

Which Bordetella Vaccine to Use and Why?

A veterinarian inquires what would be the best bordetella vaccine to give and by what route, with special considerations for low stress handling.

Question:

I am writing to ask for your advice regarding Bordetella vaccinations. You have the unique position of bridging the gap between academia and real world infectious diseases.

There has been much controversy about which is the “best” bordetella vaccine. Do you have scientific information on these vaccines? what do you recommend to be used in the shelters or client pets.

I previously used the Intranasal vaccine but became tired of wrestling with dogs to get it into their nostrils and even wondered how much was really getting in. Additionally, I tried to make the dog's experience at the hospital as least stressful as possible and felt that the intranasal vaccine did not fit with the low stress experience. Additionally, the IN vaccine can make fearful or aggressive dogs even more so.

I am aware that there is an oral vaccine but haven't seen any evaluation in refereed journals. Thank you for your thoughts and help!

Answer:

Thank you very much for the excellent question! The best strategy for Bordetella bronchiseptica vaccination is always an engaging topic for discussion. What we recommend as the “best” vaccine is similar when we are considering a shelter dog versus a privately-cared-for dog. While there is NO vaccine for Bordetella that will provide sterile immunity, vaccination still provides some protection from infection, and vaccinated dogs are expected to develop milder clinical signs if they do become infected.

In shelters, we strongly advise that all dogs and puppies (14 days of age or older) receive an intranasal (IN) Bordetella vaccine with live avirulent bacteria immediately upon intake to the shelter. Ideally, all dogs and puppies should receive an IN vaccine at least 3 days and up to 1 week prior to admission to the shelter, although we recognize that pre-intake vaccination is not always possible. Only one dose of IN vaccine is required for a year's length of immunity, but there is an exception to the “one vaccine” guideline and that is for a puppy who is under 6 weeks of age at the time of the first IN vaccination. In this case, the puppy will require one revaccination after 6 weeks of age.

When we compare parenterally-administered (ie, subcutaneous, or SQ) Bordetella vaccines with IN vaccines in the context of a shelter setting, there are several reasons why the IN vaccine is preferred:

1. Only one dose of the IN vaccine is required, which is very convenient in a shelter setting, where time and staff are typically in short supply. Conversely, the subcutaneous form of Bordetella requires two vaccines, given 2-4 weeks apart.
2. Both mucosal and systemic immunity are induced very quickly: typically, within three days of a single dose of IN vaccine. Rapid onset of immunity is, of course, of primary importance in a shelter setting, where animals are continuously exposed to infectious diseases. With a SQ Bordetella vaccine, immunity does not develop until 2-3 weeks after the second vaccine is given.
3. Mucosal vaccines are not affected by maternal antibody and therefore ideal for puppies under 5 months of age.
4. Immunity lasts for 12 months.
5. The intranasal Bordetella vaccine offers the additional advantage of coming in a bivalent or trivalent form, containing parainfluenza and/or adenovirus-2, thus providing even broader protection against common causes of canine infectious respiratory diseases. Currently, the SQ form of Bordetella vaccine is available only in monovalent form and so does not provide concurrent protection against parainfluenza or adeno-2 virus. We recommend that the parainfluenza component is included in the vaccine and adeno virus should also be considered.
6. There are some labeled IN vaccines that allow 0.5 ml of diluent to be used vs. the entire 1 ml. This provides some ease in giving this vaccine.

While there is plenty of information available about the IN and SQ Bordetella vaccines, what do we know about the oral vaccine? We know that—at least as of this writing—the oral vaccine is available in a monovalent form only, and the published data about its efficacy is somewhat limited. However, there has been at least one recent study comparing the oral and IN vaccines. This study (a link is provided below) determined that puppies vaccinated with the oral form developed more severe clinical signs of respiratory disease than did puppies who received an intranasal form. Both groups, however, developed less severe clinical signs than did puppies who received no vaccine at all, indicating that the oral vaccine is better than nothing!

With this information it is suggested that the intranasal Bordetella vaccine (bivalent, or trivalent) is most appropriate in shelters and for owned pets. Some factors to take into consideration:

- What is the dog's temperament? You are correct that wrestling with a fractious dog in order to administer an IN vaccine can be both frustrating and dangerous. And if considerable thrashing occurs, a significant amount of IN vaccine may not make it to its target destination (ie, the dog's nasal passages). In such a situation, an oral vaccination could be considered if it is less stressful for the dog, but may also pose a risk to the individual administering the vaccine. We should also keep in mind there is a low stress handling movement occurring in shelters as well and many shelters are able to get most animals vaccinated with positive reinforcement and patience, while remaining safe. If needed an application of a muzzle allows for IN vaccine to still be given.
- Does stocking multiple Bordetella vaccines pose a risk for confusion? It has happened that IN vaccines have been given subcutaneously despite only one form of Bordetella vaccines being stocked. If stocking 2 or 3 vaccines, we do pose an increased risk for the vaccine to be given the wrong route.

Which vaccine to be administered could be based upon the above criteria, with consideration for infectious disease, ability to give the vaccine and potential cautions for having various vaccines in stock.

Here are some links to articles which you may find useful:

<http://www.uwsheltermedicine.com/library/resources/canine-infectious-respiratory-disease-complex-circd-a-k-a-kennel-cough#Vaccination>

http://www.vetmed.ucdavis.edu/vmth/small_animal/internal_medicine/newsletters/vaccination_protocols.cf

https://www.aaha.org/guidelines/canine_vaccination_guidelines/practice_vaccination.aspx

<https://www.ncbi.nlm.nih.gov/pubmed/27256028>

<https://www.ncbi.nlm.nih.gov/pubmed/28761185>

Thank you again for your question, and please do not hesitate to let us know if you have further inquiries!

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