

# 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 (21 days of age or older) receive an intranasal (IN) *Bordetella* (live avirulent bacteria ) with parainfluenza vaccine with 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.

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 adenovirus 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 – multiple manufacturers offer a monovalent *Bordetella* vaccine and at least one manufacturer offers a misting, oral vaccine in the bivalent form (*Bordetella* with parainfluenza). While some research exists about the efficacy of the oral monovalent *Bordetella* vaccine compared to IN vaccines (studies are linked below), each study conveyed differing efficacy between oral vs IN vaccines in challenged dogs; however, all studies showed that oral or IN vaccine were always better than not providing any vaccination at all in protecting dogs. It should be noted

that published, independent data about the bivalent oral *Bordetella* vaccine's efficacy and onset of immunity (a critical metric in the shelter environment) are not available yet.

Until independent studies are published about the oral bivalent *Bordetella* vaccine, we still suggest the intranasal *Bordetella* vaccine (bivalent or trivalent) as the most appropriate formulation to use 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 the use 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, there is an increased risk for the vaccine to be given the wrong route so clear labels and training of staff are critical to prevent administration mistakes.

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-cir-dc-a-k-a-kennel-cough#Vaccination>

[http://www.vetmed.ucdavis.edu/vmth/small\\_animal/internal\\_medicine/newsletters/vaccination\\_protocols.cfm](http://www.vetmed.ucdavis.edu/vmth/small_animal/internal_medicine/newsletters/vaccination_protocols.cfm)

<https://www.aaha.org/aaha-guidelines/2022-aaha-canine-vaccination-guidelines/vaccination-of-shelter-dogs-and-puppies/>

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

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

<https://bvajournals.onlinelibrary.wiley.com/doi/full/10.1136/vetreco-2018-000285>

<http://jarvm.com/articles/Vol11Iss3/Vol11Iss3Schultz.pdf>

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

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