Rabies

Rabies is transmitted to humans usually by a bite or scratch from an infected animal (usually a dog) and almost always fatal once symptoms appear

Rabies is a virus carried in animal saliva that usually spreads to humans from a bite, scratch, lick to an open wound from an infected animal (typically a dog). It can also be a risk if an animal spits and saliva gets into the eyes, mouth or nose. The virus attacks the central nervous system, causing progressive damage to the brain and spinal cord.

Rabies is an extremely serious viral infection which is almost always fatal once symptoms appear, but vaccination and early treatment can prevent it. It is important that travellers visiting rabies endemic areas are aware of the risk and know what to do if they are bitten or scratched.

Human rabies cases are often unreported, so it is difficult to give reliable information on how common it is worldwide. The disease is estimated to cause 59,000 human deaths annually.

Cases of rabies in travellers are rare but are invariably fatal. Bites and scratches from potentially rabid animals occur more frequently and it is often difficult to determine whether an animal is infected.

A course of rabies vaccine can prevent infection and death. Guidance on when protection should be started prior to travel is available on our Country Information pages, but further prompt medical assessment is still needed after all potential exposures. It is important that travellers visiting areas where rabies occurs are aware of the risk and know what to do if they are bitten or scratched or an animal spits in their face. Rabies is preventable if the correct post-exposure treatment is provided quickly, but it can be expensive and difficult to obtain in some areas.

Prevention

Contact with wild or domestic animals, including pets, during travel should be avoided. Animals that appear to be behaving normally can still be infectious.

Travellers should also be advised:

- not to approach animals (or bats)
- not to attempt to pick up an unusually tame animal or one that appears to be unwell (or bats)
- not to attract stray animals by offering food or by being careless with litter
- to be aware that certain activities may attract dogs (e.g. running, cycling)

The following advice can be given regarding first aid following a possible rabies exposure for all travellers bitten, scratched, or spat at by any animal (bats included) abroad or if an animal (bats included) licks open skin:

- Urgent action is required; treatment must be started as soon as possible after the exposure.

- Immediately flush the wound/area under a running tap for several minutes, then thoroughly wash with soap/detergent and water to remove saliva.
- Apply a disinfectant to the wound such as 70 percent alcohol or iodine solution (tincture or aqueous solution of povidone-iodine).
- Apply a simple, loose dressing over the wound.
- If animal (bats included) saliva gets into eyes, nose or mouth (i.e. if the animal coughs, spits or sneezes close to face), wash face thoroughly with clean water as soon as possible.

Get urgent medical help, even if the wound or incident seems very trivial. Seek medical attention locally, do not wait until you return to the UK. If advised, you should start rabies post-exposure treatment abroad and not wait until you get back to the UK. Prompt post-exposure treatment is needed, even if you have already had a full pre-exposure vaccine course, as further vaccine doses are required for full protection.

Keep photos or written records of any rabies treatment given abroad including details on the name and type of vaccine and immunoglobulin if possible. Some countries stock rabies vaccines which are not always directly compatible and therefore additional doses of vaccine may need to be given upon your return to the UK. If you have any questions about rabies post-exposure treatment you've received in another country, speak to your medical insurance provider for advice and contact a health professional on your return to the UK. If you had rabies vaccination before you travelled, make sure you carry your vaccine record with you.

If you did not have or did not complete a rabies vaccine course before travel, you may need treatment with a blood product called rabies immunoglobulin (which may be unavailable in some world regions), as well as a full vaccine course. Post-exposure treatment (with rabies vaccine) should be started as soon as possible, whether or not immunoglobulin is available. You may need to travel to a nearby major city or possibly another country for appropriate treatment and vaccines. One study found that 204 countries out of 240 had limited or no access to rabies immunoglobulin.

Some countries stock rabies vaccines which are not compatible with the UK vaccines – see section G in the UK post-exposure treatment guidelines for details. If you cannot find compatible vaccines, seek advice from your healthcare provider.

- Tetanus vaccine is needed if tetanus vaccines are not up to date.
- If the wound needs stitching (suturing) this must be postponed until post exposure treatment has started.
- Inform your GP on return of any post-exposure treatment received abroad.

Rabies vaccine

Individuals considered at risk of exposure to rabies viruses within the UK include:

- Laboratory workers routinely handling rabies virus.
- Workers at Defra-authorised quarantine premises and carriers.
- Bat handlers who regularly handle bats, including on a voluntary basis, in the UK.

- Veterinary and technical staff who may be at increased rabies risk.

Individuals considered at risk of exposure to rabies travelling outside the UK include:

- Animal workers who regularly travel to rabies enzootic areas.
- Travellers to rabies risk areas especially if:
  - Visiting areas where access to post-exposure treatment and medical care is limited.
  - Planning higher risk activities such as cycling and running.
  - Long-stay travellers (more than one month).
  - Health workers in rabies enzootic areas who may have direct contact with rabies infected patients.

See our Country Information pages to see individual recommendations for each destination.

A course of pre-exposure vaccines simplifies post-exposure treatment when this is required, two further rabies vaccines are given on days 0 and 3 - 7 after a possible rabies exposure. These vaccines should be obtained as soon as possible after the exposure. For individuals who have not had pre-exposure rabies, four doses of rabies vaccine are usually recommended over one month, plus rabies immunoglobulin may be recommended in the event of a high-risk exposure. Immunoglobulin is in short supply worldwide and may not be available in many countries.

Vaccine schedules

Vaccine	Route of administration	Schedule	Pre-exposure recommendations**	Age range
Rabies Vaccine BP (Human diploid cell vaccine) (HDVC) **[discontinued]**	Intra-muscular	3 doses Day 0, 7 and 21 or 28* **Rapid Regimen:** 3 doses Day 0, 3, 7 and a further dose at 1 year	Primary course (3 doses of vaccine) Booster dose**	***No minimum age stated in the Summary of Product Characteristics (SPC)
Rabipur (Purified chick embryo cell vaccine) (PCECV)	Intra-muscular	3 doses Day 0, 7 and 21 or 28* **Rapid Regimen:** 3 doses Day 0, 3, 7 and a further dose at 1 year	Primary course (3 doses of vaccine****) Booster dose**	***No minimum age stated in Summary of Product Characteristics (SPC) See Interrupted or accelerated course information below for further details
Verorab (Vero cell vaccine) (PVRV)	Intra-muscular****	3 doses Day 0, 7 and 21 or 28****	Primary course (3 doses of vaccine****) Booster dose**	***No minimum age stated in Summary of Product Characteristics

				(SPC)

The Summary of Product Characteristics (SPC) should be consulted prior to the administration of any vaccine.

***A third dose can be given from day 21 if insufficient time before travel.**

****Routine booster doses are not recommended for most travellers.** See Rabies. Chapter 27. Immunisation against infectious disease.

*****Although the vaccine can be given at any age, the rapid regimen is 'off-license' in some age groups, see the Interrupted and Accelerated Courses information below. The risk of animal bites may be higher once the child is independently mobile. Children are often bitten around the face or head, a type of bite considered to be a higher risk due to the expected shorter incubation period.**

******Verorab and Rabipur have a UK license for a pre-exposure two dose regimen via intramuscular route (0.5mL) seven days apart. With Verorab this two-dose regimen is also licensed with the intradermal route (0.1mL). Guidance is awaited from UK Health Security Agency (UKHSA) and the Joint Committee on Vaccination and Immunisation (JCVI) on the use of this two-dose pre-exposure vaccine regimen.**

Interrupted or accelerated courses

Ideally, those at risk should receive pre-exposure vaccination with three doses of rabies vaccine before travel. Where there is enough time to complete the 21-28-day course, this is the preferred schedule for pre-exposure prophylaxis.

Both the 0, 3, 7 and 365 (i.e. a fourth dose at 1 year) day schedule and the 0, 7 and 21 day schedule can be given using either product, where there is less than four weeks before departure. The 0, 3, 7 and 365 day schedule is 'off-license' in some age groups and with some vaccine brands but can be given according to Ch 27 immunisation against infectious disease 'Green book' guidance.

Further guidance on the two-dose regimen for Verorab and Rabipur is awaited from UKHSA.

A risk assessment should always be undertaken when considering rabies immunisation.

Resources

- More detailed information can be found in our rabies factsheet
- Infographic: Rabies Information for Travellers
- UKHSA: Rabies: risk assessment, post-exposure treatment, management
- UKHSA: Rabies: summary of risk assessment and treatment
- UKHSA: Rabies post-exposure administration of vaccine and immunoglobulin
- UKHSA: Rabies and immunoglobulin service (RIgS)
- UKHSA: Rabies information for travellers
- Further details on the vaccines can be found in the SPC on the electronic medicines compendium