

For the Primer, visit [doi:10.1038/nrdp.2017.91](https://doi.org/10.1038/nrdp.2017.91)

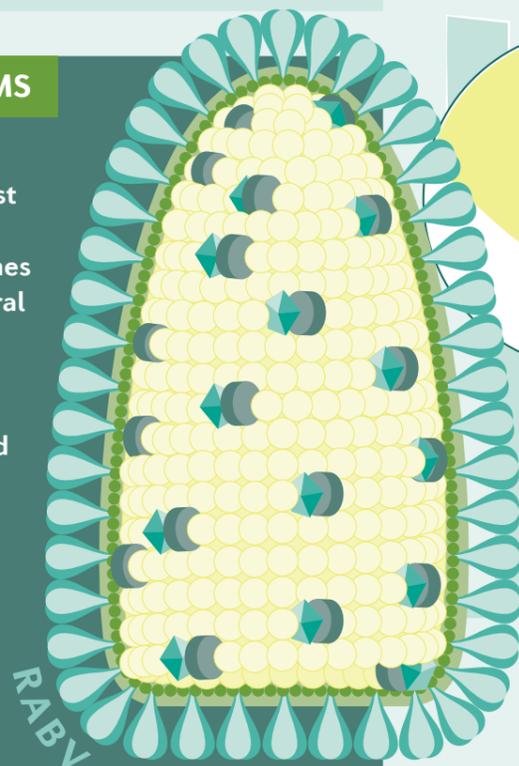
➔ Rabies is a neglected zoonotic disease that is most commonly transmitted by the bite of a dog infected with rabies virus (RABV). Prevention is essential, as rabies is virtually always fatal once symptoms develop.

EPIDEMIOLOGY

Rabies is estimated to cause ~60,000 human fatalities annually, of which up to 50% are children <15 years of age. RABV is enzootic in dog populations in many African and Asian countries, where the burden of disease is highest.

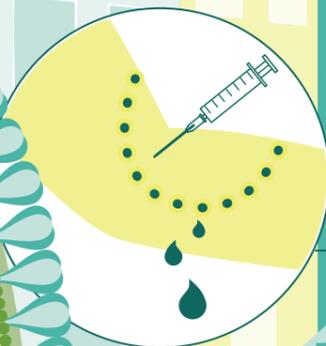
MECHANISMS

RABV enters the host through broken skin or mucous membranes and infects peripheral motor neurons via receptor-mediated endocytosis. The virus is disseminated by retrograde axonal transport to the cell body, where it replicates; inflammation triggered by viral replication causes local symptoms. Progeny virions spread to next-tier neurons and the process repeats until RABV reaches the brain. How RABV can escape the host's immune response is not completely understood: a possible mechanism is RABV-mediated reduction of the permeability of the blood-brain barrier to the infiltration of immune cells.



PREVENTION

Pre-exposure vaccination is recommended for at-risk individuals (for example, veterinarians and travellers to endemic areas), but is challenging in resource-limited endemic countries



If exposure is suspected, PEP should be administered as soon as possible

Secondary prevention includes appropriate wound care and post-exposure prophylaxis (PEP) regimens, which consist of the administration of rabies immunoglobulin (RIG) and vaccination

Rx MANAGEMENT

Treatment approaches are mainly symptomatic, primarily comprising analgesics and sedatives. Palliative care is usually the only

option, although intensive care approaches could be considered on a case-by-case basis in patients with mildly depressed

neurological functions. Fewer than 20 cases of individuals who survived overt rabies have been reported worldwide.

DIAGNOSIS

Rabies can be classified as furious or paralytic, although this distinction can typically be made only late in the disease course, when specific symptoms (agitation and muscle weakness) present. Hydrophobia (fear of water) is a strong indication for rabies, but only laboratory tests can confirm RABV infection, as other differential diagnoses are possible. In endemic settings, facilities often lack the necessary resources for ante-mortem tests (for example, reverse transcription PCR to detect viral RNA) and the diagnosis is usually confirmed post-mortem via detection of viral antigens in brain specimens.

EXPOSURE

Prodrome
Local symptoms (pain, fever and itch)

Acute neurological phase
Various symptoms

Coma

DEATH

Dog vaccination campaigns can eliminate RABV from its principal reservoir and prevent human infections, as well as increase disease awareness

VACINATE YOUR DOG TODAY

OUTLOOK

Rabies has been acknowledged as a neglected tropical disease, and dog-mediated rabies has been targeted for global eradication by 2030. Achieving this goal will require multiple strategies, including improved diagnostic tools to rapidly assess suspected cases of RABV infection to initiate early care. Additionally, access to cheaper and efficacious vaccines and RIG as well as increased education and disease awareness in endemic countries are also necessary. However, the key to rabies eradication is preventing the transmission of RABV from dogs to humans through large-scale dog vaccination campaigns.