

## USE OF SEROLOGY TO MANAGE ANIMAL EXPOSURES TO RABIES: WHAT DON'T WE KNOW?

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Recent changes to the “Compendium for Animal Rabies Control and Prevention” published in March 2016, allows for dogs and cats that have been previously vaccinated but the vaccinations are not current (vaccine was not administered at annual or three-year expiration date) be treated the same as dogs and cats that are current on vaccinations. Documentation of vaccines must be provided. In brief, a booster vaccination is administered with in home monitoring for 45 days. For dogs and cats that cannot provide documentation of vaccine history, prospective serologic monitoring (PSM) is an option to monitor the rabies antibody response, via serology, to a booster vaccination for proof of vaccinated status; allowing those pets to be treated as currently vaccinated. This decision is based on findings that upon boosting, out of date dogs and cats respond as well as currently vaccinated pets. This changes gives pets and pet owners more options; relieving the hard decision whether to pay for strict quarantine or to euthanize. The reasoning behind using PSM to assess the vaccination status assumes: 1) an unvaccinated pet does not respond to a level above 0.5 IU/mL by day 5-7 after vaccination, 2) the anamnestic response is detected by a 2-fold rise in measurement between the day 0 sample and the day 5-7 sample, and 3) serology can reliably distinguish between an initial response and an anamnestic response. A review of published studies concerning dog and cats rabies vaccination demonstrated a range of 0% to 100% of animals reaching 0.5 IU/mL at day 7 suggesting the possibility for a naïve animal to produce a robust response by day 5-7. The ability of serology testing to detect an anamnestic response by testing in parallel samples drawn at day 0 and day 5-7 is related to both the variability of individual animals responding at the same rate of antibody rise to booster vaccinations and the variability of serologic assays. It is generally accepted that the variability of antibody titer measurement is two-fold for repeat measurement of the same sample, therefore the expectation of a two-fold rise proving an anamnestic response is tenuous. The risk of contracting rabies from an exposure is related to characteristics of the host and characteristics of the virus exposure. The compendium guidelines are based on tenet that current vaccination OR evidence of rabies immunity protects an exposed animal from rabies. The ability of serologic testing to define immune status is associated to the definition of protection, the assay used, variability of the performance of the assay, as well as the biologic variation between individuals in their rate of antibody level rise in response to initial as well as booster vaccination. Knowing about these variables is essential for policy decisions.