RABIES

Cause: The rabies virus, a rhabdovirus of the genus *Lyssavirus*.

Transmission: Rabies is a zoonotic disease affecting a wide range of domestic and wild animals, including bats. Infection of humans usually occurs through the bite of an infected animal. The virus is present in the saliva. Any other contact involving penetration of the skin occurring in an area where rabies is present should be treated with caution. In developing countries transmission is usually from dogs. Person-to-person transmission has not been documented.

Nature of the disease: An acute viral encephalomyelitis, which is almost invariably fatal. The initial signs include a sense of apprehension, headache, fever, malaise and sensory changes around the site of the animal bite. Excitability, hallucinations and aerophobia are common, followed in some cases by fear of water (hydrophobia) due to spasms of the swallowing muscles, progressing to delirium, convulsions and death a few days after onset. A less common form, paralytic rabies, is characterized by loss of sensation, weakness, pain and paralysis.

Geographical distribution: Rabies is present in animals in many countries worldwide. Most cases of human infection occur in developing countries.

Risk for travellers: In rabies-endemic areas, travellers may be at risk if there is contact with both wild and domestic animals, including dogs and cats.

Prophylaxis: Vaccination for travellers with a foreseeable significant risk of exposure to rabies or travelling to a hyperendemic area where modern rabies vaccine may not be available.

Precautions: Avoid contact with wild animals and stray domestic animals, particularly dogs and cats, in rabies-endemic areas. If bitten by an animal that is potentially infected with rabies, or after other suspect contact, immediately clean the wound thoroughly with disinfectant or with soap or detergent and water. Medical assistance should be sought immediately (see box on Rabies post-exposure treatment).
The vaccination status of the animal involved should not be a criterion for withholding post-exposure treatment, unless the vaccination has been thoroughly documented and vaccine of known potency has been used. In the case of domestic animals, the suspect animal should be kept under observation for a period of 10 days.

Rabies post-exposure treatment

In a rabies-endemic area, the circumstances of an animal bite, other contact with the animal, and the animal's behaviour and appearance may suggest that it is rabid. In such situations, medical advice should be obtained immediately.

Post-exposure treatment to prevent the establishment of rabies infection involves first-aid treatment of the wound followed by administration of rabies vaccine and antirabies immunoglobulin in the case of class 3 exposure. The administration of vaccine, and immunoglobulin if required, must be carried out, or directly supervised, by a physician.

Post-exposure treatment depends on the type of contact with the confirmed or suspect rabid animal, as follows:

Type of contact (class of exposure)	Recommended treatment
1 / Touching or feeding animals Licks on the skin	None
2 / Nibbling unbroken skin Minor scratches without bleeding Licks on broken skin	Administer vaccine immediately (1)
3 / Single or multiple bites or scratches with skin penetration Contamination of mucous membrane by saliva from licking	Administer antirabies immunoglobulin and vaccine immediately

First-aid treatment

Since elimination of the rabies virus at the site of infection by chemical or physical means is the most effective mechanism of protection, immediate vigorous washing and flushing with soap or detergent and water, or water alone, is imperative. Following washing, apply either ethanol (70%) or tincture or aqueous solution of iodine or povidone iodine.

Specific treatment

Antirabies immunoglobulin (RIG) is applied by instillation into the depth of the wound and by infiltration of the surrounding tissues. As much as possible of the total RIG volume required should be instilled into the wound. Vaccine (2) is applied by intradermal or intra-muscular injection in schedules requiring several doses (4 or 5 doses by intramuscular injection, depending on the vaccine used), with the first dose being administered as soon as possible after exposure and the last dose within 28 days for intramuscular or 90 days for intradermal vaccination.

Patients who have been vaccinated prophylactically against rabies with a full course of cell-culture or duck-embryo vaccine can be given a shorter course of post-exposure treatment with fewer doses; they do not require RIG. Urgent post-exposure treatment remains essential whether or not patients have been previously vaccinated.

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1) Treatment can be stopped if the suspect animal is shown by appropriate laboratory examination to be free of rabies or, in the case of domestic dogs and cats, if the animal remains healthy throughout a 10-day observation period.

2) Modern rabies vaccines, made from cell-culture or duck-embryo-derived rabies virus which is then purified and inactivated, are replacing the older vaccines produced in brain tissue.