

## Control Methods in Humans

Prevention of human rabies is dependent upon providing exposed persons with prompt local treatment of their wounds, combined with appropriate rabies post-exposure prophylaxis (PEP) consisting of both passive and active immunoprophylaxis. Passive immunization consists of rabies antibody administration, while active prophylaxis includes immunization with cell-culture vaccines. In addition, pre-exposure vaccination is recommended for persons more likely to be exposed, such as certain laboratory workers, animal control officers, and veterinarians.

## Rabies Biologics

In general, two types of rabies products are available in the US, namely, rabies vaccines and rabies immunoglobulin. Rabies vaccines induce an active immune response that includes the production of neutralizing antibodies. This antibody response requires approximately 7-10 days to develop and usually persists for greater than or equal to 2 years. Rabies immune globulin (RIG) provides a rapid, passive immunity that persists for only a short time (half-life of approximately 21 days).

Two formulations of inactivated vaccines are currently licensed for pre-exposure and post-exposure prophylaxis in the US (see below). When used as indicated, both types of rabies vaccines are considered equally safe and efficacious. A full 1.0 mL intramuscular (IM) dose is used for pre-exposure and post-exposure prophylactic injection. There are no currently approved formulations for the intradermal dose and route for pre-exposure vaccination; both types of vaccines must be administered intramuscularly. Usually, an immunization series is initiated and completed with one vaccine product; however, no clinical studies have been conducted that document a change in efficacy or the frequency of adverse reactions when the series is completed with a second vaccine product.

### Vaccines

1. **Human Diploid Cell Vaccine (HDCV):** HDCV is prepared from the Pitman-Moore strain of rabies virus grown on MRC-5 human diploid cell culture, concentrated by ultra-filtration, and inactivated with beta-propiolactone. It is approved for **intramuscular (IM) administration only**, and is supplied in a single-dose vial containing lyophilized vaccine that is reconstituted in the vial with the accompanying diluents to a final volume of 1.0 mL just before administration.

- Manufacturer: Sanofi Pasteur
- Product Name: *Imovax Rabies* ®

2. **Purified Chick Embryo Cell Vaccine (PCEC):** PCEC became available in the US in the autumn of 1997. It is prepared from the fixed rabies virus strain Flury LEP grown in primary cultures of chicken fibroblasts. The virus is inactivated

with beta-propiolactone and further processed by zonal centrifugation in a sucrose density gradient. It is formulated for **IM administration only**. PCEC is available in a single-dose vial containing lyophilized vaccine that is reconstituted in the vial with the accompanying diluents to a final volume of 1.0 mL just before administration.

- Manufacturer: Novartis Vaccines and Diagnostics
- Product Name: *RabAvert* ®

#### **A. Rabies Immune Globulin (RIG)**

1. The two RIG products licensed in the US are rabies immunoglobulin (IgG) preparations concentrated by cold ethanol fractionation from plasma of hyper-immunized human donors. Rabies neutralizing antibody, standardized at a concentration of 150 IU per mL, is supplied in 2 mL (300 IU) vials for pediatric use and 10 mL (1,500 IU) vials for adult use; the recommended dose is 20 IU/kg body weight. Both RIG preparations are considered equally efficacious when used as described.

- Manufacturer: Talecris Biotherapeutics and Sanofi Pasteur
- Product Name: *HyperRab*<sup>TM</sup> S/D and *Imogam Rabies – HT* ®