has been more than 5 years since the primary course then most travel clinics will still advise that just a single booster be given. For some vaccines only (e.g. Aventis Pasteur Rabies Vaccine BP) the product insert advises that the whole primary course be repeated. People who have had an interrupted or incomplete course of pre-exposure vaccination should be advised that they may need five doses of post-exposure vaccine (rather than two) should they be exposed. They have two alternative options of re-starting the primary course (with attendant risks of local reactions if they have good levels of immunity) or serological testing (which is often more expensive than a rabies booster).

c) Incomplete immunisation and post-exposure treatment

The following should be considered as incomplete immunisation for post-exposure treatment

- An incomplete primary course (e.g. only two doses given for pre-exposure primary immunisation)
- Their first booster was more than 5 years after the primary 3 dose course and the primary course was not repeated
- The person has had one booster 2 years after a 3 dose primary immunisation and further boosters at 2-3 yearly intervals, but their last booster was more than 5 years ago.

In the past, two doses was regarded as a complete pre-exposure course if there was at least 28 days between the doses. This no longer applies.

Incompletely immunised individuals may require 5 doses of vaccine for post-exposure prophylaxis. Immunoglobulin is not usually needed (DoH 2000), but the indication for human rabies immunoglobulin depends on other factors in their risk assessment and should be decided on a case-by-case basis

Immediate first aid

While bites from dogs are the most frequent, remember that this advice applies following all animal bites including bats. Saliva should be thoroughly washed off with soap and water and the wound irrigated with iodine solution or alcohol. Avoid suturing. Tetanus prophylaxis is recommended.

Vaccines and Human Rabies Immunoglobulin (HRIG)

Indications

Indications

Full pre-exposure vaccination consists of three 1.0ml i.m. doses of anti-rabies vaccine (see list below) given on days 0, 21, 28 within two years. The two-dose regimen outlined for some travellers, 1.0ml i.m. of vaccine given on days 0 and 28, should be taken as not fully vaccinated and individuals should receive the full 5-dose post-exposure course. The gluteal area should never be used for rabies vaccine administration due to lower neutralising antibody titre results.

Post-exposure anti-rabies vaccination for previously un-immunised individuals should include administration of both passive antibody and vaccine for high and moderate risk rabies exposures. The combination of HRIG and vaccine is recommended for both bite and non-bite exposures (see DoH chart, memorandum on rabies 2000), **regardless of the interval between exposure and initiation of treatment.**

Vaccine only (i.e. HRIG is not required) is recommended for:

- Exposures in low risk areas
- People who have previously received complete vaccination regimens (pre-exposure or post-exposure) with a cell culture vaccine
- People who have had a prior complete vaccination course (as pre- or post-exposure treatment) but who are not up to date with boosters.

Human Rabies immunoglobulin (HRIG) is administered only once (i.e., at the beginning of the anti-rabies prophylaxis) to previously unvaccinated persons to provide immediate antibodies until the patient responds to vaccine (see list below). If HRIG was not administered when vaccination was begun, it can be administered up to the seventh day after the administration of the first dose of vaccine. **Beyond the seventh day, HRIG is not indicated since an antibody response to cell culture vaccine is presumed to have occurred.** If anatomically feasible, the full dose of HRIG should be thoroughly infiltrated in the area around and into the wounds. Any remaining volume should be injected intramuscularly at a site distant from vaccine administration.

Vaccines recommended as efficacious:

- Human diploid cell vaccine (HDCV) – Rabies Vaccine BP, Imovax (UK licence), Rabivac;
- Purified vero cell vaccine (PVRV) – Verorab, Imovax vero, Rabies vero, TRC verorab;
- Rabies vaccine absorbed (RVA) – Rabies vaccine;
- Purified chick embryo cell vaccine (PCEC) – RabAvert, Rabipur (UK licence);
- Purified duck embryo cell vaccine (PDEV) – Lyssavac N

There are currently only two rabies vaccines licensed for use in the UK – human diploid cell vaccine (HDCV) and purified chick embryo cell rabies vaccine (PCEC)

Rabies Vaccine and Human Rabies Immunoglobulin (HRIG) Availability

SEHD arrangements for the supply of Rabies Vaccine and Immunoglobulin

Rabies vaccine is available to NHS Board Public Health Specialists from designated vaccine holding centres. This vaccine is supplied FOC when required for pre-exposure immunization of those at occupational risk and bat handlers and for post-exposure use.

(In other instances, such as work-related travel or personal travel a community pharmacy will dispense an NHS General Practitioner prescription.)

Rabies Immunoglobulin is available to Public Health Specialists and is obtained through Scottish National Blood Transfusion Service (SNBTS) and the applicable Regional Blood transfusion Centre should be contacted in the first instance (24hrs telephone contact). Prior to authorising release, SNBTS should confirm with the Duty Consultant at HPS that HRIG is indicated, based on an appropriate risk assessment.

Supplies are obtained:

	Rabies Immunoglobulin From SNBTS	Rabies Vaccine From local vaccine holding Centre
North East Scotland	Blood transfusion service Foresterhill Aberdeen Day: 01224 685685 Out of Hours: 01224 552322	Pharmacy Department Aberdeen Royal Infirmary Day: 01224 553181 Contact: Heather Smith Out of Hours: 01224 552355 Switchboard will page on call medical officer
East Scotland	Blood transfusion service Ninewells Hospital Dundee DD1 9SY Day: 01382 645166 Out of Hours: 01382 660111 (via switchboard)	Pharmacy Department Ninewells Hospital Day: 01382 660111 bleep 4574 vaccineservices.tayside@nhs.net Contact: Moyra O'Shea Out of Hours: 01382 660111 Switchboard will page on call pharmacist
South East Scotland and Edinburgh	Blood transfusion service Edinburgh Royal Infirmary Old Dalkeith Road Edinburgh EH16 4SU 24 Hour Direct Line: 0131 242 7501	Pharmacy Department St John's Hospital Livingston Day: 01506 419666 (ext 2267) Contact: Anne Haddow Out of Hours: 01506 419666 Switchboard will page on call pharmacist

North Scotland (Inverness)	Blood transfusion service Raigmore Hospital Inverness IV3UJ Day: 01463 704216 Out of Hours: 01463 704000 (via switchboard)	Pharmacy Department Raigmore Hospital Day: 01463 705582 Contact: Peter Mutton Out of Hours: 01463 704000 Switchboard will page on call pharmacist
West Scotland Regional Transfusion Centre	Gartnavel General Hospital 25 Shelley Road Glasgow G12 OXB 24 Hour Direct Line: 0141 357 7700	Pharmacy Department Gartnavel General Hospital Day: 0141 211 3316 Contact: Gayle Caldwell Out of Hours: 0141 211 3000 Switchboard will page on call pharmacist <u>For Clyde area:</u> Pharmacy Department Royal Alexandra Hospital Day: 0141 314 6146 Contact: Dorothy Culver Out of Hours: 0141 887 9111 Switchboard will page on call pharmacist

HRIG

The dose is 20 iu/kg, dispensed in vials of: - 500 iu (1.0ml) (may vary depending on batch potency).

No. of vials HRIG	Weight (kg) approx.	Weight (lb) approx.
1	28	61 (4st 5lb)
2	56	123.5 (8st 12lb)
3	84	185 (13st 2lb)
4	112	247 (17st 8lb)

Appendix 1 – Risk by Country

Updated September 2004

a) Terrestrial animals (not bats)

For updated information on rabies by country, see World Health Organisation, Rabies Bulletin Europe: <http://www.who-rabies-bulletin.org/> or Centers for Disease Control and Prevention, USA: www.cdc.gov/ncidod/dvrd/rabies/epidemiology/epidemiology.htm .

NO RISK: Terrestrial animals originating from the following countries are considered 'no risk' for rabies (free of terrestrial rabies).

Europe: Belgium, Cyprus, Denmark, Faroe Islands, Finland, France, Gibraltar, Greece, Iceland, Ireland, Italy (except the northern and eastern borders), Luxembourg, Malta, Netherlands, Norway (mainland), mainland Spain (excluding North African coast) and the Canary Islands, Portugal, Sweden, and the United Kingdom.

Americas: Anguilla, Antigua & Barbuda, Bahamas, Barbados, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Equatorial Guinea, French Antilles, Guadeloupe, Jamaica, Martinique, Montserrat, Netherlands Antilles, St Christopher & Nevis, St Lucia, St Martins, St Pierre & Miquelon, St Vincent & the Grenadines, Turks & Caicos, Uruguay, Virgin Islands.

Asia: Bahrain, Brunei Darussalam, Hong Kong, Japan, Kuwait, Maldives, Qatar, Singapore, Taiwan, United Arab Emirates.

Oceania: American Samoa, Australia, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Sao Tome & Principe, Solomon Islands, Tonga, Vanuatu, Western Samoa.

LOW RISK: Terrestrial animals originating from the following countries are considered 'low risk' for rabies:

Austria, Bulgaria, Canada, Czech Republic, Germany, Switzerland, USA (the Centers for Disease Control, Atlanta, provides information on the risk of rabies in different parts of the USA).

HIGH RISK: Terrestrial animals originating from the following countries, where terrestrial rabies is enzootic, are considered 'high risk':

Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, India, Parts of Mexico, Nepal, Pakistan, Peru, Philippines, Sri Lanka, Thailand, Turkey, Vietnam.

Countries in Asia, Africa and South America not otherwise mentioned as 'no risk' or 'low risk' should be considered as 'high risk'.

b) Bats

Both classical rabies virus and rabies-related lyssaviruses may be acquired from bats depending on the species and origin. Information on the local epidemiology of rabies in bats should be sought. Although the UK is classified as rabies free according to the rules of the World Organisation for Animal Health (OIE), bats in the UK may carry a European Bat Lyssavirus