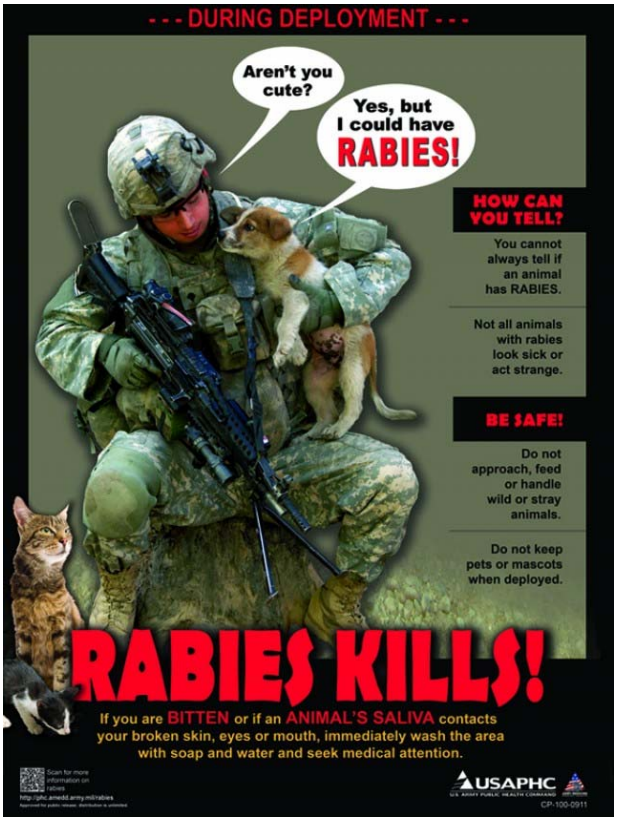
Screening Patients for Rabies Antibodies: the Rapid Fluorescence Foci Inhibition Test (RFFIT) Protocols for Health Care Providers



Whom to Test?

Rabies neutralizing antibody tests, such as the RFFIT are used to monitor antibody levels in persons that may have an occupational risk of rabies virus exposure (e.g. veterinarians, rabies virus laboratory workers, animal control officers, vivarium technicians, etc.). Serological testing may also be used to check the immune response of a person undergoing rabies post exposure prophylaxis when major deviations in vaccination schedule occur, or there are concerns about a patient's immune status.

For most persons, completing pre-exposure or post exposure prophylaxis routine serological testing is not necessary to document seroconversion unless:

- the person is immunosuppressed
- significant deviations of the prophylaxis schedule have occurred
- the patient initiated vaccination internationally with a product of questionable quality; or
- the person's antibody status is being monitored routinely due to occupational exposure to rabies virus.

Testing:

The RFFIT is a rabies neutralization test performed in cell culture to determine the rabies virus neutralizing antibody level in human or animal sera. It is the gold standard serological assay recommended by the Advisory Committee on Immunization Practices (ACIP) and the World Health Organization (WHO). The Department of Defense (DoD) Food Analysis and Diagnostic Laboratory (DoD FADL) performs RFFIT for all DoD Services Members and their beneficiaries. The testing method used by staff was originally developed by Centers for Disease Control (CDC). Other serological tests, such as enzyme-linked immunosorbent assay are more appropriate for research and are not recommended for samples requiring clinical decision making by clinicians based upon current ACIP and WHO recommendations.

Test Description:

The RFFIT is performed by mixing different dilutions of test sera with a constant amount of rabies virus and adding the mixture to cultured cells. Patient test sera

rabies neutralizing antibodies will bind to active virus and neutralize the pathogen.

Any non-neutralized virus will replicate in cells and be detected by the assay. Cells are incubated for ~20 hours before they are fixed and stained with fluorescent dyes to detect any rabies virus production. The immunofluorescent staining of infected cells is used as an indicator of rabies virus replication, with infected fields used to determine rabies virus neutralizing titer.

A rabies antibody titer is essentially an estimation of an immune response against rabies virus (either through vaccination or exposure). Current ACIP recommendations outline frequency for checks of persons with an occupational risk of rabies virus exposure. Complete neutralization of rabies virus at a serum dilution of 1:5 (~0.11 IU/mL) is recommended by the ACIP as evidence that the individual still has a detectable level of rabies virus neutralizing antibodies. At this level, an immune competent individual would be expected to mount a rapid response to a booster dose of rabies vaccine in the event of an exposure, precluding the need of rabies immune globulin during post exposure prophylaxis.

If the individual does not have evidence of rabies virus neutralizing antibody at a serum dilution of at 1:5 (~0.11 IU/mL) then they should receive a single booster dose of rabies vaccine.

Laboratory Services:

The Department of Defense Food Analysis and Diagnostic Laboratory (DoD FADL) performs RFFIT for all DoD service members and beneficiaries. For service animals, household pets, and specimens of interest the DoD FADL offers the Fluorescent Antibody Virus Neutralization (FAVN) test.

Submission information for Providers:

Submission Information for Providers
As referenced from Technical Guide 361; Visit the APHC Website and under FADL Diagnostics Forms complete FADL Form D-158, Serological Request and Report Form (Human Serum). Contact the laboratory by calling DSN: 421-4387/4010/4605; Com: 210-295-4387/4010. Or Email usarmy.jbsa.medcom.list.phc-rabies-favn-sa@mail.mil to request a copy of our current standard operating procedure for collecting and sending a RFFIT sample to the FADL.

We request all submitted samples refrain from the use of Social Security Numbers and utilize DoD Identification Numbers.

Before shipping your samples, please email the listed email above to assist laboratory personnel in tracking your shipment.

RFFIT Turn Around Times are currently 10-14 days.

Sources:

Manning SE, Rupprecht CE, Fishbein D, Halon CA, Lumlertdacha B, Guerra M, Meltzer MI, Dhankhar P, Vaidya SA, Jenkins SR, Sun B, Hull HF. Human Rabies Prevention – United States 2008. Recommendations of the Advisory Committee on Immunization Practices (ACIP).

Briggs DJ, Schwnke JR. Longevity of rabies antibody titer in recipients of human diploid cell rabies vaccine. Vaccine. 1992; 10: 125-9.

Smith JS, Yager PA, Baer GM. A rapid reproducible test for determining rabies neutralizing antibody. Bull World Health Org. 1973; 48: 535-541.