

Avoid the coughing kennel: CIRDC management in the shelter.

Erin Doyle, DVM, DABVP (Shelter Medicine Practice)

Canine infectious respiratory disease complex (CIRDC), colloquially known as kennel cough, is a very common concern in shelter dogs. Numerous pathogens can cause CIRDC, ranging from the common pathogen *Bordetella bronchiseptica* to more virulent pathogens such as Canine Influenza Virus (CIV) or Canine Distemper Virus (CDV). These proceedings and corresponding session will focus on a three-tiered approach to CIRDC management in the shelter: individual case management, outbreak response, shelter population management and prevention.

### *Individual case management*

Uncomplicated CIRDC is often self-limiting and requires minimal therapeutic intervention. The disease can become complicated and require more intensive intervention based on host factors or pathogen factors. Complicated cases may include additional concerns such as lower airway disease, significant signs beyond upper airway disease (i.e. anorexia, lethargy, fever), and/or chronic upper airway signs. Host factors contributing to complicated CIRDC can include immaturity (neonates or juveniles), immune suppression, concurrent disease, or potentially chronic stress. Pathogen factors typically include infection with a more virulent agent such as CIV or CDV.

Isolation is the first step in individual case management unless symptoms are very mild. However, isolation should be balanced with a mindfulness towards length of stay. It is often advisable to allow uncomplicated CIRDC cases to remain available for adoption. Depending on the shelter design, staff/volunteer availability, and overall shelter population, this may involve isolation *in situ* in the adoption area with a mindfulness toward the potential airborne spread of CIRDC. Alternatively, potential adopters may be allowed to visit an affected dog in the isolation space. Dog-dog interaction in the shelter such as in playgroups should generally be avoided until clinical signs resolve. However, the decision regarding cessation and resumption of dog-dog interactions should consider the behavioral health of the affected dog and general health and susceptibility of any dogs who would be potentially exposed.

Antibiotic therapy is warranted in most complicated CIRDC cases and some uncomplicated cases. Doxycycline is the ideal first line antibiotic choice for CIRDC. Antibiotic treatment can expedite a resolution of clinical signs which in turn can reduce the risk of spread in the shelter. However, this benefit of use should be balanced with a mindfulness towards antibiotic stewardship and the self-limiting nature of uncomplicated CIRDC. Individual adult dogs in an otherwise healthy shelter population can often be managed without the need for therapeutic intervention. Additional supportive care such as fluid and nutritional support may be necessary for complicated CIRDC cases. Cough suppressants are typically not indicated for affected dogs in a shelter setting.

Another decision regarding individual case management in the face of CIRDC is whether to perform diagnostic testing. PCR respiratory panel testing is a convenient and effective option when diagnostic testing is indicated. Bacterial culture and sensitivity can be another useful diagnostic test particularly when lower airway disease is present. However, most uncomplicated CIRDC cases do not warrant additional diagnostics. In the context of individual case management, testing should be considered if clinical signs are unexpected in their nature and/or severity or if the dog has a clinical history that would warrant increased suspicion for a more virulent pathogen (i.e. transported from a CDV endemic area).

### *Outbreak response*

Outbreak response in the face of CIRDC will vary depending on the pathogen involved. The response to uncomplicated cases should involve isolation of affected dogs and a review of population management and preventative measures as discussed later in these proceedings. However, management of CIV or CDV in the shelter involve a more robust immediate response plan. As such, another factor that should prompt respiratory PCR panel testing would be unexpected spread of disease

in the shelter, either related to the quantity of affected dogs or the signalment of affected dogs. For example, significant morbidity in adult vaccinated dogs should increase the index of suspicion for CIV and prompt diagnostic sampling. The exact number of dogs to sample will vary based on the affected population but at minimum should include 10-30% of the population<sup>1</sup>.

When faced with a diagnosis of CIV or CDV, outbreak response should proceed in a manner like that described in the CPV proceedings including categorization of the canine shelter population as infected, exposed or unexposed. However, complicating factors for CIV and CDV include the airborne transmission risk as well as the prolonged shedding period for H3N2 CIV (up to 21 days) and prolonged incubation period for CDV (up to six weeks).

### *Shelter population management and prevention*

Shelter-acquired CIRDC should trigger a review of shelter population management and prevention strategies. Increased levels of CIRDC are a common symptom of operations functioning beyond the shelter's capacity. A shelter's capacity includes resources beyond just the physical space including staff/volunteer time, veterinary capabilities, and adopter or placement capacity. The implications for CIRDC levels on capacity concerns highlight the importance of regular data monitoring and daily population rounds. Increased CIRDC levels should prompt an evaluation of bottlenecks in the normal flow of animals through the shelter. With a successful balance of intake need and outcomes along with an efficient flow of animals through the shelter, non-existent or rare shelter-acquired CIRDC is achievable.

However, even shelters with successful population management programs require additional measures to prevent CIRDC outbreaks in the shelter. Some dogs will enter the shelter previously exposed or affected. In addition, unexpected events such as large-scale intakes or sudden capacity shifts can temporarily impact the population dynamics in the shelter. CIRDC prevention efforts begin at or before intake. Thorough intake screening for signs of disease should take place for all dogs. Dogs identified with clinical CIRDC at intake should be isolated and managed accordingly to avoid exposure of the population. In relocation efforts, dogs should be screened for signs of CIRDC prior to transport with affected dogs removed from the transport population.

Intake vaccinations are another critical tool in the prevention of CIRDC infection in the shelter<sup>2</sup>. Modified-live intranasal vaccination against *B. bronchiseptica* and canine parainfluenza virus (canine adenovirus-2 optional) will not fully prevent CIRDC but is vital to the reduction of CIRDC in a shelter setting. Intranasal is the preferred administration route due to its onset of action and efficacy. The efficacy and rapid onset of protection against CDV with parenteral modified-live or recombinant vaccination make this vaccine a critical component of CDV prevention in the shelter. The role of CIV vaccination in a shelter setting is less straightforward given the need for booster vaccination to achieve full efficacy. However, its use may be warranted based on community disease levels and shelter length of stay.

Fortunately, none of the common CIRDC pathogens are particularly durable outside the host. Thus, routine sanitation and biosecurity protocols will readily address CIRDC agents. Ultimately, CIRDC in the shelter can be successfully prevented with thoughtful and well-implemented preventive medicine protocols, good biosecurity, conscientious daily monitoring, and effective population management strategies.

### References:

1. Hurley KF. Outbreak management. In: Miller L, Hurley KF, ed. Infectious disease management in animal shelters. Ames, IA: Wiley-Blackwell, 2009; 39-48.
2. AAHA. Vaccination recommendations – shelter-housed dogs. Available at: [https://www.aaha.org/guidelines/canine\\_vaccination\\_guidelines/shelter\\_vaccination.aspx](https://www.aaha.org/guidelines/canine_vaccination_guidelines/shelter_vaccination.aspx).