

Summary

Vaccination plays a central role in protecting dogs from major canine infectious diseases. These include viral and bacterial diseases, which can cause significant illness and are difficult to treat. All vaccines authorised for use in the UK have met quality, safety and efficacy standards as assessed by the independent veterinary regulator. Vaccines and vaccination guidelines continue to evolve with research, development and scientific understanding. Based on current scientific understanding and knowledge of local disease threats, vets working with pet owners, can develop vaccination plans to suit the particular needs of individual dogs.

Introduction

Dogs are susceptible to a range of infectious diseases that can have a serious effect on their health and welfare. Fortunately, safe, effective, high quality vaccines have been developed to tackle many of these disease threats. Just as in human medicine, it makes sense to prevent, rather than to try and cure, whenever possible with widespread, serious and hard to treat infectious diseases. Vaccines are the cornerstone of any preventative approach to ensure good health and welfare. All vaccines on the UK market have shown greater benefits that outweigh the small risk associated with using any medicine – human or veterinary. Indeed, the profound positive impact that vaccines have can be forgotten, because they continue to be so successful at controlling disease. Yet when vaccination rates fall below certain levels the risk of disease outbreak increases, due to lack of herd immunity (explained later). Vaccinating to protect the health of dogs therefore makes good sense and benefits both individual dogs and the wider community are clearly evident when weighed against the increased major disease risks where they are not widely used.

Vaccine development, approval and monitoring

Years of significant investment in research and development has resulted in the vaccines available to use in the UK today. Behind the scenes, veterinary scientists work hard to develop safe, effective and high quality vaccines. Only the most suitable candidate vaccines make it through and are approved by

independent regulators, which are the Veterinary Medicines Directorate (VMD) in UK and the European Medicines Agency (EMA) in the EU. This means considerable investment, expertise and regulatory approval underpin all our veterinary medicines including vaccines. Animal medicine companies continue to support and invest in the safety and efficacy of their vaccines on the market through pharmacovigilance – an ongoing mechanism to continually assess products as they are used by vets. [Pharmacovigilance](#) means vets and owners can report adverse reactions, which must then be reviewed by animal medicine companies and the relevant regulatory agencies (1). Considerable resource is deployed for the ongoing monitoring of the safety and efficacy of all veterinary medicines, including vaccines, available to animals. These responsibilities are taken seriously by animal medicines companies and the continued review and input from the veterinary medicines regulatory agencies ensure that vaccines continue to remain safe and efficacious into the future. Reassuringly, serious adverse reactions are very rare and today the benefits of vaccination are considerable considering the potential risks associated with many canine infectious diseases.

Canine Vaccines and Vaccination

The important canine diseases for which vaccines are available include:

- Canine Distemper Virus (CDV)
- Canine Parvovirus (CPV)
- Canine Adenovirus (CAV)
- Canine Leptospira
- Canine parainfluenza virus (CPI)
- *Bordetella bronchiseptica*
- Rabies

It is important to remember that there is no single ideal vaccine schedule solution for all dogs. But rather, best practice considers dogs as individuals that should be assessed to determine what is appropriate. Important considerations include their travel/holiday plans e.g. rabies vaccination for dogs travelling outside of the UK –often referred to as the PETS travel scheme

and vaccinations for kennel cough if they are at significant risk of respiratory infection from being mixed with other dogs whilst e.g. staying at boarding kennels, with dog sitters or dog walkers (3).

The UK veterinary medicines regulator, the VMD, has published a position paper on authorised vaccination schedules for dogs including core and non-core vaccines (2). The 'core' canine UK vaccines, based on potential morbidity and mortality, are CDV, CPV and CAV, which cause canine distemper, parvovirus infection and infectious canine hepatitis respectively. These vaccines are recommended for all dogs, to protect them against these severe or life-threatening diseases. The 'non-core' canine vaccines are recommended for those puppies and dogs who are at risk of specific infections due to their geographical location, local environment or lifestyle. These include vaccines for canine leptospirosis, CPi and *Bordetella bronchiseptica* (2).

Canine leptospirosis is a serious and potentially fatal disease caused by bacteria called leptospires. These survive well in damp environments such as waterways and ditches. It is spread mainly by particularly rats and other rodents via their urine, which many dogs are likely to come into contact with. It may also be transmitted to humans from the environment or from an infected animal too. The *Leptospira* bacteria can cause a wide range of disorders and syndromes in dogs including commonly liver and/or kidney failure, bleeding disorders and lung disease. In humans, initial signs appear flu-like although again very serious consequences may follow. Any damage to the kidneys can be permanent even after appropriate treatment. Canine leptospirosis cases are identified throughout the UK, and dogs of all ages are susceptible. Vaccination is the best form of protection therefore this is commonly recommended by veterinary surgeons (2).

There is an opportunity for pet owners, working alongside their vet, to plan vaccination tailored to their dogs' particular needs. These requirements can be reviewed during regular veterinary health check-ups and altered as needed. A vaccination appointment not only help to protect your animal against infectious diseases, it also enables pet owners to discuss any concerns with their veterinary surgeon and allows the vet to perform a full health examination and diagnose any other issues that need to be addressed, nipping potential problems in the bud and keeping the dog in the best of health.

As the characteristics of vaccines differ, the frequency of booster vaccinations to ensure continued protection will typically depend on the minimum duration of immunity that has been demonstrated for that particular vaccine. This information can be found on associated product literature (the Summary of Product Characteristics or SPC), which will inform veterinary advice.

The benefits of vaccination can extend beyond the protection of individual dogs and puppies. The prevalence of disease in regional communities can also be reduced by decreasing the overall numbers of susceptible animals that are not immune. When a high proportion of dogs in the community are vaccinated the protection offered is called 'herd immunity' and this limits the ability for disease outbreaks to spread. Herd immunity also helps to protect the animals which have weakened immune systems and are not able to react to vaccinations appropriately, such as puppies, geriatric, pregnant and sick or immune-compromised dogs.

We have a legal and moral responsibility to protect the animals in our care from pain, suffering and disease (4). Responsible pet ownership includes regular veterinary health visits and ensuring preventative steps are taken to avoid the negative welfare consequences of ill health. Working with vets, owners can expect to receive up to date vaccination advice and access to the range of vaccines available to protect their dogs.

Titre testing

Vaccination is an individual recommendation by the vet, based on a dog's particular lifestyle and circumstances. In recent years, veterinary surgeons sometimes offer a different way of approaching vaccinations, namely serological titre testing. Titre testing assesses the level of antibodies circulating in your pet's blood when it is next due for a vaccine. When your pet's immune system is still able to protect the body against some of the diseases vaccines cover, a minimal level of antibodies are detectable on a blood test. Titre testing is based on the principle that in some animals the immunity after vaccination lasts longer than expected allowing a tailored decision on whether to revaccinate.

However, titre testing also has some significant shortcomings, and importantly, titre testing only provides a snapshot picture of antibodies at the time of the test and is only available and appropriate for some of the diseases that animals are vaccinated against. In most cases regular vaccination will still be recommended by your veterinary surgeon to maintain optimum protection against some diseases that cannot be accurately assessed in this way, such as canine leptospirosis and sometimes kennel cough. For dogs, immunity can be predicted reliably from a blood test for canine distemper, parvovirus, infectious hepatitis and rabies, however for the other diseases a blood test is unlikely to prove helpful in informing the decision as to whether to vaccinate or not.

The pros and cons of titre testing should be discussed with a veterinary surgeon and together a decision can be made if it is appropriate for a particular dog.

Take home messages:

- Many serious viral and bacterial diseases of dogs can be controlled through vaccination.
- All vaccines on the UK market meet rigorous safety, efficacy and quality standards through independent regulatory approval.
- Serious adverse reactions to vaccines are rare and the benefits of vaccination continue to outweigh this small risk.
- Vaccination appointments allow for a full general health examination to take place.
- Consult with your veterinary surgeon to plan the most appropriate vaccination schedule for your dog.

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What is NOAH? The National Office of Animal Health Ltd represents the UK animal health industry. It promotes the benefits of safe, effective, quality products and services for the health and welfare of all animals. For further information, including more briefing documents on animal medicines topics see www.noah.co.uk and follow @UKNOAH on Twitter.

(For more information on veterinary vaccines and regulation and safety of veterinary medicines see NOAH briefing documents on Vaccination for Animal Health: An Overview, Cat Vaccination, Rabbit Vaccination, Equine Vaccination, Farm Animal Vaccination, Pharmacovigilance and Controls on Veterinary Medicines).

References:

1. VMD adverse event reporting:
www.gov.uk/report-veterinary-medicine-problem
2. VMD position paper on authorised vaccination schedules for dogs, November 2015:
www.gov.uk/government/uploads/system/uploads/attachment_data/file/485325/Vaccines_VMDPositionPaper.pdf
3. UK government pet travel requirements for rabies vaccination guide:
4. <https://www.gov.uk/bring-your-pet-to-uk> Animal welfare guidance and legislation:
www.legislation.gov.uk/ukpga/2006/45/contents
www.gov.uk/guidance/animal-welfare