2-dose Pre-exposure Prophylaxis, Rabies Vaccine

Claims one life every ***9 minutes***, resulting in ***59,000 deaths*** annually worldwide[1]

Transmitted by ***bites*** or ***scratches*** from rabid animals, ***99%*** by dogs[1]

Leads to ***acute brain inflammation***, manifesting in either furious or paralytic forms[1]

Virtually fatal once symptoms appear[1]

ACIP recommendations for pre-exposure prophylaxis (PrEP) are based on risk categories[2]

Highest risk categories: 1 & 2

Persons working with live rabies virus or handling rabid animals (bats)

Risk Category 1
- Exposure to high concentration of rabies virus
- Recognized or unrecognized exposures
- Can be unusual exposures (e.g. aerosolized)

Risk Category 2
- Recognized or unrecognized exposures
- Unusual exposure unlikely

Elevated Risk categories: 3 & 4

Persons who work with potentially rabid animals/travellers in rabies at-risk areas

Risk Category 3
- Recognized exposures, sustained risk **longer than 3 years**

Risk Category 4
- Recognized exposures, unsustained risk **duration ≤3 years**

Recommendations

2-dose rabies PrEP (IM D0,D7)

Titer check

Risk Category 1
- serial titer checks needed every 6 months (booster if titer <0.5 IU/mL*)

Risk Category 2
- serial titer checks needed every 2 years (booster if titer<0.5 IU/mL)

Risk Category 3
- One-time titer check (between Year 1-3 and booster if titer <0.5 IU/mL) or one-time booster (between Day 21-Year 3) needed

Risk Category 4
- No titer check necessary if risk remains unsustained ≤3 years

Low Risk Category 5

uncommon exposure → No vaccination recommended

Other ACIP recommendations: Special regimens for distinct populations[2]

Immunocompromised patients: if rabies vaccination cannot be delayed, the recommendation is still the 2-dose IM PrEP with additional specific measures

2-dose IM PrEP

Day 0, Day 7

*Titer check 2-4 weeks after + booster dose if titer <0.5 IU/mL

Week 2-4

*Titer check 2-4 weeks after booster + additional booster dose if titer <0.5 IU/mL

*Minimum acceptable antibody titer level 1:5 serum dilution replaced by 0.5 IU/mL aligned with World Health Organization (WHO)

Year 3

+ Titer check and booster if needed as per ACIP recommendations for each risk category. Booster dose followed by subsequent titer check

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- If ***2 booster doses fail***, consult public health authorities
- Recommend your patients to avoid high-risk activities until lab confirms acceptable antibody level

Co-administration of IM Rabies PrEP and Chloroquine or drug related to chloroquine:

- Recent data show chloroquine with IM rabies PrEP reduced antibody titer, however titers remain >0.5 IU/mL
- Clinicians may consider avoiding chloroquine during rabies vaccination

Rabies PrEP should be considered before traveling to at-risk areas

Because international travelers may expose themselves to risky situations, especially if engaged in outdoor activities[1,3]

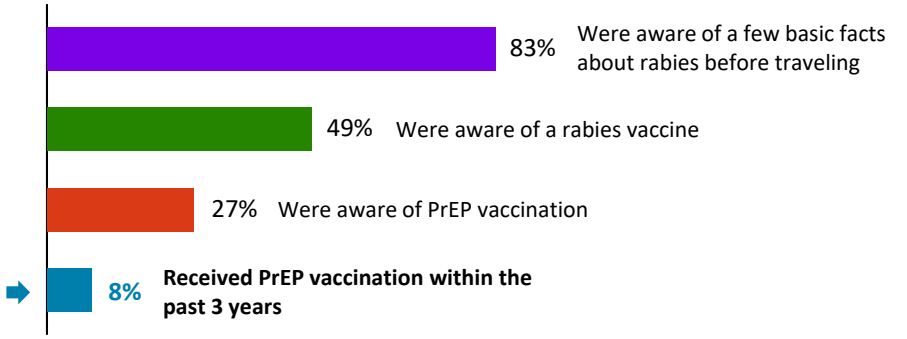
CDC WHO

Because rabies PrEP is recommended for travelers to rabies endemic areas by health bodies[1,3-7]

Because PrEP followed by appropriate post-exposure prophylaxis (PEP) has never failed to prevent rabies[6]

"Risk of rabies exposure and proper medical care availability at destination should be a component of the risk analysis during the pre-travel consultation[3] → To avoid premature end of trip or fatal outcome

There is low awareness of rabies risk and prevention among travelers[8]



Traveler's education on **rabies awareness**, **prevention** and **behavior** in case of exposure is key[9]

Pretravel consultations **must be encouraged**, and their content should include the risk of all possible exposures (bite, scratch, lick, etc.) to animals and the importance of timely PEP for rabies[10]

Rabies PrEP grants a simplified PEP regimen

PrEP before traveling will ensure

Optimization of the response to PEP + Reduced number of visits and PEP injections in case of exposure + **NO RIG** Avoid the need for RIG after severe exposure

Overall conclusions on 1-week, 2-dose (D0, D7) PrEP schedules

By reducing time and dose number, the 1-week, 2-dose (D0, D7) schedule can ease travelers' access and compliance to pre-travel rabies vaccination

Abbreviations

ACIP: Advisory Committee for Immunization Practices; D: Day; PrEP: pre-exposure prophylaxis; IM: intramuscular injection; RIG: rabies immunoglobulins

References

1. WHO. Position paper on rabies vaccines. 2018;16:201–220. 2. Rao AK et al. Use of a modified preexposure prophylaxis vaccination schedule to prevent human rabies: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:619–627. 3. WHO Expert Consultation on Rabies, third report. Geneva: World Health Organization; 2018 (WHO Technical Report Series, No. 1012). 4. Nadal D et al. Rabies and the pandemic: lessons for One Health. Trans R Soc Trop Med Hyg 2022;116:197–200. 5. Henry RE et al. A country classification system to inform rabies prevention guidelines and regulations. J Travel Med 2022;29:taac046. 6. Shlim DR. Preventing rabies: the new WHO recommendations and their impact on travel medicine practice. J Travel Med 2018;25:tay119. 7. US CDC. ACIP recommendations. MMWR 2022;71:613-644. 8. Marano C, et al. Perceptions of rabies risk: a survey of travellers and travel clinics from Canada, Germany, Sweden and the UK. J Trav Med. 2019;26(Suppl 1):S3–S9. 9. Knopf L and Steffen R. Revised recommendations for rabies pre-exposure prophylaxis in travellers: avoid bumpy roads, select the highway! J travel Med. 2019;26:taz021. 10. Muehlenbein MP et al. Traveller exposures to animals: a GeoSentinel analysis. J Travel Med. 2020;27:taaa010.

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