CATS, VACCINATIONS & STANDARD OF CARE

Paola Dall'Ara
Associate Professor of Veterinary immunology and Infectious diseases of dogs and cats
Department of Veterinary Medicine and Animal Sciences, University of Milan, Italy

Since ancient times, cats represent our life companions worldwide, and with the civilization progress their number has significantly increased. According to the latest demographic analysis, the global cat pet population ranges from 300 to 600 million. They seem to be more common in the United States where they are 75 million (representing the highest feline population in the world), followed by China (53 million), and Russia (almost 18 million). In Europe, they are about 113 million, present mostly in Eastern Europe (Romania, Latvia, Poland, and Hungary), and their number is increasing with time.

Owners' attention to the care and well-being of these beautiful animals has also increased over time, and today many cat owners regularly visit a vet to check the health status of their furry friends and to protect them against dangerous diseases through vaccination.

Vaccination has always helped to significantly reduce the incidence of many life-threatening diseases both in human and in veterinary medicine, and as in the past it continues to play an important role in preventive medicine today, representing an indispensable mainstay for promoting human and animal health all over the world.

According to the main international pet vaccination guidelines (World Small Animal Veterinary Association – **WSAVA**, American Animal Hospital Association – **AAHA**, American Association of Feline Practitioners – **AAFP**, European Advisory Board on Cat Diseases – **ABCD**, Australian Veterinary Association – **AVA**, Canadian Veterinary Medical Association – **CVMA**, British Small Animal Veterinary Association – **BSAVA**, and many others), pet vaccines are classified in core and non-core. *Core vaccines* are essential and intended for all dogs and cats since they protect against dangerous and life-threatening diseases, while *non-core vaccines* are optional and recommended only for cats at risk of specific infections. Feline core vaccines are against Feline Panleukopenia Virus (**FPV**), Feline Herpesvirus-1 (**FHV-1**), and Feline Calicivirus (**FCV**), the last two responsible for the so-called feline Upper Respiratory Tract Infections (URTI). ABCD adds another vaccine category, the "*circumstantial*" one, in which there are vaccines required under specific circumstances (eg, for cats travelling to areas where **rabies** is endemic, or cats with outdoor access and therefore at risk of **FeLV** infection).

All cats should be vaccinated with core vaccines at least once in their life for a dual purpose: to prevent individual infections and to assure herd immunity: in fact, unvaccinated cats represent a risk to the entire cat community by serving as a source of infection for all other cats. Kittens should receive a series of core vaccinations till at least 16 weeks of age (plus the first two FeLV vaccine administrations), with a first booster (core and FeLV) one year later. For decades, subsequent core boosters were traditionally performed on an annual basis. Nowadays, due to new knowledge and modern vaccines, the guidelines on good vaccination practices suggest vaccinating adult cats in different ways according to the disease and the cats' lifestyle: FPV no more frequently than every 3 years possibly using modified live (attenuated) vaccines (MLV), while FHV-1 and FCV depending on the risk of each cat. In fact, cats are not all the same, and they can be at low- or high-risk. *Low-risk cats* are generally solitary indoor cats that never visit a boarding cattery or a cat show, while *high-risk cats* live in a multicat, indoor/outdoor

household or regularly travel or visit boarding catteries or feline exhibitions. The FeLV infection status of all cats should be determined, and only seronegative cats should receive FeLV boosters every 2 years if a low-risk of infection and annually if at high-risk, based on their lifestyle, environment, and overall health status. FeLV vaccination can be discontinued thereafter if there is no further risk.

And all core vaccines are not the same either. In fact, FHV-1 and FCV vaccines can't always provide the same robust protection as those against FPV (or as canine core vaccines). Consequently, high-risk cats should be vaccinated more frequently than low-risk cats, generally every one or two years depending on the risk of each single cat. Nevertheless, in some cats is also possible a long persistence of the specific vaccine-induced protection not only with FPV vaccines but also with respiratory ones (FHV-1 and FCV), even if several factors can heavily interfere with the mount of an adequate immune protection, first the interference of the Maternally Derived Antibodies (MDA) in kittens.

As a result, knowing the serum antibody concentration specific for feline core vaccines would represent a good standard of care, helping clinicians to administer core vaccines appropriately as needed, reducing in this way both vaccination failures and unnecessary vaccinations, thus avoiding adverse vaccine events, first the much-feared feline injection site sarcoma (FISS) in cats.

In-clinics tests are rapid and simple serological test kits, based on the ELISA or lateral flow techniques, that can detect and sometimes quantify the presence of protective antibodies exclusively for core vaccines (for other diseases, available rapid tests have only diagnostic value). But while for the dog there are several commercially available kits, for the cat they are very few. VacciCheck is one of these, registered and validated both for dog and cat, in the latter for the determination of serum antibody concentration to FPV, FCV and FHV-1. Different studies report an excellent correlation between the presence of antibody against FPV and resistance to infection: a positive test result means that the cat is protected, while a negative test result indicates that the cat has little or no protection, and then revaccination is recommended. On the contrary, the correlation between serum antibody and protection against FCV and FHV-1 infection could be less robust than for FPV, since for these infections a mucosal immunity and a cell-mediated immunity, respectively, could play an important but not easily measurable role. For this reason, a negative test result for these two respiratory viruses would not necessarily indicate a lack of protection. In my personal experience on several hundred cats, however, I never noticed any particular difference with the dog, highlighting as negative for FHV and/or FCV only a very few cats properly vaccinated. In my opinion, therefore, the antibody titration can represent a valid standard of care for both dog and cat, very useful in determinating protection of kittens following the first vaccination series, and of adult cats before booster vaccinations to correctly decide if revaccination is needed or not. Rapid antibody titration can be also used in stray cats for knowing the prevalence of the seropositivity for these three viruses, and in cat shelters for controlling FPV outbreaks.

At present, such in-clinics tests might be relatively expensive. However, as well pointed out in the last WSAVA guidelines, the principles of Evidence-Based Veterinary Medicine (EBVM) suggest that testing for antibody status is a better practice than simply administering a vaccine booster just because this would be safe and cost less.

REFERENCES

American Animal Hospital Association (AAHA) – American Association of Feline Practitioners (AAFP) (2020): 2020 AAHA/AAFP Feline vaccination guidelines. *Journal of Feline Medicine and Surgery, 22*, 813-830

American Association of Feline Practitioners (AAFP) (2020): 2020 AAFP Feline Retrovirus Testing and Management Guidelines. *Journal of Feline Medicine and Surgery, 22*, 5-30

American Veterinary Medical Association (AVMA) – Federation of Veterinarians of Europe (FVE) – Canadian Veterinary Medical Association (CVMA) (2018): Statement on the benefits of animal vaccination programs in advancing animal and human https://fve.org/publications/fve-avma-cvma-benefits-of-animal-vaccination-programs-in-advancing-animal-human-health/

Australian Veterinary Association (AVA) (2018): Vaccination of dogs and cats. *Website*: https://urly.it/3rm9h

Bedford E. (2020): Number of dogs and cats kept as pets worldwide in 2018. Statista. *Website*: https://www.statista.com/statistics/1044386/dog-and-cat-pet-population-worldwide/

Bedford E. (2022): Number of pet cats in Europe 2010-2021. Statista. *Website*: https://www.statista.com/statistics/516041/cat-population-europe-europe/

Canadian Veterinary Medical Association (CVMA) (2017): Vaccination and your cat. *Website*: https://www.canadianveterinarians.net/related-resources/vaccination-and-your-cat/

Dall'Ara P. (2020): Vaccini e vaccinazioni degli animali da compagnia. *EDRA*, Milano

Dall'Ara P., Labriola C., Sala E., Spada E., Magistrelli S., Lauzi S. (2019): Prevalence of serum antibody titres against feline panleukopenia, herpesvirus and calicivirus infections in stray cats of Milan, Italy. *Preventive Veterinary Medicine, 167*, 32-38

European Advisory Board on Cat Diseases (ABCD) (2015): Matrix vaccination guidelines – 2015 ABCD recommendations for indoor/outdoor cats, rescue shelter cats and breeding catteries. *Journal of Feline Medicine and Surgery, 17*, 583–587

European Advisory Board on Cat Diseases (ABCD) (2020): Vaccine recommendations for cats according to their lifestyle. *Website*: http://www.abcdcatsvets.org/wp-content/uploads/2020/03/Tool_Vaccine-recommendations_Feb2020.pdf

Lappin M.R., Andrews J., Simpson D., Jensen W.A. (2002) Use of serologic tests to predict resistance to feline herpesvirus 1, feline calicivirus, and feline parvovirus infection in cats. *Journal of the American Veterinary Medical Association, 220*, 38-42

Logan M. (2020): How many cats are in the world? Better with cats. *Website*: https://betterwithcats.net/how-many-cats-are-in-the-world/

World Small Animal Veterinary Association (WSAVA) (2016): Guidelines for the vaccination of dogs and cats compiled by the Vaccination Guidelines Group (VGG). Website: https://wsava.org/wp-content/uploads/2020/01/WSAVA-Vaccination-Guidelines-2015.pdf