

Vaccination by Jo Tucker

Some of us (over a certain age) may be able to recall in the 1960's and 70's, the distressing signs of a young dog or puppy with a disease called distemper, sometimes known as 'hard pad'. I was about ten years old when I witnessed my friend's puppy 'climbing the walls' (as I remember it) during a seizure caused by distemper. It clearly had a lasting effect on me especially as there was no hope for the poor puppy and it had to be 'put to sleep'. In the late 1970's many kennels were blighted with a new 'killer' disease called parvovirus and this proved to be devastating, especially to puppies.

Both of these diseases are highly contagious and even today parvovirus could wipe out a whole litter and the virus remain active within the environment for a year or more. Modified live vaccines were developed in an attempt to control these and other infectious diseases, including infectious canine hepatitis (canine adenovirus), and the good news is the vaccines have been very successful. Distemper and infectious hepatitis are very rare in the UK these days, and parvovirus appears to be well under control in protected dogs. No one would want to see the return of those 'dark days', nor should we overlook the amazing achievement of immunisation – but can you have too much of a good thing? Is annual vaccination a thing of the past and is it doing more harm than good? Clearly some members of the veterinary profession, anti -vaccination groups and the pet owning public think so and in 2006 the World Small Animal Veterinary Association (WSAVA) Vaccination Guidelines Group (VGG), Chaired by Prof. Michael J Day of Bristol University and author of '*Clinical Immunology of the Dog and Cat*', convened to reassess the annual "vaccinate against everything" protocol (practiced by vets for the best part of 50 years) and formulate a new and more appropriate global vaccination guideline for cats and dogs based on modern science and decades of experience provided by internationally recognised experts in immunology, microbiology and vaccinology.

So why question the vaccine protocol that has been used for decades and successfully brought these nasty diseases under control; and in doing so have saved so many dog's lives? Vaccines were genuinely considered harmless, but over the last 20 years or so, advancement in veterinary knowledge, experience, and reports of adverse reactions, such as the link to sarcomas developing at the vaccine injection site in cats, and a vaccine-linked trigger for immune mediated diseases in dogs, gave rise to

question vaccine safety in companion animals. This train of thought was further fuelled by all the adverse publicity surrounding the safety of the MMR vaccine in children. Adverse reactions were, and still are, uncommon, but they do exist and vaccination guideline groups began to wonder if something could be done to reduce the small risk of adverse reaction without compromising the beneficial effect of vaccination. The safety of vaccines was not the only reason for reassessing vaccine protocols. It was the growing awareness that the duration of immunity for some vaccines was far longer than first thought and therefore likely that annual vaccination could be unnecessary.

The first World Small Animal Veterinary Association (WSAVA) guidelines were produced in 2007 and updated in 2010. The guidelines are not compulsory but their recommendations could ***“assist the vet in practice to use vaccines more efficiently”*** (M.J.Day), and can be obtained from the WSAVA website. In addition to the Vaccination Guidelines for vets there is an excellent, comprehensive step by step document written specifically for pet owners and breeders and this is a ‘must’ for any pet owner. These guidelines take the reader through eleven sections giving sound, factual and scientific information, covering the major infectious diseases that we vaccinate against, through to how to report adverse reactions. There is even a glossary of terms. This document is essential reading - and it’s free! You just need to print it or read it on screen.

The chapter on immune response explains about the immune system and how the body responds to infections etc. It also describes how the mother’s immunity (maternally derived antibodies- MDA) is passed to the pups via the placenta and mother’s milk (colostrum), and how the presence of these antibodies can negate the effect of vaccinations if they are given too early in the pup’s life. The maternal antibodies, present in the pup’s blood, will ‘fight’ and consequently cancel out the vaccine. So if your puppy has been vaccinated too early, unknown to you, it may not be protected.

It also explains how the MDA levels in individual pups can differ, and why some pups in the litter may, depending on how much or how little maternal antibodies are present, respond to a vaccination at the age of 8 weeks and why others will not respond until 12 weeks or more. The waning of mother’s immunity will vary from pup to pup but it is unlikely there will be any significant antibodies present after the age of 14-16 weeks.

The document explains the principle of vaccination, and how infectious disease can be brought under control, but in order for this to be possible ‘*herd immunity*’ is essential, meaning that the greater number of the population has to be immunised (>65%) for full effect. BUT THIS DOES NOT MEAN THAT AN INDIVIDUAL DOG OR CAT HAS TO BE VACCINATED EVERY YEAR!

“We should aim to vaccinate every animal with core vaccines, and to vaccinate each individual less frequently by only giving non-core vaccines that are necessary for that animal” WSAVA, *Vaccination Guidelines Group.*

The VGG recognises that vaccination requirements may differ greatly between developed and undeveloped countries. The global vaccination guidelines, devised by the VGG, have been welcomed by countries as a basis to further develop their existing national vaccination guidelines, and adopted by some countries where guidelines did not previously exist.

Different types of vaccines, and the duration of immunity (DOI) are discussed. The two major types of vaccines are defined as infectious (core) and non-infectious (non-core). Infectious vaccines are also known as modified live vaccines (MLV) or live attenuated vaccines, and to be effective these have to infect the animal in order to cause an immune response which consequently produces protective antibodies.

Core vaccines: ***‘Contains antigens of infectious agents every dog and cat should be protected against as those infectious agents cause lethal disease.’***

The VGG’s recommended core vaccination programme for dogs in the UK is canine parvovirus (CPV-2), canine distemper (CDV) and canine adenovirus (CAV), more commonly known as infectious hepatitis. Fortunately, modern science has taken the guesswork out of knowing if your dog is protected against these diseases as the level of immunity can now be established by a simple blood test which measures antibodies to the core diseases that we vaccinate against. Antibody titre testing has shown that the duration of immunity provided by modified live vaccines is far greater than we are lead to believe by many vets in general practice and also the vaccine manufacturers. Certainly the duration of protection provided by modified live vaccines is considerably longer than the non-infectious vaccine. It is known that immunity provided by MLV’s can last many years; in fact, it has been proven that only one dose of a MLV given after the maternal antibodies have left (greater than 16 weeks or as

an adult) **can** provide a lifetime of immunity for a dog. However, if the vaccination programme is started at 16 weeks of age it is recommended that two doses are given, two weeks apart, as some pups may not respond to one dose. The manufacturer's guidelines recommending MLV revaccination, or boosters, after 3 years is attributed to the duration of the product's license and not the duration of proven immunity.

Non-core vaccines: ***'Are to protect against infectious agents that not every dog or cat risks being exposed to. Their use should be carefully considered and they should only be given to animals with a defined exposure risk.'***

Non-infectious vaccines are referred to as 'inactive'. These are used to vaccinate against diseases such as leptospirosis, bordetella, parainfluenza etc. The duration of immunity created by inactive vaccines is known to be much shorter than the immunity produced by a live vaccine. Unlike MLV's, non-infectious vaccines cannot infect the animal, so in order to be successful a substance called an adjuvant is added to enhance its effect. This allows the vaccine a clear passage to the immune system. Inactive vaccines, especially if they contain an adjuvant or whole killed bacteria, are more likely to cause adverse reactions.

The need to give non-core vaccinations should be assessed by the owner and vet based on lifestyle and the possibility of exposure to the non-core diseases. For example, it may be prudent give a dog a leptospirosis vaccination if it regularly plays in water where rats may live, whereas a dog with a different lifestyle that's unlikely to come in contact with rat infested water is at far less risk of contracting leptospirosis. The owner and vet should adopt a ***'risk-benefit analysis'*** for each individual animal and not just blindly vaccinate because 'it is that time of the year again!' The VGG recommend that vets should aim to reduce the 'vaccine load' on individual animals. The manufacturer's guidelines are for non-core vaccines to be given annually but it is known, for example, that immunity for leptospirosis may not last for twelve months, and can be a little as three, so you may think your dogs have immunity when for most of the time they haven't! So do your dogs really need the non-core vaccinations? Perhaps if the risk of exposure is so great they may need this vaccination more often than once a year.

Unlike infectious vaccines, non-infectious vaccines do not have the ability to produce a strong antibody presence; therefore an antibody titre test for this type of vaccine is of no value. Core vaccines are often 99% effective as opposed to only 70% or less efficacy of non-core vaccines. A simple

blood test can show the immunity your dog has to these core diseases and is a far better, scientific way of knowing if your dog is protected than simply giving yet another jab.

`The presence of serum antibody, regardless of titre, in an actively immunised dog over the age of 16 weeks is correlated with protection'.

Try not to be put-off by the cost of titre testing. Your dog may only need one testing to indicate life-long protection, and at least you will know if previous vaccination has been successful or not. Titre testing performed at Glasgow Veterinary School has always been very reasonably priced, and there is now a new product available in the UK, an in-house titre test called VacciCheck. This can be done quickly and simply at your vet's surgery.

Genetics play a part in how an animal responds to vaccination. Some dogs, due to their genetic make-up, will be a `non-responder' and no matter how many times they are vaccinated they will never be able to produce protective antibodies to the core diseases. Conversely, there are a percentage of dogs who respond to vaccination by producing a very high antibody titre. Most adverse reactions are genetically driven, and some breeds or families will be more likely to develop adverse reactions than others. The sire and dam of these affected dogs should not be mated together again.

It is proven that the duration of protection given by the core vaccines may last in excess of 9 years and possibly for the life of the dog and yet many vets in general practice still insist their `*clients*' should be vaccinated annually, even though this could be doing the animal more harm than good. A survey showed only 53% of UK vet practices had adopted the VGG recommended vaccine protocols for dogs.

A change is also needed in local bylaws that govern kennels and catteries as, unbelievably, they still insist on annual vaccination for boarders. Annual, or repeated, modified live vaccination does not necessarily increase protective immunity, as existing antibodies can fight against the vaccine, blocking it at the injection site and rendering it useless, therefore no benefit is gained. How many times do you hear if a dog has missed the revaccination date it has to have a full course of vaccinations again? Dogs that have not been regularly vaccinated but have previously received puppy shots and a yearly booster, only require a single dose of core vaccine and not a full course of vaccinations again. The VGG state

that ***‘this practice is unjustified and simply contrary to the fundamental principle of immunological memory’***.

So why has the uptake of the WSAVA vaccination guidelines been so slow in general veterinary practice in the UK? I’ll leave you to think about that.

This short article is intended to be an *‘appetiser’*. It is impossible to condense such a comprehensive document into a few paragraphs. Please don’t take my word for it – go into the WSAVA website and print off the information you need. It is so refreshing to have experts in the veterinary field writing a paper, specifically for pet owners and breeders, and one that doesn’t try to *‘pull the wool over our eyes’*. It has been written for good reason, in an attempt to transform the old fashioned, traditional vaccine protocol that has been in place for almost half a century, and this can only benefit our pets. Change can be made through the power of reliably informed dog owners and breeders. Yes, it is saying that vaccinating the individual is important (it must not be forgotten that vaccination was successful in eradicating smallpox virus from the world) but it is also suggesting that the decision whether to revaccinate or not lies with the owner and should be tailored to the individual dog. Annual vaccination is outdated and a thing of the past so don’t let your vet convince you that you are being irresponsible by not continuing to annually vaccinate your dog – in fact **you** are being responsible! Your vet should be aware of these guidelines, and if he or she chooses to ignore the VGG recommendations and continue to encourage annual vaccination then it is the vet who is being irresponsible and perhaps contravening the veterinary surgeons code:

“.....to ensure the welfare of animals committed to my care and that I will pursue the work of my profession with integrity and accept my responsibilities.....”

References:

World Small Animal Veterinary Association Vaccination Guidelines (WSAVA) for the Owners and Breeders of Dogs and Cats (2011)
<http://www.wsava.org/VGG1.htm>

WSAVA Guidelines for the Vaccination of Dogs and Cats (Revised 2010)

Veterinary Record – BSAVA Congress: Different Perspectives on Vaccination Advice (April 2011) Report by Catherine Jacob

Veterinary Record – Research: Vaccination of Dogs and Cats: No Longer so Controversial? M.J.Day (May 2011)

Draft Code of Professional Conduct for Veterinary Surgeons (2011)

Antibody titre testing can be performed at University of Glasgow, School of Veterinary Medicine and other UK laboratories.

VacciCheck is now available in the UK from: Complete Veterinary Care – <http://www.cvcgroup.co.uk/>, telephone 01923 470 0101. The parent company's website is www.biogal.co.il/.