STANDARDS-RELATED DOCUMENT

SRD-11 to AJMedP-4

SUMMARY OF KEY POINTS – WHO POSITION PAPER ON RABIES VACCINE

Edition A, Version 1

MAY 2025

NORTH ATLANTIC TREATY ORGANIZATION

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NATO LETTER OF PROMULGATION

23 May 2025

1. The enclosed Standards-Related Document, SRD-11 to AJMedP-4, Edition A, Version 1, SUMMARY OF KEY POINTS – WHO POSITION PAPER ON RABIES VACCINE, which has been approved in conjunction with AJMedP-4 by the nations in the MILITARY COMMITTEE MEDICAL STANDARDIZATION BOARD, is promulgated herewith.

2. SRD-11 to AJMedP-4, Edition A, Version 1 is effective upon receipt and supersedes AJMedP-4-11, Edition A, Version 1 which shall be destroyed in accordance with the local procedure for the destruction of documents.

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Thierry POULETTE
Major General, FRA (A)
Director, NATO Standardization Office

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Introduction

The guidelines contained in this document are illustrative. They do not necessarily have to be followed and in no way affect other national directives.

Summary of Key Points

WHO Position Paper on Rabies Vaccine, February 2018

World Health Organization

Introduction

- This position paper replaces the WHO position paper on Rabies vaccines published in 2010.

- It presents new evidence in the field of rabies and the use of rabies vaccines, **focussing on programmatic feasibility**, **simplification of vaccination schedules** and **improved cost-effectiveness.**

- The recommendations concern the two main immunization strategies, namely post-exposure prophylaxis and pre-exposure prophylaxis.

Background

- Rabies is a viral zoonotic disease responsible for an estimated 59 000 human deaths and over 3.7 million disability-adjusted life years (DALYs) lost every year.
- Rabies is almost invariably fatal once clinical signs occur, as a result of acute progressive encephalitis.
- Up to 99% of human cases of rabies result from the bite of an infected dog.
- Mass vaccination of dogs is the principal strategy for interrupting RABV transmission between dogs and reducing transmission to humans and other mammals

World Health Organization

Background
Exposure to infection

The following categories describe the risk of a RABV exposure according to the type of contact with the animal suspected of having rabies.

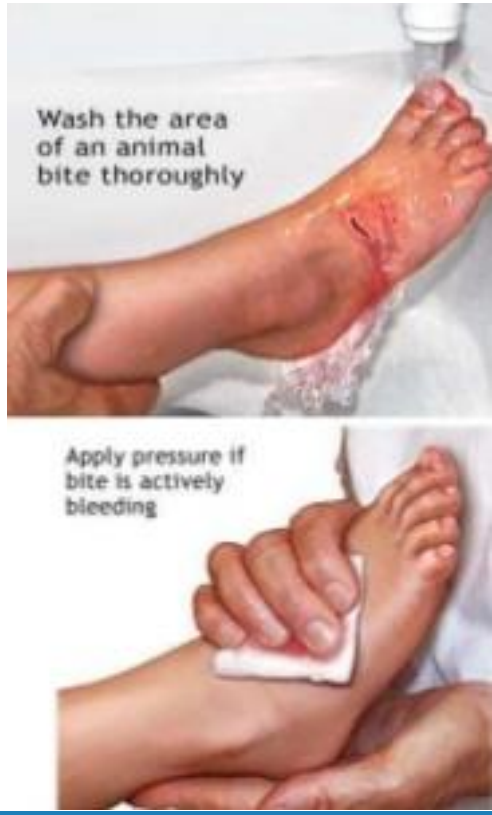
- **Category I** touching or feeding animals, animal licks on intact skin (**no exposure**);
- **Category II** nibbling of uncovered skin, minor scratches or abrasions without bleeding (**exposure**);
- **Category III** single or multiple transdermal bites or scratches, contamination of mucous membrane or broken skin with saliva from animal licks, exposures due to direct contact with bats (**severe exposure**).

Background
Exposure to infection

- Human-to-human transmission of RABV is extremely rare. The only documented cases of human-to-human transmission occurred via tissue and organ transplants from RABV-infected individuals, and a single case of likely perinatal RABV transmission.
- No case of human rabies resulting from consumption of raw meat or milk from a rabid animal has been documented.
- RABV infection in rodents is very uncommon. No human rabies cases due to bites by rodents have been reported.

Postexposure Prophylaxis (PEP)

- PEP **always** includes:
  - Wound washing and wound care
  - A series of rabies vaccine injections should be administered **immediately** after an exposure
- PEP sometimes includes:
  - Administration of rabies immunoglobulins (RIG)
    - in severe category III exposures
    - in category II exposures to bats



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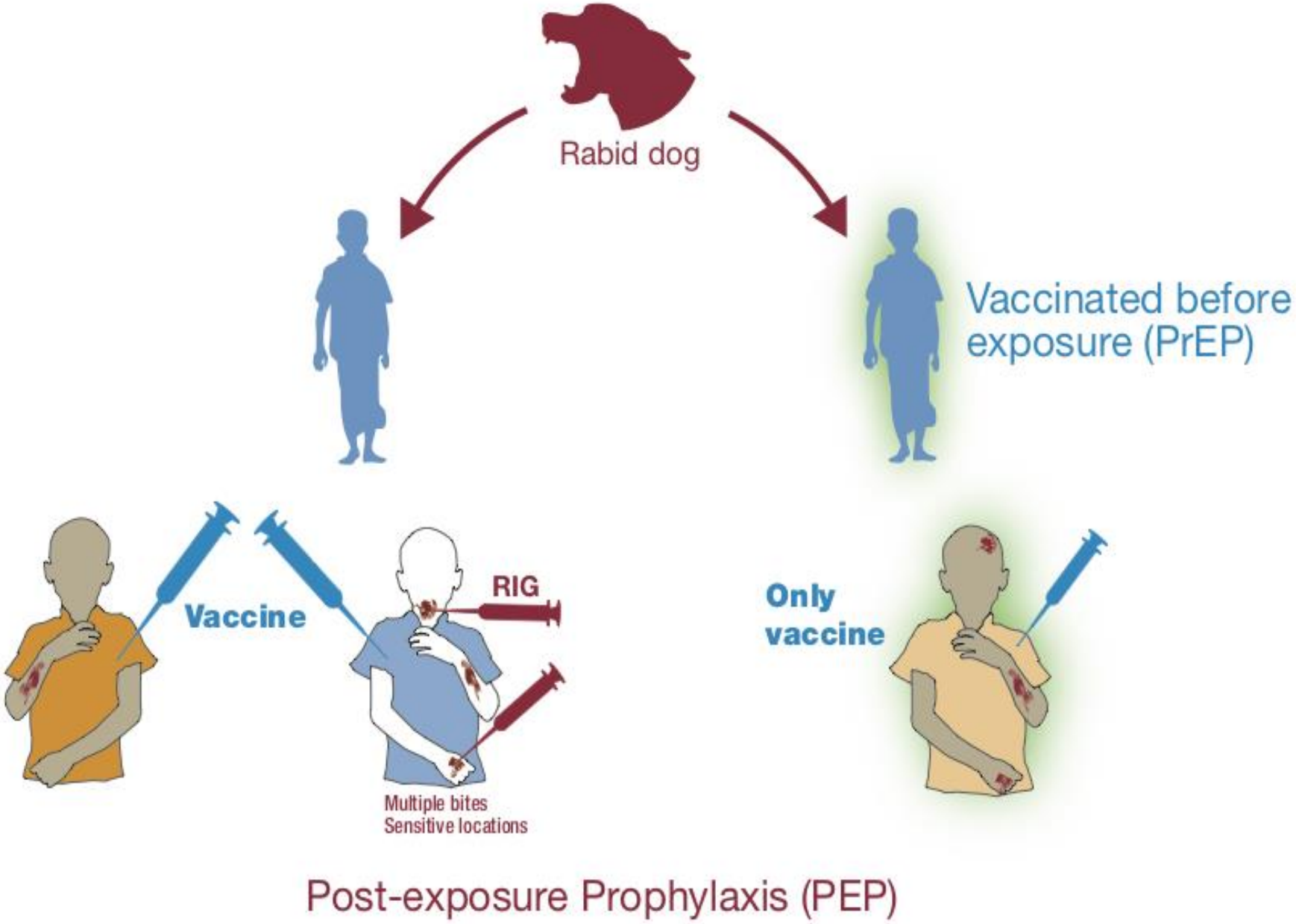
Pre Exposure Prophylaxis (PrEP)

- PrEP is vaccination in preparation for potential risk of exposure to RABV
- PrEP is recommended for individuals at higher risks due to occupation or for sub-populations in remote rabies-endemic settings.
- PrEP makes administration of RIG unnecessary after a bite wound
- Previously immunized individuals benefit from abridged PEP in case of exposure to RABV



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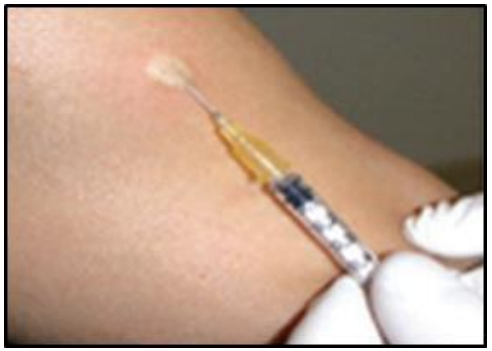
Vaccines

- Cell culture and embryonated egg-based rabies vaccines (CCEEVs) are intended for use in both pre-exposure prophylaxis (PrEP) and for post-exposure prophylaxis (PEP).
- Since 1984, WHO has strongly recommended discontinuation of production and use of nerve tissue vaccines and their replacement by modern, concentrated, purified CCEEVs.
- CCEEVs have been shown to be safe, highly immunogenic and well tolerated.

Vaccine administration

- Evidence supports administration of CCEEVs by intradermal (ID) or intramuscular (IM) injection.



- ID administration of rabies vaccines provides a cost-saving and dose-sparing alternative.
- A systematic review of vaccine potency has shown that current vaccines (> 2.5 IU/IM dose), when administered by the ID route for either PEP or PrEP, have efficacy equivalent to or higher than that of the same vaccine administered by the IM route.

Rabies immunoglobulins (RIG)

- After exposure to RABV, RIG provides passive immunization by neutralizing the virus at the wound site before the immune system can respond to the vaccine by producing VNAs.
- RIG is derived from human blood (hRIG) or equine blood (eRIG). They are considered to have similar clinical effectiveness.
- A single monoclonal antibody (mAb) product against rabies, licensed in India in 2017, has been demonstrated to be safe and effective in clinical trials.

WHO Position

WHO recommends two main immunization strategies for the prevention of human rabies:

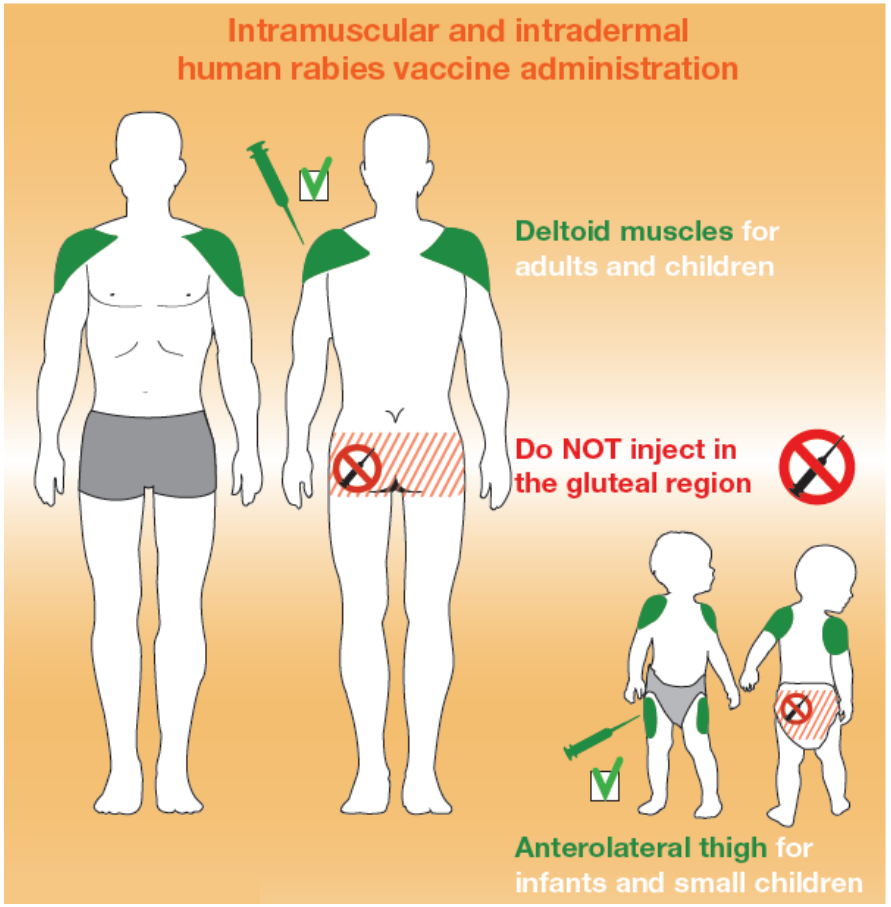
- Post-exposure prophylaxis (PEP) which includes extensive and thorough wound washing at the RABV-exposure site, together with RIG administration if indicated, and the administration of a course of several doses of rabies vaccine;

- Pre-exposure prophylaxis (PrEP) which is the administration of several doses of rabies vaccine before an exposure to RABV.

WHO retains its recommendation that the production and use of nerve-tissue vaccines should be discontinued and replaced by vaccines based on RABV grown in cell culture or embryonated eggs (CCEEVs).

WHO Position: Administration of rabies vaccines

- For both PEP and PrEP, vaccines can be administered by either the ID or IM route.
  - One ID dose is 0.1 mL of vaccine;
  - One IM dose is 0.5 mL or 1.0 mL depending on the product, i.e. the entire content of the vial.



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WHO Position: Administration of rabies vaccines

- If any doses are delayed, vaccination should be resumed, not restarted.
- A change in the route of administration or in vaccine product during a PEP or PrEP course is acceptable if such a change is unavoidable.

WHO Position: Recommended Schedules

	Category I exposure	Category II exposure	Category III exposure
Immuno-logically naive individuals of all age groups	Wash exposed skin surfaces. No PEP required.	Wound washing and immediate vaccination: - 2-sites ID on days 0, 3 and 7 - OR 1-site IM on days 0, 3, 7 and between day 14-28 - OR 2-sites IM on days 0 and 1-site IM on days 7, 21 RIG is not indicated.	Wound washing and immediate vaccination - 2-sites ID on days 0, 3 and 7[1] - OR 1-site IM on days 0, 3, 7 and between day 14-28[2] - OR 2-sites IM on days 0 and 1-site IM on days 7, 21[3] RIG administration is recommended.
Previously immunized individuals of all age groups	Wash exposed skin surfaces No PEP required.	Wound washing and immediate vaccination*: - 1-site ID on days 0 and 3; - OR at 4-sites ID on day 0; - OR at 1-site IM on days 0 and 3); RIG is not indicated.	Wound washing and immediate vaccination*: - 1-site ID on days 0 and 3; - OR at 4-sites ID on day 0; - OR at 1-site IM on days 0 and 3; RIG is not indicated.

[1] one-week, 2-site ID regimen / Institut Pasteur du Cambodge (IPC) regimen/2-2-2-0-0; Duration of entire PEP course: 7 days.
[2] two week IM PEP regimen/4-dose Essen regimen/1-1-1-1-0; Duration of entire PEP course: between 14 to 28 days.
[3] three week IM PEP regimen/Zagreb regimen/2-0-1-0-1; Duration of entire PEP course: 21 days.

* *except if complete PEP already received within <3 months*

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WHO Position: Post-exposure prophylaxis (PEP)

- The indication and procedure for PEP depend on the type of contact with the suspected rabid animal and immunization status of the patient.
  - For category I exposures, no PEP is required;
  - for category II, immediate vaccination is recommended;
  - for category III, immediate vaccination is recommended, and administration of RIG, if indicated.

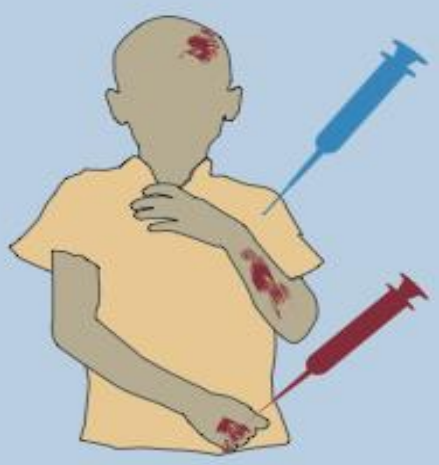
- For categories II and III, thorough washing and flushing with soap or detergent and copious amounts of water of all bite wounds and scratches should be done immediately, or as early as possible. Depending on the characteristic of the wound, antibiotics, analgesics and a tetanus vaccine booster might be indicated.

REMINDER

Wash immediately for 15 minutes, with soap, water and disinfectant

Bite wounds

Vaccines
+ RIGs



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WHO Position: *Administration of rabies immunoglobulins (RIG)*

- RIG should be administered only once, preferably at, or as soon as possible after, the initiation of PEP.
- RIG is infiltrated into and around the wound
- For optimal effectiveness, the maximum dose calculation for RIG is 40 IU/kg body weight for equine derived RIG (eRIG) products, and 20 IU/kg body weight for human derived RIG (hRIG). Skin testing before eRIG administration should not be done because of unreliable prediction of adverse effects.

Did you know:

Even if RIG is not available at the first visit (PEP day 0), RIG can be given up to day 7 after the first rabies vaccine administration.

World Health Organization

WHO Position: Pre-exposure prophylaxis (PrEP)

- WHO recommends PrEP for individuals at high risk of RABV exposure:
  - These include sub-populations in highly endemic settings with limited access to timely and adequate PEP
  - Individuals at occupational risk
  - Travellers who may be at risk of exposure
- PrEP should be considered in sub-populations living in remote, rabies-endemic areas, where the dog bite incidence is >5% per year or vampire bat rabies is known to be present.
- WHO recommends the following PrEP schedule:
  - 2-site ID vaccine administered on days 0 and 7.
  - 1-site IM vaccine administration on days 0 and 7.

Future Research Needs

- Vaccines with improved thermostability, prolonged shelf-life and reduced packaging volume would ease delivery at community level.
- There is still a need for vaccines with enhanced profiles that cover other lyssaviruses.
- Further research could illustrate potential benefits, feasibility and cost-effectiveness of potential of novel vaccine delivery tools such as needle-free jet injection, microneedle injection systems and topical patches.
- To support improved study design, guidance on data and sample size requirements will help to assess non-inferiority of new rabies PEP and PrEP regimens. Studies on immunization of individuals with repeat exposures are encouraged, to understand the optimal spacing of PEP and number of series needed over a lifetime.
- The factors determining seroconversion and clinical outcomes in immunocompromised individuals would be helpful. Studies on 1-visit PrEP in rabies endemic settings, including special populations and their response to simulated PEP, would be useful.
- Development of products containing two or more mAbs with non-overlapping epitopes would increase the efficacy and breadth of RABV neutralization.

For more information on the WHO Rabies position paper, please visit the WHO website:

www.who.int/immunization/documents/positionpapers

World Health Organization